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### A Comparison of Use of Archived Video-Streamed Tapes

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**A Comparison of Use of Archived Video-streamed Tapes**

A Research Project Presented to the Graduate Faculty of the  
Department of Occupational and Technical Studies  
Old Dominion University

In Partial Fulfillment of the Requirements for the  
Masters of Science in Occupational and Technical Studies

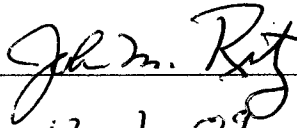
By  
Donald Jerry Bartley

November 2009

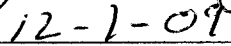
## Approval Page

This research paper was prepared by Donald Jerry Bartley under the direction of Dr. John M. Ritz in OTED 636, Problems in Occupational and Technical Studies. It was submitted to the Graduate Program Director as partial fulfillment of the requirements for the Masters of Science in Occupational and Technical Studies.

APPROVED BY:



Date:



Dr. John M. Ritz, Advisor and Graduate Program Director

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## **Chapter I**

### **Introduction**

Modern technology had enabled colleges and universities to offer classroom instruction called distance learning in many different localities, states, and even countries. A common complaint about distance learning was the lack of human contact between instructor and student (Mullins-Dove, 2006). A recent method of incorporating human interaction in distance education was streaming video (Nickerson, 2003). Cornell University's index (2009) defined video-streaming as "a technology to play audio and/or video files (either live or pre-recorded) directly from a server without having to download the file" (para. 4).

Streaming video came both as a live feed and in archived form (Mullins-Dove, 2006). Live webcasts were real time viewings of the classroom. Archives were tapes of the class that could be viewed after the class session had ended. Live video-streaming was usually restricted for students that were registered for video-streaming, while archived tapes were usually available to all students of the class. A big advantage of archived tapes was that they allowed a student to review a part of the class that they might not have understood or had missed altogether.

Video-streaming courses had been offered at Old Dominion University in Norfolk, Virginia, since 1998 (Gordon, 2002). While there was a recognized value of having video-streaming classes at Old Dominion University, no research existed on how much impact archived video-streaming class tapes had on students' academic success. This study was undertaken to determine if archived tapes in their present form make a difference in the academic success of students who took the classes.

### **Statement of the Problem**

The problem of this study was to compare Old Dominion University's Occupational and Technical Studies distance education graduate students who made use of archived classroom tapes in order to determine the usefulness of the archived tapes for improved classroom performance.

### **Research Goals**

To guide this study the following hypothesis was established:

H<sub>1</sub>: Occupational and Technical Studies distance education video-streaming graduate students who review archived classroom tapes would out perform academically compared to video-streaming graduate students who did not review archived tapes.

### **Background and Significance**

Distance learning had grown at a phenomenal rate in the last ten years. A survey conducted by the National Center for Education Statistics (2001) reported that 56% of all two and four year post-secondary schools offered some type of distance learning. A survey by the same agency reported the number of two and four year post-secondary education schools offering distance learning had jumped to 66% (National Center for Educational Statistics, 2006).

Many factors were fueling the growth of distance learning in post-secondary schools. Students were demanding more flexible schedules. Distance learning technology enabled post-secondary schools to provide college access to students who would not otherwise have had access. Distance learning enabled post-secondary schools to offer more courses and increased student enrollment (Lewis & Parsad, 2008).



Despite its rapid growth, distance learning was in its infancy. It was important that the resources used in distance learning were used in the most effective manner (Corry, 2008). While research would not prevent mistakes from being made, it would help alleviate many of the problems and provide more success stories for students taking the classes (Corry, 2008).

Video-streaming was a delivery mode of distance learning. Studies on video-streaming had produced evidence that its use might increase learning in the classroom (Boster, Meyer, Roberto, Inge, & Storm, 2006). While research studies on video streaming had been conducted, little research was available for some of the technological offshoots or learning object of video streaming, such as archived tapes of the classes (Keown, 2007).

Old Dominion University (ODU) was a pioneer in telecommunications and had been a leader in distance learning since the mid 1980's (Cooley, 2009). More than 3500 students at ODU had completed part of their courses leading to graduation through the Office of Distance Learning (Cooley, 2009). In order to maintain a high quality distance learning program, observation and research of all aspects of ODU's distance learning program was needed. This study researched the use of archived tapes in video-streaming distance learning classes by graduate students in the Occupational and Technical Studies (OTS) Department. This study would compare students that made extensive use of archived tapes to those that seldom used them to determine the usefulness of archived tapes for improved academic performance. By conducting this study, a better understanding of the effectiveness of archived tapes for academic achievement would be achieved.

### **Limitations**

The limitations of this study were as follows:

- This study was limited to final grades of students registered in Occupational and Technical Studies from Fall 2008 to Summer 2009. These included the following distance learning graduate courses: OTED 635, Research Methods in Occupational and Technical Studies; OTED 730/830, Introduction to Technology; OTED 750/850, Trends and Issues in Training: Model and Simulation; OTED 760/860, Trends and Issues in Occupational Education; OTED 761/861, Foundations of Adult Education/Training; OTED 765/865, Trends and Issues of Economic and Workforce Development; OTED 785/885, Curriculum Development in Occupational Education and Training; OTED 788/888, Instructional Strategies and Innovations in Training and Occupational Education; and OTED 789/889, Instructional Technology in Education.
- This study was limited to video-streaming students in the above classes at Old Dominion University.
- This study did not consider the effect, if any, of previous experiences of students taking distance learning classes and using archived tapes would have on the final grades received.

### **Assumptions**

In the study there were several factors that were assumed to be true and correct.

Those assumptions were as follow:

- All students taking Occupational and Technical Education (OTED) Fall 2008 to Summer 2009 classes that were offered through distance learning were either

degree seeking, taking a course for recertification, or for professional improvement.

- All students enrolled in the courses were in an Occupational and Technical Studies graduate program or a program that required the completion of OTED 635, Research Methods in Occupational and Technical Education.
- Course requirements for TELETECHNET and campus-based students were the same.
- All students of the study had access to archived tapes of the individual classes.
- The distance learning courses were taught by a variety of instructors with varying personalities and teaching styles.

### **Procedures**

This study compared the academic performance of students taking Occupational and Technical Studies that were available through distance learning through video-streaming. Video-streaming students' were asked to complete a questionnaire detailing how much they viewed archived tapes during the OTED courses available in Fall 2008 to Summer 2009. The students were put into one of two categories, those that used archived tapes extensively (those viewing tapes 6 or more times) and those that made little use of archived tapes (those viewing tapes less than 6 times). Students involved in the study were asked if archived tapes helped improve their grade in the class. Once all the data were collected, the grades of the two groups were compared using chi-square statistics to determine how much impact viewing the archived tapes had on overall academic success.

## Definition of Terms

With regards to this study, the following terms were defined for clarification purposes:

Asynchronous Internet-based instruction (AIBI) - Internet-based instruction sent and viewed after the instruction was written.

Campus-based classes - A traditional classroom environment where the instructor and all of the students participating in the course are located in the same room.

Distance learning students - Students away from the instructional location that view the classes through video-streaming or at a remote site through a live television.

Degree seeking student - A student who has applied and met admission requirements for a specific college and is actively pursuing a Masters of Science or Doctorate degree at Old Dominion University.

Distance learning - Distance learning is acquisition of knowledge, both synchronous and asynchronous, that takes place in a remote location away from the instructional location.

Learning Objects - Keown (2007) defines learning objects as “quick items of instruction or information that are designed to support the learning objectives of the course or training” and have the four attributes of “reusability, interoperability, durability, and accessibility” (p. 75).

Teletechnet – Old Dominion University’s satellite delivery distance learning system.

Video-streaming –Mullins-Dove (2006) defines video-streaming as “a new instructional technology used to deliver audio and video presentations over the Internet” (p. 63).

## **Summary and Overview of Chapters**

This study sought to determine the effectiveness of archived tapes of video-streaming classes for students' academic success. The study was restricted to students taking OTED 635, OTED 730/830, OTED 750/850, OTED 760/860, OTED 761/861, OTED 765/865, OTED 785/885, OTED 788/888, and OTED 789/889 from the Fall 2008 to the Summer 2009 sessions at Old Dominion University. Chapter I introduced the reader to the research area of archived tapes in video-streaming classes. The chapter identified the problem area of determining the usefulness of archived tapes for academic success based on the grades of the participants being studied. Chapter I discussed the background of video-streaming and archived tapes and identified why studies like this one are significant to maintain a high quality distance education program. The chapter listed the limitations of the study to video-streaming students in Occupational and Technical Studies graduate programs from Fall 2008 through Summer 2009. Chapter I listed the assumption that the participants in the study were degree seeking Occupational and Technical Studies graduate students with the ability to view archived tapes. Finally, the chapter defined the procedures of how the study will progress and defined special terms that were used in the study.

Chapter II of this study would include a review of literature relating to video-streaming and archived tapes. Chapter III contained the methodology describing how data were collected and what procedures were used to analyze the data. Chapter IV contained the findings of the study. Chapter V stated the conclusions based on the findings and recommendations for future research studies.

## **Chapter II**

### **Review of Literature**

The goal of this study was to collect and analyze data comparing students who make extensive use of archived tapes to students that seldom or never view them and determine if viewing archived tapes improved academic performance. Before collecting the data and evaluating the results, a review of video-streaming and archived tapes was offered.

This section of the study introduced many concepts relating to archived tapes in distance learning. Chapter II discussed the history and development of archived tapes, past research of video-streaming and archived tapes, and the implementation of video-streaming at Old Dominion University. The chapter concluded with a summary of the covered material.

### **History and Development of Archived Tapes**

The early forerunner of modern archived tapes of classes was the introduction of audio-visual devices in schools in the early 1900's (Jefferies, 1999). Early audio-visual devices were educational or instructional films or tapes that were prerecorded and shown in the classroom by projector or on a television. Modern archived tapes were electronically recorded class sessions and instruction delivered on a computer by the Internet. The early systems were entirely asynchronous, as were present day archived tapes.

The importance of visual instruction was first realized in 1905 and the first instructional films were published in 1910 (*Before 1920*, 2009). They were used in

correspondence classes for distance students. The public school system in Rochester, New York, was the first to use films as a teaching tool in 1910 (*Before 1920*, 2009). Due to the lack of teacher training and the uncertainty of how to use audio-visual devices, the early machines never progressed beyond the instructional film phrase. Real progression was not achieved until the United States participation in World War II.

World War II presented a challenge to the United States military to develop programs that could train the troops quickly and conveniently (Chadha, Dixon, Treat, & Wang, 2006). The eventual answer was the use of instructional films. The military hired many well-established researchers to work in the newly created Division of Visual Aids for Training within the United States Office of Education (*The 1940s*, 2009). The position of instructional technologist emerged leading to instructional development teams (*The 1940s*, 2009).

Instructional television grew in the 1950's following the war (Reiser, 1987). The audiovisual instruction movement shifted from the actual devices to the entire process of sender, receiver, and communication medium (Reiser, 1987). Following the passage of the National Defense Act of 1958, the government funded media research and curriculum development, as well as, university based research and development (Reiser, 1987).

Private sector businesses also got in the act of developing instructional systems during this time period. IBM (International Business Machines) teamed with Stanford University in 1963 to form the Computer Curriculum Corporation (CCC) to develop computer aided instruction (CAI) (*The 1960's*, 2009). IBM introduced the IBM 1500 in 1966 (Troutner, 1991). The machine was the first computer built with education in mind (Troutner, 1991). In the late 1960's, the machines were used in a research project done at

Brentwood Elementary School in East Palo Alto, California (Troutner, 1991).

Individualized drill and practice, computer use as tutorial systems, and dialogue interaction between the students and the computers were the focus of the study (Troutner, 1991). The study concluded that computers would impose a rigid curriculum on students, widespread computer use would lead to excessive standardization, and individuality and human freedom were threatened by the modern technology (Suppes, 1968).

In addition, two other significant developments of computers were developed and implemented in the 1960's and early 1970's. Professor Don Blitzer and some colleagues founded the Computer-based Education Research Laboratory (CERL) at the University of Illinois in the early 1960's (Wooley, 1994). CERL created the Programmed Logic for Automatic Teaching Operation (PLATO) (Troutner, 1991). Many current instructional technology educators considered PLATO as the beginning of educational computer software (Troutner, 1991). The CERL team initially produced thirty courses for elementary, high school, and college students (Troutner, 1991). The system had the ability to provide tutorial instruction, inquiry logic, and research (Troutner, 1991). Students could work on their own pace, ask for additional help, and branch through reflection questions in different ways (Trippon, 1968). PLATO's developers added formats for on-line chat, instant messaging, message boards, online forums, email, and remote screen sharing (Wooley, 1994).

The other system was developed by collaboration between the University of Texas and Brigham Young University with a grant from the National Science Foundation called the Time-Shared Interactive Computer Controlled Information Television



(TICCIT) (*The 1970's*, 2009). It was a primary system for college students using mincomputers, color TV, graphics, and the expertise of content specialists and psychologist well versed in instructional design (Chambers & Sprecher, 1983). Freshman mathematic and English courses at Phoenix College in Arizona and a community college in Alexandria, Virginia, using TICCIT began in the 1971-1972 school year (Chambers & Sprecher, 1983). This TICCIT project was the first large scale project emphasizing innovative approaches to hardware as well as consideration of learning theory and instructional strategies in the design of course material (Chambers & Sprecher, 1983). The Education Testing Service (ETS) evaluated the effectiveness of the programs and determined that students made significant achievement over traditional classes (Chambers & Sprecher, 1983). The students, however, stated that they preferred traditional lecture classes (Chambers & Sprecher, 1983). A big reason for this was students received little feedback from their instructors resulting in uncertainty of their progression in the class (Chambers & Sprecher, 1983). The ETS study taught designers that a feedback mechanism and instructor training were necessary components in the systems success (Chambers & Sprecher, 1983).

The 1970's brought about the development of mini-computers using newly designed micro-chips (Troutner, 1991). The early microcomputers were expensive and not readily affordable in many homes or school districts. Job and Wozniak introduced the Apple II personal computer in 1978 and schools could begin to afford microcomputers (Troutner, 1991). Computer educational software was divided into six categories based on the observation and studies of three systems developed in the 1960's and early 1970's (Troutner, 1991). Drill and practice programs used the computer much

like flash cards were used (Troutner, 1991). Tutorial programs were developed to teach concepts and provide comprehension questions (Troutner, 1991). Simulation programs were developed to allow students to interact with realistic situations as they were developing their thinking skills (Troutner, 1991). Interactive video programs were developed to control a video source, computer graphics, and text (Troutner, 1991). Utility programs helped a teacher produce learning tools for students (Troutner, 1991). The final classification was tool software such as word processors, spreadsheets, databases, and so forth (Troutner, 1991). Students and teachers used these utility tools to help them with daily work and assignments (Troutner, 1991). Many of these classifications were combined and became transparent as educational computer systems advanced.

Satellite broadcast of instructional video eventually reached the Internet in wide spread use with the development of GOPHER by the University of Minnesota in 1991, the World Wide Web by CERN (European Organization for Nuclear Research) in 1992, and Mosaic by the University of Illinois in 1994 (Pedroni, 1996). Old Dominion University implemented a satellite classroom delivery network in 1994 causing a dramatic increase in the scope of its distant learning program (Gordon, 2002).

As the reader would see in the next chapter, many of the early studies of video-streamed classes found problems similar to those encountered in the early stages of audio visual classrooms. Relating the past attempts of using instructional television in education would give the reader a clearer idea as to why video-streaming evolved in distance education and problems associated with using the technology.

### **Past Research Studies of Video-Streamed Classes**

Video-streaming was the process of viewing video over the Internet (Boster et al., 2006). A streamed file was simultaneously downloaded and viewed, but left no physical file on the viewer's machine (Boster et al., 2006). A video player buffer stored the information while the user viewed the program (Boster et al., 2006). The required connection came without a cost to the viewer other than an Internet connection (Boster et al., 2006).

An archived tape was webcasts that were prerecorded and could be played back at a later time (Mullins-Dove, 2006). Many real time events, such as video-streaming were often recorded so that viewers could replay them at their convenience (Mullins-Dove, 2006).

Studies had shown that video-streaming and archived tapes had numerous advantages in education, but some disadvantages as well (Boster et al., 2006; Mullins-Dove, 2006). Many of the studies had shown that the use of video-streaming in education increased learning. Archived tapes allowed students who were unable to attend a class to view the class at a later time (Mullins-Dove, 2006). Some of the disadvantages were similar to those in earlier studies on instructional television for education.

Research had shown that video-streaming increased student attention in the classroom (Boster et al., 2006). Teachers reported believing that the increased attention by students increased retention and motivation to learn which led to improved learning rates and improvement in student grades (Boster et al., 2006). The studies had shown that students with learning and attention problems and those with different learning styles did better academically in video-streaming classes due to the large amount of information

being presented quickly (Boster et al., 2006). Studies had shown students' receptivity, interest, alertness, attentiveness, and curiosity increased in video-streaming classes as compared to standard instructor lectures (Boster et al., 2006). Recent studies had shown that communication technology promoted an environment in which students were actively engaged to learn through individual and collaborative participation with the teacher and through interaction with other students (Boster et al., 2006).

Another big advantage of distance education and video-streaming was making education available to students who would not otherwise have access (Lewis & Parsad, 2008). Education availability and increasing student enrollment was a major factor affecting higher learning institutions decision to offer credit gaining distance education classes (Lewis & Parsad, 2008). Asynchronous Internet-based classes were the most widely used instructional delivery of distance education courses (Lewis & Parsad, 2008). Students appreciated the use of asynchronous delivered lectures because it made them feel as if they were in the classroom while allowing them to view the classes at their convenience (Mullins-Dove, 2006). The student had control of his or her learning and could rewind and replay the content as needed (Mullins-Dove, 2006). Physically disabled students, who might not have the ability to attend regular classrooms or have access to learning opportunities, could have the class brought to them through distance education (Mullins-Dove, 2006). Faculty members considered pre-recorded lectures invaluable because no book or handout could provide the depth of information a lecture from a leading expert on the subject could (Mullins-Dove, 2006).

Research suggested that the use of communication technology, such as video-streaming, reduced disciplinary and attendance problems in the classroom (Boster et al.,

2006). For one, students were not in the classroom to cause disruptions. Studies had shown that students paid more attention viewing classes through video-streaming, thus enhancing their desire to learn (Boster et al., 2006). These factors produced a more engaged and focused classroom (Boster et al., 2006). Teachers could spend their time actually teaching students rather than performing tasks that did not contribute to the learning process (Boster et al., 2006).

Research had shown video-streaming did have some disadvantages. Some teachers lacked the motivation and ability to use video-streaming (Boster et al., 2006). Teachers did not consider time zone differences and technical difficulties that made it hard for some distance education students to participate in “virtual office hours” and other real time classroom activities (Evans & Lockbee, 2008). The teachers did not provide appropriate feedback to distance education students’ questions or progress in class causing a feeling of detachment by the distance education students (Evans & Lockbee, 2008).

Another disadvantage was network problems. Research had shown that technology breakdowns sometimes occurred causing students without archived tapes no way of viewing the missed class (Boster et al., 2006). Another problem associated with technology breakdowns was for students doing a project or taking a timed exam within the class website. A disconnected network would cause the student to lose all of the work he or she had been doing (Evans & Lockbee, 2008).

Despite the research that had been done on synchronous and asynchronous instructional delivery, more research needed to take place. As video-streaming and asynchronous instructional delivery grew and transformed, available research findings

would help prevent major problems, but it might not produce the most effective manner of using the technology (Corry, 2008). Thus, new studies were needed to ensure that the technology was used in the most effective manner (Corry, 2008).

### **Old Dominion University's Teletechnet System**

Old Dominion University (ODU) had been a pioneer in telecommunications and distance education since the mid-1980's (Cooley, 2006). In the early 1990's, Old Dominion University began constructing a satellite broadcast of classes at select community colleges in the United States (Snowdy, 2009). In 1994, ODU introduced Teletechnet (Cooley, 2006). The early Teletechnet system was interactive television delivered by satellite broadcast from the main campus to various distant sites (Snowdy, 2009). At that time, any student in the state of Virginia was within 50 miles of access to a four year degree at the university (Gordon, 2002). Today, Teletechnet was recognized as the largest satellite-based distance education system of its kind in the United States (Dishbrow et al., 2001) with nearly 50 locations throughout Virginia and as far away as Arizona, Georgia, Washington, the Bahamas, and United States Navy ships and submarines deployed around the Earth (Cooley, 2006).

In 1998, the president of Old Dominion University mandated that the University would make its programs available to students in their homes and businesses using the Internet and streaming video (Gordon, 2002). Engineers, technicians, and designers gathered to answer the mandated building of a video-streaming system that was ahead of its time (Gordon, 2002). Accreditation boards were not knowledgeable of streaming video and were not sure it would provide an acceptable education for distance learning (Gordon, 2002). To answer this problem, the staff of engineers built an infrastructure

that would provide the same educational experience the university based students received (Gordon, 2002). The staff built six video-streaming classrooms with cameras and microphones to capture the learning experience and fed the signals to a sub-control room (Gordon, 2002). The audio and video were recorded on a digital video tape deck in the sub-control room as a backup if the archive encoder had a problem during the live delivery of the class (Gordon, 2002). The sub-control signals were routed through master control, where supervisors monitored all incoming and outgoing signals for satellite delivery.

In the 2000's, ODU expanded its delivery modes to include online and video-streaming classes (Snowdy, 2009). By 2000 and 2001 school year, ODU had streamed 60, 3-hour classes each semester (Gordon, 2002). In addition, the video-streamed classes contained archived tapes of the class sessions that distance learning students taking the class could view at a later time. Implementing video-streaming and archived tapes had enabled ODU's Teletechnet student program to grow, thus expanding the market ODU was able to reach and increasing enrollment (Gordon, 2002).

### **Summary**

Chapter II produced the background of audio-visual learning systems and studies that resulted in the satellite and Internet based distance learning courses that were prominent today. The evolution of instructional films from training troops in World War II to the development of three early computer systems, the IBM 1500, PLATO, and TICCIT in the 1960's, led to the satellite and Internet classroom delivered systems that were in use today. PLATO in particular developed and introduced concepts of online collaboration, network conferencing, and email that were similar to those in present

distance education systems. Inventions of the microcomputer and development of techniques made the Internet easier to use in the 1980's and early 1990's and produced the computer based Internet delivery systems used in higher learning today.

Old Dominion University (ODU) developed the largest satellite delivery educational system of its kind in the early 1990's. The system provided opportunities for higher education to students in many remote communities. ODU added a computer based Internet delivery system in the early 2000's. The ODU system was provided as web-based classes and in a video-streaming format. Archived tapes were available to video-streamed students. Archived tapes remedied many problems found in video-streamed classes, but they lacked the instructor and group interaction found in live video-streamed classes.

Chapter III of this study would analyze and discuss the methods and procedures used to determine if there was an improvement in the grades of distant education students taking graduate Occupational and Technical Studies video-streamed classes who made extensive use of archived tapes to those that did not.



## **Chapter III**

### **Methods and Procedures**

This study was a descriptive research study to determine the effectiveness of archived taped viewing of classroom sessions in regards to students' academic achievement. The purpose of this chapter was to describe the methods and procedures used to determine if archived tapes improved the academic performance of video-streaming graduate students at Old Dominion University. This chapter will describe the population, research methods, and statistical procedures used to collect and analyze the data. This chapter concluded with a summary of the covered material.

### **Population**

The population of this study consisted of video-streaming students taking Occupational and Technical Education graduate courses OTED 635, OTED 730/830, OTED 750/850, OTED 760/860, OTED 761/861, OTED 765/865, OTED 785/885, OTED 788/888, and OTED 789/889 during the Fall 2008 to Summer 2009 sessions at Old Dominion University. The students involved in this study resided throughout the United States.

The population of the students in the study consisted of both male and female students ranging in age from the mid-twenties to the mid-fifties. The study consisted of 77 students in 10 different classes from the Fall 2008 to the Summer 2009 semesters. All the students in the study were graduate students taking the classes through video-streaming. The level of experience of using video-streaming technology and archived tapes varied among the participating students.

### **Instrument Design**

The instrument used to collect the data was a survey sent by email to all video-streaming students taking OTED 635, OTED 730/830, OTED 760/860, OTED 765/865, OTED 785/885, OTED 788/888, OTED 850, OTED 861, and OTED 889 from the Fall 2008 to Summer 2009 semesters. The survey contained five questions concerning the amount of use of archived tapes during the semester, the helpfulness of using archived tapes, and whether viewing archive tapes caused an improvement in the final grades in the course. See Appendix A for a copy of the survey.

### **Methods Of Data Collection**

This research study was based on the use of archived tapes and was developed to determine if viewing archived tapes improved the academic performance of students that used them. In order to collect the data required for this study, the researcher contacted the Graduate Program Director of Occupational and Technical Studies for a list of names of video-streaming students in the classes within the scope of this research. The email addresses of the students were obtained using the Old Dominion University Student Email Directory. Each eligible student was sent an email explaining the scope of the study, why the study was important, and the importance of participating in the study. The students were asked the number of times they viewed archived tapes in the class, whether the archived tapes helped to improve their grade, whether they could have passed the class without archived tapes, how much of a grade difference, if any, the archived tapes helped, and the final grade they received in the class. The students were assured their identity would remain confidential. See Appendix B for a copy of the cover letter that was sent to the participants.

### **Statistical Analysis**

Once all of the data were returned to the researcher, the results were tabulated and analyzed to determine the comparison between academic success of video-streaming students that made frequent use of archived tapes and video-streaming students that seldom used archived tapes. Since the focus of the research was on the frequency of use of archived tapes for academic success, a chi-square statistical analysis was used. The four factors used for the chi-square were students who viewed archived tapes six or more times during the semester, students who viewed archived tapes less than six times during the semester, whether viewing archived tapes helped improve their grade, and if viewing archived tapes had no affect on their grade.

### **Summary**

This chapter provided information on how the research study was conducted. The chapter described the population involved. It described the instrument design of a five question survey concerning the amount of times the subjects viewed archived tapes during the semester, how helpful archived tapes were, and whether viewing archived tapes helped the students achieve academic success in the class. The chapter described how data would be collected. Once the data were collected, they were tabulated into four factors of students using archived tapes six or more times during the semester, students using archived tapes less than six times during the semester, if viewing archived tapes helped improve their grade and if viewing archived tapes had no affect on their grade. A chi-square statistics was used to determine the significance of the frequency of use of archived tapes to academic success. The findings of the statistical analysis will be discussed in Chapter IV.

## **Chapter IV**

### **Findings**

The problem of this study was to compare Old Dominion University Occupational and Technology Education distance learning graduate students who made use of archived classroom tapes in order to determine the usefulness of the archived tapes for improved classroom performance. This chapter would present the findings of the research study.

#### **Participation Response**

Surveys were sent to 77 participants by email. Forty-three surveys were returned for a returned rate of 56%. Some of the respondents wrote open-ended opinions stating pros and cons of the present archived tape system. The chief complaint cited by 14 responders was that the user had to watch the whole archived tape in order to view the section he or she needed. They stated a tool enabling them to fast forward to the desired instructional location would compel them to use the tapes more. Six video-streamers at distant sites remarked they used archived tapes because they had difficulties receiving the live feed of the class for some classes. They used the tapes to view missed classes. Eighteen of the respondents reported that they found archived tapes to be valuable though their answers to the survey questions might indicate otherwise. One respondent who supported the present system wrote that video-streaming had the student in mind and was essential for academic success.

#### **Survey Results**

Question 1 concerned the survey results of participants who used archived tapes more than six times and those who used archived tapes less than six times. As shown in

Table 2

Did viewing archived tapes help improve your grade?

Participants	Yes	Percentage	No	Percentage
All	21	49%	22	51%
Viewed tapes more than six times.	14	33%	2	5%
Viewed tapes less than six times.	7	16%	20	46%

passed their class without archived tapes. Only four of that group felt they needed archived tapes to pass their class. See Table 3.

Table 3

Could you have passed the class without archived tapes?

Participants	Yes	Percentage	No	Percentage
All	32	74%	11	26%
Viewed tapes more than six times	9	21%	7	16%
Viewed tapes less than six times	23	54%	4	9%

Question 4 asked how much of a grade difference if any did viewing archived tapes help. The responders could choose one of two options of one or grades higher or made no difference in my grade. Sixteen of the participants returning the survey stated that archived tapes improved their grade by one or more letter grades, while 27 reported viewing archived tapes made no difference in their grade. For those that viewed archived tapes more than six times, six did not think archived tapes made any difference in their

grade, while ten thought viewing archived tapes made their final grade one or more grade letters higher. For the participants that viewed archived tapes less than six times, 25 thought that archived tapes made no difference in their final grade while two thought it bettered their grade by one or more grade letters. See Table 4.

Table 4

How much of a grade difference viewing archived tapes help?

Participants	One or more letter grades	Made no difference
All	12	31
Viewed tapes more than six times	6	10
Viewed tapes less than six times	2	25

Question 5 asked the participants what grade they got for the course. All 25 of the participants who viewed archived tapes less than six times reported they received an A in their class. There was a greater variance in participants viewing archived tapes six or more times. Eleven responders from the group reported they received an A in their class. Two participants reported they earned a B and three stated they had earned a C. On a scale of zero for a F to four for an A, the mean score for responders who viewed archived tapes six or more times was a 3.5 or a B+. See Table 5.

### **Statistical Analysis**

Fourteen participants who viewed archived tapes six or more times stated that the archived tapes improved their final grade and two stated that viewing archived tapes

Table 5

Average letter grade for each group

<u>Participants</u>	<u>Average Letter Grade</u>
Viewed archived tapes more than six times	B+
Viewed archived tapes less than six times	A

made no improvement in their final grade. Seven participants that viewed archived tapes fewer than six times stated that archived tapes helped improve their final grade and 20 stated that that archived tapes made no improvement to their final grade. When the results were analyzed using a chi-square statistical analysis, the value of chi-square was 15.24, which is higher than the  $p > 0.01$  level of significance of 5.41. See Appendix C for Chi Square table.

### Summary

A five question survey was sent by email to 77 participants and 43 returned the survey for a 56% response rate. Sixteen responders reported they viewed archived tapes more than six times in their class. Twenty-seven stated they viewed archived tapes less than six times in their class. Twenty-one of all responders thought archived tapes improved their final grade, while twenty-two responders did not. Thirty-two responders reported they could have passed their class without archived tapes. Eleven participants thought they could not have passed their class without having archived tapes available to them. Twelve responders reported that viewing archived tapes improved their final grade by one or more letter grades. Thirty-one stated that viewing archived tapes made no difference in their final grade. The average grade point average for the participants who

viewed archived tapes more than six times was a 3.5 on a scale of zero to four which equals a B+. The average grade point average of responders who viewed archived tapes less than six times was a four or an A. A chi-square statistical analysis was used to determine if frequency of viewing archived tapes improved the grades of participants

Chapter V will summarize the research study. The chapter provides a conclusion of the research and makes recommendations on how the research can be used.



## **Chapter V**

### **Summary, Conclusions, and Recommendations**

The purpose of this chapter was to summarize the previous chapters and draw a conclusion on the research information collected. This chapter will contain a recommendation for how this research can be used now and for future researches of this topic.

#### **Summary**

Old Dominion University began video-streaming on a limited base in 1998 following a request from the university president of that time. Old Dominion University was a pioneer of distance learning among higher education institutions through its TELETECHNET (televised distance learning) program started in the early 1990's. The university president wanted to expand distance learning and make higher education available to students in their homes and businesses using the Internet. Since then, the delivery technique had grown significantly. Archived tapes were included in the early video-streamed classes and continue to be included in present video-streaming classes. Past studies (Bolster et al., 2006; Mullins-Dove, 2006; Lewis & Passard, 2008) had proved that video-streaming and archived tapes offered many advantages to students and enabled colleges and universities to grow beyond their physical boundaries. Today, Old Dominion University offers video-streaming delivery in 26 of its undergraduate, graduate, and certification programs.

The problem of this study was to determine the usefulness of viewing archived tapes for improved classroom performance. Surveys were sent by email to 77 students

who took Occupational and Technical Education graduate classes from the Fall semester of 2008 to the Summer semester of 2009. A frequency of more or less than six viewings of archived tapes by participants was used as a benchmark to determine if frequency of viewing archived tapes improved the overall grade. Two respondents reported they had neither used nor needed to use archived tapes in their class.

The assumptions and limitations were used to ensure that all participants received an equal learning atmosphere and had access to archived tapes in the selected classes. The assumptions acknowledged that distance learning classes within the survey were taught by a variety of different instructors with different personalities. The research was conducted by requesting a list of students taking distance learning classes with access to archived tapes from the graduate program director of Occupational and Technical Studies. The list included the classes and the semester of each potential participant. The information in the list enabled the researcher to ensure the assumptions and limitations of the study were met.

Fifty-six percent of the participants responded to the survey request. The information was analyzed using a chi-square statistical analysis. The four factors that were used in the chi-square were participants viewing archived tapes six or more times who stated their grade improved, participants viewing archived tapes six or more times who stated their grade did not improve, participants viewing archived tapes less than six times who stated their grade improved, and participants viewing archived tapes less than six times who stated their grade did not improve. Participants were asked additional questions of whether they could have passed the class without archived tapes and their final grade in the class. An average of all grades in each group was computed.

## **Conclusion**

The hypothesis of this study was:  $H_1$ : Occupational and Technical Studies distance education video-streaming graduate students who frequently review archived classroom tapes would out perform academically compared to video streaming graduate students who did not frequently review archived tapes. The data received produced a chi-square factor of 15.24. Using the level of significance of a one-tailed test, the chi-factor was significantly higher than the  $p > .01$  of 5.410. Therefore, the researcher would be justified to accept the hypothesis and conclude that students who frequently review archived tapes would outperform academically students who did not frequently review archived tapes. In other words, it could be concluded that viewing archived tapes improved the academic performance of students who frequently viewed them.

## **Recommendations**

During the course of this study it was discovered that archived tapes improved the academic performance of students who used them, but a majority of the students made infrequent use of the tapes. A major reason for the infrequency of use that was given by respondents was the lack of ability to fast forward and rewind the tapes to a desired location. Students were forced to watch a tape from the beginning in order to view the section of the class they needed to watch. Future studies could determine if the inclusion of a fast forward or rewind tool and other similar improvements in archived tapes would result in more frequent use by students.

Another recommendation was to expand the survey to include all video-streaming students at Old Dominion University with access to archived tapes. Students in different academic disciplines might have additional things that would result in more frequent use

of archived tapes. Further studies on improvements to the current system would help technicians produce a system that would improve the academic performance of all students who used it.

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## **Appendix A**

### **Survey**

#### **Determining the Effectiveness of Viewing Archived Tapes for Improved Classroom Performance**

1. How many times did you view archived tapes during the semester?  
\_\_\_\_\_ six or more times; \_\_\_\_\_ less than six times.
2. Did viewing archived tapes help you improve your grade?  
\_\_\_\_\_ yes; \_\_\_\_\_ no.
3. Could you have passed the course without archived tapes?  
\_\_\_\_\_ yes; \_\_\_\_\_ no.
4. How much of a grade difference if any did viewing archived tapes help?  
\_\_\_\_\_ one or more grades higher; \_\_\_\_\_ made no difference in my grade.
5. What grade did you get for the course?  
\_\_\_\_\_ A; \_\_\_\_\_ B; \_\_\_\_\_ C; \_\_\_\_\_ D; \_\_\_\_\_ F.



## **Appendix B**

### **Cover Letter**

Dear participant,

I am undertaking a research project to determine how effective archived tapes are for the academic success of video-streaming students that use them. Old Dominion University began full scale implementation of video-streaming in January of 2008. No research is available at the present time of the effectiveness of tools used in video-streaming classes, such as archived tapes. Since you have taken an Occupational and Technical Education graduate level class through video-streaming and had the opportunity to use archived tapes, your experience doing so and how much the tapes helped you or did not help you in your academic success will provide valuable information to the university and future researchers. Only through research studies such as this one, can the process of archived tapes be improved. As early pioneers of archived tape use at Old Dominion University, you can make a big difference to those that use it in the future.

I want to assure you that all information I receive will be protected for confidentiality. All email questionnaires received will be kept in a password protected file on my computer. I log off the computer each time I am finished using it. It takes a password that only I know to log back on. In addition, your questionnaire will be stored in a password protected file on the same computer. If you chose to send the survey by mail, I will lock all returned mail questionnaires in a safe that only I have a key. At the conclusion of the research, I will delete all returned email questionnaires. At no time during and after the research, will I disclose the names of any person that returns a questionnaire to me.

I urge you to fill out and return the enclosed questionnaire as quickly as possible. The questionnaire follows this letter. The questionnaire consists of five multiple choice questions that are easy to complete. Answering the questions should not take more than ten minutes of your time. I deeply appreciate your participation and hope you the best in the future.

Sincerely,

Donald Jerry Bartley

**Appendix C**  
**Chi-Square Matrix**

	Viewing archived tapes improved final grade	Viewing archived tapes made no improvement in final grade
Participants viewing archived tapes more than 6 times	14	2
Participants viewing archived tapes fewer than 6 times	7	20

table one, sixteen of the participants responding to the survey reported they had viewed archived tapes six or more times during the semester. Twenty-seven reported they viewed archived tapes less than six times. See Table 1.

Table 1

Participants archived tapes viewing frequency.

Participants	Number	Percentage
Viewed tapes more than six times.	16	37%
Viewed tapes less than six times.	27	63%

Question 2 asked the participants if archived tapes helped to improve their grade. Twenty-one responders thought that archived tapes helped improve their grade in the class. Twenty-two participants thought that viewing archived tapes did not help improve their grade. Of the responders who viewed archived tapes six or more time, 14 thought viewing archived tapes helped to improve their grade and two thought it made no improvement in their final grade. Seven of the participants who viewed archived tapes six or fewer times thought archived tapes helped to improve their grade, while 20 did not think viewing archived tapes improved their grade. See Table 2.

Question 3 asked the participants if they could have passed their class without archived tapes. Thirty-two responders stated they could have passed the class without archived tapes, while 11 reported they could not. Nine of the participants who viewed archived tapes six or more times thought they could have passed the class without archived tapes, while seven did not think they could. Twenty-three of responders who stated they viewed archived tapes less than six times in their class felt they could have