2002

Factors which influence faculty attitudes and perceptions of distance education in analytical subject areas

Jeffrey G. Sumrall
Louisiana State University and Agricultural and Mechanical College, jsumra1@lsu.edu

FACTORS WHICH INFLUENCE FACULTY ATTITUDES AND PERCEPTIONS OF DISTANCE EDUCATION IN ANALYTICAL SUBJECT AREAS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The School of Human Resource Education and Workforce Development

by
Jeffrey G. Sumrall
B.S. University of Southern Mississippi, 1993
M.S. University of Southern Mississippi, 1995
May 2002

Acknowledgments

This dissertation would not have been possible without support and guidance of several individuals whom I would like to express my sincere appreciation. First I would like to thank the almighty GOD for blessing me a supportive family and good friends. I cannot begin to thank my friends and family enough for all their continued support and understanding throughout this entire process.

I would like to thank Dr. Gerri Holmes and Dr. Michael Burnett for their professional level guidance, advice and time committed to my research. Also, I want to extend my sincere appreciation to the rest of my committee members: Dr James Trott, Dr. Joachim Singelmann, and Dr. Yiping Lou. Thank you for your valuable time and guidance.

I am indebted to several colleagues and friends who have had direct influence on my research: Jerlando Jackson, Ernie Hughes, Christopher Davis, Denni Cravins, Bradford Edwards, Patrice Hawkins and Kotoiya Knighten.

Table of Contents

List of Tables

Abstract

This study focuses on current faculty attitudes and perceptions of distance education. A thorough review of literature indicates that faculty members are critical elements of distance education delivery and that certain factors (tenure, departmental incentives, gender, age) influence faculty participation. The main hypothesis being investigated is whether or not the analytical nature of the course is in fact the prime indicator in faculty participation.

Faculty members from three randomly chosen SREB member institutions were surveyed. The purpose for choosing SREB member institutions for the population was for generalizing the findings to higher education institutions throughout the Southeastern United States.

The findings suggest that “lack of fit with university missions and goals,” “lack of incentives,” and concerns about course quality were the primary obstacles for faculty participation in distance education. The analytical nature of the course proved to be statistically significant for Course Related factors but not for Institutional Related factors, in decision whether or not to participate in distance education.

Chapter 1

Introduction

Over the next twenty years technological innovations will have significant effects on the United States' economy, higher education, jobs and workers (Judy & D'Amico, 1997). Hesselbein, Goldsmith, Beckhard & Drucker (1997), predicted that by the end of the twentieth century, technology savvy "knowledge workers" would make up one third or more of the United States workforce. Technology's impact on American society has been spurred by the emergence of cost effective personal computers and startling developments in network communications such as high speed fiber optic digital networks (Judy & D'Amico, 1997).

The worldwide desire for learning is strong and essential as the global society moves into the Information Age (Shoemaker, 1998). Globalization is a complex concept and its effects are felt by all sectors of the world's population (Jakupec & Garrick, 2000). Globalization has a direct impact on higher education and the U.S. job market in the following ways: world wide economic integration; technological advances, influence on the economy, culture, and society; deregulation of trade; redistribution of the workforce and the rise of knowledge workers etc. (Jakupec & Garrick, 2000).

A large majority of twenty-first century jobs will require qualifications and skill that yesterday's industrial workers do not possess and are poorly equipped to acquire. Higher education is the mechanism that levels the playing field and opens the door to the twenty-first century job market (Judy & D'Amico, 1997). Institutions of higher education are the primary resource for reshaping and retraining the workforce while playing an extremely critical role in the development of the next generation workforce (Shoemaker, 1998).

Based on rapidly improving network communications technology and the Internet, distance education is now able to extend the scope of higher education by providing access to an otherwise unreachable audience (Hancock, 1999). For non-traditional students who have irregular work schedules or do not have access to a college campus, distance education can be a vehicle to state-of-the art higher education. In the last 30 years, distance education has moved from the margins to the mainstream of higher education policy and practice (Harry, 1999). In many countries, including the United States, higher education has recently witnessed spectacular growth in programs, institutions and enrollments (Harry, 1999). Governments and higher education institutions are increasingly seeing distance education as a valuable economic and social tool in meeting the demands of an information society (Harry, 1999). Distance education, at the end of the twentieth century reflects global economic, political and related ideological change and is being shaped by technology (Harry, 1999).

Economic indicators for Americans living in the Southeastern United States, as listed by Tardanico and Rosenberg (2000) suggest that higher education has never been more important to their quality of life than it is right now. Tardanico and Rosenberg (2000), conclude that the Southeastern United States yields slower economies and higher poverty rates than the rest of the country. Falk and Lyson (1988) state that a lack of industrial development and the pervasiveness of agriculture production systems keep the Southeastern United States mired in the backwaters of the American Economy. Over the past five decades there has been only slight improvement in this trend. During this time span, hundreds of millions of dollars have been spent on manpower development programs, yet the South lags far behind the rest of the nation on

virtually all quality of life indicators (Falk & Lyson, 1988). These quality of life indicators referred to by Falk and Lyson (1988) seem to revolve around educational achievements and personal and community economic gain. Distance education can serve as an additional avenue for accessing higher education therefore increasing individual and community economic gain.

Distance education can provide a cost effective solution to the most demanding job training and educational needs (Chute, Thompson, & Hancock, 1999). Chute, Thompson, & Hancock (1999) also list other benefits for educational institutions to implement distance education.

1. Distance education reduces travel cost and makes time formerly spent traveling available for more productive purposes.
2. Distance education is scalable; it offers the ability to add students and instructors as needed without incurring significant additional expenses.
3. Distance education provides for real-time updates and just-in-time information access.
4. Distance education programs can be delivered to any residential or commercial site.
5. Distance education offers live interactive programs that can be delivered to multiple networked sites for group learning and collaborative problem solving.
6. Distance education programs are learner centered, affording students more control of the pacing, sequencing and style of interaction of the learning experience.
7. Distance education offers access to learning resources and remote experts internal and external to the institution. (pp. 5-6.)

According to a report published by the National Center for Education Statistics (Distance Learning in Higher Education Institutions, 1997), the Southeastern United States offers less in terms of distance education than most other regions of the country. Distance education has the distinct potential of offering residents of this region learning opportunities that were never before available, especially those residents living in remote rural areas. Distance education via the Internet virtually eliminates geographic distance limitations. Time of day concerns, are also no longer an issue. Students can access course material any time of the day or night and learn at their own pace.

The computer itself has almost unlimited computational and informational resources which can be used as an efficient automated learning tool (Chute, Thompson, & Hancock, 1999). Distance education can offer the benefits of higher education to handicapped individuals who otherwise find it very difficult to leave the confines of their home. For people who work irregular hours or work schedules that change periodically, higher education is now an option. Distance education is borderless in concept (Harry, 1999). It is quite possible to complete entire Bachelor's or Masters degree requirements over the Internet, thus eliminating the need to leave home (Chute, Thompson, & Hancock, 1999).

One of the major problems hindering the complete adoption of distance education in higher education institutions is faculty resistance (Challis, 1998). There are many reasons or causes of faculty resistance. Currently, United States higher education still employs the traditional reward structure emphasizing research and publication, not technological innovation or participation in distance learning (Challis, 1998). In order for distance education technologies to reach their full potential, higher education faculty

acceptance is critical in terms of pedagogy development and accreditation (Challis, 1998). Challis (1998) states that prior research has shown that higher education faculty play important roles in distance education. The development of distance education in higher education institutions requires a renewed commitment to its most important resource – faculty (Challis, 1998). If higher education faculty members don't fully believe in the credibility of distance education then distance education will be reduced to just another method of electronic communication. Recent studies such as Challis (1998) and Betts (1998) have sited major factors that influence faculty participation; tenure, age, and promotional compensation by department.

Faculty attitudes toward distance education result from a variety of factors: personal opinions about distance education; experience with distance teaching or learning; the attitudes of peers or superiors; and incentives for participation (Clark, 1993). Faculty attitudes are critically important to the existence or success of distance education due to the fact that higher education faculty members have almost complete autonomy in teaching courses. Full administrative and faculty support is the key to bringing distance education into the mainstream of public higher education.

The primary premise for the researcher wanting to conduct a study of this nature stemmed from the intuitive logic that highly analytical subjects are harder to replicate in an electronic environment. The idea that analytical courses are harder to implement was enhanced after the researcher conducted random evaluations of the different courses offered by Southern Regional Board of Education (SREB) member institutions via the World Wide Web. The strategy employed by the researcher was to compare the number of analytical courses versus the number of less analytical courses offered by individual

institutions. Then, the researcher evaluated individual course help menus for technical content and complexity. Analytical courses seemed to have much more extensive and complicated help menus as opposed to less analytical courses. This indicates that analytical courses require substantially more time and resources to develop for distance delivery. The combination of personal observation and logical reasoning led the researcher to define the problem statement for this study.

Related experience and observation also played key roles in providing the researcher with a basis for the main hypothesis in this study. The researcher has a total of four years work experience as a computer analyst for a higher education institution. For the past two years, while developing this topic, the researcher has performed daily job tasks along with personal interviews of faculty members who already participate and some who don't participate in the development of distance education courses. The daily job tasks performed include mainly the technical aspects of configuring and designing closed circuit video conferencing for a higher education / research environment. Personal interviews were conducted on an ad hoc basis to establish the rationale for the hypothesis. The overwhelming opinion of those faculty members interviewed was: technically oriented courses are much more difficult to replicate electronically.

Statement of the Problem

The inherent problem associated with distance education is a matter of acceptance and accreditation among higher education faculty. Recent studies such as Challis (1998) and Betts (1998) have shown various factors that influence faculty participation in distance education (age, tenure, incentives for promotion etc.). Without strong faculty support distance education can never

reach its full potential. It has now become strategically important for educational researchers to properly identify the sources of faculty resistance. The primary purpose of this study is to compare university faculty perceptions of distance education in program areas that are analytical in nature with those of university faculty in areas that are less analytical in nature, regarding selected aspects of distance education including but not limited to its usefulness and applicability. The review of literature for distance education and related topics, specifically Minoli (1996) Distance Learning: Technology and Applications and Williams, Paprock & Covington (1999) Distance Learning reveal fundamental aspects of facilitating distance education. In practically every model studied, there seemed to be a viable support component which was geared towards overcoming technically oriented problems, thus laying the foundation for conducting this study.

Specific Objectives

1. Describe faculty members currently employed in instructional positions in higher education on the following personal and professional demographic characteristics:
    a. age;
    b. nature of the content of the course being taught (defined as more analytical or less analytical);
    c. preferred method of course delivery (traditional / distance education);
    d. gender;
    e. previous distance teaching experience;
    f. academic rank;
    g. whether or not the faculty member is currently employed in a tenure track position; and

h. whether or not the faculty member is tenured.

2. Determine the influence of the following factors that may prohibit institutions from participating in distance education as perceived by the faculty in that institution:
   a. lack of fit with institution's mission;
   b. lack of support from institution administrators;
   c. equipment cost;
   d. equipment support and maintenance;
   e. limited technological infrastructure to support distance education;
   f. lack of rewards or incentives;
   g. legal concerns (e.g. intellectual property rights, copyright laws);
   h. institutional use of distance education technology;
   i. concerns about course quality;
   j. technical or analytical nature of the course being taught; and
   k. lack of university sponsored technology training.
3. Determine if a relationship exists between the attitudes toward distance education in higher education as measured by the sub-scale scores of the "Institutional Support" scale and each of the following selected personal demographic characteristics of faculty in higher education:
   a. age;
   b. preferred method of course delivery;
   c. gender;
   d. whether or not the faculty member is currently employed in a tenure track position;
   e. whether or not the faculty member is tenured; and

f. whether or not the faculty member has experience teaching distance education.

4. Based on previous research findings, objective four was written in the form of a research hypothesis as follows:

   Faculty from more analytical fields will have more negative attitudes/perceptions of distance education than faculty from less analytical fields.

Significance of the Study

Prior distance education studies such as Challis (1998) and Betts (1998) have suggested certain reasons or factors that influence faculty participation in distance education. According to distance education literature, these factors are significant, however, there may have been one very important factor overlooked, the analytical nature or the technical content of the course. This study will attempt to validate the hypothesis that the analytical nature and or the technical content is the primary determining factor in faculty participation in distance education.

The eventual integration of higher education and instructional technologies is inevitable (Challis, 1998). Therefore, this study will attempt to improve the body of knowledge concerning faculty resistance. Black (1998) reports one of the major challenges facing the development and expansion of distance education is faculty scepticism and resistance concerning course quality. The analytical or quantitative nature may play a vital role in the decision of faculty to develop distance education courses. This study evaluates this statistical significance of course nature along with other documented significant factors from the literature. This study is designed to explore faculty perceptions at the course level, not academic disciplines. Some

academic disciplines are multi-faceted and they encompass analytical and less-analytical courses.

The researcher's ultimate goal in identifying faculty perceptions of distance education in terms of course type (analytical versus less-analytical) was to draw university administrative attention. This type of attention could be used for shaping academic policy or securing increased funding for distance education research and development in analytical subject areas.

Limitations of the Study

Based on the chosen method of sample selection (Simple Random Sample) and the chosen method of data collection certain limitations may be prevalent. A simple random sample will not account for instructors who cannot be reached via email for the period of data collection or instructors who don't check email on a regular basis. Also, this method of data collection will not compensate for technological glitches such as downed email servers or campus network problems.

Because of the low response rate (11%), the researcher is unable to generalize the study beyond the respondents. Comparisons of the total population and the sample were made to check for representativeness.

Definition of Terms

Distance Education is defined by this study as higher education courses where at least 75% of the course content is taught via electronic media. Specifically, courses taught via the Internet, high speed-high bandwidth telecommunication lines, and or satellite communications. There is no distinction drawn between faculty who use distance education as a sole means of teaching and learning, and faculty who teach an occasional course.

Analytical Course A course that is quantitatively rooted where a significant portion, (25%) of the required material involves the application of mathematical computations. This study does not make distinctions between calculations done by hand or electro-mechanical devices. For example, general courses in the following fields will be considered “analytical” for the purposes of this study: calculus, statistics, physics, chemistry, engineering courses, etc.

Less Analytical Course A course that is theoretical, historical, or rule based where the application of mathematical principles or computations are not prerequisites for strong performance. For example, general courses in the following fields will be considered “less analytical” for the purposes of this study: history, English, art, computer programming, sociology, psychology etc.

Southeastern United States – (Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia)

Chapter 2

Review of Related Literature

The review of related literature examines issues in distance education, while providing insight into recent distance education related research. The future state of distance education is also examined. Current faculty perceptions toward the use of using distance education technology are explored. The literature review also examines the use of electronic surveys and likely response rates associated with their use.

Journal articles on the topic of distance learning were scanned for applicability. The time period examined initially concentrated on the past five years; however, it was expanded to include reference material dating back to the early 1970's. The justification for only focusing on the last five years' literature was based on the rapidly changing nature of technology. Articles and books that were written five years ago are technologically outdated and of little value to this study. The review of literature was expanded beyond the last five years in order to include pertinent documentation concerning course quality, categorization of academic disciplines, and electronic survey response issues.

There were also three 1998 dissertations that dealt with faculty perceptions of distance education that were extracted and used to establish the main hypothesis for this study. These studies indicate that faculty participation in distance education differed significantly along the lines of age and gender, and also when options dealing with tenure and incentives were present.

Distance Education

Background/History on Distance Education

Educational institutions throughout time have been created and supported using the contemporary information technologies of that era (Nyiri, 1997). As

technologies changed, institutions also changed and their instructional patterns conformed to resemble the most current techniques. Dating back to medieval times when the only form of educational exchange occurred through oral communication, students were forced to rely on word of mouth and memory. But with the invention of the printing press and the rising prevalence of books during the middle 18th century, reading and writing replaced memorization. Oral communication was no longer the only means of communicating and educating. New needs arose, such as developing a place where collections of books could be kept. Inevitably, problems arose when this change occurred. As Nyiri (1997) states, educators faced both organizational and conceptual problems and were forced to answer questions such as how to arrange the books and how should they be catalogued. Through changing times, the need for integrating current technology with education has been a constant. Instead of the integration of books into the curriculum, the current challenge is over the use of distance education (Nyiri, 1997).

The advent of the microchip in the early 1960s sparked what is currently known as the Information Age. This age of information can be attributed with making distance learning possible. The past few decades have seen explosive growth in microchip-based technologies including computers, robotics, the World Wide Web, satellites and cell phones. According to Bossert (1997), computer technology and telecommunications are reshaping every aspect of today's social, educational, and working environments. Bossert (1997) also notes that these technologies are not yet fully developed and their potential impact to society is still undetermined.

Early forms of educational technology in higher education included the e-mail or a CDROM of images and self-help exercises with branches to additional

reading when incorrect answers are detected (Brown, 2000). Today college professors are fundamentally remodeling their teaching approaches to reflect the many advances in educational technology (Brown, 2000). Brown (2000) says that these innovative professors understand that computer tools can be used as means to increase the quantity and quality of exchange both between themselves and their students and among students.

Types of Distance Education

According to the Institute for Distance Education, University System of Maryland, there are currently three distinct forms of distance education (Institute for Distance Education, 1997). Model A is the distributed classroom. In this model, the classroom-based course is extended by interactive telecommunications technologies from one location to a group of students at one or more other locations. The typical result is an extended "section" that mixes on-site and distant students. The faculty and institution control the pace and place of instruction.

Characteristics of Model A are sessions involving synchronous communication. Students and faculty are required to be in a particular place at a particular time (once a week at a minimum). The number of sites varies from two (point-to-point) to five or more (point-to-multipoint). The greater the number of sites, the greater the technical, logistical and perceptual complexity.

In this model, the faculty does not change their role significantly from the one they assume in the traditional classroom. However, the use of technology does require adaptability. In the manner of presentation, faculties generally find it necessary to reduce the amount of material presented to allow additional time for relational tasks and management of the technology. It is usually necessary to increase the amount of planning time for each class. It may increase

presenter self-confidence, reduce unnecessary stress and enable faculty to conduct classes with greater ease.

The second model, Model B, focuses on independent learning. This model frees students from having to be in a particular place at a particular time. Many Web-based courses fit this model. Students are provided a variety of materials, including a course guide and detailed syllabus, and access to a faculty member who provides guidance, answers questions, and evaluates their work. Contact between the individual student and the instructor is achieved by telephone, voice mail, computer conferencing, e-mail and regular mail.

In Model B, there are no class sessions. Students study independently following the detailed guidelines in the syllabus. Students may interact with the instructor and in some cases with other students. Presentation of course content is through print, Internet, computer disk, or videotape, all of which students can review at a place and time of their own choosing. Course materials are used over a period of several years, and are generally the result of a structured development process that involves instructional designers, content experts, and media specialists. The materials are not specific to a particular instructor.

Faculty member structure and facilitate the learning experience in Model B, but shares control of the process with the student to a great extent. Faculty members must become familiar with the content in the print and other materials prior to the beginning of the semester to develop the detailed syllabus. If appropriate, they must also plan for effective use of the interactive technologies such as computer conferencing and voice mail.

The final model, Model C, is an Open Learning + Class paradigm. This model involves the use of a printed course guide and other media (such as

videotape, computer disk or the Web World Web) to allow the individual student to study at his or her own pace, combined with occasional use of interactive telecommunications technologies for group meetings among all enrolled students.

Model C's presentation of course content is through print, computer disk, the Internet or videotape, all of which students can review at a place and time of their own choosing, either individually or in groups. Course materials are used for more than one semester but can be specific to the particular instructor (e.g., a videotape of the instructor's lectures). Students gather periodically in groups in specified locations for instructor-led class sessions through interactive technologies. Class sessions are for students to discuss and clarify concepts and engage in problem-solving activities, group work, laboratory experiences, simulations, and other applied learning exercises.

Like Model B, Model C faculty members structure and facilitate the learning experience but share control of the process with the student to some extent. This role change encourages faculty to focus on the instructional process and to take advantage of the available media. Hence, the teacher must become familiar with the content in the print and other materials and plan for effective use of the interactive sessions to draw upon these resources. As in Model B, the faculty member is more available to facilitate individual student's learning because of freedom from preparing and delivering content for weekly class sessions.

Pros and Cons of Distance Education

Pros. According to Markel (1999), distance education is bringing about fundamental changes in higher education. The advantages of distance education are numerous. Depending on the model chosen, distance education

can significantly reduce the need for student and instructor to be in the same geographical location. Worries about meeting a class at a certain time are eliminated in the world of distance learning. Lectures and course material can be downloaded at will.

Distance learning courses that use the Internet offer an unprecedented amount of flexibility. Lectures, class notes, assignments, questions and other class-related materials can be uploaded by the instructor and downloaded by the students around the world at any time. For students who are confined to homes and cannot attend traditional classes, these classes are the most flexible alternative. Online classes also allow for discussion questions to be posted for individual or group responses. Therefore, students who are apprehensive about voicing their opinions in a traditional classroom setting are given an avenue to state their opinions without the pressures of a traditional classroom setting.

One benefit of some distance learning models has little to do with the convenience of classes. Markowitz and Estrella (1998) shared their views about how distance education could potentially decrease parking problems associated with large universities. If more courses were taught over the Internet and students were granted dialup access, essentially this would decrease the number of vehicles traveling through congested campus streets and parking lots during peak business hours.

In sum, distance education in all of its forms creates many opportunities in the education world. As the student moves from passive receptacle to self-motivated managers of their own learning, teachers move from oral and lecturer to consultant, guide and resource provider. As students move from competing for a limited amount of marks, teachers move toward grading for

collaborative projects and creating a “learning team” both inside and outside the classroom. As students acquire learning strategies, teachers acquire strategies that address diverse learning styles. Distance education is removing the traditional notion of the instructor possessing ‘supreme power’ to more contemporary educational approaches such as team building exercises. The end result is the breaking down of the teacher-student hierarchy and the significant expansion of student access to learning resources.

Cons. Distance education is by no means flawless. Blumenstyk & McCollum (1999) report two studies that raise questions about the effectiveness of distance education and its ability to provide learning opportunities to people who might not otherwise pursue them. Blumenstyk and McCollum (1999) stated “The first report from the Institute for Higher Education Policy argues that the many articles and papers published recently on distance education aren’t as useful as they could be because so few of them involve original research on the effectiveness of the practice”, p. 1.

A lot of the original research that has been done, the report says, is of such ‘questionable’ quality that it ‘renders many of the findings inconclusive.’ (Wells, 1999). Another report by the College Board raises serious questions about technology’s effects on students who lack access to computers and the Internet.

Advances in computer technology are happening at such an alarming rate that by the time the average individual masters a particular technology, there is already a replacement for that technology on the market. Commentators in distance education literature argue that distance education requires a radically new, qualitatively different pedagogy built on a unique relationship between the

instructor and the student (Markel, 1999). The proposed new pedagogy faces strong opposition from distance education critics.

A critical drawback to distance education is the considerable expense associated with installation and maintenance of distance education facilities. This problem is essentially eliminated when the Internet is used as the method of transmission as opposed to more traditional methods such as phone lines and satellites. Nevertheless, money can be a hindrance for institutions or organizations without money on hand for technology upgrades.

Finally, training for instructors is necessary for distance education to be effective. Distance education options offer students significant learning opportunities only if their professors know how to make use of the technology (Floyd, 1998).

The Present State of Distance Education

Schneider, Glass, Henke, and Overton (1997) define distance education as a form of teaching and learning in which the instructor and student may not be in the same place at the same time but are still able to communicate electronically or by some other form of information technology. As was the case for the early stages of the development of the automobile, higher education has only begun to realize the value and importance of information technology.

Bossert (1997) compared the global emergence of information technology to the transportation revolution of the early twentieth century. Bossert (1997) explains how humans failed to fully understand the impact that the automobile would have on human life, and compares this phenomenon to the recent information technology revolution.

Because the marriage of education and technology is still in the newlywed stage, it is experiencing some growing pains. The administrative staffs of

higher education institutions will have to weather a few storms but distance education will become a fundamental element in higher education infrastructures (Smith, 1998).

Today many adults would like to attend college but due to circumstances such as business-related travel, physical disabilities and family obligations, limitations are placed on their learning opportunities. Distance education is poised to fill the void left by traditional higher education as well as expanding opportunities for younger students. Additionally, Schneider, Glass, Henke, and Overton (1997) found that adults in the workforce require lifelong learning to upgrade skills, maintain license, or change careers. By applying interactive technology over the Web, the students are offered access to enormous amounts of educational material. Teaching such large amounts of information would be almost impossible through traditional educational techniques (Schneider et al., 1997).

Lawmakers drafting legislation to extend the Higher Education Act have moved slowly in expanding federal financial aid to students in distance education programs. This measure has been taken because so much is still uncertain about the future of distance education. However, it leaves the interested student with limited options.

In order for the federal government to gain more insight into distance education programs, Congress is expected to endorse a pilot program, the Distance Education Demonstration Program. This program essentially waives many federal requirements for a student participating in a small select group of distance education programs. Selingo (1998) states that many advocates of distance learning say lawmakers do not understand the popularity and significance of distance education programs. Advocates fear that changes in

the financial aid policy, occurring about every five years when the Higher Education Act is extended, will not keep pace with the unsettled nature of distance education (Selingo, 1998).

In any case, distance education is fast becoming a fundamental part of the higher education infrastructure. Some colleges, for example, are now offering distance courses in the regular course catalogues (Guernsey, March, 1998).

According to Moore (1999), it is useful and prudent to think seriously about the impact information technologies will probably have on universities and on all educational institutions. Distance education via the Internet is one of the more recent technologies that stand to have a fundamental impact on higher education.

Faculty Perceptions of Distance Education

From a faculty standpoint, there are both good and bad attributes associated with distance learning. Before distance education can become common practice, the faculty reward system must be established and the effectiveness of distance learning must be addressed.

New tools have led to more conversation about teaching methods and more concern about assessment (Brown, 2000). Many instructors have started using computer technology in their teaching environments because they feel that students will learn more if teachers embrace proven technological teaching and learning tools (Brown, 2000).

The most important step for each faculty member in translating the potential of computers into more effective teaching is the careful identification of past teaching successes. From these successes grow ideas, beliefs and convictions about teaching and learning. From these beliefs, then it becomes

possible to choose among the vast array of new tools and technologies (Brown, 2000).

The most frequent drawback for university faculty teaching distance education courses is the reward system. Markel (1999) explains that the reward system of higher education offers little incentive for instructors to make the substantial investment of time and effort required to convert their courses to distance offerings. Tenure, promotion and release-time policy at most institutions fail to acknowledge the considerable time and effort required for developing a distance course (Markel, 1999).

Commercialization may also influence faculty perceptions. Due to the commercialization of higher education, there is a heightened competition for administrators to secure funds and attract top students. College and university leaders are rethinking how their institutions might be reorganized to produce a more dynamic infrastructure and to meet the competitive demands of a student-based, customer-driven market (Oblinger, 1997). Institutions that want to gain a competitive edge use technological resources as a primary tool in advertising. Hence, distance education will play an increasingly important role in calculating the technological strength of institutions for higher learning.

Course Quality. Although the pros of distance learning are documented, one of the biggest questions of distance education remains unsolved. Distance education technology has been deemed by some scholars as second rate and inappropriate for many courses (DeLoughry, 1995).

Potashnic and Capper (1998) reveal that the quality of some distance education programs is perceived poor but research has shown that distance education effectiveness measures as high or higher than traditional classrooms. Computer technology and telecommunications are reshaping

every aspect of today's social, educational, and working environments. Bossert (1997) notes that these technologies are not yet fully developed and their potential impact to society is still undetermined.

In an article entitled Faculty Support for Distance Education, Black (1998) reported that faculty in the hard and pure disciplines were significantly less supportive of distance education than those in the soft and applied disciplines. The hard, pure natural science grouping was the least supportive overall. This finding concurs with that of Thompson and Brewster (1978) who studied faculty voting patterns in faculty senates. They found that the hard, science disciplines voted more unfavorably than others on curriculum changes that gave students more course choices.

Distance Education Demographics

Today's children are growing up in an ever-expanding information driven world. Perhaps, distance learning in higher education will be a seamless transition for today's youth. The Telis Foundation and Stanford University are examples of how technology can work in education. Together they are currently in the process of developing a unique type of software and approach for literacy development I'M Reading (Interactive Multi-Intelligence). The goal of the I'M Reading project is to produce software that will make it possible for children (8-12 years old in phase one and younger as well as adults, in the future development) who are experiencing difficulty learning to read conventional instructional settings to succeed in alternative environments (Blanchard, 1999). The I'M Reading project is grounded in principles of learning theory and current research in multimedia learning. It is designed to make children want to become independent learners outside of the traditional classroom. This software will be designed to give children the understanding

that reading is immediately relevant and practical in their daily lives (Blanchard, 1999).

The Telis Foundation and Stanford University are also conducting other distinct research projects with the ultimate goal of integrating online software programs designed to assist students with delayed literacy development. A secondary goal for these projects is to contribute to a growing body of research investigating the use of software for reading instruction and the efficacy of using multimedia (Blanchard, 1999).

Trends Shaping the Future of Distance Education

According to Brown (2000) the benefits of interactive learning are collaborative learning, learning by doing, role-playing, integrating theory and practice. Professors who use computer technology often encourage their students to collaborate on data collection and laboratory experiments and to work together in study clusters. This electronic exchange of information seemed to be another very effective way to increase interactivity (Brown, 2000). Computers provide an opportunity to activate some of the rich relationships between apprentice and master, to allow apprentices of differing intellectual maturity levels to teach each other, and to compensate for the loss of dialogue necessitated by increased students/faculty ratios (Brown, 2000).

Some forms of motivation for adopting computer methods are as follows: Communication, which includes frequent dialogue, is the quest for better communication with and among students. Prompt feedback, which is accomplished in three ways: interaction between the students and the computer using materials, interaction between the instructor and the computer, and asynchronous interactions between students and instructors via the network.

Additionally, new materials and modes of presentation break down the points of visualization, comparative analysis, motivating material, spectrum of materials and equal access to materials. Student initiative and responsibility is enhanced by visualization, comparative analysis, motivating material, supplying a variety of materials and equal access to materials (Brown, 2000).

Glenn and Knapp (1996) state that,

> "Americans are looking to education for meeting the challenges facing the United States. They have high expectations for their schools such as teaching students basic skills, preparing them for the world of work or higher education, and teaching them to be responsible citizens in a democracy. When Americans think about schools, they want it all. They want schools to prepare young people for the future, and when the future becomes a threatened, citizens believe schools should provide the answers. If they do not, they believe that schools ought to change." p. 32

Some critics are calling for dramatic changes that would do away with schools as we now know them and provide new educational alternatives. Others seek renewed educational system as the means of addressing U.S. problems and leading its citizens to a more productive future (Glenn & Knapp, 1996).

Glenn and Knapp (1996) state how proponents of educational change contend that schools must change from an emphasis on the recall of knowledge to enabling students to think abstractly, problem solve, collaborate with others, and seek out creative solutions. According to critics, educators should stop teaching facts, skills, and concepts as if they were furniture of the mind to be acquired, occasionally dusted, and used for a lifetime. Instead, they

need to help students to learn to think for themselves and be able to create knowledge (Glenn & Knapp, 1996).

According to Glenn and Knapp (1996) the foundation for change begins with the need to restructure education. Education goals should shift from facts and formulae to assisting young people to find facts and develop strategies to solve problems they will confront in the future. To achieve these revitalized educational goals, educators must think carefully about how schools are structured, the manner in which teachers teach, the organization of the curriculum, classroom organization, assessment techniques, and the use technology (Glenn & Knapp, 1996). Educators must redesign curriculum and instruction to promote problem solving and deeper understanding, empower schools to design their own structure and decision-making process, and assist schools in becoming more accountable to parents and the community (Glenn & Knapp, 1996). Some of the recommended changes to the renewing of American education are in the areas of learning, teaching, curriculum, classrooms, assessment, and technology. These changes will be made based on conventional and restructured schools (Glenn & Knapp, 1996).

One of the more dramatic changes has been the incredible advance in technology. With the increase in access to these advanced technologies, educators have had opportunities to explore different ways to teach and design instruction and also move forward with the assumptions in the restructuring changes (Glenn & Knapp, 1996).

A modern digital computer is perhaps the most complex toy ever created by man. It can also serve many other productive functions, such as, richly interactive as a musical instrument or a sophisticated global communication system (Sewel, 1990). The microcomputer is a tool of awesome potency,

which is making it possible for education to take giant steps forward into the 21st century (Sewel, 1990).

Recent years have witnessed what many authorities have heralded as the major development in 20th and 21st century education, namely the widespread acceptance of a significant role for microcomputers in schools throughout the world (Sewel, 1990). A congressional committee for education and informatics, brought together several hundred educationalists from all over the world to Paris to discuss computer applications in education. Three influences can be seen as relevant to the present context of educational computing. These are educational philosophies and practice, cognitive and developmental psychology, and computer sciences (Sewel, 1990).

According to Sewel (1990) the congressional committee stated specific advantages of computer use in education. First, individualization of instruction, a limited number of computers per school will have little immediate effect on classroom practice. Another advantage was interactivity. Computers are potentially interactive and can promote more active learning amongst students of all ages and all abilities.

In the social context of educational computing computers can provide a one-to-one teaching situation. Sewel (1990) states that in reality the classroom use of computers in K-12 classrooms frequently involves children working with computers in groups. The purpose was to maximize access to a limited number of computers, and secondly co-operation among learners. The case of the computer as a cognitive tool, is basically a perspective, which views the technology as a means to an end, with the end being defined in terms of cognitive growth (Sewel, 1990).

The impact of a technology on cognition, simply states that the invention of the symbol system of writing enabled many things, amongst the most significant of which was the value we now place on the cognitive processes involving reflection, rational thought, abstract thinking and logic (Sewel, 1990). The concept of intelligence is determined by the extent to which individuals can cope with the demands of their environment. Intelligence itself is the ability to deal with particular environments. It has to be specified within the context of the culture in which it is operating (Sewel, 1990).

The role for computers in the classrooms has been as an aid to traditional teaching and to traditional curricula. However, there have been documented claims that computers can be used to enable new ways of learning and teaching (Sewel, 1990). It can also break down the barriers that frequently exist between differing areas of the curriculum, as revolutionizing the nature of learning, and as lowering the threshold of the abstract (Sewel, 1990). Sewel (1990) described computer intelligence as though the computer is like a fragmented projection of the human psyche, where each of its functions replaces one of our own.

Electronic Surveys

Recent developments in communication technologies have created alternative survey methods in the form of e-mail questionnaires and Web sites surveys. Both methods use electronic text communication, require fewer resources, and provide faster responses than traditional snail mail survey methods (Yun & Trumbo, 2000). For the right population (Web users), Internet research can provide a fast, inexpensive way to collect data. With a good questionnaire, data can be delivered in a matter of days without the added risk of introducing coding errors (Tse, et al, 1995).

The researcher chose to use an e-mail survey to reduce the turnaround time and data coding associated with postal surveys. A large portion of the survey responses were received within 24 hours of sending the e-mail and there was very little additional coding required for data analysis. The additional coding was mandatory for categorizing faculty teaching disciplines using Biglan's (1973) academic classification system. The Biglan-Kolb classification system of academic knowledge splits academic disciplines into categories as follows; hard/pure sciences and mathematics, hard/applied science-based professions (e.g. engineering), soft/pure humanities and social sciences and soft/applied social professions (e.g. education, social work and law).

The literature also reveals certain drawbacks to using electronic surveys, representativeness and response rates (Yun & Trumbo, 2000). In a recent study entitled Comparative Response to a Survey Executed by Post, E-mail, & Web Form (Yun & Trumbo, 2000) set out to conduct an empirical study to measure the difference in response rates among the three methods. Yun and Trumbo (2000) reported that 360 subjects were selected to receive their survey on paper, e-mail, and Web site option. Overall, the response rates fell as follows; 45% snail mail, 9.23% email, 9.72% Web site. Yun and Trumbo (2000) concluded the best way to achieve a desired response rate would be to use the multi-mode approach. Their results were also consistent with a very similar study conducted in 1996 by VirtualSurveys.com, The Use of the Internet as a Data Collection Method. In this study the overall e-mail response rate was 13.8% and this was considered reasonable.

According to (Anderson & Gansneder, 1995; Kittleson, 1995) overall response rates for e-mail surveys are known to be somewhat lower than paper and pencil surveys. Kittleson (1995) also indicated that he could not achieve a

satisfactory response rate even among active e-mail users and argued that snail mail was the best way of getting a reasonable response rate.

In another study, Tse et al (1995) conducted a survey by e-mail and internal post at the Chinese University of Hong Kong. The study showed a lower response rate for e-mail (6%) compared with mail (27%). The difference was explained in terms of fear of the new e-mail technology, difficulty of completely e-mail surveys, and traceability of the respondent for a potential sensitive subject.

Chapter 3

Methodology

Population and Sample

The target population for this study was defined as public university faculty members from Southern Region Education Board (SREB) member institutions. SREB member states include the following; Florida, Georgia, Alabama, Mississippi, Louisiana, Texas, Arkansas, North Carolina, South Carolina, Tennessee, Kentucky, Virginia, West Virginia, Delaware, Maryland, and Oklahoma. The accessible population for this study was derived from a list of the largest public universities within the sixteen SREB member states. Three universities were randomly selected (Clemson University, Mississippi State University and Virginia Polytechnic Institute and State University). The researcher then acquired recent or current campus telephone directories from the selected universities. Next, the researcher manually extracted names, faculty rank and email addresses for all faculty members who held the rank of assistant, associate or full professor. The researcher decided not to include faculty instructors for lack of real influence in shaping educational policy. This information was complied into spreadsheet format and later used as the population database.

Instrumentation and Reliability

An electronic survey instrument was developed for the purposes of this study. (See Appendix A) The survey instrument consisted of a World Wide Web page for subject interface and a Microsoft SQL relational database on the back-end for data storage. The subjects were instructed to answer each question by checking the appropriate box with their left mouse button. After all questions had been answered they were required to click the “submit” radio

button to upload the data into the database. The instrument contained two sections, Demographics and Institutional Support (See Appendix A). The demographics section of the instrument was designed to gather traditional demographic characteristic information, and selected information related to distance education. The Institutional Support section measured faculty perceptions of institutional support for distance education. A list of distance education related questions were complied from the review of literature. Additionally, questions were taken from an instrument developed for a study published in 1997 by the National Center for Educational Statistics (NCES) a subsidiary of the U.S. Department of Education's Office of Educational Research and Improvement. The title of this study is *Distance Education in Higher Education Institutions*.

The reliability of the 11-item scale was assessed from the data collected in the study using Cronbach's Alpha internal consistency coefficient. The reliability coefficient for the survey instrument was recorded at Alpha= .64 The survey instrument contained two sections, Demographics and Institutional Support. The demographics section of the instrument was designed to gather traditional demographic characteristic information, and selected information related to distance education. The Institutional Support section measured faculty perceptions of institutional support for distance education.

Field Test Procedures

The instrument was reviewed and critiqued by a panel of experts consisting of faculty members from Louisiana State University's Education Learning and Resource Center (ELRC) Department. This panel was chosen based on their professional credentials and teaching experience in the distance education arena. During the field test, a comments field was provided within

the electronic survey for suggested modifications. Modifications to the instrument were made as needed.

Data Collection Procedure

The researcher first contacted the Louisiana Board of Regents and requested that the survey instrument be disseminated to the appropriate faculty members via their Listserv. The Louisiana Board of Regents forwarded the request to the SREB Headquarters in Atlanta Georgia. After two weeks of correspondence authorization was denied, with no given reasons. Next, the researcher contacted the Institutional Review Boards at each of the three selected universities. A request was made for the names and email addresses for all faculty members who held the rank of Full, Associate, or Assistant Professor during the 2000-2001 School year. Privacy issues and the lack of an institutional research liaison made this approach unworkable. The final population database was developed based on directory information as reflected in the official university telephone book of each institution. The researcher then proceeded to hand transfer this information into a Microsoft Excel spreadsheet which would later be used as the email database for the purposes of this study. The total number of assistant, associate and full professors for the three selected universities totaled 2078. One hundred three subjects responded but declined participation. One hundred thirty seven email addresses were no longer deemed valid due to a return error code received by the originating email server. For those email addresses that were no longer valid the researcher eliminated the subjects from the population. The entire adjusted assessable population, 1,941 subjects were sampled.

Survey instrument instructions were distributed via email to each of the subjects in the sample. The body of the email contained specific survey

instrument instructions as well as a hyperlink that directed the subject's web browser to the appropriate Web site (www.agcenter.lsu.edu/de). Once logged onto the Web site the subjects then input their responses by clicking on the appropriate square using the left mouse button.

After the instrument was completed, the data were then uploaded to a central database file for analysis purposes. Over 80% of the total responding faculty replied within 24 hours of sending out the survey. There was a 11% response rate. The researcher deemed this response rate normal based on the three week posting period for an electronic survey instrument. The survey instrument developed for use in this study is located in the Appendix A section of this study.

Data Analysis

Each of the following objectives was analyzed by applying the most appropriate statistical technique.

Objective 1 was to describe faculty members currently employed in instructional positions in higher education on the following personal and professional demographic characteristics:

a. age;
b. nature of the content of the course being taught (defined as more analytical or less analytical);
c. preferred method of course delivery (traditional /distance education;
d. gender;
e. previous distance teaching experience;
f. academic rank;

g. whether or not the faculty member is currently employed in a tenure track position; and

h. whether or not the faculty member is tenured.

This objective was descriptive in nature and was analyzed using descriptive statistics. The variables were measured categorically and summarized using frequencies and percentages. Interval level variables were measured and summarized using means and standard deviations.

Objective 2 was to determine the influence of the following factors that may prohibit institutions from participating in distance education as perceived by the faculty in that institution:

a. lack of fit with institution's mission;

b. lack of support from institution administrators;

c. equipment cost;

d. equipment support and maintenance;

e. limited technological infrastructure to support distance education;

f. lack of rewards or incentives;

g. legal concerns (e.g. intellectual property rights, copyright laws);

h. institutional use of distance education technology;

i. concerns about course quality;

j. technical or analytical nature of the course being taught; and

k. lack of university sponsored technology training..

Objective 2 was established to quantify higher education faculty's perceived limitations of distance education. This objective was accomplished by using the Factor Analysis to reduce the total number factors

Objective 3 was to determine if a relationship exists between the attitudes toward distance education in higher education as measured by the

sub-scale scores of the “Institutional Support” scale and each of the following selected personal demographic characteristics of faculty in higher education:

a. age;
b. preferred method of course delivery;
c. gender;
d. whether or not the faculty member is currently employed in a tenure track position;
e. whether or not the faculty member is tenured; and
f. whether or not the faculty member has experience teaching distance education.

Objective 2 reduced the scale to two fundamental factors (institutional support and course related factors) this objective was accomplished by using (Kendall’s tau_b) correlation coefficient and Independent T-Test to determine whether or not these specific demographic variables explained a statistically significant portion of the variance in institutional related factors and or course related factors.

Based on previous research findings, objective 4 was written in the form of a research hypothesis as follows:

Faculty from more analytical fields will have more negative attitudes concerning distance education than faculty from less analytical fields. This objective was also accomplished by using (Kendall’s tau_b) correlation coefficient to determine whether or not the analytical nature of the course explained a statistically significant portion of the variance in institutional related factors and or course related factors.

Chapter 4

Findings

The results presented in this chapter are arranged by the objectives of the study. The primary purpose of this study was to compare university faculty perceptions of distance education in program areas that are analytical in nature with those of university faculty in areas that are less analytical in nature, regarding selected aspects of distance education including but not limited to its usefulness and applicability. A total of 1,941 faculty from three Southeastern, land-grant institutions were surveyed via electronic mail.

One hundred three subjects responded but declined participation. One hundred thirty-seven email addresses were deemed no longer valid due to a return error code received by the originating email server. For those email addresses that were no longer valid the researcher considered the subjects to no longer be employees at the respective universities. From the useable faculty population ($\underline{x}$=1,941), a total of 209 subjects (11%) responded to the survey. The data were analyzed using the Statistical Package for Social Sciences (SPSS). Although the survey response rate was only 11%, substantial data were collected. Follow-up was not done for two reasons. One, according to the literature review a 11% response rate is normal for this type of survey. Two, the researcher left the instrument active for a three week time span. Based on the review of literature, three weeks is adequate for this type of data collection.

This chapter contains the findings that are the result of investigation into faculty perceptions of distance education. The results presented in this chapter are arranged by the objectives of the study.

Objective One

Objective one was to describe faculty members that were currently employed in instructional positions in selected higher education institutions on the following personal and professional demographic characteristics: age; nature of the content of the course being taught (defined as more analytical or less analytical); preferred method of course delivery (traditional / distance education); gender; previous distance teaching experience; academic rank; whether or not the faculty member is currently employed in a tenure track position; and whether or not the faculty member is tenured.

Table 1 gives the breakdown of the faculty's teaching disciplines, according to Biglan's (1973) system of categorizing faculty teaching disciplines. The majority (n=86 or 48.6%) of the faculty were from the hard applied sciences while the hard pure sciences made up the smallest percentage of the responding faculty (n=15 or 8.5%).

Table 1

Teaching Disciplines of Faculty Members from Three Southeastern, Land-grant Institutions

Disc	Universities							
	Clemson		Va Tech		Miss State		Total	
	n	%	n	%	n	%	n	%
1	11	23.9	13	22.0	16	22.2	40	22.6
2	4	8.7	4	6.8	7	9.7	15	8.5
3	21	45.7	36	61.0	29	40.3	86	48.6
4	10	21.7	6	10.2	20	27.8	36	20.3
Total	46	100.0	59	100.0	72	100.0	177	100.0

Note: Data for 32 participants were not available. 1=Soft applied sciences; 2 = Pure hard sciences; 3=Hard applied sciences; 4=Soft, pure humanities sciences; Disc=Teaching Discipline.

Respondents were asked to select their age group. A large majority of the responding faculty indicated that they were over the age of 40 (n=167 or 78.6%). There was a low percentage (n=39 or 18.6%) of responding faculty under the age of 40. The highest percentage of responding faculty (n=75 or 36.4%) fell into the 50-59 years age group. Table 2 further summarizes the age groups of the respondents.

Table 2

Age Groups of Faculty Members from Three Southeastern, Land-grant Universities

Age Groups	n	%
20-29	5	2.4
30-39	34	16.5
40-49	68	33.0
50-59	75	36.4
60-69	24	11.6
Total	206	100.0

Note: Three faculty members did not respond to age group.

In responding to the question “Are 75% of the courses you teach, analytical or less analytical?” the majority (n=112 or 53.6%) indicated the courses they taught were less analytical while 46.4% (n=97) indicated the courses they taught were analytical. Faculty members were asked “Generally, what is your preferred method of course delivery?” The majority (n=203 or 97.1%) of the respondents indicated they preferred the Traditional Classroom while only 2.9% (n=6) indicated they preferred the Distance Education method.

The majority (n=165 or 78.9%) of the responding faculty members were male while 21.1% (n=44) were female. In response to the question “Have you had previous distance teaching experience?” the majority (n=118 or 56.5%) of

the respondents indicated that they had no prior distance education teaching experience while 43.5% (n=91) indicated that they did have prior distance education teaching experience.

When asked to select their current academic rank, the highest percentage of responding faculty members (n=91 or 43.5%) reported that their rank was Full Professor category as shown in Table 3.

Table 4 indicates that the sample was not representative of the population. There was a lower percentage of Full professors and a larger percentage of Associate and Assistant professors in the sample than in the population. A simple explanation could be that the Full professors were nearing the end of their careers and were generally unfamiliar with distance education while the younger professors were more technologically savvy and willing to try new methods.

Table 3

Professional Rank of Faculty Members from Three Southeastern, Land-grant Universities

Professional Rank	n	%
Full	91	43.5
Associate	73	35.0
Assistant	45	21.5
Total	209	100.0

In response to the question “Are you currently employed in a tenure track position?” the majority (n=195 or 93.3%) of responding faculty members indicated that they were employed in a tenure track position, while only 6.7% (n=14) indicated that they were not in a tenure track position.

Table 4

Comparison of Population versus Sample of Professional Rank of Faculty Members from Three Southeastern, Land-grant Universities

Professional Rank	Population		Sample	
	n	%	n	%
Full	1251	64.5	91	43.5
Associate	485	25.0	73	34.9
Assistant	204	10.5	45	21.5
	1940	100.0	209	100.0

Participants were asked if they were tenured. The majority (n=155 or 79.5%) of responding faculty members who were employed in a tenure track position indicated that they were tenured while only 20.5% (n=40) of responding faculty members who were employed in a tenure track position indicated that they were not tenured.

Objective Two

Objective 2 was to determine the influence of the following factors that may prohibit institutions from participating in distance education as perceived by the faculty in that institution: lack of fit with institution's mission; lack of support from institution administrators; equipment cost; equipment support and maintenance; limited technological infrastructure to support distance education; lack of rewards of incentives; legal concerns (e.g. intellectual property rights, copyright laws); institutional use of distance education technology; concerns about course quality; technical or analytical nature of the course being taught; and lack of university sponsored technology training.

The information used to accomplish this objective was drawn primarily from Section II of the instrument, Institutional Support, in which subjects were

asked to indicate how selected factors affect their motivation to participate in distance education. Responses were reported on a five point Likert-type scale ranging from “Strongly Agree” to “Strongly Disagree”: 1=Strongly Agree, 2=Agree, 3=Undecided, 4=Disagree, and 5=Strongly Disagree.

Overall responding faculty members indicated that they Disagreed on the motivating factors for teaching using distance education technology (see Table 5). The variables that respondents tended to Agree with were ”Distance education fits with your institution’s educational goals and missions” ($\underline{m}$ = 1.9). “Concerns about course quality are primary obstacles for developing distance education courses” ($\underline{m}$ = 2.3) and “The lack of incentives is a primary obstacle for developing distance education courses” ($\underline{m}$ = 2.3). Responding faculty were Undecided on two factors.

Table 5

Perceived Limitations of Faculty From Three Southeastern, Land-grant Institutions of Teaching Using Distance Education on Selected Variables

Selected Variables	Mean	SD	Median	Classification
DE fits with your institution’s educational goals and missions.	1.9	0.89	2.0	Agree
Concerns about course quality are primary obstacles for developing DE courses.	2.3	1.15	2.0	Agree
The lack of incentives is a primary obstacle for developing DE courses.	2.3	1.21	2.0	Agree
Your institution makes adequate use of distance education technology to adequately meet the needs of it students.	2.9	0.91	3.0	Undecided

(table cont’d.)

Selected Variables	Mean	SD	Median	Classification
Equipment support and maintenance are primary obstacles for developing DE courses.	3.0	1.18	3.0	Undecided
Limited technological infrastructure is a primary obstacle for developing DE courses.	3.2	1.29	4.0	Disagree
There is a lack of support from institution administrators when attempting to develop DE courses.	3.2	1.17	4.0	Disagree
The technical or analytical nature of the course being taught is the primary obstacle for developing DE courses.	3.2	1.17	4.0	Disagree
Legal concerns are primary obstacles for developing DE courses.	3.3	1.13	4.0	Disagree
Equipment cost is a primary obstacle for developing DE courses.	3.3	1.14	4.0	Disagree
The lack of university sponsored technology training is a primary obstacle for developing DE courses.	3.5	1.17	4.0	Disagree

Note: DE = Distance Education.

The researcher used factor analysis to further determine if primary underlying constructs could be identified in the scale. The analysis procedure used was principal components analysis with a Varimax rotation method. The first step in conducting the factor analysis was to determine the optimum number of factors to be extracted from the scale. Using the Latent Root criterion and the Scree test criterion, the number of factors extracted was determined to be two. The two sub-scales, Factor 1 and Factor 2 were labeled

by the researcher as “Institutional Factors” and “Course Related Factors.” The results of the factor analysis, including the percentage of variance explained and individual factor loadings for each item, are presented in Table 6.

Factor 1, which the researcher labeled “Institutional Factors,” included the following seven items: lack of support from institutional administrators, equipment cost, equipment support and maintenance, limited technological infrastructure, lack of incentives, adequate use of distance education technology, and lack of university sponsored training. The factor loadings ranged from a high of .791 to a low of -.433 and explained 27.7% of the overall variance in the scale.

The second factor consist of items relating to the importance of courses. Factor 2, “Course Related Factors,” included the following four items: technical or analytical nature of the course, concerns about course quality, legal concerns, and fit within institution’s educational goals. This factor added an additional 15% of explained variance and yielded factor loadings from .774 to -.407. The total amount of variance accounted for by the factors was 42.7%. Generally, a factor solution which accounts for more than 30% of the total variance can be considered adequate (Bahr, 2002).

Table 6

Factor Analysis of Factors that Affect Motivation for Participation in Distance Education

	Components	
Questionnaire item	Factor 1	Factor 2
Equipment cost	.791	
Limited technological infrastructure	.778	

(table cont’d.)

	Components	
Questionnaire item	Factor 1	Factor 2
Lack of support from institutional administrators	.735	
Equipment support and maintenance	.599	
Lack of university sponsored training	.597	
Lack of incentives	.568	
Adequate use of distance education technology	-.433	
Concerns about course quality		.774
Technical or analytical nature of the course		.660
Legal concerns		.562
Fit within institution's educational goals		-.407
Percentage of total variance accounted for	27.7%	15.0%

Objective Three

Objective 3 was to determine if a relationship existed between the attitudes toward distance education in higher education as measured by the sub-scale scores of the "Institutional Support" scale and each of the following selected personal demographic characteristics of faculty in higher education: age; preferred method of course delivery; gender; whether or not the faculty member is currently employed in a tenure track position; whether or not the faculty member is tenured; and whether or not the faculty member has experience teaching distance education.

Factor analysis reduced the scale to two fundamental factors (institutional factors and course related factors). After the two sub-scales and items to be included in each were identified, the researcher computed scale scores for each of the two identified sub-scales. These sub-scales scores were identified as the mean of the items included in each of the respective factors. Since some of the items were designed as reverse scale items (for example, on some items strongly disagree represented the more positive attitude while on some items strongly agree represented the more positive attitude), the items were recoded so that for all items, the lower value represented a more positive attitude toward how the factor affected the faculty's motivation for participating in distance education. After the items were recoded, an overall mean scores was computed for each sub-scale (Institutional factors, n=7; Course related factors, n=4) identified by the factor analysis. It should be noted that these scores no longer reflect simply agreement/disagreement due to the recoded items. The sub-scale scores should now be interpreted as positive or negative attitudes toward how the factor affected the faculty's motivation for participating in distance education

For the first scale labeled "Institutional Support" the individual mean scores ranged from a low of 2.3 to a high of 3.5 with an overall mean of 3.04 (SD = .69). For the second scale labeled "Course Related Factors" the individual mean scores ranged from a low of 1.9 to a high of 3.3 with an overall mean of 2.67 (SD = .61).

Institutional Factors by Age Groups

The correlation between age groups and Institutional Factors was measured using the Kendall's tau procedure. This comparison revealed that

the five age groups were not statistically different in their overall mean responses to the items in the Institutional factors, ($r_{209)}$=0.054, p=.320).

Course Related Factors by Age Groups

The correlation between age groups and Course Related Factors was measured using the Kendall's tau procedure. Kendall's Tau procedure also revealed no significant correlation between age groups and Course Related Factors ($r_{(206)}$=0.039, p=.481).

The remaining demographic variables were compared on their overall mean scores using the independent t-test procedure. The comparison between respondents' preferred method of course delivery with the two factors' scores revealed that the two groups were not statistically different in their overall mean responses to the items on the Institutional factor score ($t_{(209)}$ = .43, p=.67) or the Course related factor score ($t_{(209)}$ = -.32, p=.75) . (See Tables 7 and 8)

Table 7

Comparison of Mean Institutional Factor Score by Preferred Method of Course Delivery

Variable	n	M	SD	t	p
Traditional Method	203	3.05	.69	.43	.67
Distance Education	6	2.93	.92		

Note: Generally, what is your preferred method of course delivery?

Table 8

Comparison of Mean Course Related Factor Score by Preferred Method of Course Delivery

Variable	n	M	SD	t	p
Traditional Method	203	2.67	.61	-.32	.75
Distance Education	6	2.75	.85		

Note: Generally, what is your preferred method of course delivery?

Although the males in the study outnumbered the females by a ratio of 4.1, the comparison by respondents' gender of the two factor scores revealed that the two groups were not statistically different in their overall mean responses to the items on the Institutional factor score ($t_{(209)} = 1.0$, $p=.32$) or the Course related factor score ($t_{(209)} = 1.8$, $p=.24$) . (See Tables 9 and 10)

Table 9

Comparison of Mean Institutional Factor Score by Gender

Gender	n	M	SD	t	p
Male	165	3.07	.67	1.0	.32
Female	44	2.95	.76		

Table 10

Comparison of Mean Course Related Factor Score by Gender

Gender	n	M	SD	t	p
Male	165	2.70	.60	1.18	.24
Female	44	2.57	.66		

While only a small percent 6.7% ($n=14$) of the faculty were in a tenure track position, the comparison between respondents' response as to whether or not they were currently employed in a tenure track position with the two factors' scores revealed that the two groups were not statistically different in their overall mean responses to the items on the Institutional factor score ($t_{(209)} = -1.7$, $p=.08$) or the Course related factor score ($t_{(209)} = 1.08$, $p=.28$) . (See Tables 11 and 12) Due to the large discrepancy in responses, individual independent T-Test were performed for each state of the variable "employed" in order to achieve presented results.

Table 11

Comparison of Mean Institutional Factor Score by Employment in Tenure Track Position

Employed	n	M	SD	t	p
Yes	195	3.03	.68	-1.7	.08
No	14	3.36	.85		

Note: Are you currently employed in a tenure track position?

Table 12

Comparison of Mean Course Related Factor Score by Employment in Tenure Track Position

Employed	n	M	SD	t	p
Yes	195	2.68	.60	1.08	.28
No	14	2.50	.82		

Note: Are you currently employed in a tenure track position?

The comparison between respondents' response as to whether or not the faculty member is tenured with the two factors' scores revealed that the two groups were not statistically different in their overall mean responses to the items on the Institutional factor score ($t_{(195)} = .90$, $p=.37$) or the Course related factor score ($t_{(195)} = -1.24$, $p=.90$) . (See Tables 13 and 14)

Table 13

Comparison of Mean Institutional Factor Score by Whether or not Faculty were Tenured

Tenured	n	M	SD	t	p
Yes	151	3.04	.69	.90	.37
No	44	2.94	.63		

Note: Only faculty members who were in tenure track positions were used in the analysis. Question: Are you tenured?

Table 14

Comparison of Mean Course Related Factor Score by Whether or not Faculty were Tenured

Tenured	n	M	SD	t	p
Yes	151	2.68	.60	-1.24	.90
No	44	2.69	.59		

Note: Only faculty members who were in tenure track positions were used in the analysis. Question: Are you tenured?

The comparison between respondents' response as to whether or not the faculty member has experience teaching distance education with the two factors' scores revealed that the two groups were not statistically different in their overall mean responses to the items on the Institutional factor score ($t_{(209)} = -.73$, $p=.46$) or the Course related factor score ($t_{(209)} = 1.76$, $p=.08$) . (See Tables 15 and 16)

Table 15

Comparison of Mean Institutional Factor Score by Distance Education Teaching Experience

Experience	n	M	SD	t	p
Yes	91	3.01	.67	-.73	.46
No	118	3.08	.71		

Note: Have you had previous distance teaching experience?

Table 16

Comparison of Mean Course Related Factor Score by Distance Education Teaching Experience

Experience	n	M	SD	t	p
Yes	195	2.76	.61	1.76	.08
No	14	2.60	.61		

Note: Have you had previous distance teaching experience?

Objective Four

Based on previous research findings (Biglan, 1973), objective four was written in the form of a research hypothesis as follows: Faculty from more analytical fields will have more negative attitudes concerning distance education than faculty from less analytical fields. Faculty were asked "Does the nature of the course influence your decision on whether or not you are willing to teach the course via distance education?" The majority (n=155 or 74.2%) indicated No while 54 or 25.8% indicated Yes.

When comparing disciplines and faculty responses to the question "Does the analytical nature of the course influence your decision on whether or not you are willing to teach the course via distance education?" it is interesting to note that the majority (n=69, 52.7%) of the faculty in the Hard applied sciences indicated No as shown in Table 17.

Table 17

Biglan-Kolb Classification of Academic Knowledge

Disciplines	The influence of course nature by discipline					
	Yes		No		Total	
	n	%	n	%	n	%
1[a]	13	27.1	28	21.4	41	22.9
2[b]	8	16.7	7	5.3	15	8.4
3[c]	18	37.5	69	52.7	87	48.6
4[d]	9	18.8	27	20.6	36	20.1
Total	48	100.0	131	100.0	179	100.0

Note: 1=Soft applied sciences; 2 = Pure hard sciences; 3=Hard applied sciences; 4=Soft, pure humanities sciences.

Faculty were also asked to rank factors on a scale of 1 to 5, with 1 being the strongest influential and 5 being the least influential, on the extent to which

the factors deterred them from personally participating in distance education. Table 18 shows that “Lack of incentives or professional promotion” was most influential while “Tenured or not” was the least influential. The means for the other factors (Analytical or technical nature of the course being taught, m=3.19; Lack of institutional support, m=3.16; and Lack of departmental support, m=3.10) appeared to be equivalent, indistinguishable factors. The majority (n=53 or 25%) of the respondents, when asked to rank ”Analytical or technical nature of the course being taught,” ranked it 5, which means that the analytical nature of the course was not a major deterrent to faculty participating in distance education. The majority (n=61 or 29%) ranked “Lack of institutional support” a 3, which means that the faculty was undecided as to whether the factor was a determent or not. “Lack of departmental support” (n=57 or 27%) was ranked 2 by the majority of the faculty members. This means that they agreed that the factor did influence them from personally participating in distance education.

Table 18

Ranking of Factors that Deter Faculty From Three Southeastern, Public, Land-grant Institutions of Teaching Using Distance Education from Participating in Distance Education

Factors	Ranking					Factor Average
	1	2	3	4	5	
Lack of incentives or professional promotion	97 46%	44 21%	18 9%	24 12%	26 12%	2.22
Tenured or not	12 6%	17 8%	23 11%	27 13%	130 62%	4.17
Analytical or technical nature of the course being taught	42 21%	32 15%	34 16%	48 23%	53 25%	3.19

(table cont’d.)

Factors	Ranking					Factor Average
	1	2	3	4	5	
Lack of institutional support	27 13%	36 17%	61 29%	46 22%	39 19%	3.16
Lack of departmental support	20 10%	57 27%	53 25%	40 19%	39 19%	3.10

The factor analysis conducted in Objective two reduced the data (11 factors) to two sub-scales: Sub-scale 1, Institutional Factors and Factor 2 Course Related Factors. The researcher then used the t-test procedure to test for statistical significance. The nature of the course for sub-scale1 Institutional Factors proved not to be statistically significant ($t_{(209)} = -0.962$, $p=.337$), see Table 19.

The results of the t-test procedure proved the nature of the course for sub-scale 2 Course Related Factors was statistically significant ($t_{(209)} = -4.129$, $p=.000$), see Table 20. When asked “does the analytical nature of the course influence your decision on whether or not you are willing to teach the course via distance education.” Faculty members generally agreed that the analytical nature of the course was deemed important in their decision whether or not to participate in distance education. The researcher’s initial hypothesis “Faculty from more analytical fields will have more negative attitudes/perceptions of distance education than faculty from less analytical fields” was validated because of this finding. Based on these findings future research involving faculty attitudes or perceptions of distance education should include the analytical or technical nature of the course being taught as a potential factor of influence.

Table 19

Comparison of Mean Institutional Related Factor Score by Nature of the Course

Influence	n	M	SD	t	p
Yes	54	3.0	.74	-0.962	.337
No	155	3.1	.77		

Note: Does the analytical nature of the course influence your decision on whether or not you are willing to teach the course via distance education?

Table 20

Comparison of Mean Course Related Factor Score by Nature of the Course

Influence	n	M	SD	t	p
Yes	54	2.9	.68	-4.129	.000
No	155	3.4	.64		

Note: Does the analytical nature of the course influence your decision on whether or not you are willing to teach the course via distance education?

Chapter 5

Conclusion, Implications and Recommendations

The primary purpose of this study was to compare university faculty perceptions of distance education in program areas that are analytical in nature with those of university faculty in areas that are less analytical in nature, regarding selected aspects of distance education including but not limited to its usefulness and applicability. Courses considered to be analytical or quantitative for this purposes of this study were courses that are quantitatively rooted where a significant portion (25%), of the required material involves the application of mathematical computations. This study does not make distinctions between calculations done by hand or electro-mechanical devices. For example, general courses in the following fields were considered "analytical" for the purposes of this study: calculus, statistics, physics, chemistry, engineering courses, etc.

Survey instrument instructions were distributed via email to each of the subjects in the sample. The body of the email contained specific instructions as well as a hyperlink that directed the subject's web browser to the appropriate Web site (www.agcenter.lsu.edu/de). Once logged onto the Web site the subjects then inputted their responses by clicking on the appropriate square using the left mouse button. After the instrument was completed, the data were then uploaded to a central database file for analysis purposes.

Based on the chosen method of sample selection (Simple Random Sample) and the chosen method of data collection certain limitations were prevalent. The simple random sample did not account for instructors who could not be reached via email for the period of data collection. Also, collecting data electronically does not account for technological glitches in a subjects' campus

email system. In order to investigate the research problem, the following objectives were formulated to guide the research study.

The Biglan-Kolb classification system was used to categorize respondents into four academic disciplines. This classification system of academic knowledge splits academic disciplines into categories as follows; hard/pure sciences and mathematics, hard/applied science-based professions (e.g. engineering), soft/pure humanities and social sciences and soft/applied social professions (e.g. education, social work and law).

Objective 1

Objective one was to describe faculty members currently employed in instructional positions in higher education on the following personal and professional demographic characteristics:

a. age;
b. nature of the content of the course being taught (defined as more analytical or less analytical);
c. preferred method of course delivery (traditional / distance education);
d. gender;
e. previous distance teaching experience;
f. academic rank;
g. whether or not the faculty member is currently employed in a tenure track position; and
h. whether or not the faculty member is tenured.

Objective 1: Conclusion

The majority of the responding faculty was over the age of 40 (n=167 or 78.6%). There was a low percentage (n=39 or 18.6%) of responding faculty under the age of 40. The highest percentage of responding faculty (n=75 or 36.4%) fell into the 50-60 years of age group. The highest percentage of responding faculty members (n=91 or 43.5%) fell into the Full Professor category. The majority (n=165 or 78.9%) of the responding faculty members were male. The majority (n=118 or 56.5%) of the respondents indicated that they had no prior distance education teaching experience. The majority (n=195 or 93.3%) of the faculty members were employed in a tenure track position. The majority (n=155 or 79.5%) of faculty members in the tenure track indicated that they were tenured.

The statistical analysis of the demographic variables measured in this objective are consistent with Betts (1998) recently published study "Factors Influencing Faculty Participation in Distance Education in Postsecondary Education in the United States: An Institutional Study." Betts reported 74.4% of responding faculty to be 45 years of age or older and that 55.3% of responding faculty were already tenured. Betts also reported 70.9% of responding faculty to be male. Although, in this researcher's opinion tenured, more experience faculty probably felt a little more at ease to speak their minds on institutional or departmental policy because they are not worried about job security. This opinion is based on the high percentage of respondents (43.5%) the fell into the full professor category.

The researcher recommends that future studies exploring faculty attitudes or perceptions in the distance education arena employ several

different marketing strategies to promote survey participation among all faculty age groups. For example, a researcher may first request survey participation via a plain text email set of instructions. Follow-up data collection could include multimedia or graphically enhanced survey instructions. This way potential subjects don't see follow-up data collection efforts as merely a retransmission of a previous set of instructions. The literature suggest a combination of electronic and paper surveys for higher response rates (Yun & Trumbo, 2000).

Objective 2

Objective 2 was to determine the influence of the following factors that may prohibit institutions from participating in distance education as perceived by the faculty in that institution.

a. Lack of fit with institution's mission;

b. Lack of support from institution administrators;

c. Equipment cost and maintenance;

d. Limited technological infrastructure to support distance education;

e. Lack of rewards of incentives;

f. Legal concerns (e.g. intellectual property rights, copyright laws);

g. Concerns about course quality; and

h. Technical or analytical nature of the course being taught.

Objective 2: Conclusion

The majority of the faculty members indicated that they disagreed with the listed limitations to teaching using distance education technology presented in objective 2. "Lack of incentive," "fit with institutions educational goal," and "course quality concerns" were the three items measured in this objective that

responding faculty felt were primary obstacles affecting their motivation to participate in distance education. Factor Analysis was used in this objective to reduce the total number of factors that prohibit responding faculty from participating in distance education. The two sub-scales, Factor 1 and Factor 2 were labeled by the researcher as “Institutional Support” and “Course Related Factors.” Factor 1, Institutional Factors, included such items as; lack of support from institutional administrators, equipment cost, equipment support and maintenance, limited technological infrastructure, lack of incentives, adequate use of distance education technology, and lack of university sponsored training. Factor 2, Course Related Factors, included such items as: technical or analytical nature of the course, concerns about course quality, legal concerns, and fit within institution’s educational goals.

The results of the factor analysis combined with independent sample T-Test reveal that responding analytical faculty and non-analytical faculty were statistically equivalent in terms of Institutional Factors, Factor 1 and Course Related Factors, Factor 2. Since Factor 2,Course Related Factors, explained (15.0 %) of the variance it seems likely that higher education faculty would start by concentrating their efforts on relieving concerns associated with course quality, which explained 27.7% of the variance; technical or analytical nature of the course, concerns about course quality, legal concerns, and fit within institution’s educational goals. This type of administrative intervention can only be achieved by addressing the course related factors at the university and Board of Regents level. As for the items in Factor 1, Institutional Factors, lack of support from institutional administrators, equipment cost, equipment support and maintenance, limited technological infrastructure, lack of incentives, adequate use of distance education technology, and lack of university

sponsored training, this researcher recommends that higher education administration make a commitment to distance education by ensuring course quality prior to addressing institutional support.

Objective 3

Objective 3 was to determine if a relationship exist between the attitudes toward distance education in higher education as measured by the sub-scale scores of the “Institutional Factor” scale and each of the following selected personal demographic characteristics of faculty in higher education:

a. age;

b. preferred method of course delivery;

c. gender;

d. whether or not the faculty member is currently employed in a tenure track position; and

e. whether or not the faculty member is tenured; and

f. whether or not the faculty member has experience teaching distance education.

Objective 3: Conclusion

There were six demographic variables selected for measurement in this objective, none of which showed a statistical significance as related to positive attitudes toward distance education.

Since none of the other measured factors have a significant impact on developing positive attitudes toward distance education, a qualitative study should be conducted to further investigate faculty reported demographics that affect participation in distance education.

Objective 4

Based on previous research findings, objective four was written in the form of a research hypothesis as follows:

Hypothesis

> Faculty from more analytical fields will have more negative attitudes/perceptions of distance education than faculty from less analytical fields.

Objective 4: Conclusion

Faculty were asked the question “does the analytical nature of the course influence your decision on whether or not you are willing to teach the course via distance education?” Using the independent T-Test procedure The nature of the course proved not to be statistically significant for Factor 1 (Institutional Factors) and significant for Factor 2 (Course Related factors), thus proving the researchers initial hypothesis.

However, somewhat of a different result was received in survey item number 15. When faculty were asked to rank a list of factors on the extent to which they deter individual participation in distance education, the nature of the course was indistinguishable from two other factors, “lack of institutional support” and ”lack of departmental support” in the decision whether or not to participate in distance education. “Incentives” clearly ranked highest and “tenured or not” ranked lowest in the list of factors that motivate participation in distance education.

In light of the finding presented it appears that incentives and promotional opportunity, not technology will be the primary driving force towards changing attitudes and perceptions of distance education. It is

obvious that developing a course to be taught via distance education requires a significant investment in terms of preparation time. University systems need to be made aware of this and incorporate distance education related activities into their incentives and promotional structures.

The researcher believes that whether or not a faculty member was employed in a tenure track position or not probably plays a more significant role than indicated by the study. Only 6.7% of the respondents indicated that they were not employed in a tenure track position and 97.3% indicated that they were. One plausible cause for this type of one sided response would be that non-tenure track faculty felt apprehensive about responding to an electronic survey. This apprehension probably resulted from the fear that their responses may later be used against them in their quest to gain tenure.

Finally, the study clearly shows that the analytical or technical nature of the course being taught needs to be added to the body of knowledge for factors motivating faculty participation in distance education. Based on the Biglan-Kolb academic classification system, 48.6% of the respondents were from the hard applied sciences discipline where highly analytical courses are normally taught. This means that analytical faculty were well represented in the sample and the nature of the course is a significant consideration in terms of preparing a course to be taught via distance education.

Recommendations for Future Research

There are three recommended paths for further research. First, it is recommended that a follow up study be conducted to examine student outcomes of analytical courses taught via distance education vs student outcomes of analytical courses taught in a traditional classroom environments.

These outcome measurements can then be broken out by certain demographics to serve the specific needs of the research institution involved.

The second recommendation is that a multi-institutional regional qualitative study be conducted to identify specific items that prohibit distance education participation. In order to make more definitive conclusions quantitative studies such as this one should be paralleled with qualitative efforts. The combination of having faculty respond to predefined survey questions with predefined responses and using open ended questions and letting faculty members respond as distance education pertains to their individual environments should offer further insight into distance education obstacles.

The final recommendation would be to use an electronic survey for data collection efforts. Reduced cost in terms of printing and postage, the elimination of data coding, and faster data collection make electronic surveys an undeniable resource for future data collection in the social science arena. In addition to the electronic survey, the researcher also recommends sending out a snail mail postcard informing potential subjects that they will be receiving an electronic survey request. This should help increase the inherently low electronic survey response rates.

References

Anderson, S. E. & Gansneder, B. M.(1995). Using Electronic Mail surveys and computer monitored data for studying computer mediated communication systems. Social Science Review, 13(1), 33-46.

Allen, R. (1960). Must home study be a stepchild of education? Home Study Review, 1(1), 15.

Betts, K. S. (1998). Factors Influencing Faculty Participation in Distance Education in Postsecondary education in the United States: An Institutional Study. Washington, DC: UMI .

Bahr, M. (2002) http://www.umuc.edu/ide/modldata.html, Factor Analysis.

Biglan, A. (1973). The characteristics of subject matter in different academic subject areas. Journal of Applied Psychology,57, 195-213.

Black, E. J. (1992). Faculty Support for University Distance Education. CADE: Journal of Distance Education,7(2)

Blanchard, J. (1999). Educational computing in the schools; technology, communication, and literacy. New York: Hawthorne Press

Blumenstyk, G. (1998, February 6). Western Governors u. takes shape as a new model for higher education. The Chronicle of Higher Education, 44(22), A21-A24.

Blumenstyk, G., McCollum, K. (1999, April 16). 2 reports question utility and accessibility in distance education. The Chronicle of Higher Education, 44(32), A31-A33.

Bossert, P. (1997, November). Horseless classrooms and virtual learning: Reshaping our environment. National Association of Secondary School Principals, 81(592), 3-15.

Brown, D. (2000). Educational Technology. Bolton, MA: Anker Pub. Co.

Challis, A. (1998, May). Faculty Attitudes Toward Distance Education in Utah Public Colleges and Universities. Ann Arbor, Mi: Umi

Chute, A., Thompson, M., & Hancock, B. (1999). The McGraw-Hill handbook of distance learning. New York: McGraw-Hill.

Clark, T. (1993, June). Attitudes of higher education faculty toward distance education: A national survey. The American Journal of Distance Education, 7(2), 19-33.

Cwiklik, R. (1998, November16). Technology (A Special Report): Pieces of the puzzle—A Different Course: For many people, college will no longer be a specific place, or a specific time. Wall Street Journal.

DeLoughry, T. (1995, April 7). Distance learning program inflames Maine faculty. The Chronicle of Higher Education, 41(30), A24.

Falk, W. & Lyson, T. (1988). High tech, low tech, no tech: Recent industrial and occupational change in the south. Albany: State University of New York Press.

Floyd, B. (1998, August 14). Bookmark. The Chronicle of Higher Education, 44(49), A25.

Glenn, A., Knapp, L. (1996). Restructuring schools with technology. Boston: ALlyn and Bacon.

Guernsey, L. (1998, March 27). Distance education for the not-so-distance. The Chronicle of Higher Education, 44(29), A29-A30.

Hancock, A. (1999, March). The evolving terrain of distance learning. Satellite Communications, 23(3), 24.

Harry, K. (1999). Higher education through open and distance learning. London: Routledge.

Hesselbein, A., Goldsmith, M., Goldsmith, M., Beckhard, R., & Drucker, P. (1997). The Organization of the Future. San Francisco: Jossey-Bass.

Institute for Distance Education. (1997) http://www.uq.edu.au/~uqmbahr/faex.htm.

Jakupec, V. & Garrick, J. (2000). Flexible learning, human resource and organizational development: Putting theory to work. London: Routledge.

Judy, R. & D'Amico, C. (1997). Workforce 2010: Work and workers in the 21st century. Indianapolis: Hudson Institute.

Markel, M. (1999, April). Distance education and the myth of the new pedagogy. Journal of Business and Technical Communication, 13(2), 208.

Markowitz, F. & Estrella, A. (1998, July). Campus Moves. Planning, 64.(7), 14-18.

Minoli, D. (1996). Distance learning: Technology and applications. Norwood: Artech House, Inc.

Moore, J. (1999, March). Higher education in transition. Journal of Chemical Education, 76(3), 293.

Nyiri, J. (1997, December). Open and distance learning in an historical perspective. European Journal of Education, 32(4), 347-357.

Oblinger, D. (1997, Winter). High tech takes the high road: New players in higher education. The Educational Record, 78(1), 30-37.

Potashnik, M., & Capper, J. (1998, March). Distance Education: Growth and Diversity. Finance & Development,11

Schneider, E., Glass, S., Henke, M., & Overton, J. (1997, Fall). Distance learning in gerontology: The future is here. Generations, 21(3), 46-49.

Selingo, J. (1998, June 5). Congress moves cautiously on aid for students in distance education. The Chronicle of Higher Education, 44(39), A30.

Sewel, D. (1990). New Tool for New Minds A cognitive Perspective on the Use of Computers with Young Children. New York: St. Martin's Press.

Shoemaker, C. (1998). Leadership in continuing education and distance education in higher education. Needham Heights: Allyn & Bacon.

Smith, G. (1998, November 9). Education poised to go the 'distance.' National Underwriter, 102(45), 19-20.

Tardanico, R., & Rosenburg, M. (2000). Poverty or Development. New York: Routledge.

Thompson, M. E. , & Brewster, D. A. (1978). Faculty Behavior in Low-paradigm versus High-paradigm disciplines: A Case Study. Research in Higher Education,8 169-175

Tse, A. C. B. et al (1995). Comparing two methods of sending out questionnaires: Email versus mail. Journal of the Market Research Society, 37, 441-446

U.S. Department of Education. National Center for Education Statistics. *Distance Education in Higher Education Institutions*, NCES 97-062, by Laurie Lewis, Debbie Alexander, and Elizabeth Farris. Project Officer, Bernie Greene. Washington, DC: 1997

Wells, R. (1999, March). Back to the (Internet) classroom. Training, 36(3), 50-54.

Williams, M., Paprock, K., & Covington, B. (1999). Distance learning. Thousand Oaks: Sage Publications.

Appendix A Survey Instrument

Louisiana State University

April 2001

Factors Which Influence Faculty Attitudes and Perceptions of Distance Education in Analytical and Quantitative Subjects Areas

Distance Education is defined by this study as higher education courses where at least 75% of the course content is taught via electronic media. Specifically, courses taught via the Internet, high speed-high bandwidth telecommunication lines, and or satellite communications. There is no distinction drawn between faculty who use distance education as a sole means of teaching and learning, and faculty who teach an occasional course.

Analytical Course A course that is quantitatively rooted where a significant portion, (25%) of the required material involves the application of mathematical computations. This study does not make distinctions between calculations done by hand or electromechanical devices. For example, general courses in the following fields will be considered “analytical” for the purposes of this study: calculus, statistics, physics, chemistry, engineering courses, etc.

Jeffrey G. Sumrall

School of Human Resource Education and Workforce Development

Section I Demographics

1. Name _____

2. Institutional Affiliation _____

3. Age
   Under 30 ……._
   30 – 40……._
   40 – 50……._
   50 – 60 ……._
   Over 60……._

4. Current academic rank
   Prof……..._
   Assoc. Prof.....……....._
   Asst. Prof……._

5. Have you had previous distance teaching experience?
   Yes……..……_
   No……._

6. Gender
   Male……._
   Female……._

7. Are you currently employed in a tenure track position?
   Yes……._
   No……..._

8. Are you tenured?
   Yes……._
   No……..._

9. Generally, what is your preferred method of course delivery?
   Traditional Classroom……._
   Distance Education……._

10. Are 75% of the courses you teach?
    Analytical……._
    Less Analytical……._

11. Does the analytical nature of the course influence your decision on whether or not you are willing to teach the course via distance education?
    Yes……._
    No……..._

12. Are your students required by university or departmental policy to own a personal computer?
    Yes……._
    No……..._

13. Do your students have adequate access to computer lab facilities?
    Yes……_
    No……_

Section II Institutional Support

14. For each of the following factors please indicate how it affects your motivation for participate in distance education.

    a. Distance Education fits with your institution's educational goals and missions.
       1=Strongly Agree
       2=Agree
       3=Undecided
       4=Disagree
       5=Strongly disagree

    b. There is a lack of support from institution administrators when attempting to develop distance education courses.
       1=Strongly Agree
       2=Agree
       3=Undecided
       4=Disagree
       5=Strongly disagree

    c. Equipment cost is a primary obstacle for developing distance education courses.
       1=Strongly Agree
       2=Agree
       3=Undecided
       4=Disagree
       5=Strongly disagree

    d. Equipment support and maintenance are primary obstacles for developing distance education courses?
       1=Strongly Agree
       2=Agree
       3=Undecided
       4=Disagree
       5=Strongly disagree

    e. Limited technological infrastructure is a primary obstacle for developing distance education courses.
       1=Strongly Agree
       2=Agree
       3=Undecided
       4=Disagree
       5=Strongly disagree

    f. The lack of incentives is a primary obstacle for developing distance education courses.
       1=Strongly Agree

2=Agree
3=Undecided
4=Disagree
5=Strongly disagree

g. Legal concerns (e.g. intellectual property rights, copyright laws, etc.) are primary obstacles for developing distance education courses.
1=Strongly Agree
2=Agree
3=Undecided
4=Disagree
5=Strongly disagree

h. Your institution makes adequate use of distance education technology to adequately meet the needs of its students.
1=Strongly Agree
2=Agree
3=Undecided
4=Disagree
5=Strongly disagree

i. Concerns about course quality are primary obstacles for developing distance education courses.
1=Strongly Agree
2=Agree
3=Undecided
4=Disagree
5=Strongly disagree

j. The technical or analytical nature of the course being taught is the primary obstacle for developing distance education courses.
1=Strongly Agree
2=Agree
3=Undecided
4=Disagree
5=Strongly disagree

k. The lack of University sponsored technology training is a primary obstacle for developing distance education courses.
1=Strongly Agree
2=Agree
3=Undecided
4=Disagree
5=Strongly disagree

15. Rank the following factors on the extent to which they deter you personally from participating in distance education (1=strongest influential to 5=least influential).

a. Lack of incentives or professional promotion……._
b. Tenured or not……..._
c. Analytical or Technical nature of the course being taught...._

d. Lack of Institutional Support…….._
e. Lack of Departmental Support…….._

Appendix B IRB Application for Exemption

HSSC accession #: LSU Proposal #:

LSU INSTITUTIONAL REVIEW BOARD (IRB) for 388 8692; FAX 6792
HUMAN RESEARCH SUBJECT PROTECTION Office:117B David Boyd Hall

APPLICATION FOR EXEMPTION FROM INSTITUTIONAL OVERSIGHT

Unless they are formally qualified as meeting the criteria for exemption from Institutional Review Board (IRB) oversight, ALL LSU research/projects using living humans as subjects, or samples or data obtained from humans, directly or indirectly, with or without their consent, must be approved in advance by the LSU IRB. This Form helps the PI determine if a project may be exempted, and is used to request an exemption.

NOTE: Even when exempted, the researcher is required to exercise prudence in protecting the interests of research subjects, obtain informed consent if appropriate, and must conform to the Ethical Principles and Guidelines for the Protection of Human Subjects (Belmont Report), 45 CFR 46, and LSU Guide to Informed Consent; (Available from OSR or http://www.osr.lsu.edu/irb)

Instructions: Complete checklist, pp 2 4; if exemption appears likely, see instructions, p.4. If not, submit IRB applicator.**

Principal Investigator Jeffrey Sumrall Student? Y (N
Ph: 578 6340 E mail jsumral@lsu.edu Dept/Unit Human Resource Education

If Student, name supervising professor Dr. Gerri Holmes Ph:578 2464
Student Mailing Address Room 231, H.D. Wilson Labs Ph:578 6340

Project Title Factors Which Influence Faculty Attitudes and Perceptions of Distance Education in Analytical and Quantitative Subject Areas

Agency expected to fund project

Subject pool (e.g. Psychology Students) University Faculty/(Full, Assoc. & Asst. Professors)

Circle any "vulnerable populations" to be used: (children <18; the mentally impaired, pregnant women, the aged, other). Projects with incarcerated persons cannot be exempted.

I certify my responses are accurate and complete. If the project scope or design is later changed I will resubmit for review. I will obtain written approval from the Authorized Representative of all non LSU institutions in which the study is conducted.

PI Signature Date 5/8/01 (no per signatures)

Screening Committee Action: Exempted Not Exempted

Reviewer Signature Date

Comments
cc PI (signed face page only; Dr. C. Graham (application with protocol) 117B David Boyd Hall, LSU.

Help available from Dr. Charles Graham, 388 8692 cgraham@lsu.edu or any screening committee member.

Part A: DETERMINATION OF "RESEARCH" and POTENTIAL FOR RISK

This section determines whether the project meets the Department of Health and Human Services definition of "research" and if not, whether it nevertheless presents more than "minimal risk" to humans that makes IRB review prudent and necessary.

1. Is the project a systematic investigation designed to develop or contribute to generalisable knowledge?

(Note "systematic investigation" includes "research development, testing and evaluation"; therefore some instructional development and service programs will include a "research" component).

YES X Go to Part B: Project constitutes research

NO Go to 2

2. Does the project present physical, psychological, social or legal risks to the participants reasonably expected to exceed chose risks normally experienced in daily life or in routine diagnostic physical or psychological examination or testing? You must consider the consequences if individual data inadvertently become public.

YES Check C2 and stop here: IRB review required

NO X Check C1: Apply for exemption from IRB oversight

Part B: EXEMPTION CRITERIA FOR RESEARCH PROJECTS

This Part establishes whether the project is confined to research activities that may be exempted from IRB oversight.

Please answer each question 1 5; although a single exemption criterion may be sufficient to exempt a project, some projects contain several elements that may be met by different criteria.

#1. Is this research conducted in established or commonly accepted educational settings, AND does the research involve normal educational practices (e.g. research on regular and special education strategies or research on the effectiveness of, or comparison among instructional techniques, curricula or classroom management methods)? (NOT exempt merely because conducted at a university or school)

YES X Check C1 & go to #2: This exemption criterion is satisfied
NO Go to #2: This exemption criterion is not applicable

#2. Will this research use educational tests (cognitive, diagnostic, aptitude, achievement), survey

procedures, interview procedures or observation of public behavior?

YES Go to 2.1

NO X Skip to #3: (Criterion not applicable)

2.1 Will minors (<18y) be subjects AND does this research use survey procedures, interview procedures, or observation of public behavior in which the observer participates?

YES Check C2, and skip to #3: IRE review probably required

NO Go to 2.2

2.2 Is the information recorded in such a manner that human subjects can be identified directly, or indirectly through identifiers (such as a code) linked to the subjects?

YES Go to 2.3

NO Skip to #3: This exemption criterion is satisfied

2.3 will any inadvertent disclosure of individual human subjects' responses have the potential to place the subjects at risk of criminal and civil liability, or be damaging to the subjects' financial standing, employability or reputation?

(The collection of sensitive data regarding the subjects' (or relatives' or associates') possible substance abuse, sexuality, criminal history or intent, medical or psychological condition, financial status, or similarly compromising information are examples of instances which will require an answer of YES):

YES Go to 2.4

NO Skip to #3: This exemption criterion is satisfied

2.4 Are the human subjects elected or appointed public officials or candidates for public office?

YES Check C1, go to #3: Exemption criterion satisfied
NO Check C2 and go to #3: IRE review probably required

#3. Does this research involve the collection or study of existing* data, documents, records, pathological or diagnostic specimens? (*"existing" implies a retrospective study)

YES Go to 3.1

NO X Skip to #4: (Criterion not applicable)

3.1 Is this material or information publicly available, or will it be recorded in such a manner by the investigator that the subjects cannot be identified directly, or indirectly through identifiers linked to the subjects?

YESCheck C1 & go to #4: Exemption criterion satisfied

NO Check C2 & go to #4: IRE review probably required.

#4. Is this a taste or food evaluation or food acceptance study?

YESGo to 4.1

NO X Skip to #5: (criterion not applicable)

4.1 Will only wholesome foods without additives be consumed? OR any food ingredients (including additives) consumed will be demonstrably at or below the level, and for a use found to be safe; are agricultural chemicals or environmental contaminants demonstrably at or below the level found to be safe by the Food and Drug Administration or approved by the Environmental Protection Agency or the USDA Food Safety and Inspection Service?

YESCheck C1 & Go to #5: Exemption criterion satisfied

NO, or unsure Check C2 & go to #5: IRB review may be required

#5. Does the project include ANY research activity with human subjects not exempted under one or more of the above criteria?

YESCheck C2: IRB review required

NO X Check C1; Go to Part C and proceed accordingly

Part C: PRELIMINARY EVALUATION of EXEMPT STATUS by Investigator:

C1 C2 If C1, or C1 AND C2 are checked, seek exemption
If only C2 is checked, IRB review is required: obtain instructions from Sponsored Research or Web address on p 1.

Exemption Applicant: Send 2 copies of completed form, a brief project protocol (adequate to evaluate risks to subjects and to explain your responses to Parts A & B), instruments, and the consent form to ONE member in the most closely related department/discipline or to IRB office.

HUMAN SUBJECTS SCREENING COMMITTEE MEMBERS can assist & review:

COLLEGE OF ARTS AND SCIENCES:		MASS COMMUN/SOC WK/AG:	
Dr. Northup * (Psych)	388 4112	Dr. Nelson (Mass C)	388 6686
Dr. Williamson* (Psych)	388 1494	Dr. Archambeault(Soc Wk)	8 1374
Dr. Geiselman * (Psych)	763 2695	Dr. Kim (Soc Wk)	388 1109
Dr. Deseran (Socio)	388 1113	Dr. Rose (Soc Wk)	388 1015
Dr. Honeycutt (Speech)	388 6676	Dr. Biswas (Marketing)	388 8818

Dr. Dixit (Comm Sc./Dis) 388 3938 Dr. Keenan* (Hum Ecol) 388 1708
Dr. Belleau (Hum Ecol) 388 1535
ED/LIBRARIES/INFO SCI
Dr. Kleiner (Middleton)388 4016
Dr. Taylor (Admin&Fnd) 388 2193 Dr. Munro* (Curric & 1)388 2352
Dr. Saia (Lab Sch) 388 3221 Dr. Fuhrmann (Dean EDU)388 1258
Dr. Landin* (Kinesiol) 388 2036 Dr. Paskoff (Lib/Sci)388 1480
Dr. MacGregor (ELRC) 388 6900
(* = IRB member) irbexem.wpd (1/12/2000)
** IRB application materials available from IRB office, or from IRB web site (fill in forms with your word processor)

Appendix C Reasons for Faculty Non-response

1. No longer employed by specific university.
2. Non teaching faculty.
3. Retired faculty member.
4. Apprehensive about email surveys.
5. No reason given.

Vita

Jeffrey G. Sumrall was born in Hattiesburg, MS, July 21, 1970. His mother is Mary Sumrall Porter and he has one brother, Norris D. Sumrall. Jeffrey graduated from Blair High School in 1988. Jeffrey received a bachelor of science degree in computer engineering technology from the University of Southern Mississippi in 1993. In 1995, he graduated from the same university with an master's degree in computer engineering technology. Jeffrey is a candidate for the degree of Doctor of Philosophy from the School of Human Resource Education and Workforce Development with a concentration in Educational Technology from Louisiana State University with an anticipated graduation date in May 2002.

Jeffrey's work experience includes teaching, information systems management and technology consulting. He is involved with many civic and professional organizations including the Institute for Electrical and Electronics Engineers (IEEE), the Society of Manufacturing Engineers (SME), Order of Omega, Kappa Alpha Psi Fraternity Inc. and the National Society of Black Engineers (NSBE).