To the Graduate Council:

I am submitting herewith a dissertation written by Elizabeth Crawford Dodd entitled "An Investigation Of The Learning Outcomes Of Distance Learning Students Versus Traditional Classroom Students Attempting The Masters Of Business Administration." I have examined the final paper copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Education.

Lloyd D. Davis, Major Professor

We have read this dissertation
And recommend its acceptance:

Mary Jane Connelly

Dan R. Quarles

C. Glennon Rowell

Accepted for the Council:

Vice Provost and Dean of
Graduate Studies

An Investigation Of The Learning Outcomes Of Distance Learning Students Versus Traditional Classroom Students Attempting The Masters Of Business Administration

A Dissertation
Presented for the
Doctor of Education
Degree
The University of Tennessee, Knoxville

Elizabeth Crawford Dodd
December 2001

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DEDICATION

This dissertation is dedicated to the memory of Dr. Kitty Kirby Miller (1945-2001). Also a graduate of the UT College of Education Ed. D. program, Kitty gave me my first opportunity to work in higher education, as well as put me on my first distance learning committee. From my first day on the job as a nervous graduate assistant, Kitty treated me as a professional from whom she expected great things. Kitty had a great love for education and some of it must have rubbed off. Fifteen years ago I could never have envisioned traveling as far as I have down this path, but I know that if it had not been for Kitty's belief in my abilities and the opportunities she gave me, I never would have seen the path at all.

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ABSTRACT

This study was designed to investigate any significant differences in the learning outcomes of graduate students in the MBA degree program at The University of Tennessee at Chattanooga in traditional instructional settings as compared with students who received their instruction via distance learning. Additionally, the study compared these previously mentioned groups to students who received a mixture of distance learning and traditional classroom instruction.

Research questions:

1) Is there a difference between the cumulative GPA scores of students in a distance learning setting and students in a traditional classroom setting, or students with a combination of distance learning and traditional classroom?

2) Is there a difference in the degree completion rates between students in traditional and distance learning settings?

3) Is there a difference in the length of time it takes students to complete the program?

There were 864 subjects divided into three groups. The traditional group received 70% or more of its instruction in the traditional classroom and had a total of 632 subjects. The mixed delivery group received between 31% and 69% of its instruction via distance learning and had 130 subjects. Finally, the distance learning group, students who received more than 70% of their instruction via distance learning, had 102 subjects.

Analysis of variance (ANOVA) and analysis of covariance (ANCOVA) were used for questions 1 and 3. The chi-square was calculated for question 2.

Overall, the results for Question 1 revealed no significant differences between the traditional and distance learning groups. In cases where significant differences were found, the mixed delivery group had a higher mean score than the traditional and the distance learning groups. The ANCOVA increased these differences.

While reviewing the graduation status, the researcher found scattered occurrences of significant differences between the groups. There were no occurrences of the distance learning students scoring below the traditional students. In several tests, the mixed delivery group did have a significantly larger percentage of graduates than the traditional and distance learning groups.

Question 3 revealed consistent findings across the tests—the distance learning group completed the degree programs in less time than the traditional group.

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CHAPTER 1

INTRODUCTION

Over the past few decades, universities throughout the world have used distance learning technology to convey education to students who are remote from the traditional campus. There are several factors behind this growing trend. First, with the markets for higher education becoming more difficult to define, colleges and universities have to be more competitive in the types of credit offerings available to students (Portway & Lane, 1992). Colleges and universities are not only finding it more and more difficult to compete with other colleges nearby and in the local regions, but are also now facing competition from colleges and universities that have taken their programs worldwide. For example, NOVA University and The University of Phoenix offer classes and degrees to students nearly anywhere, anytime. The University of Phoenix offers "bachelor's, master's and doctoral degrees, as well as professional certificate programs in several areas...including more than 107 campus and learning centers across the country and via the Internet." (University of Phoenix website, p. 1). In addition, the advent and growth of corporate universities has broadened the market and opportunities for education available to potential students. The Tennessee Valley Authority, The Saturn Corporation, and others have added corporate universities onsite at many plants and are partnering with schools and universities to offer degree programs and needed courses to their employees onsite or online. Jeanne Meister (1998) identified the impact corporate universities can have on higher education in her book, Corporate Universities, stating, "the learning and development programs profiled here are evidence of a movement that is both an

opportunity and a threat to traditional institutions of higher education." Second, many students are bound by time or geographic restrictions that do not allow them to attend traditional classes (Annenberg, 1994). Many students who are bound by place and time, but desire a degree or coursework will find some way to get access to education. The above mentioned global and corporate universities will address their educational needs if the local and regional colleges and universities do not. Third, the continued development of interactive television (ITV) equipment, computers and Internet services makes distance education more affordable, more accessible, and more global each year (Rossman, 1992). Another reason for the move toward instructional television is a growing scarcity of resources within university budgets. Portway and Lane (1992) reflected on the significant impact that recessionary times have had on college and university budgets, saying that schools are having to do more with less funding. By using distance learning classes, one instructor can now teach multiple sections and sites of the same course simultaneously to more students, both on the campus and located at one or more remote sites. Another impact the advent of distance learning can have on colleges and universities is that the traditional higher education's competitors mentioned above have adopted distance learning methodologies to attempt to meet the educational needs and desires of students and will not hesitate to offer students access to education in non-traditional modes.

And yet, some colleges and universities are still reluctant to utilize distance learning as part of the instructional base. Most critics of distance learning base their opinions on the argument that the quality of instruction and learning is somehow lessened

by the use of distance learning modes. Despite these opinions to the contrary, research shows that many educators and researchers have found that there is either no significant difference in the quality of learning outcomes between students who receive instruction via distance learning technology and those who sit in a traditional classroom, or in fact, many studies show that students at the remote sites may have slightly better or even significantly better outcomes than do the students on campus and in the traditional classrooms. Rossman (1992) said that one important theory of distance learning is merely an expansion of the belief that the university is a "collective intelligence" in which the whole is greater than the sum of its parts. The arrival of distance learning and instructional and interactive television has expanded the body of intelligence and "parts" which should lead to an even greater "whole" (Rossman, 1992). Not only is the use of distance learning and interactive systems not a deterrent to the quality of education, it can be used as a way to enhance the learner's access to information and ideas previously unavailable outside the traditional classroom. In addition, by expanding the university's walls to remote students, the entire "community" of learners can be extended and enhanced as well.

Problem Statement

Like many of the universities mentioned in the introduction, The University of Tennessee was faced with the challenges of servicing the educational needs of the students and residents of Tennessee in times of retrenchment and increased competition from other local, regional, and national colleges and universities seeking to send their

programs to Tennessee citizens. In the early 1990s, the University of Tennessee system elected to use interactive compressed video to offer distance learning programs throughout the state. Starting in 1991, "Smart classrooms" as they were called, were added on the primary UT campuses, including Knoxville, Chattanooga, Martin, Memphis Medical School, and the Space Institute in Tullahoma. These classrooms consisted of television monitors to show students and faculty at one site to those at the other site. Microphones on the desktops carried the sound to the system, and speakers mounted in the rooms projected the audio to them from the other site (see Figure 1). At the time of this study there were 22 such interactive video classrooms in the UT system and approximately 70 more located at Tennessee Board of Regents Schools (see Figure 2). The University of Tennessee at Chattanooga added its first of four interactive video classrooms just prior to the beginning of the Spring 1993 term.

In the Fall semester of 1993, The University of Tennessee at Chattanooga responded to a request from the Knoxville community to offer the part-time MBA program in the Knoxville area via two-way interactive video. The UTK MBA program was changing and would only be offered to students who could do their coursework full-time. There was a large body of students in the Knoxville area who were interested in the MBA degree, but who were only available to take classes on a part-time basis. UTC offered at least two courses per semester to the Knoxville community via interactive television courses from 1993 to 2000. Since the typical program takes approximately two years, several cycles of the degree program were run during this time period.

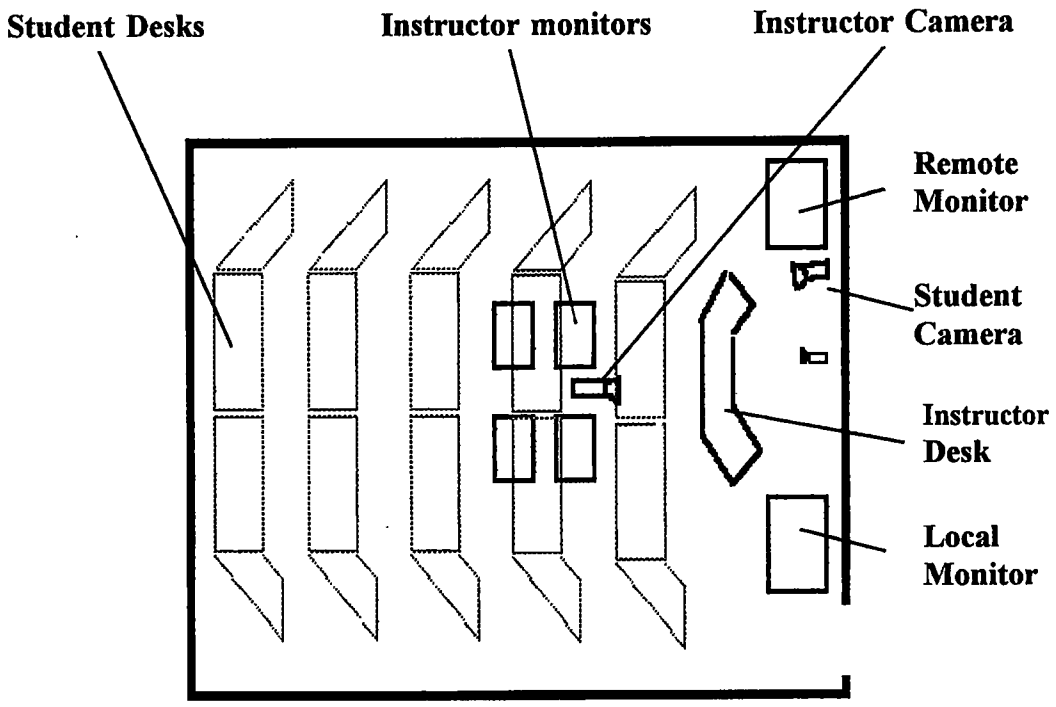

Figure 1: Diagram of Typical Distance Learning Classroom

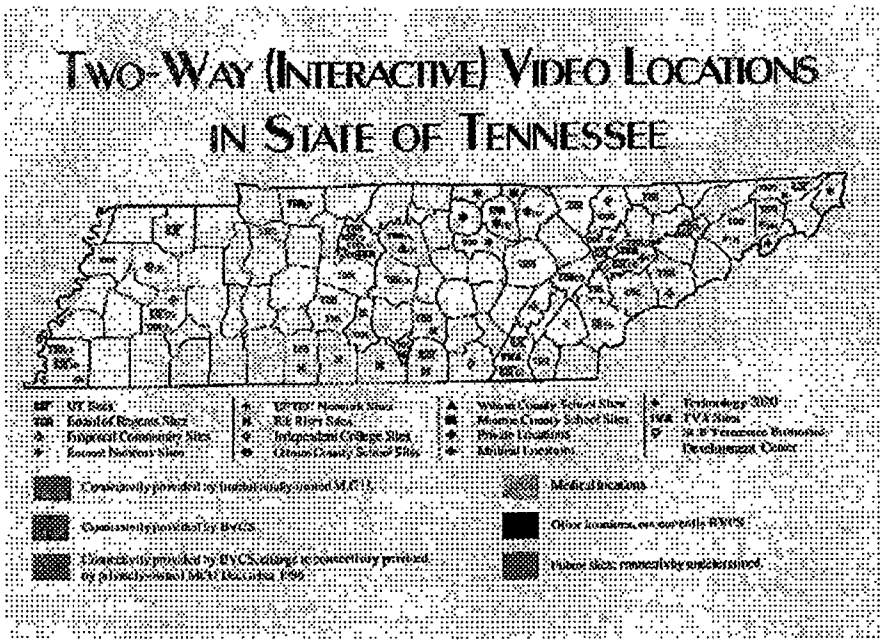

Figure 2: Map of Tennessee Interactive Classrooms

Though review of the results from previous studies indicated that there was no significant difference between the learning outcomes of traditional students and distance learning students, many authors of previous research projects surmise that this may be attributed to other factors such as age, motivation, and experience of adult students. Since distance learning programs are primarily designed to help students who are place and time bound to attend college, historically most distance learning students tend to be working adults. Because of this, the assumption noted in the literature is that they may be more motivated to achieve and succeed (Phipps & Merisotis, 1999). The authors surmise that the lack of significant differences in grades and other outcomes may possibly be due to differences in increased motivation or experience in adult learners, but still leave unanswered the question of whether the use of distance learning technologies has any significant effect on student learning outcomes.

Purpose of the Study

The purpose of this study was to investigate whether there were any statistically significant differences in the overall learning outcomes of graduate students enrolled in the MBA degree program at The University of Tennessee at Chattanooga in traditional classroom instructional settings as compared with students who received their instruction via interactive distance learning television. These outcomes were determined as follows:

1. Cumulative Grade Point Average [GPA]
2. Graduation Status – Did the student complete the degree in the study period.
3. Total Semesters – Length of time in semesters from start of program to graduation.

Additionally, the study compared students who received some of their instruction via distance learning and some in the traditional classroom to these pre-mentioned groups.

Research Questions

1. Is there a statistically significant difference among the cumulative GPA scores of students in a distance learning classroom setting and students in a traditional classroom setting, or students with a combination of distance learning and traditional classroom settings?
2. Is there a statistically significant difference in the degree completion rates between students in traditional and distance learning settings?
3. Is there a statistically significant difference in the length of time it takes to complete the program for students in a distance learning classroom setting and students in a traditional classroom setting, or students with a combination of distance learning and traditional classroom settings?

Definition of Terms

Many of the following terms have much broader definitions in academia, but for the purposes of this study, the terms have been narrowly defined as follows.

The University of Tennessee – a land grant college system comprised of universities and institutes located throughout the state of Tennessee.

The University of Tennessee at Chattanooga – a primary campus of The University of Tennessee. UTC is a regional university with a firm grounding in the liberal arts and professional preparation, offering undergraduate and graduate programs (UTC Graduate Catalog, 1999-2000).

UTC College of Business Administration – this college offers a number of undergraduate and graduate business degree programs including the MBA.

Masters of Business Administration – this graduate program is designed for students with an undergraduate degree in either business or a non-related field who wish to advance in some field of business administration. Concentrations include: accounting, economics, entrepreneurship, finance, health service management, human resource management, international business, management information systems, marketing, operations/production management and organizational management (UTC Graduate Catalog, 1999-2000, 1993-1995). See Appendix.

Traditional classroom setting – those classes held on the campus, in a traditional style room with the professor/instructor present in the room.

Distance learning setting – those classes held in an interactive televised classroom

where instruction occurs nearly simultaneously between two or more sites and students and faculty at both sites can see and hear each other.

Traditional student – is defined as someone who has taken 70% or more of master's coursework in the traditional classroom setting.

Distance learning student – is defined as someone who has taken 70% or more of coursework via interactive televised courses.

Partial distance learning student – is defined as someone who has taken between 31% and 69% of coursework via interactive televised courses.

Mostly Traditional – students who received 70% or more of their instruction in a traditional classroom setting.

Mixed Delivery – students who received 31% to 69% of their instruction via distance learning.

Mostly Distance Learning – students who received 70% or more of their instruction in a distance learning setting.

GMAT – Graduate Management Admission Test is an exam measuring general verbal, mathematical, and analytical writing skills that are developed over a long period of time. It is designed to help graduate schools of business assess the qualifications of applicants for advanced study in business and management. (GMAT booklet, 1999)

AI score – is an admissions index for MBA students calculated as follows: (200 x undergraduate GPA) + GMAT Score = AI. Minimum required AI score for The University of Tennessee at Chattanooga is 950.

Assumptions

It is assumed for the purposes of this study that:

1. Cumulative grade point average (GPA) is a valid and reliable measure of student learning outcomes.
2. Age of graduate students may have an effect on the level of motivation and therefore needs to be controlled when looking for differences attributed to method of instruction.
3. The AI is a valid predictor of success in the MBA course of study.
4. MBA students are similar to other graduate students.

Delimitations

1. The population is delimited to students enrolled in the MBA program at The University of Tennessee at Chattanooga between 1993 and 2000.
2. Distance Learning classes used for this study will be delimited to two-way interactive televised classes.

Significance of the Study

As distance learning and other non-traditional methods of instruction continue to escalate in today's educational systems, quality of instruction and learning will be key concerns for university faculty and administrators. Colleges and universities answer to a wide variety of constituents; state-funding agencies, accrediting bodies, business and industry that hire graduates, faculty, and customers/students. As universities look to a

broader spectrum of instructional media in order to expand the student base in an era of leaner budgets and a more scattered student population, they are going to be required to defend and maintain the quality of instruction and learning. This study was designed to help to determine if there were any statistically significant differences in the learning outcomes of students in distance learning settings as compared to students in traditional settings. The researcher decided to focus on cumulative grade point averages because, despite all the ephemeral measures of student outcomes currently being used (surveys, questionnaires, etc.), most colleges and universities still use grades and GPA as the primary measure of student success and probably will continue to do so in the future.

Additionally, though past studies have reviewed undergraduate programs and specific courses, the researcher was unable to find any comprehensive studies of graduate degree programs. This study provided an opportunity to measure any existing statistically significant differences between traditional and distance learning settings (while controlling for age and its suspected related motivational factors).

Educational institutions need to establish that the quality of learning via distance learning is equal to that of the traditional classroom. Accrediting agencies, such as SACS (Southern Association of Colleges and Schools), are spending more time and putting more emphasis on schools demonstrating equality of education in distance learning situations. For example, some of the same questions asked by visiting accrediting teams include: "Are ... instructional design policies and procedures similar to those used for traditional campus-based programs?" and "Are goals and objectives, and skills and competencies, the same for courses offered on main campus as those offered through

distance learning activities (Handbook for Peer Evaluations, Southern Association of Colleges and Schools, p. 55). Universities can use the information in this study to assist in making decisions regarding the future use of distance learning systems. In addition, if through further study it can be determined which factors or variables might help to predict student success in a distance learning setting, universities can consider either advising students into the type of instructional method where they are most likely to succeed, or possibly setting different admissions requirements for students who will be taught using distance learning instructional methods. It is critical for educational institutions to examine the quality of new instructional methods and media and to act upon the results of those examinations.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

Over the past few decades, universities throughout the world have implemented the use of distance learning technology for conveying education to students who are remote from the traditional campus. There are several factors behind this growing trend. First, with the markets for higher education becoming more difficult to define, colleges and universities are having to be more competitive in the types of credit offerings available (Portway & Lane, 1992). Second, many students are bound by time or geographical restrictions that do not allow them to attend traditional classes (While evening classes are often viewed as non-traditional, for the purposes of this study, traditional classes are defined as those held on the campus, in a traditional style room with the professor/instructor present in the room) (Annenberg, 1994). Third, the continued development of interactive television (For the purposes of this paper, unless otherwise indicated, Distance Learning and Interactive Television or ITV will be used synonymously) equipment and computers makes distance education more affordable, more accessible, and more global each year (Rossman, 1992). Another reason for the move toward instructional television is a growing scarcity of resources within university budgets. Portway and others (Portway, et al., 1992) state that "the national recession has had a significant impact on the reduction of college and university budgets. Colleges are being asked to do more with less." By using distance learning classes, one instructor can

now teach multiple sections and sites of the same course simultaneously to students, both on the campus and located at one or more remote sites.

As of 1994, reports show that at least 80% of U.S. community colleges are using some form of distance learning programs and that number is expected to increase (Parrott, 1995). And yet, some colleges and universities are still reluctant to utilize distance learning as part of the instructional base. Most critics of distance learning base their opinions on the argument that the quality of instruction and learning is somehow lessened by the use of distance learning modes. Despite these opinions to the contrary, studies show that many educators and researchers have found that there is no statistically significant difference in the quality of learning outcomes between students who receive instruction via distance learning technology and those who sit in a traditional classroom. In fact, many studies show that students at the remote sites may have slightly better or even significantly better outcomes than do the students on campus and in the traditional classrooms.

Learning outcomes can be defined in several ways. In a paper given at the Conference for Productivity in Tertiary Education in Australia in 1986, Johnson stated that effective distance learning, like other modes of education should be evaluated by at least the following four criteria:

1. Student learning of information and understanding, which are usually measured by academic assessments.
2. Student satisfaction with the content and processes of the course, which is usually measured by a questionnaire to the student.

3. Retention rates and graduation rates.

4. Employability or advancement within current employment.

While all of the above are important considerations for any educational program, with the exception of student perceptions of how their education might help their employability or advancement, nothing in the literature lends evidence of demonstrating the effectiveness of distance education with regards to the fourth issue, employability/advancement. Some studies have touched on the subject of retention or course completion, but it is not a common theme. Consequently, throughout this review, the following outcomes will be addressed: (1) student grades/scores, (2) student attitudes about the learning experience, and (3) faculty attitudes about the learning experience.

Literature Review

Rossman (1992) says that one important theory of distance learning is merely an expansion of the belief that the university is a "collective intelligence" in which the whole is greater than the sum of its parts. The arrival of distance learning and instructional and interactive television has expanded the body of intelligence and "parts" which should lead to an even greater "whole" (Rossman, 1992). Not only is the use of distance learning and interactive systems not a deterrent to the quality of education, it can be used as a way to enhance the learner's access to information and ideas previously not available. This theory that the learning will be of equal quality, regardless of whether the student is in a live traditional class or a remote site receiving instruction by television, is the issue that most concerns educators. Throughout the literature, "results of most studies conducted

under controlled conditions concurred that there were no statistically significant differences in performances" (Zigerell, 1991) of students in classroom settings remote from the instruction compared to students in a live, face-to-face setting with the instructor. In a study of Chicago's TV college, results showed that TV students not only equaled, but outperformed their on-campus counterparts (Zigerell, 1991). As early as 1962, a series of 393 studies comparing television learning to conventional classroom instruction showed there were no differences in the relative effectiveness of the two methods of instructional delivery as reported in 255 of the studies. Surprisingly, in the remaining 138 studies, television was shown to be more effective than conventional instruction (Lucas, Heald, & Bazemore, 1979).

The primary focus of this review is on distance learning through the medium of interactive television in colleges and universities. However, many other types of nontraditional education methods can be considered to be distance learning. In addition secondary education has a large role in distance learning, whether using interactive television or other modes. The next several cases include examples of computer-based learning, specialized nontraditional classes away from the campus, independent study, evening classes and programs in secondary or higher education settings.

A series of evaluation studies developed for the Louisiana School Distance Learning Program assessed the success of Telelearning used to deliver college preparatory courses required for admission to Louisiana State University (McElveen, 1992). The typical Telelearning classes were comprised of five secondary schools with five to seven students per site and the instructor at one (origination) site. The system

provides for instruction from the teacher via computer to the remote sites and includes microphones to allow for voice contact between the remote sites and the instructor. A 1990-1991 study was designed to evaluate student acceptance and performance through the use of telephone interviews, surveys, interviews, and student grades. Through the interviews and surveys, the data collectors determined student satisfaction levels on the delivery mechanism, convenience, time effectiveness, and perceptions of their instructors. The researchers collected mid-term and final grades to assess student performance. The students indicated a high level of acceptance of the system in the interviews and surveys. Most of the students were satisfied with the Telelearning program as a means for receiving instruction, and most of the scores were above average to high. McElveen states however that one reason behind the grade levels being high was that students who were not doing well tended to drop the classes early in the program. Due to difficulties in collecting the grades for the 1990-1991 study, a second study for 1991-1992 focused only on student perceptions of effectiveness and quality and the effectiveness of teacher delivery.

In Wisconsin, the Western Wisconsin Technical Institute connected nine K-12 school districts via an innovative cable television system (Lienau, 1987). Developed in the late 1970s, Western Wisconsin Communications Cooperative (WWCC) was the first rural cable system using a two-way instructional delivery system for the public schools. Lienau's article cites findings from a survey of students and staff identifying that many of the teachers had a variety of reservations and concerns about the system. The students were questioned about their reasons for not taking cable courses and their knowledge and

opinions of the learning opportunities via cable. The findings show that the students did not rate any particular reason (given on the survey) for not taking classes. In addition, the survey of student opinions revealed no conclusive data.

At the University of Wisconsin, Platteville, researchers needed to assess the learning outcomes of students in a marketing course delivered to nontraditional learners via three different nontraditional methods of course delivery: (1) in-house corporate classes at a business site 40 miles from the campus, (2) evening classes on the campus, and (3) independent study coursework. (Paul, 1990). Students were measured according to progress rate, satisfaction with the instruction, and achievement in the coursework. The same instructional materials and faculty members were used for all three course options. The results showed that progress rates were in line with the school's expectations and students seemed satisfied with the delivery systems they chose. The achievement scores did not vary noticeably, "indicating that students may learn equally well through a variety of delivery systems" (Paul, 1990). Even though the corporate students received the fewest A's and B's, 95 percent were satisfied with their grade and learning experience. The evening students, who had the closest to a traditional setting, surprisingly had 10% dissatisfied with the delivery and only 33% ranked the system as convenient. Only 75% of the evening students were satisfied with the grade they received. Of the students in the independent study program, nearly half received A's for the course. Eighty percent indicated the system was convenient and stated they would enroll in another similar class. Paul (1990) concluded his paper stating that though student satisfaction seems to be

affected by the instructional delivery system, achievement does not show any statistically significant differences.

Spartanburg Technical College in South Carolina, in a collaborative effort with Cable TV, offered GED preparation courses via instructional television and compared them to similar courses taught traditionally at the college. The studies concluded that cable students who took the courses by ITV performed as well as or better than students in the traditional classroom setting (Lucas, et. al., 1979).

For a group of students at Pennsylvania State University taking independent study courses, researchers sought to determine a model which would explain and predict completion and success rates of students enrolled in that type of instruction (Chacon-Duque, 1985). The study determined that 75.38 % of the students completed their courses with a pass rate of 70.35%. The researchers also found that most of the students took longer than the standard semester to complete their work. A comparison of the demographic data led to the finding that there were no statistically significant correlations between grades, age, or number of prerequisites completed. One very odd statistically significant finding the researchers in this study discovered was that students with less professorial contact did better than did those seeking more professorial contact. One reason for this is the possibility that the poorer students are the ones seeking the most assistance, while the stronger students are going on and finishing their work primarily on their own.

Though the above cases are interesting because they show that many forms of the instructional process can be effective for a wide variety of students, the remainder of the

paper will focus on distance education using interactive television in higher education settings. Distance Education students have many faces, but in the higher education realm most are nontraditional students over 26 years of age. They are seen as highly motivated, goal-oriented, and unable to attend the traditional classroom setting either because of time or distance constraints(Parrott, 1995). Chattanooga State Technical Community College reported that most distance learners are working adults or other students seeking alternative courses for a variety of reasons including; convenience, location, cost-savings, flexibility, and/or personal constraints which limit the times they can attend classes (Hyatt, 1992). In a survey of distance learning students, Chattanooga State determined that

- 80.4% felt they had gained as much information as they would have in a traditional class
- 89.2% were either satisfied or very satisfied with the course
- 93-98% rated instruction as adequate to excellent
- 75.5%-84.9% rated the experience as good to excellent

These results were from students in several different types of distance learning experiences including ITV, videotape courses and independent study.

As colleges and universities enter the realm of distance learning, many are working early on to develop evaluation systems to provide evidence of the effectiveness of distance learning as an instructional tool. At Christopher Newport University (CNU) in Virginia, distance education programs have been designed to provide ease of access to a "variety of non-traditional students who, taken together, constitute the majority of today's

and tomorrow's students" (Ridley, 1996). CNU's online course evaluators have set seven specific goals to measure and, hopefully, meet in their quest for effectiveness of the distance learning situation. (Ridley).

In his dissertation abstract, Britton (1992) studied perceptions of students taking a course via one-way video and two-way audio, with a survey designed to measure attitudes toward course content and satisfaction with delivery method. Results showed no statistically significant differences in perceptions of course content and instructional delivery methods between the students at the origination site and those at the remote sites. After reviewing interim and final exam scores, Britton concluded that there were no statistically significant differences in grades between the sites.

Worley (1991) conducted her dissertation research comparing two different types of ITV instruction. Students were enrolled in the same course taught either via one-way video/two-way audio or two-way video/two-way audio. Student grades, student attitudes, and instructor attitudes were measured and compared. There were no statistically significant differences between student grades or student attitudes toward learning between the two groups. Instructors however, significantly preferred two-way video/two-way audio to one-way video/two-way audio platforms.

Another dissertation by Sisung (1992) dealt with a study of students in three sections of the same Humanities course. One section was taught in the traditional classroom, while the other two were taught simultaneously through ITV from a host site to a remote site. This study had one interesting twist—all the students in the ITV classroom faced monitors in the front of the room showing both the instructor and the

students from the other site. The instructor stood in the back of the host site and taught to the camera as students watched on video. The study measured student outcomes on four levels: (1) school attitude measure, (2) instructor-developed Knowledge-of-Humanities test, (3) final exam scores, and (4) observation of behavior. The results showed that all three sections of the class were equivalent on all four measures of student outcomes.

At Iowa Lakes Community College, final grades of students taught via interactive television were compared with students in the same classes taught in the origination classroom. The study included three main groups: (1) students at an origination site on the campus, (2) students at remote sites with two-way interactive video, and (3) students at a remote site with only one-way video—they could see the teacher, but the teacher could only hear them (Nixon, 1992). The statistical analysis of the study concluded that there was no statistically significant difference between mean learning outcomes of students at the origination and two-way remote sites. Surprisingly, there was a statistically significant difference between the learning outcomes of the students at the origination site and the one-way video remote site, but it was in favor of the remote students (Nixon, 1992). Though the study did not try to explain the findings, Nixon stated that it was noted that the remote site students tended to be older and may have had increased motivational factors in their favor.

Eastern Iowa Community College District developed a video system linking three community colleges via two-way microwave connections. Through the Televised Interactive Education (TIE) system, the schools offered sophomore level courses with historically low enrollments in an attempt to broaden the student population (Kabat &

Friedel, 1990a). They developed a model to determine the effectiveness of the system based on six indices including average grade per site, student evaluation of the system, evaluations of students who withdrew from system classes, and instructor evaluation of the system. In a subsequent study, students' grades in distance learning classes in the Eastern Iowa Community College District were reviewed comparing remote site average GPA's to origination site averages. Based on a t-test of the results using .05 level of significance, there were no statistically significant differences between the grades of origination and remote site students (Kabat & Friedel, 1990b). Kabat also administered a survey to both students and faculty to measure their perceptions of the quality and amount of learning taking place in distance learning classes. Despite the previous grade point average results, 41.1 percent of the remote students felt that they were not learning as much as they would in a standard campus course. In addition, 11.1 percent of the origination site students felt they were not learning as much in the distance learning course as they would in a traditional style class. Also, differently from the students' perceptions, 83.3 percent of the faculty felt that students learned as much in the distance learning course, as they would have in a traditional campus course. Only 8.3 percent felt that the distance learning course students did not learn as much as they would have in a standard campus class (Kabat, et. al., 1990b).

At Calhoun Community College in Decatur, Alabama, the Associate Dean of Instruction initiated a study to determine if there was a statistically significant difference in grade distributions between sections of courses taught in both telecourse format and traditional classroom format (Searcy, 1993). The Office of Institutional Research

conducted a study to compare grades awarded to students in different sections of the same courses taught by the same instructors in the same semester in both telecourse and traditional format. Grade point averages were calculated for each section and t-tests run to determine if there were any statistically significant differences.

The study concluded that there were no statistically significant differences between the average scores for telecourses and the average scores for traditional classroom courses. One finding that disturbed the researchers was that rate of completion of the course was higher for students in the traditional classroom setting. They were concerned with what factors might cause more telecourse students to withdraw before completion and suggested future study in this area.

At The University of Tennessee at Chattanooga (UTC), results of a limited unpublished study of available data on interactive television courses offered in Fall 1993 and Spring 1994 revealed similar findings to those in the literature (Crawford, 1994). Average GPA's of students enrolled in ITV classes were compared to determine if there were any significant differences in achievement. Table 1 lists the average GPA's of remote versus origination students for 12 courses. As shown, in all but two cases, the remote site average GPA is equal to or higher than the origination site scores.

A second measurement compared average GPA's of students in six ITV courses compared with students taking the same class in a traditional classroom setting. Table 2 compares the average GPA levels of both ITV and standard campus sections of the same course offered the same semester. As shown, in four cases, the distance learning class had a higher average GPA than did a traditional, on-campus section of the same class. In the

Table 1: Average GPA scores of Remote Students VS Origination at UT-Chattanooga

Course # & Semester	Remote Site	Local GPA	Remote GPA	Difference
BMGT 511 (Fall 1993)	Knoxville	3.54	3.78	.24
BMGT 512 (Fall 1993)	Knoxville	3.75	3.70	(.05)
CRMJ 500 (Fall 1993)	Knoxville	3.36	3.88	.52
CRMJ 570 (Fall 1993)	Knoxville	4.00	4.00	0
BACC 508 (Spring 1994)	Tullahoma	3.64	4.00	.36
BACC 530 (Spring 1994)	Knoxville	3.40	3.56	.16
BMGT 509 (Spring 1994)	Tullahoma	3.55	4.00	.45
BMGT 511 (Spring 1994)	Tullahoma	3.63	3.67	.04
BMGT 512 (Spring 1994)	Tullahoma	3.33	3.80	.47
CRMJ 530 (Spring 1994)	Knoxville	3.71	3.80	.09
CRMJ 540 (Spring 1994)	Knoxville	2.93	3.80	.87
ECON 520 (Spring 1994)	Knoxville	4.00	3.62	(.38)

Table 2: Comparison of Average GPA for ITV Students at UT-Chattanooga

Course # & Semester	Standard Class GPA	ITV Class GPA	Difference
BMGT 511 (Fall 1993)	3.666	3.636	-.03
BMGT 512 (Fall 1993)	3.88	3.714	-.17
BACC 530 (Spring 1994)	3.60	3.50	-.1)
BMGT 511 (Spring 1994)	3.416 & 3.500	3.642	.22 & .142
BMGT 512 (Spring 1994)	3.56	3.625	.07
ECON 520 (Spring 1994)	4.0 & 3.0	3.687	-.31 & .687

rest of the cases, the average GPA of the distance learning class did not differ more than two or three tenths of a point (Crawford, 1994).

In Kabat's (1990) study, one surprising result was that the students did not perceive that they had learned as much in the distance learning class as they would have in a traditional class setting. However, the findings of a survey given to Fall 1994 distance learning students at UTC in Knoxville and Tullahoma revealed that 67% of the remote students responded **strongly agree** (on a 5-point Likert scale) to a question about whether they learned as much as they would in a traditional class. Thirty-three percent of the remote students responded **agree**, while none of the remote students responded that they disagreed with the statement or were unsure about the level of learning. Surprisingly, the origination site students did not respond as favorably as did the remote students. Twenty-nine percent of the students responded **strongly agree**, 50% replied **agree**, 14% stated they were **unsure**, and 7% responded **disagree** to the question about

whether they learned as much in the distance learning course as they would in a traditional campus course (Crawford, 1994). These results may stem from the origination site students' resistance to change in their traditional "comfortable" classroom. Because time or geography may not bind them as to when they take their courses, they may be less likely to embrace or accept the new technologies being used in the classroom.

In a study designed to examine the impact of telecommunications media on learning outcomes at the University of Oklahoma's (UO) School of Library and Information Studies, researchers analyzed data based on written exams, observations, interviews, interactions between learners and instructors, and student attitudes (Haynes & Dillon, 1992). Students in simultaneous sections of a class taught via ITV between UO's Norman and Tulsa sites were subjects of this review to measure differences in learning outcomes between on-campus students and those receiving instruction via a compressed video system. Both groups were nontraditional students, primarily working adults with full-time jobs and part-time school. The results of the study showed that there were no significant differences between the two groups with regards to achievement on six of seven levels. There was a single exception where local on-campus students scored significantly better than distance students on a readings component of the class. Though not statistically different, the distance students scored higher on two of the categories (Haynes, et al., 1992). One interesting note is that on the interaction component of the study, although the distance students interacted with the instructor much less than the on-campus students, they interacted more with the other students at their site. Haynes, et al. (1992) propose that distance students may develop a peer teaching strategy in the absence

of a live, present instructor. Unfortunately, the researchers discovered that the students had very negative attitudes toward the use of interactive television for instruction. In response to a question about recommending this type of course to a friend, the mean response was 1.81 on a five point Likert scale with 5 ranked as high positive. In an attempt to detail this dissatisfaction, UO performed a detailed analysis of the students' attitudes and found that most of the problems were related to the technology rather than the course. The audio system, availability of resources, advisement, access to faculty, and other technical aspects were all seen to be in need of improvement by the students. Haynes, et al., (1992) remarked on the fact that though the students said they were dissatisfied with the course, the statistical findings show that it had no significant impact upon their learning at any level. She went on to surmise that dissatisfaction or discomfort with the delivery system may even have a positive impact on the learner outcomes. "...if students perceive the media to be less demanding, they tend to invest less mental effort. Likewise, students who perceive the media to be more demanding may invest more effort." (Haynes et al., 1992)

The good news though, is that repeatedly, the literature research shows that televised instruction "can be as effective as traditional classroom-based lectures and face-to-face discussions" (Rossman, 1992). When the quality of instruction is the same, distance students in ITV classes score as well on tests as do students in conventional classrooms (Rossman, 1992).

Most of the sources cited in this paper used consistent measures on similar topics and for the most part demonstrated similar findings. Overall, the research clearly showed

that in most settings, distance learning student outcomes were equivalent to or sometimes slightly better than those of students in traditional classroom settings. Almost exclusively throughout the literature, studies have shown that student outcomes and achievements were not significantly impacted by the use of distance learning technologies and strategies for instruction. The attitudes of faculty and students involved in distance learning courses tended to be much more diverse.

Summary

When assessing the results of studies on learning outcomes using distance learning methods, several outlying factors must be considered. In cases where distance learning students outperformed traditional students, the motivation and maturity levels of adult learners typical of distance learning students may be causal factors. The important point however, is that distance learning does not appear to have any negative effect on learner outcomes. Another question to consider is whether the faculty may be grading more leniently in an effort to compensate for any difficulty the students may have in adapting to the new instructional method.

Based on the results shown in the literature, one problem colleges and universities need to focus on is the students' perception of the level and quality of learning in distance learning classes. Since results showed that quality of learning was not adversely affected by the use of distance learning, higher education institutions need to assure students by "educating" them that the quality of using new and innovative methods of instruction is as high as the traditional classroom setting. If institutions can establish acceptance of

instructional television among both the students and the faculty, then the only hurdle will be to maintain the integrity of the educational process itself. A report on Distance Education at Penn State has this advice, "The antidote by the organized educational community is a set of standards for instruction and academic and administrative services that is so high that the quality of all aspects of distance education can never be questioned." (Froke, 1994, p. 18)

CHAPTER 3

METHODOLOGY

Introduction

As is stated in the literature, reporters of previous studies have not revealed any overall statistically significant differences between the learning outcomes of students in traditional classroom settings as compared with students receiving their instruction via distance learning. Though many researchers have compared results in individual courses and various undergraduate programs, evidence could not be found of any studies of full degree programs at the graduate level utilizing instructional television in a two-way live setting.

While isolated classes or incidences of a statistically significant negative effect on students in a distance learning setting have been found in a few studies, the majority of statistically significant differences found have been when Distance Learning students have scored better than traditional students. There is much speculation about what other factors may contribute to these positive differences or lack of differences. Are the distance learning students in some way predisposed to do better?

The purpose of this study was to investigate whether there were any statistically significant differences in the overall learning outcomes (as measured by cumulative GPAs, completion rates, or length of time to graduate) of graduate students enrolled in the MBA degree program at The University of Tennessee at Chattanooga in traditional classroom instructional settings as compared with students who received their instruction via interactive distance learning television. Additionally, the study compared students

who received some of their instruction via distance learning and some in the traditional classroom to the previously mentioned groups. This study attempted to hold constant factors, such as age, that might affect the dependent variable and to isolate any differences that can be attributed to the method of instructional delivery.

Subjects

While many studies reported in the literature reviewed in Chapter 2 were based on programs, courses, and degrees for undergraduate students, there were very few studies designed to focus on students pursuing a graduate degree and none were found that investigated whole graduate degree programs. With the reported and observed growing need for adult students to find non-traditional ways to achieve their educational goals, it is important to determine the effect, if any, alternative delivery methods have had on educational outcomes. This study was designed to review the cumulative GPA scores, graduation rates, and length of time to graduate for graduate students enrolled in the Masters of Business Administration (MBA) program offered at The University of Tennessee at Chattanooga between 1993 and 2000. At the time of this writing, the MBA program was offered in the traditional classroom delivery method on the main campus in Chattanooga. Additionally, the program was offered via interactive television between the UTC campus and the UT Knoxville campus as well as between Chattanooga and Knoxville in cooperation with the Tennessee Valley Authority University (TVAU). The interactive television offerings were initiated in 1993 and the TVAU project began in 1996. For eight semesters (Summer 1995 – Fall 1997) in the study period, courses were

also offered in a traditional delivery format with the instructor in a live classroom on the Knoxville campus. Thus, there were students in both Knoxville and in Chattanooga who had the opportunity to take courses in either the traditional or the interactive television formats.

The MBA program at UTC required students to take a minimum number of core semester hours to complete the degree program. This program included core course required for all MBA students, and elective or concentration courses. Over the course of this research study, the MBA program changed in 1997 from a 36 hour program with 27 required core hours and 9 hours of electives to a 31 hour program with 16 required core hours and 15 hours of concentration courses. Core courses included management, marketing, finance, accounting, and operations management classes. Concentrations include: accounting, economics, entrepreneurship, finance, health service management, human resource management, international business, management information systems, marketing, operations/production management and organizational management (UTC Graduate Catalog, 1993-1995; UTC Graduate Catalog, 1999-2000).

The subjects were divided into three groups; 1) students who received the great majority (70% or more based on credit hours) of their instruction in the traditional classroom setting, 2) students who received a limited amount (between 31% and 69% of their credit hours) of their instruction via distance learning, and 3) students who received the great majority (70% or more based on credit hours) of their instruction via distance learning.

Procedures

This study was a comparative study of the three groups mentioned above to determine if there were any statistically significant differences in the cumulative GPAs, retention rates, or graduation rates of the students.

Admission to the MBA program requires that students:

1) Have achieved a bachelor's degree from a regionally accredited institution (while technically any major is accepted, since non-business majors are usually required to take foundational classes to prepare for the core coursework, only students who were, at the time of the study, fully admitted to the program without the need for foundation level courses were included).
2) Be granted admission to UTC's Graduate Division based on a minimum cumulative undergraduate GPA of 2.5, or a GPA of 3.0 in the senior year.
3) Have an official GMAT score and meet the minimum acceptable admissions index (AI) score of 950. This score is calculated with the following formula: 200 x undergraduate GPA + GMAT score = AI.

The following data were collected on students enrolled in the MBA program between Fall 1993 and Fall 2000:

- Undergraduate GPA
- GMAT Score
- AI Score = 200 x undergraduate GPA + GMAT score
- Percent coursework (credit hours) taken in traditional classroom setting
- Percent coursework (credit hours) taken in distance learning classroom setting

- Degree completion rate – defined as whether the student has completed the degree during the study period
- Cumulative GPA at graduation (if degree completed) – what if they didn't
- Date of entry into MBA program
- Gender
- Date of Birth
- Length of time to complete degree (in semesters – since this is a year-round program, summers will be included)

Data for all students fitting the criteria were gathered. There were 864 total subjects. The group receiving 70% or more of their instruction in the traditional classroom (Group 1 - Mostly Traditional) had a total of 632 subjects. Group 2 (Mixed), those students who received between 31% and 69% of their instruction via distance learning, had 130 subjects. Group 3 (Mostly DL), students who received more than 70% of their instruction via distance learning, had 102 subjects. There were 505 males and 359 females. The participants ranged in age (at start of program) from 20 to 56 with the following breakdown by age range: ages 20-29, 500 subjects, ages 30-39, 247 subjects, and ages 40+, 117 subjects. The breakdown by race was 40 black, 728 white, and 96 other. Four hundred twenty seven of the subjects had completed the degree and graduated, while 437 of the participants had not graduated. The data were gathered from records within the Graduate Office, the Division of Continuing Education, the Records Office and the Office of Institutional Research at UTC.

Control

This research was designed to try to determine if there were any statistically significant differences in student outcomes that could be attributed to the delivery method being used. According to the majority of the literature reviewed, there were no significant differences in the outcomes of students receiving their coursework via distance learning methodology. Researchers have concluded that the lack of differences in outcomes may have been affected by other variables. One common opinion found in the literature was that adult students may have tended to be more motivated and dedicated than were traditional 18-24 year old students. Some authors have postulated that since most distance learning students tended to be adults, they would be more motivated to succeed, which might mask or hide any negative effect the instructional method might have caused. It logically follows that negative effects, which should be attributed to the instructional method, might have appeared if distance learning classes were made up of traditional age students. Consequently, this study sought to neutralize the effects of age, which might have impacted the dependent variable (GPA) and presented an appearance of no difference where differences may indeed have existed. In addition, the researcher attempted to control for other variables that might have impacted the dependent variable including undergraduate GPA, GMAT, and the AI score.

Statistical Analysis

Initially, the data were analyzed using the Analysis of Variance (ANOVA) to determine if there were statistically significant differences in the cumulative graduating

GPA scores of the three groups that might be attributed to the use of distance learning instruction. In addition, in order to neutralize any effect caused by other variables such as age, the data were analyzed with the Analysis of Covariance (ANCOVA). The following assumptions were necessary to use the ANCOVA: 1.) the relationship between the dependent variable and the covariate was linear, and 2.) there was homogeneity of regression--there was no interaction between the covariate and the treatment. The ANCOVA is often used in experimental causal design projects where the groups cannot be randomly assigned or already exist. In this case, the students were assigned to their group according to the percentage (if any) of distance learning instruction they had received. ANCOVA provided a means to help remove bias attributable to the groups not being matched as well as providing more precision than did the ANOVA (Wildt, 1978).

Finally, the ANOVA and ANCOVA were used to investigate whether there were statistically significant differences among the groups. The results did not yield indications of where those differences lay. For the significant differences that were found, the Tukey-Kramer post hoc comparison test was applied to the data to determine where the differences among the three groups actually existed. Since the group sizes were different based on the design of the study and the definitions of the groups, the Tukey-Kramer was the most appropriate post hoc test for this research situation. Where differences were found with the ANOVA or ANCOVA, the Tukey-Kramer test was used to determine which groups' means differed significantly and in which direction.

Research Question 1 – Is there a statistically significant difference among the cumulative GPA scores of students in a distance learning classroom setting and students in a traditional classroom setting, or students with a combination of distance learning and traditional classroom settings?

The dependent variable was the graduate GPA; the independent variable was the type of instruction received. As an added measure for isolating any differences caused by the method of instructional delivery, the researcher further analyzed the data using the ANCOVA with the dependent variable being the graduating GPA, the independent categorical variable the type of instruction received, and the age of the students, the AI score, undergraduate GPA and/or GMAT scores treated as covariates. This measure further helped to control for and isolate any differences attributed to the instructional method, while controlling for predetermining factors such as age, which previous authors have suggested may contribute to the lack of differences in previous research. If significant differences were found, the data were further analyzed using the Tukey-Kramer post hoc test to determine where the differences occurred among the groups.

Research Question 2 – Is there a statistically significant difference in the graduation rates between students in traditional and distance learning settings?

Since this research question dealt with nominal data (degree completion: yes or no), the data could not be analyzed using the ANOVA or ANCOVA. Instead, the data were analyzed using the Chi-square test of homogeneity.

The chi-square test was used to determine if any of the groups differed

significantly in the number of students who completed the degree in the study period. As was outlined in Research Question 1, there was an attempt to control for any other factors besides the instructional method that might have affected the degree completion rate (i.e. AI, GMAT, undergraduate GPA, Age). The data were analyzed with the three-way chi-square test based on degree completion status (yes or no), Instructional Method groups (Traditional, Distance Ed, Some Distance), and each of the control variables mentioned treated as a layer variable (AI, GMAT, undergraduate GPA, Age). Ranges of these layer or control variables were established and chi-square values calculated with regard to degree completion rate, type of instruction and the layer variable. Any statistically significant differences found with the chi-square tests were analyzed by reviewing the standardized residuals to determine which sample group(s) contributed to the statistically significant X^2 value.

Research Question 3 – Is there a statistically significant difference in the length of time it takes to complete the program for students in a distance learning classroom setting and students in a traditional classroom setting, or students with a combination of distance learning and traditional classroom settings?

This research question was analyzed with the same statistical measures listed above in Research Question 1, except that the dependent variable was length of time taken to graduate from the program (measured in semesters). The direction of any differences found in the length of time to completion was determined by examining the

scores from the Tukey-Kramer tests conducted to determine which instructional method(s) was significantly higher or lower.

Summary

It is important for colleges and universities to determine if the use of distance learning methods of instruction has any statistically significant effect on the learning outcomes of students. Any statistically significant differences found need to be reviewed by higher education officials to determine if there is any negative impact on the student outcomes of those receiving their education via distance learning. In addition, this researcher suggests that these or similar data be analyzed in a future study using regression analysis to try to determine which combination of factors or variables might indicate that a student is likely to do well receiving instruction via distance learning methods of instruction. Also, if the factors or variables which might help to predict student success in a distance learning setting can be isolated and identified, universities can consider either advising students into the type of instructional method where they are most likely to succeed, or possibly setting different admissions requirements for students who will be taught using distance learning instructional methods.

CHAPTER 4

FINDINGS

Purpose of the Study

The purpose of this study was to investigate whether there were any statistically significant differences in the overall learning outcomes of graduate students enrolled in the MBA degree program at The University of Tennessee at Chattanooga in traditional classroom instructional settings as compared with students who received their instruction via interactive distance learning television. These outcomes were determined as follows:

1. Cumulative Grade Point Average [GPA]
2. Graduation Status – Did the student complete the degree in the study period.
3. Total Semesters – Length of time in semesters from start of program to graduation.

Additionally, the study compared students who received some of their instruction via distance learning and some in the traditional classroom to these pre-mentioned groups.

This study attempted to hold constant several factors (such as age) that might affect the dependent variable and to isolate any differences that can be attributed to the method of instructional delivery.

Subjects

This study was designed to review the cumulative GPA scores, retention rates, and length of time to graduate for graduate students enrolled in the Masters of Business Administration (MBA) program offered at The University of Tennessee at Chattanooga between 1993 and 2000.

The subjects were divided into three groups; Group 1 (Mostly Traditional) students who received the great majority (70% or more based on credit hours) of their instruction in the traditional classroom setting, Group 2 (Mixed Delivery) students who received a limited amount (between 31% and 69% of their credit hours) of their instruction via distance learning, and Group 3 (Mostly Distance Learning) students who received the great majority (70% or more based on credit hours) of their instruction via distance learning. There were 864 total subjects and demographics are displayed in Table 3. The group receiving 70% or more of their instruction in the traditional classroom (Group 1 - Mostly Traditional) had a total of 632 subjects. The mean percentage of distance learning coursework was 7.033 percent and the median percentage was 0.00 for the Mostly Traditional group. Group 2 (Mixed Delivery), those students who received between 31% and 69% of their instruction via distance learning, had 130 subjects. The mean percentage of distance learning coursework was 43.99 percent and the median percentage was 40.50 for the Mixed Delivery group. Group 3 (Mostly Distance Learning), students who received more than 70% of their instruction via distance learning, had 102 subjects. The mean percentage of distance learning coursework was 93.33 percent and the median percentage was 100.00 for the Mostly Distance Learning

Table 3: Description of Participants by Group, Sex, Age Range and Degree Completion

Variables	N	%
Group		
1 – Mostly Traditional	632	73.15
2 – Mixed Delivery	130	15.05
3 – Mostly Distance Learning	102	11.80
Sex		
Males	505	58.45
Females	359	41.55
Age Range		
20-29	500	57.87
30-39	247	28.59
40+	117	13.54
Race		
Black	40	4.63
White	728	84.26
Other	96	11.11
Degree Completion		
Yes	427	49.42
No	437	50.58

group. There were 505 males and 359 females. The participants ranged in age (at start of program) from 20 to 56 with the following breakdown by age range: ages 20-29, 500 subjects, ages 30-39, 247 subjects, and ages 40+, 117 subjects. The breakdown by race was 40 black, 728 white, and 96 other. Four hundred twenty seven of the subjects had completed the degree and graduated, while 437 of the participants had not graduated.

Findings

This study was a comparative study of the three groups mentioned above to determine if there were any statistically significant differences in the cumulative GPAs, retention rates, or graduation rates of the students by group.

The following data were collected on students enrolled in the MBA program between

Fall 1993 and Fall 2000:

- GMAT Score
- Undergraduate GPA
- AI Score = 200 x undergraduate GPA + GMAT score
- Percent coursework (credit hours) taken in distance learning classroom setting
- Degree completion rate – defined as whether the student has completed the degree during the study period
- Cumulative graduate GPA
- Date of entry into MBA program
- Gender
- Date of Birth
- Length of time to complete degree (in semesters)

Research Question 1 – Is there a statistically significant difference among the cumulative GPA scores of students in a distance learning classroom setting and students in a traditional classroom setting, or students with a combination of distance learning and traditional classroom settings?

Initially, an Analysis of Variance (ANOVA) was run to determine if there were differences in the mean graduating GPAs of the three groups. The dependent variable was the graduating GPA; the independent variable was the group assigned based on the type of instruction received. ANOVA results, presented in Table 4, showed a statistically significant main effect, ($F=3.119$, $p=.045$).

Table 4: ANOVA – Analysis of GPA by Group

Source	Sum of Squares	df	Mean Square	F	Eta Squared
Group	1.268	2	.634	3.119*	.007
Error	174.794	860	.203		
Corrected Total	176.062	862			

Note = * Significant at $\alpha = .05$

The Tukey-Kramer post hoc test was conducted to determine which groups were significantly different. Results revealed that the mean of Group 1 (Mostly Traditional) differed significantly from the mean of Group 2 (Mixed Delivery) (p=.034) with a mean difference of -.1081. There were no statistically significant differences found between groups 1 and 3 (p=.832), and groups 2 and 3 (p=.372). From Table 5, one observes that of the three groups, Group 1 (Mostly Traditional) had the lowest mean GPA (3.479), with Group 3 (Mostly Distance Learning) slightly higher. Group 2 (Mixed Delivery) mean was slightly higher than that of Group 3 (Mostly Distance Learning). And finally, Group 2 (Mixed Delivery) had a significantly higher mean GPA than Group 1 (Mostly Traditional).

As an added measure for further isolating any differences caused by the method of instructional delivery, the researcher analyzed the data using independent ANCOVA tests with the dependent variable being the graduating GPA, the independent categorical variable the type of instruction received, and the age of the students, the AI score, undergraduate GPA and/or GMAT scores each treated as independent covariates. Each of these variables might be expected to have some significant effect on the dependent variable (GPA). Therefore the researcher wished to control for those variables to

Table 5: Tukey-Kramer Comparison of Group GPA Means

Group	Mean	Mean Difference $(\bar{X}_i - \bar{X}_k)$ Between Groups	
		1	2
1	3.479		
2	3.587	-.108*	
3	3.506	-.028	.080

Note = * Significant at $\alpha = .05$

determine any actual differences due to the amount of distance learning received (Group).

An analysis of covariance (ANCOVA) was conducted to determine the effect that instructional method had on graduating GPA when controlling for age at entry of program. Interaction of factors was first analyzed, as is required to run an ANCOVA, and found not to be statistically significant (p=.879). Since there was no significant interaction, the ANCOVA was run with EntryAge as the covariate with the following results (Table 6).

The ANCOVA revealed that while controlling for entry age, there was a statistically significant difference among the groups. The adjusted and unadjusted means are shown in Table 7.

In order to determine where the significant difference(s) lie, the Tukey-Kramer Q scores were calculated. The critical values for the Q score for df > 120 are as follows – for $p<.05$, $Q_{cv} > 3.31$, and for $p<.01$ $Q_{cv}>4.12$. The calculation for the Q score is $\frac{X_1 - X_2}{\sqrt{MS_w\left(\frac{\frac{1}{N_1} + \frac{1}{N_2}}{2}\right)}}$ (Hinkle, 1994).

Table 6: ANCOVA – Analysis of GPA by Group with Covariate Entry Age

Source	Sum of Squares	df	Mean Square	F	Eta Squared
Group	1.443	2	.721	3.611 *	.008
Entry Age	3.203	1	3.203	16.033**	.018
Error	171.591	859	.200		
Corrected Total	176.062	862			

Note = * Significant at $\alpha = .05$ ** Significant at $\alpha = .01$

Table 7: ANCOVA Adjusted GPA Means by Groups Controlling for Entry Age

Group	Adjusted Mean	Unadjusted Mean
1 – Mostly Traditional	3.484	3.479
2 – Mixed Delivery	3.596	3.587
3 – Mostly Distance Learning	3.462	3.507

The Q_{1-2} score (Table 8) was –4.768, which is significant to at least p=.01. The Q_{2-3} score was 4.142, which is significant to at least p=.01. The Q_{1-3} score is .842, which was not statistically significant. Therefore, after controlling for the EntryAge of the subjects, the adjusted means and Q scores revealed that both Groups 1 (Mostly Traditional) and 3 (Mostly Distance Learning) were significantly lower than the Group 2 (Mixed Delivery) mean graduating GPA. There was however no statistically significant difference found between Group 1 (Mostly Traditional) and Group 3 (Mostly Distance Learning).

Next, the ANCOVA on group GPAs was again calculated, this time using the Admissions Index score as the covariate. Interaction of the factors was analyzed and found not to be statistically significant (p=.547). The ANCOVA was run and revealed that while controlling for the admissions index, there were no statistically significant differences found among the groups.

Table 8: Tukey-Kramer Comparison of Adjusted Group GPA Means Controlling for Entry Age

Group	Mean	Q Score	
		1	2
1	3.484		
2	3.596	-4.768**	
3	3.462	0.842	4.142**

Note = * Significant at $\alpha = .05$ ** Significant at $\alpha = .01$

The ANCOVA was again calculated, this time using the Undergraduate GPA score as the covariate. Interaction of the factors was analyzed and found not to be statistically significant (p=.117). The ANCOVA was run with the following results (Table 9).

The ANCOVA revealed that while controlling for undergraduate GPA, there was a statistically significant difference among the groups. The adjusted and unadjusted means are shown in Table 10.

To determine where the significant difference(s) lie, the Tukey-Kramer Q scores were calculated. The Q_{1-2} score was –3.7578 (Table 11), which was significant to at least p=.05. Therefore, after controlling for the Undergraduate GPA of the subjects, the

Table 9: ANCOVA – Analysis of GPA by Group with Covariate Undergraduate GPA

Source	Sum of Squares	df	Mean Square	F	Eta Squared
Group	1.322	2	.661	3.395*	.008
UG GPA	8.601	1	8.601	44.188**	.051
Error	159.809	821	.195		
Corrected Total	169.723	824			

Note = * Significant at $\alpha = .05$ ** Significant at $\alpha = .01$

Table 10: ANCOVA Adjusted GPA Means by Groups Controlling for Undergraduate GPA

Group	Adjusted Mean	Unadjusted Mean
1 – Mostly Traditional	3.476	3.479
2 – Mixed Delivery	3.589	3.587
3 – Mostly Distance Learning	3.488	3.507

Table 11: Tukey-Kramer Comparison of Adjusted Group GPA Means Controlling for Undergraduate GPA

Group	Mean	Q Score	
		1	2
1	3.476		
2	3.589	-3.759*	
3	3.488	-.359	2.439

Note = * Significant at $\alpha = .05$

adjusted means and Q scores reveal that Group 1 (Mostly Traditional) was statistically significantly lower than the Group 2 (Mixed Delivery) mean graduating GPA. There were however no statistically significant differences found between Group 1 (Mostly Traditional) and Group 3 (Mostly Distance Learning) or Group 2 (Mixed Delivery) and Group 3 (Mostly Distance Learning).

Next, the ANCOVA was again calculated, this time using the GMAT score as the covariate. Interaction of the factors was analyzed and found not to be statistically significant (p=.595). The ANCOVA was run and revealed that while controlling for the GMAT score, there were no statistically significant differences among the groups.

As an additional measure to try to determine any differences among the groups while holding multiple covariates constant, ANCOVA tests were calculated utilizing two or more variables as multiple covariates. The first combined covariate test was run using

entry age and GMAT score as covariates. Interaction of the factors was analyzed and found not to be statistically significant (p=.876). The ANCOVA was run and revealed that while controlling for the entry age and GMAT simultaneously, there were no statistically significant differences among the groups.

Next, the ANCOVA was run using entry age and Admissions Index as covariates. Interaction of the factors was analyzed and found not to be statistically significant (p=.934). The ANCOVA was run with the results shown in Table 12.

The ANCOVA revealed that while controlling for entry age and Admissions Index, there was a statistically significant difference among the groups. The adjusted and unadjusted means are shown in Table 13.

Table 12: ANCOVA – Analysis of GPA by Group with Covariates Entry Age and Admissions Index

Source	Sum of Squares	df	Mean Square	F	Eta Squared
Group	1.259	2	.630	3.345*	.008
Entry Age	3.533	1	3.533	18.766**	.022
Adm. Index	11.370	1	11.370	60.394**	.067
Error	157.203	835	.188		
Corrected Total	173.534	839			

Note = * Significant at $\alpha = .05$ ** Significant at $\alpha = .01$

Table 13: ANCOVA Adjusted GPA Means by Groups Controlling for Entry Age and Admissions Index

Group	Adjusted Mean	Unadjusted Mean
1 – Mostly Traditional	3.485	3.477
2 – Mixed Delivery	3.584	3.585
3 – Mostly Distance Learning	3.448	3.494

In order to determine where the significant difference(s) lie, the Tukey-Kramer Q scores were calculated. The Q_{1-2} score (Table 14) was –3.314, which was significant to at least p=.05. Therefore, after controlling for the Entry age and Admissions Index, the adjusted means and Q scores revealed that Group 1 (Mostly Traditional) was statistically significantly lower than the Group 2 (Mixed Delivery) mean graduating GPA. There were however no statistically significant differences found between Group 1 (Mostly Traditional) and Group 3 (Mostly Distance Learning) or Group 2 (Mixed Delivery) and Group 3 (Mostly Distance Learning).

Again, the ANCOVA was run using entry age and Undergraduate GPA as the covariates. Interaction of the factors was analyzed and found not to be statistically significant (p=.157). The ANCOVA was run with the following results (Table 15).

The ANCOVA revealed that while controlling for Entry Age and Undergraduate GPA, there was a statistically significant difference among the groups. The adjusted and unadjusted means are shown in Table 16.

In order to determine where the significant difference(s) lie, the Tukey-Kramer Q scores were calculated. The Q_{1-2} score (Table 17) was –3.9498, which was significant to at least p=.05. The Q_{2-3} score was 3.8828, which was significant to at least p=.05. Therefore, after controlling for the entry age and Undergraduate GPA of the subjects, the adjusted means and Q scores revealed that Group 1 (Mostly Traditional) was statistically significantly lower than the Group 2 (Mixed Delivery) mean graduating GPA and Group 3 (Mostly Distance Learning) was statistically significantly lower than the Group 2 (Mixed Delivery) mean graduating GPA. There was however no statistically significant

Table 14: Tukey-Kramer Comparison of Adjusted Group GPA Means Controlling for Entry Age and Admissions Index

Group	Mean	Q Score	
		1	2
1	3.485		
2	3.584	-3.314*	
3	3.448	1.099	3.280

Note = * Significant at $\alpha = .05$

Table 15: ANCOVA – Analysis of GPA by Group with Covariates Entry Age and Undergraduate GPA

Source	Sum of Squares	df	Mean Square	F	Eta Squared
Group	1.745	2	.873	4.588**	.011
Entry Age	3.852	1	3.852	20.254**	.024
UG GPA	8.522	1	8.522	44.808**	.052
Error	155.957	820	.190		
Corrected Total	169.723	824			

Note = ** Significant at $\alpha = .01$

Table 16: ANCOVA Adjusted GPA Means by Groups Controlling for Entry Age and Undergraduate GPA

Group	Adjusted Mean	Unadjusted Mean
1 – 70% or more traditional instruction	3.482	3.476
2 – 31-69% distance learning instruction	3.600	3.588
3 – 70% or more distance learning instruction	3.439	3.490

Table 17: Tukey-Kramer Comparison of Adjusted Group GPA Means Controlling for Entry Age and Undergraduate GPA

Group	Mean	Q Score	
		1	2
1	3.482		
2	3.600	-3.950*	
3	3.349	1.2783	3.883*

Note = * Significant at $\alpha = .05$

difference found between Group 1 (Mostly Traditional) and Group 3 (Mostly Distance Learning).

The next combined covariate test was run using GMAT and Undergraduate GPA as covariates. Interaction of the factors was analyzed and found not to be statistically significant (p=.062). The ANCOVA was run and revealed while simultaneously controlling for GMAT and Undergraduate GPA, there were no statistically significant differences among the groups.

One final ANCOVA was run using entry age, Undergraduate GPA and GMAT score all as covariates with the following results. Interaction of the factors was analyzed and found not to be statistically significant (p=.843). The ANCOVA was run with the following results (Table 18).

The ANCOVA revealed that while controlling for entry age, GMAT, and Undergraduate GPA, there was a statistically significant difference among the groups. The adjusted and unadjusted means are shown in Table 19.

In order to determine where the significant difference(s) lie, the Tukey-Kramer Q scores again were calculated. The Q_{1-2} score (Table 20) was –3.4737, which was significant to at least p=.05. The Q_{2-3} score was 3.3182, which was significant to at least p=.05. Therefore, after controlling for the entry age, GMAT and Undergraduate GPA of the subjects, the adjusted means and Q scores revealed that Group 1 (Mostly Traditional) was statistically significantly lower than the Group 2 (Mixed Delivery) mean graduating GPA and Group 3 (Mostly Distance Learning) was statistically significantly lower than the Group 2 (Mixed Delivery) mean graduating GPA. There was however no statistically

G1 ↓ G2
G3 ↓ G2
G1 = G3

Table 18: ANCOVA – Analysis of GPA by Group with Covariates Entry Age, Undergraduate GPA and GMAT

Source	Sum of Squares	df	Mean Square	F	Eta Squared
Group	1.243	2	.622	3.522*	.009
Entry Age	2.547	1	2.547	14.430**	.018
GMAT	10.011	1	10.011	56.712**	.066
UG GPA	6.663	1	6.663	37.748**	.045
Error	142.633	808	.177		
Corrected Total	165.715	813			

Note = * Significant at $\alpha = .05$ ** Significant at $\alpha = .01$

Table 19: ANCOVA Adjusted GPA Means by Groups Controlling for Entry Age, Undergraduate GPA and GMAT

Group	Adjusted Mean	Unadjusted Mean
1 – 70% or more traditional instruction	3.485	3.479
2 – 31-69% distance learning instruction	3.587	3.592
3 – 70% or more distance learning instruction	3.452	3.488

Table 20: Tukey-Kramer Comparison of Adjusted Group GPA Means Controlling for Entry Age, Undergraduate GPA and GMAT

Group	Mean	Q Score	
		1	2
1	3.485		
2	3.587	-3.474*	
3	3.452	.0999	3.318*

Note = * Significant at $\alpha = .05$

significant difference found between Group 1 (Mostly Traditional) and Group 3 (Mostly Distance Learning).

Though the initial ANOVA showed there to be a statistically significant difference among the groups, the covariate analyses showed mixed results. The covariate analyses holding only Admissions Index, only GMAT, GMAT and entry age, or GMAT and Undergraduate GPA constant revealed no statistically significant differences among the groups. When holding Undergraduate GPA constant, and the combined covariates of entry age and Admissions Index, the Mostly Traditional group was found to have a statistically significantly lower adjusted mean GPA than the Mixed Delivery group. As anticipated in the literature, entry age was found to have a highly significant effect on the cumulative GPA score. While holding the entry age constant, the adjusted means derived by the ANCOVA showed both the Mostly Traditional and Mostly Distance Learning groups to have statistically significantly lower mean GPAs than the Mixed Delivery group. In this case, the adjusted mean GPA of the Mostly Distance Learning group actually dropped below the mean GPA of the Mostly Traditional group, though it was not statistically significantly lower. A similar outcome was found while controlling for entry age and Undergraduate GPA at the same time, and with the combined covariates of entry age, Undergraduate GPA, and GMAT.

Research Question 2 – Is there a statistically significant difference in the degree completion rates between students in traditional and distance learning settings?

Since this research question deals with nominal data (degree completion: yes or

no), the data cannot be analyzed using the ANOVA or ANCOVA. Instead, the data were analyzed using the Chi-square test of homogeneity.

The chi-square test was used to determine if any of the groups differ significantly in the proportion of students who have completed the degree in the study period. As was outlined in Research Question 1, there was an attempt to control for any other factors besides the instructional method that might affect the degree completion rate (i.e. AI, GMAT, undergraduate GPA, Age). The data were analyzed with the three-way chi-square test based on degree completion status (yes or no), Instructional Method groups (Mostly Traditional, Mixed Delivery, and Mostly Distance Learning), and each of the variables mentioned above (AI, GMAT, undergraduate GPA, Age) treated separately as layer variables. Ranges of these layer or control variables have been established and chi-square values calculated with regard to degree completion rate, type of instruction and the layer variable. The average number of semesters to graduate was 7.62. Some basic demographics by graduation status are displayed in Table 21.

An initial chi-square was run and the test for homogenous groups (as seen in Table 22) revealed that there was a statistically significant difference ($p=.012$). There were 864 subjects with 427 (49.4%) who completed the degree and 437 (50.6%) who did not complete the degree. The standardized residuals show that Group 2 (Mixed Delivery) (31-69% Distance Learning) contributed the most to this significant difference (standardized residual 1.8). It was expected that 49.4% would graduate while the actual amount who graduated was 60.8%.

Table 21: Description of Participants by Graduation Status

Variables	Graduation Status: Yes	Graduation Status: No
Group		
1 – Mostly Traditional	295 46.7%	337
2 – Mixed Delivery	79 60.8%	51
3 – Mostly Distance Learning	54 52.9%	48
Sex		
Males	254	251
Females	172	187
Age Range		
20-29	253	247
30-39	118	129
40+	57	60
Race		
Black	20	20
White	349	379
Other	60	36
AI Range		
Below 1100	193	190
1100.00-1249.99	148	149
1250.00 and Above	58	73
GMAT Range		
Below 400	27	49
400-490	201	180
500-590	144	133
600 and Above	48	63
UGGPA Range		
2.000-2.499	33	24
2.500-2.999	128	131
3.000-3.499	166	159
3.500-4.000	76	109

Table 22: Chi-square Analysis of All Subjects
Graduation Status Yes or No by Group

Graduate: Yes or No		Group 1	Group 2	Group 3	Total
Yes	Count	295	79	53	427
	% within Group	46.7%	60.8%	52.0%	49.4%
	Std. Residual	-1.0	1.8	.4	
No	Count	337	51	49	437
	% within Group	53.3%	39.2%	48%	50.6%
	Std. Residual	1.0	-1.8	-.4	
Total	Count	632	130	102	864

$\chi^2 = 8.864^*$ Note = * Significant at $\alpha = .05$

Next, the researcher ran the chi-square test with each of the layer variables. The ages of the subjects ranged from 20 years old to 56 years old. The researcher set age ranges of 20-29, 30-39 and 40 or more years old. There were 500 subjects in the 20-29 age range, 247 subjects in the 30-39 year range, and 117 subjects in the 40 and over range. The chi-square test was run with the following results.

Of the 500 subjects in the 20-29 age range, 253 completed the degree program and 247 did not. Accordingly, it was expected that 50.6% of the subjects in each group should have completed the degree, while 49.4% were expected not to finish. The chi-square value was 2.535, which showed no statistically significant differences among the three groups in the age 20-29 range (p=.282).

Of the 247 subjects in the 30-39 age range, 117 completed the program and 130 did not. Accordingly, it was expected that 47.4% of the subjects in each group should have completed the degree, while 52.6% were expected not to finish (Table 23). The chi-square value was 7.613, which showed a statistically significant difference among the three groups in the age 30-39 range (p=.022). The standardized residuals show that Group 2 (Mixed Delivery) had the greatest contribution (1.8) to the significant difference.

Table 23: Chi Square Analysis of Graduation Status by Group with Layer variable Age Range (30-39)

30-39 Age Range Graduate: Yes or No		Group 1	Group 2	Group 3	Total
Yes	Count	74	28	15	117
	% within Group	43.8%	66.7%	41.7%	47.4%
	Std. Residual	-1.0	1.8	.4	
No	Count	95	144	21	130
	% within Group	56.2%	33.3%	58.2%	52.6%
	Std. Residual	.6	-1.7	.5	
Total	Count	169	42	36	247

χ^2=7.613* Note = * Significant at α = .05

Of the 117 subjects in the 40+ age range, 57 completed the degree program and 60 did not. Accordingly, it was expected that 48.7% of the subjects in each group should have completed the degree, while 51.3% were expected not to finish (Table 24). The chi-square value was 12.555, which showed a statistically significant difference among the three groups in the age 40+ range (p=.002). The majority of this difference was evidenced in the group receiving 70% or more of instruction via distance learning (Group 3 - Mostly Distance Learning) with a standardized residual of 2.0.

The Admissions Index scores ([UGGPA x 200] + GMAT) of the subjects ranged from 821.40 to 1520.00. The researcher set AI ranges of Below 1100, 1100.00-1249.99, and 1250.00 and Above. There were 383 subjects in the Below 1100 AI range, 297 subjects in the 1100.00-1249.99 AI range, and 131 subjects in the 1250.00 and Above range. The chi-square test was run with the following results.

Of the 383 subjects in the Below 1100 range, 193 completed the degree program and 190 did not. Accordingly, it was expected that 50.4% of the subjects in each group should have completed the degree, while 49.6% were expected not to finish. The

Table 24: Chi Square Analysis of Graduation Status by Group with Layer variable Age Range (40+)

40+ Age Range Graduate: Yes or No		Group 1	Group 2	Group 3	Total
Yes	Count	27	6	24	57
	% within Group	36.5%	60.0%	72.7%	48.7%
	Std. Residual	-1.5	.5	2.0	
No	Count	47	4	9	60
	% within Group	63.5%	40.0%	27.3%	51.3%
	Std. Residual	1.5	-.5	-1.9	
Total	Count	74	10	33	117

χ^2=12.555** Note = ** Significant at α = .01

chi-square test showed no statistically significant differences among the three groups in the AI range Below 1100.

Of the 297 subjects in the 1100.00-1249.99 range, 148 completed the degree program and 149 did not. Accordingly, it was expected that 49.8% of the subjects in each group should have completed the degree, while 50.2% were expected not to finish (Table 25). The chi-square value was 8.188, which showed a statistically significant difference among the three groups in the AI range 1100.00-1249.99 range (p=.017). The standardized residuals show that Group 2 (Mixed Delivery) had the greatest contribution (1.8) to the significant difference.

Of the 131 subjects in the 1250.00 and Above AI range, 58 completed the degree program and 73 did not. Accordingly, it was expected that 44.3% of the subjects in each group should have completed the degree, while 55.7% were expected not to finish. The chi-square value was not statistically significant.

Next, the chi-square was run with GMAT as the layer variable. The GMAT scores ranged from 250 to 740. The researcher set GMAT ranges of Below 400, 400-490,

Table 25: Chi Square Analysis of Graduation Status by Group with Layer variable Admissions Index Range (1100.00-1249.99)

AI Range 1100.00-1249.99 Graduate: Yes or No		Group 1	Group 2	Group 3	Total
Yes	Count	96	29	23	148
	% within Group	45.3%	69.0%	53.5%	49.8%
	Std. Residual	-.9	1.8	.3	
No	Count	116	13	20	149
	% within Group	54.7%	31.0%	46.5%	50.2%
	Std. Residual	.9	-1.8	-.3	
Total	Count	212	42	43	297

χ^2=8.188* Note = * Significant at α = .05

500-590, and 600 and Above. There were 76 subjects in the Below 400 range, 381 in the 400-490 range, 277 in the 500-590 range, and 111 in the 600 and Above range. The chi-square test was run with the following results.

Of the 76 subjects in the Below 400 GMAT range, 27 completed the degree program and 49 did not. Accordingly, it was expected that 35.5% of the subjects in each group should have completed the degree, while 64.5% were expected not to finish. The chi-square value showed no statistically significant differences among the three groups in the Below 400 GMAT score range .

Of the 381 subjects in the 400-490 GMAT range, 201 completed the degree program and 180 did not. Accordingly, it was expected that 52.8% of the subjects in each group should have completed the degree, while 47.2% were expected not to finish. The chi-square value did not show a statistically significant difference among the three groups in the 400-490 GMAT range.

Of the 203 subjects in the 500-590 GMAT range, 144 completed the degree program and 133 did not. Accordingly, it was expected that 52.0% of the subjects in each

group should have completed the degree, while 48.0% were expected not to finish. The chi-square value for GMAT range 500-590 was not statistically significant

Of the 111 subjects in the 600 and Above GMAT range, 48 completed the degree program and 63 did not. Accordingly, it was expected that 43.2% of the subjects in each group should have completed the degree, while 56.8% were not expected to finish (Table 26). The chi-square value was 6.179, which showed a statistically significant difference among the three groups in the GMAT range 600 and Above (p=.046). The standardized residuals show that Group 3 (Mostly Distance Learning) made the greatest contribution (1.2) to the significant difference, though this residual value was not particularly large.

The undergraduate GPA scores of the subjects ranged from 2.000-4.000. The researcher set UG GPA ranges of 2.000-2.499, 2.500-2.999, 3.000-3.499, and 3.500-4.000. There were 57 subjects in the 2.000-2.499 range, 259 subjects in the 2.500-2.999 range, 325 subjects in the 3.000-3.499 range, and 185 in the 3.500-4.000 range. The chi-square test was run with the Undergraduate GPA layer variable and there were no

Table 26: Chi Square of Graduation Status by Group with Layer variable GMAT Range (600 and Up)

GMAT Range 600 and Up Graduate: Yes or No		Group 1	Group 2	Group 3	Total
Yes	Count	27	13	8	48
	% within Group	35.5%	56.5%	66.7%	43.2%
	Std. Residual	-1.0	1.0	1.2	
No	Count	49	10	4	149
	% within Group	64.5%	43.5%	33.3%	50.2%
	Std. Residual	.9	-.8	-1.1	
Total	Count	76	23	12	111

χ^2=6.179* Note = * Significant at α = .05

statistically significant differences found in any of the ranges. In the overall Chi-Square test for completion status, the Mixed Delivery group had a significantly higher number of graduates. After establishing ranges of the variables (Entry Age, Admissions Index, Undergraduate GPA, and GMAT), the Chi-Square tests run with the layer variables showed Group 2 to have significantly more graduates in the entry age layer for subjects aged 30-39, and in the Admissions Index layer 1100-1249 range. In two situations, entry age layer 40+ and GMAT layer range 600 and up, the Mostly Distance Learning group had the highest percentage of graduates.

Research Question 3 – Is there a statistically significant difference in the length of time it takes to complete the program for students in a distance learning classroom setting and students in a traditional classroom setting, or students with a combination of distance learning and traditional classroom settings?

This research question was analyzed with the same statistical measures listed above in Research Question 1, except that the dependent variable was length of time taken to graduate from the program (measured in mean semesters). There were 427 students in the population who completed the degree program. Initially, an Analysis of Variance (ANOVA) was run to determine if there were differences in the mean number of semesters to graduate among the three groups. The dependent variable was the number of semesters taken to graduate; the independent variable was the group assigned based on the type of instruction received. ANOVA results, presented in Table 27, showed a statistically significant main effect, ($F=4.657$, $p=.010$).

Table 27: ANOVA – Analysis of Semesters to Graduate by Group

Source	Sum of Squares	df	Mean Square	F	Eta Squared
Group	116.638	2	58.319	4.657**	.021
Error	5309.901	424	12.523		
Corrected Total	5426.539	426			

Note = ** Significant at $\alpha = .01$

The Tukey-Kramer post hoc test was conducted to determine which groups were significantly different. Results revealed that Group 1 (Mostly Traditional) differed significantly from Group 3 (Mostly Distance Learning) (p=.004) with a mean difference of 1.538. There were no statistically significant differences found between groups 1 and 2, or groups 2 and 3 (See Table 28).

As an added measure for further isolating any differences caused by the method of instructional delivery, the researcher analyzed the data using independent ANCOVA tests with the dependent variable being the number of semesters to graduate, the independent categorical variable the type of instruction received, and the age of the students, the AI score, undergraduate GPA and/or GMAT scores each treated independently as covariates.

An analysis of covariance (ANCOVA) was conducted to determine the effect that instructional method had on the length of time taken to graduate when controlling for age at entry of program. Interaction of factors was first analyzed and found not to be statistically significant. The ANCOVA was run with entry age as the covariate with the following results (Table 29). Since the ANCOVA did not show entry age to have a statistically significant effect, no further tests were conducted with this covariate.

Table 28: Tukey-Kramer Comparison of Group Means of Semesters to Graduate

Group	Mean	Mean Difference $(\bar{X}_i - \bar{X}_k)$ Between Groups	
		1	2
1	7.925		
2	7.316	.609	
3	6.377	1.548**	.939

Note = ** Significant at $\alpha = .01$

Table 29: ANCOVA – Analysis of Number of Semesters to Graduate by Group with Covariate Entry Age

Source	Sum of Squares	df	Mean Square	F	Eta Squared
Group	143.191	2	71.595	5.734**	.026
Entry Age	27.942	1	27.942	2.238	.005
Error	5281.959	423	12.487		
Corrected Total	5426.539	426			

Note = ** Significant at $\alpha = .01$

Next, the ANCOVA was again calculated, this time using the Admissions Index score as the covariate. Interaction of the factors was analyzed and found not to be statistically significant. The ANCOVA was run with the following results (Table 30).

The ANCOVA revealed that while controlling for the admissions index, there was a statistically significant difference among the groups. The adjusted and unadjusted means are shown in Table 31.

In order to determine where the significant difference(s) lie, the Tukey-Kramer Q scores were calculated. The $Q_{1\text{-}3}$ score was 4.5587, which was significant to at least p=.01. Therefore, after controlling for the Admissions Index of the subjects, the adjusted means and Q scores revealed that Group 1 (Mostly Traditional [8.030 adjusted]) took significantly longer to complete the degree than did Group 3 (Mostly Distance Learning)

Table 30: ANCOVA – Analysis of Semesters to Graduate by Group with Covariate Admissions Index

Source	Sum of Squares	df	Mean Square	F	Eta Squared
Group	150.892	2	75.446	5.860**	.028
Adm. Index	55.815	1	55.815	4.335*	.011
Error	5150.292	400	12.876		
Corrected Total	5342.218	403			

Note = * Significant at $\alpha = .05$ ** Significant at $\alpha = .01$

Table 31: ANCOVA adjusted Number of Semesters to Graduate Means by Groups Controlling for Admissions Index

Group	Adjusted Mean	Unadjusted Mean
1 – Mostly Traditional	8.030	7.925
2 – Mixed Delivery	7.222	7.316
3 – Mostly Distance Learning	6.223	6.377

(6.223 adjusted). There were however no other statistically significant differences found between groups (Table 32).

Next, the ANCOVA was again calculated, this time using the Undergraduate GPA score as the covariate. Interaction of the factors was analyzed and found not to be statistically significant. The ANCOVA was run with the following results (Table 33). Since the ANCOVA revealed that Undergraduate GPA did not have a statistically significant effect, no further tests were run with this covariate.

Next, the ANCOVA was again calculated, this time using the GMAT score as the covariate. Interaction of the factors was analyzed and found not to be statistically significant. The ANCOVA was run with the following results (Table 34).

Table 32: Tukey-Kramer – Adjusted Group Number of Semesters to Graduate Means Controlling for Admissions Index

Group	Mean	Q Score	
		1	2
1	8.030		
2	7.222	2.462	
3	6.223	4.559**	2.135

Note = ** Significant at α = .01

Table 33: ANCOVA – Analysis of Number of Semesters to Graduate to Graduate by Group with Covariate Undergraduate GPA

Source	Sum of Squares	Df	Mean Square	F	Eta Squared
Group	127.723	2	63.861	4.907**	.024
UG GPA	13.749	1	13.749	1.056	.003
Error	5192.985	399	13.015		
Corrected Total	5333.777	402			

Note = ** Significant at α = .01

Table 34: ANCOVA – Analysis of Number of Semesters to Graduate to Graduate by Group with covariate GMAT

Source	Sum of Squares	df	Mean Square	F	Eta Squared
Group	413.442	2	71.721	5.802**	.027
GMAT	91.736	1	91.736	7.421**	.017
Error	5167.282	418	12.362		
Corrected Total	5380.912	421			

Note = ** Significant at α = .01

The ANCOVA revealed that while controlling for GMAT score, there was a statistically significant difference among the groups. The adjusted and unadjusted means are shown in Table 35.

In order to determine where the significant difference(s) lie, the Tukey-Kramer Q scores were calculated. Once again, the Q_{1-3} score was significant (4.6192) to at least p=.01. Therefore, after controlling for the GMAT score of the subjects, the adjusted means and Q scores revealed that Group 1 (Mostly Traditional) took statistically significantly longer to graduate than Group 3 (Mostly Distance Learning). There were however no other statistically significant differences found among the groups (Table 36).

In the ANOVA for Research Question 3, the Mostly Distance Learning group was found to have graduated significantly faster than the Mostly Traditional group. Similar results were found across all tests. The entry age and the Undergraduate GPA were found to have no significant effect on number of semesters to graduate, though GMAT and Admissions Index did. Regardless, all ANCOVA tests run revealed that the Mostly Distance Learning group graduation rates were significantly faster than the Mostly Traditional.

Table 35: ANCOVA adjusted Number of Semesters to Graduate Means by Groups Controlling for GMAT

Group	Adjusted Mean	Unadjusted Mean
1 – Mostly Traditional	7.951	7.925
2 – Mixed Delivery	7.237	7.316
3 – Mostly Distance Learning	6.222	6.377

Table 36: Tukey-Kramer – Adjusted Group Number of Semesters to Graduate Means Controlling for GMAT

Group	Mean	Q Score	
		1	2
1	7.952		
2	7.237	2.268	
3	6.222	4.619**	2.286

Note = ** Significant at $\alpha = .01$

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE STUDY

Introduction

Based on assumptions stated in the results of previous studies noted in the literature, the researcher in this study sought to take a closer look at the comprehensive results of a distance learning program over an extended period of time. After reviewing previous studies, the researcher found no reports of statistically significant differences between the learning outcomes of traditional students and distance learning students, many authors of previous research projects surmised that this might have been attributed to higher motivational factors of adult students. Since distance learning programs are primarily designed to help students who are place and time bound to attend college, historically most distance learning students tended to be working adults. Because of this, the assumption noted in the literature was that these working adults might have been more motivated to achieve and succeed. The authors making this assumption attributed the lack of statistically significant differences in grades and other learning outcomes to differences in increased motivation in adult learners, but still left unanswered the question of whether the use of distance learning technologies had any statistically significant effect on student learning outcomes.

The purpose of this study was to investigate whether there were any statistically significant differences in the overall learning outcomes of graduate students enrolled in the MBA degree program at The University of Tennessee at Chattanooga in traditional

classroom instructional settings as compared with students who received their instruction via interactive distance learning television. These outcomes were determined as follows:

1. Cumulative Grade Point Average [GPA]
2. Graduation Status – Did the student complete the degree in the study period.
3. Total Semesters – Length of time in semesters from start of program to graduation.

Additionally, the study compared students who received some of their instruction via distance learning and some in the traditional classroom to these two groups.

Research Questions

1. Is there a statistically significant difference among the cumulative GPA scores of students in a distance learning classroom setting and students in a traditional classroom setting, or students with a combination of distance learning and traditional classroom settings?
2. Is there a statistically significant difference in the degree completion rates between students in traditional and distance learning settings?
3. Is there a statistically significant difference in the length of time it takes to complete the program for students in a distance learning classroom setting and students in a traditional classroom setting, or students with a combination of distance learning and traditional classroom settings?

Summary of the Findings

Overall, the majority of the results found for Research Question 1 revealed no statistically significant differences between the Mostly Traditional and the Mostly Distance Learning students. In cases where statistically significant differences were found, many of these were when the Mostly Traditional students scored significantly below those who received a mixture of traditional instruction and distance learning instruction. In several tests where Entry Age was a covariate, the Mostly Distance Learning students also scored significantly below the Mixed Delivery students. This particular finding is very interesting because it seems to support the researchers cited in the literature who were concerned that age, experience, and motivation of adult learners could be masking any negative effect the distance learning type of instruction might cause. An initial look at the overall ANOVA would only have shown the differences between the Mostly Traditional students and the Mixed Delivery group. However, when holding Entry Age constant, the Mostly Distance Learning group was also shown to score significantly below the Mixed Delivery group. It is important to note that though in a few tests, the Mostly Distance Learning group's mean GPA dropped below the Mostly Traditional group, there were no statistically significant differences found between the Mostly Traditional and the Mostly Distance Learning groups.

While reviewing the graduation status of the subjects, the researcher found only a few occurrences of statistically significant differences among the groups, but no overriding trends as were identified in Research Question 1. There were no occurrences of statistically significant differences between the groups Mostly Traditional and Mostly

Distance Learning, with the exception of one test. Where Age Range was the layer variable, looking at those subjects 40 years of age or older, the Mostly Distance Learning group had a significantly higher number of graduates than expected. In several tests, the Mixed Delivery group did have a significantly larger number of graduates than was expected as compared to both Mostly Traditional and Mostly Distance Learning groups. As mentioned above, further research could focus on factors that might somehow contribute to these findings.

Across all the statistical tests conducted for Research Question 3 (Number of Semesters to Graduate) the results were consistent across all tests—the Mostly Distance Learning students completed their degree programs in significantly less time than the traditional students. One possible reason for these results could be that because distance learning students tended to be treated in a cohort format, they were more likely to work straight through their programs in a structured timely manner. While the UTC MBA Distance Learning program was not structured with strict lock-step cohorts, groups of students tended to begin the program together and continue together throughout.

Conclusions

In a time when more and more students are looking for ways to achieve higher education goals without undue disruption to their work and family lives, many colleges are looking to use distance learning formats to broaden their audiences and meet student demand. It is important for colleges and universities to determine if the use of these distance learning methods of instruction has any significant effect on the learning outcomes of students.

There were no statistically significant differences found in the graduate grade point averages of the Mostly Traditional students compared to the Mostly Distance Learning students. Therefore, based on the results of this study, distance learning instructional methods were not shown to have any detrimental effect on the learning process (as measured by GPA) of the students involved. Surprisingly though, in some situations, the results of this study did show statistically significantly higher scores for the students in the Mixed Delivery group than those in the Mostly Traditional and also those in the Mostly Distance Learning groups. While this research project did not attempt to determine why this might have happened, it is an interesting finding which might provide a topic for further research.

Likewise, when reviewing the results of the degree completion rates of the students in the study, there was only one instance where there was a statistically significant difference between the Mostly Traditional students and the Mostly Distance Learning students, and in that test, the Mostly Distance Learning students had a significantly higher completion rate than expected. Therefore, the results did not show any detrimental effect that distance learning instruction had on the student's successful completion of the program. Again however, many of the tests showed that the students in the Mixed Delivery group had a significantly higher percentage of completion than expected. This group of findings also suggests there is an opportunity for future study to try to determine if there might be some unexpected benefit in the use of a mixed system of instructional delivery.

The most surprising result for this researcher was that the students in the Mostly

Distance Learning group had graduated in significantly fewer semesters than did the students in the Mostly Traditional and Mixed Delivery groups. One possible reason for this difference might be the loose cohorts formed by the cohort nature of the groups of students progressing through the program together.

Recommendations for Further Study

As distance learning instruction and enrollment increase on college campuses, administrators, governing bodies, and accrediting agencies are taking a closer look at the instructional process and most especially student outcomes. This is important on a number of levels. It is critical that higher education institutions satisfy all of their constituents that distance learning programs are of equal quality. Though the lines are often blurred, the business of higher education is to educate, not merely to push increased numbers of students through the doors. It is therefore important that colleges and universities assess the outcomes of all instructional processes to verify that high quality education is being provided. This is especially important as colleges and universities are adding new and different types of instructional formats. This researcher feels that several opportunities for further study were raised by this project.

The findings where the Mixed Delivery students scored significantly better than either Traditional or Distance Learning students, and showed higher rates of graduation, might indicate opportunities for further research on any benefits students may be receiving from having a mixed instructional delivery system. One opportunity might be to investigate whether or not there is some power in the combination of traditional and

distance learning instructional processes that gives students an unexpected edge. Are the students who are taking courses of many types those students seeking a more well-rounded program. Are they risk takers who are wanting to try new things. Are there other variables in their natures which make them predisposed to score better.

Additionally, is it possible that students enrolled in distance learning programs, which may be offered in a structured, orderly format, finished faster because they linked together as a cohort? The researcher has had personal experience in a cohort setting and is of the opinion that becoming a member of a group taking all the same classes together can often provide an additional measure of motivation. As the group studies and grows through the program together, study groups are formed, and members often develop a strong support system.

An additional study here might investigate whether there are differences in traditional students and distance learning students in the area of course opportunities. Many distance learning students may be concerned that courses may not always be available in their area, while many of the traditional students may take longer because they are not concerned about when and where they will get the rest of their coursework?

While this study did not reveal any situations where distance learning students scored lower or showed significantly lower graduation rates than traditional students, this researcher suggests that future studies using regression analysis attempt to determine which combination of factors or variables might indicate whether a student is likely to do well receiving instruction via distance learning methods of instruction. In addition, if the factors or variables that might help to predict student success in a distance learning

setting can be isolated and identified, universities can consider either advising students into the type of instructional methodology where they are most likely to succeed, or possibly setting different admissions requirements for students who will be taught using distance learning instructional methods, or at least establish a profile for successful Distance Learning students that might be used as a screening process. The researcher is aware of noncredit programs where the potential learner is first required to complete a survey which is designed to assess the learners ability to perform well in a distance learning situation.

Over the past few years, distance learning programs have evolved to include large numbers of Internet-based courses where students can complete coursework without ever seeing or talking to the instructor (except electronically). One suggested area for future study would be to conduct a study similar to this one on Internet-based programs to determine if there are any differences in the student outcomes when the student is almost completely separated from the instructor and the campus. Though there are few whole degree programs available on the Internet at this time, many colleges and universities are beginning to develop full programs. Because of the increased "distance" experienced in an Internet-based program, students utilizing this type of instruction may be even more likely to feel removed, or even abandoned, from the instructor and the school. In addition, Internet instruction requires an enormous shift in instructional practices for the faculty. Classroom instruction, even interactive video instruction, has historically been primarily lecture or verbally based, with print and multimedia used only for supplemental material. Part of any assessment measures for Internet-based courses must include determining that

faculty are trained in instructional design practices to make print and multimedia as effective as verbal and lecture style instruction formats. Not only is it critical to determine that these programs are educationally viable, it is even more important to determine what characteristics a student needs to have to successfully complete a program of this type.

Finally, while the results of this particular study did not reveal any statistically significant differences that would indicate that distance learning is a less effective method of instructional delivery, are there programs or courses that are better suited than others to be delivered in a distance format? For example, would science and lab courses be appropriate for this type of delivery format, and if not, how can higher education institutions determine the appropriateness of using distance learning delivery methods for different types of programs and courses?

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APPENDIX

APPENDIX 1

School of Business Administration

Professor Fletcher, *Dean*
Instructor Hannah, *Director of Graduate Programs in Business Administration*

Master of Business Administration

Admission

A student who holds a bachelor's degree in any discipline from a regionally accredited college or university may be considered for admission to the M.B.A. program. Applications are accepted by the Graduate Office at any time; however, in order to insure adequate time for consideration, the completed application, Graduate Management Admissions (GMAT) test score, and any other supporting credentials should be received by the Graduate Office no later than one month prior to the beginning of the term for which admission is desired.

Application Procedures

To be accepted into the M.B.A. Program, a student must:

1. Have a bachelor's degree from an accredited institution (any major is acceptable). Two official transcripts are required from each previously attended college. An application and a non-refundable application fee of $15 should also be submitted to the Graduate Office, 114 Race Hall.
2. Be granted admission to UTC's Graduate Divison based on a minimum cumulative undergraduate GPA of 2.5, or a GPA of 3.0 in the senior year, or the successful completion of qualifying work (9-12 hours of 300/400 level undergraduate courses with a B+ or better average).
3. Have an official Graduate Management Admissions Test (GMAT) score. The GMAT is offered in January, March, June, and October at UTC and other collegiate institutions. The GMAT application brochure may be obtained from the MBA Director or from the Graduate Office.
4. Meet the minimum acceptable admissions index (AI) of 950. The admissions index is calculated as follows: 200 x (undergraduate GPA) + GMAT Score =AI.

Note: If the applicant earned an undergraduate degree at a non-accredited institution, different standards will apply.

Foundation Courses

The MBA program requires that a student complete a minimum of 36 semester hours credit in graduate coursework. Students admitted to the program who lack academic experience in certain areas will be assigned up to 24 hours of additional coursework in the foundation courses listed below in order to gain needed competencies. Some or all of the foundation courses in which academic training has previously been completed may be waived. Once the foundation courses have been completed the student can design one-quarter of his or her remaining program by choosing three elective courses (9 semester hours).*

Economics 501 — Concepts in Economics
Business Accounting 502 — Survey of Financial Accounting Principles
Business Management 503 — Business Statistics
Business Finance 504 — Fundamentals of Managerial Finance
Business Marketing 506 — Essentials of Marketing Management
Business Management 507 — Operations Management
Business Marketing 508 — The Legal Environment of Business
Business Management 509 — Management Theory and Practice

*All required foundation courses must be completed before more than six hours of core or elective courses are completed.

Core Courses

All MBA students complete 36 semester hours of core and elective courses. Twenty-seven of these graduate hours are taken in the following nine required core courses:

Business Management 511 — Business Research Methods
Business Management 512 — Fundamentals of Information Systems
or Business Accounting 536 — Accounting Information Systems

Source: UTC Graduate Catalog, 1993-1995.

Core Courses

All M.B A. students complete 31 semester hours of core and elective courses. Sixteen of these graduate hours are taken in the following required core courses:

Business Administration 510 — Advanced Management and Marketing Tools (4)
Business Administration 511 — Advanced Finance and Accounting Tools (4)
Business Administration 520 — Small Business/Entrepreneurship (2)
Business Administration 525 — Manufacturing Applications (2)
Business Administration 530 — Service Applications (2)
Business Administration 540 — Business Simulation (2)

Concentrations and Elective Courses

The academic program of a particular student should reflect the student's career objectives. An M.B.A. student may select an area of concentration in accounting, economics, entrepreneurship, finance, health services management, human resource management, international management, information systems, marketing, operations/production management, or organizational management. The offering of electives in these concentrations is determined by demand for the concentration. The area of concentration will be noted on the student's permanent record. Students may also receive the M.B.A. degree without a concentration. Electives must be chosen in consultation with and approved by an M.B.A. adviser. The requirements for each of the concentrations are set forth below. For each of the concentrations, one of the five elective courses must be outside the area of specialization. The appropriate foundations are required by each concentration. A maximum of six hours of elective course work taken at the 400-level may be applied to the degree. This limitation applies in each concentration.

Accounting

Students must take four of the following five classes:

Business Accounting 531 — Advanced Managerial Accounting and Control
Business Accounting 536 — Accounting Information Systems
Business Accounting 542 — Tax Planning For Business Decision Making
Business Accounting 547 — Financial Accounting Theory and Issues
Business Accounting 552 — Advanced Auditing

The fifth course taken for the accounting concentration may be any 400-level, non-accounting or graduate level course offered at UTC, subject to department head approval.
(Business Accounting 300, 301, 302 or their equivalent—Intermediate Accounting—is required of all accounting concentration candidates.)

Economics

The following two courses are required:

Economics 510 — Macroeconomics Analysis for Business
Economics 520 — Managerial Economics

One course must be selected from the following:

Economics 404 — International Economics
Economics 426 — Comparative Economic Systems
Economics 444 — Economics of Underdeveloped Areas
Economics 453 — History of Economic Thought

One course must be selected from the following:

Economics 417 — Women in the Economy
Economics 425 — Industrial Organization
Economics 430 — Environmental Economics
Economics 455 — Urban Economics
Economics 460 — Introduction to Econometrics
Economics 465 — Economics of Regulated Industries
Economics 527r — Topics in Economics
Economics 529 — Microeconomic Theory

Entrepreneurship

The concentration in Entrepreneurship includes four specialty courses emerging from functional business areas. Since entrepreneurship is by necessity a cross-disciplinary subject matter, multiple business departments and other non-business departments have courses which are acceptable as an optional fifth course. The following four courses are required:

Business Marketing 540 — Entrepreneurship and New Ventures
Business Marketing 545 — Family Business Concepts and Practice
Business Management 540 — Managing Innovation
Business Finance 534 — Entrepreneurial Finance

Finance

The following are required:

Business Finance 518 — Financial Institutions and Markets
Business Finance 546 — Investments

One of the following:

Business Finance 534 — Entrepreneurial Finance
Business Finance 540 — Problems in Finance
Business Finance 576 — International Finance Management

One of the following:

Business Finance 403 — Financial Statement Analysis
Business Finance 421 — Security Analysis and Portfolio Management
Business Finance 471 — Real Estate Appraisal
Business Finance 472 — Real Estate Finance
Business Finance 488 — Seminar in Portfolio Management
Business Finance 534 — Entrepreneurial Finance
Business Finance 540 — Problems in Finance
Business Finance 543 — Commercial Bank Management
Business Finance 544 — Theory of Finance
Business Finance 575 — Global Portfolio Strategies
Business Finance 576 — International Financial Management
Business Administration 569 — Health Services Accounting and Finance

Health Service Management

Four courses must be selected from:

Business Administration 560 — Health Services Law
Business Administration 562 — Health Services Marketing
Business Administration 565 — Health Services Administration
Business Administration 569 — Health Services Accounting and Finance
Business Administration 575 — Special Topics in Health Services

Source: UTC Graduate Catalog, 1993-1995.

College of Business Administration

Professor Finch, *Executive Director*
(423) 755-4210 or email at Howard-Finch@utc.edu
Instructor Gee, *Director of Graduate Programs*
(423) 785-2326 or email at Kim-Gee@utc.edu

Master of Business Administration

Distance Learning Program

In addition to the regular M.B.A. program offered on-site at the Chattanooga campus, the College of Business Administration also offers satellite core M.B.A. courses which are televised to various sites in the state. This Distance Learning Program enables students to earn an M.B.A. degree on a part-time basis while continuing full-time employment

Admission

A student who holds a bachelor's degree in any discipline from a regionally accredited college or university may be considered for admission to the M.B.A. program. Applications are accepted by the Graduate Office at any time; however, in order to insure adequate time for consideration, the completed application, Graduate Management Admissions (GMAT) test score, and any other supporting credentials should be received by the Graduate Office no later than one month prior to the beginning of the term for which admission is desired.

Application Procedures

To be accepted into the M.B.A. program, a student must complete all of the following:

1. Have a bachelor's degree from a regionally accredited institution (any major is acceptable). Two official transcripts are required from each previously attended college. An application and a non-refundable application fee of $25 should also be submitted to the Graduate Office, 114 Race Hall.
2. Be granted admission to UTC's Graduate Division based on a minimum cumulative undergraduate GPA of 2.5, or a GPA of 3.0 in the senior year. Applicants who do not meet this admission requirement may be considered for conditional admission (6-9 hours of foundation courses with a B or better average).
3. Have an official Graduate Management Admissions Test (GMAT) score.The GMAT is offered at Sylvan Learning Centers. The GMAT application brochure may be obtained from the M.B.A. Director or from the Graduate Office.
4. Meet the minimum acceptable admissions index (AI) of 950. The admissions index is calculated as follows: 200 x (undergraduate GPA) + GMAT Score =AI.

Foundation Courses (leveling courses for non-business majors)

The M.B.A. program requires that a student complete a minimum of 31 semester hours credit in graduate coursework. Students admitted to the program who lack academic experience in certain areas will be assigned up to 18 hours of additional coursework in the foundation courses listed below in order to gain needed competencies. Some or all of the foundation courses in which academic training has previously been completed may be waived. The requirements to waive a foundation class are:

1. The course must have been completed within 10 years of the semester of acceptance into the program *with*
2. A grade of "C" or better from an AACSB accredited business school, *or*
3. A grade of "B" or better from a non-AACSB accredited business school.

All required foundation courses must be completed before more than two courses of core or elective courses are completed.

Business Accounting 503 — Survey of Accounting Principles and Legal Environment of Business (4)
Business Finance 503 — Foundations of Financial Management (2)
Business Management 501 — Introduction to Decision Sciences (4)
Business Management 508 — Management and Operations Theory and Practice (4)
Business Marketing 506 — Essentials of Marketing Management (2)
Economics 507 — Economics for Business Decision Makers (2)

Source: UTC Graduate Catalog, 1999-2000.

Economics 520 — Managerial Economics or Economics 510 Macroeconomics
Business Management 525 — Organizational Behavior Theory and Practice or Business Management 527 — Organizational Theory

Business Accounting 530 — Managerial Accounting and Control
Business Marketing 533 — Concepts in Marketing
Business Finance 535 — Financial Management
Business Management 570 — Problems in Operations Management
Business Management 595 — Business Policy

Concentrations and Elective Courses

The academic program of a particular student should reflect the student's career objectives. An MBA student may select an area of concentration in accounting, economics, finance, marketing, operations/production management, or organizational management by completing at least three courses (nine semester hours) in the selected area. The area of concentration will be noted on the student's permanent record. Students may also receive the MBA degree without a concentration. Electives must be chosen in consultation with and approved by an MBA adviser. The requirements for each of the six concentrations are set forth below. The appropriate foundation and nine core courses are required by each concentration. A maximum of six hours of elective course work taken at the 400-level may be applied to the degree. This limitation applies in each concentration.

Accounting

Business Accounting 536 — Accounting Information Systems (Substitute for BMGT 512 in core requirements)
Nine hours must include the following courses or an approved substitute:
Business Accounting 542 — Tax Planning for Business Decision Making
Business Accounting 547 — Financial Accounting Theory
Business Accounting 552 — Auditing

(Business Accounting 300, 301, 302 or their equivalent -Intermediate Accounting- is required of all accounting concentration candidates)

Economics

Six hours of required courses:
Economics 460 — Econometrics
Economics 510 — Macroeconomic Analysis for Business Decisions (Cannot apply to core requirement; must take ECON 520 for core)
Three hours chosen from 400 and 500 level economics courses other than Economics 429, 470, 495r, 497r, 498r, 500r, or 501

Finance

Nine hours must be selected from:
Business Finance 403 — Financial Statement Analysis
Business Finance 421 — Security Analysis
Business Finance 482 — Study Abroad: International Finance
Business Finance 540 — Problems in Finance
Business Finance 543 — Commercial Bank Management
Business Finance 544 — Theory of Finance
Business Finance 546 — Investments
Economics 510 — Macroeconomic Analysis

Operations/Production Management

Six hours of required courses:
Business Management 577 — Production and Inventory Control
Business Management 579 — Current Topics in Operations/Production Management
Three hours must be selected from:
Business Management 555 — Management Science or Business Management 556 — Problems in Operations Research
Engineering 457 — Quality Control
Engineering 552 — Industrial State and Quality Control
Engineering 554 — Project Control and Scheduling Systems

Organizational Management

Three hours of required courses:
Business Management 525 — Organizational Behavior Theory and Practice*
Business Management 528 — Industrial Relations and Human Resource Management
Three hours of electives from the following:
Business Management 526 — Business Leadership
Business Management 527 — Organizational Theory*
Business Management 529 — EEO Management
Business Management 538 — International Management
Business Management 597 & 598 — Independent Study/Research
* These courses may count both as core and concentration

Marketing

Nine hours must be selected from:
Business Marketing 415 — Industrial Marketing
Business Marketing 417 — Distribution Channels
Business Marketing 430 — Entrepreneurship
Business Marketing 442 — Services Marketing
Business Marketing 450 — Marketing Research
Business Marketing 564 — Promotion
Business Marketing 565 — Problems in Marketing
Business Marketing 566 — Seminar in Marketing
Economics 425 — Industrial Organization

Transfer Credit

Courses completed at other universities for graduate credit may be considered to satisfy MBA degree program requirements at UTC. A transferred course generally must form a logical part of the MBA program to be approved.
Those who request transfer credit must be prepared to provide the university catalog in effect at the time at which the courses were completed as well as any other supporting information to the MBA Director. Additional requirements regarding transfer credit may be found on page 14.

Admission to Candidacy

To be eligible for admission to candidacy, a student must have completed the required foundation courses and 9 hours of core and elective courses including any two of the following:
a. Economics 510 or 520
b. Business Management 511
c. Business Administration 512 or Accounting Information Systems 536
d. Business Accounting 530 Managerial Accounting and Control

An application form for admission to candidacy form may be obtained from the Graduate Office. Students should refer to page 13 for additional regulations regarding admission to candidacy. Application for candidacy must be approved by the MBA Director and the Director of Graduate Studies prior to completion of more than 18 hours.

Source: UTC Graduate Catalog, 1999-2000.

VITA

Elizabeth Crawford was born in Kingsport, TN on September 23, 1962. She was raised in Kingsport and attended Dickson Elementary, Robinson Junior High, and graduated from Dobyns-Bennett High School in 1980. From there, she attended The University of Tennessee at Chattanooga and received her B.A. in Communications in 1985 and M.S. in Psychology in 1988. Elizabeth married Steve Dodd on March 7, 1999. Elizabeth received her Ed.D. in Education from The University of Tennessee at Knoxville in 2001.

Elizabeth is currently working as Director of Continuing Education at The University of Tennessee at Chattanooga.

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