

12-20-2007

# University Faculty Expressions of Computer Self-Efficacy and Personal Attitudes Regarding the Viability of Distance Learning

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UNIVERSITY FACULTY EXPRESSIONS OF COMPUTER SELF-EFFICACY  
AND PERSONAL ATTITUDES REGARDING THE VIABILITY OF DISTANCE  
LEARNING

A Dissertation

Submitted to the Graduate School and Research

in Partial Fulfillment of the

Requirements for the Degree

Doctor of Education

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December 2007

Title: University Faculty Expressions of Computer Self-Efficacy and Personal Attitudes Regarding the Viability of Distance Learning

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Studies have shown that there is a direct link between a teacher's attitude towards self-efficacy and effectiveness. Further studies have refined this idea of how expressions of computer self-efficacy impacts upon attitudes regarding the use of technology in the classroom and by inference, the effectiveness of such technology. The purpose of this mixed method design study was to examine the impact that such attitudes can have upon faculty teaching at institutions of higher education as they relate to distance learning programs. This study examined 98 education faculty volunteer participants at five Pennsylvania State Systems of Higher Education Universities. Based upon responses to a survey, participants were assigned to one of three groups: low self-efficacy, high self-efficacy and high proficiency. The pool of participants was divided into two groups: have taught distance learning classes or have not taught

distance learning classes. Quantitative analysis in the form of *t-test* analysis of the have taught and have not taught groups was performed and found significant differences between the groups at  $p < .05$  regarding self-expressed attitudes of computer and technological self-efficacy. A one-way ANOVA analysis of variance was performed using the low efficacy, high efficacy and high proficiency groups and found significant differences between the groups at  $p < .05$  regarding acceptance attitudes of distance learning programs and attitudes towards the hiring of faculty who have matriculated from graduate level distance education programs. Follow-up interviews were conducted with 12 survey respondents who volunteered to participate. The interviews revealed varying levels of confidence and mistrust of distance learning programs. The vast majority of the interview respondents indicated a reluctance to consider distance learning graduates for faculty positions.

## ACKNOWLEDGEMENTS

I would like to take this opportunity to recognize several individuals who helped make this dissertation possible. First, I would like to thank my chair, George Bieger, whose encouragement and support kept me going. I would like to thank the members of my committee, Kelli Paquette, James Hooks and James Lenze for their support. Sometimes you told me things that were difficult to hear, but only served to help me stretch myself more fully. I further acknowledge the assistance of Taiwo Ande, the Evaluation and Research Support Specialist at Indiana State University, who provided both statistical support and feedback while I was compiling and analyzing my data. I would also like to take this opportunity to thank several individuals from my past who provided great encouragement to follow my dreams. I must offer my greatest appreciation to my mother, who is looking down from heaven. You always believed in me. I would also like to thank my father and sister. Although you did not understand the academic path that I set, were always there to offer encouragement, love and patience. Finally, I would be remiss in not recognizing several people from my first venture into graduate study:

Dr. Gloria Gerbracht who provided enormous emotional support through my first college course in 30 years, Dr. Alfred Riccomini who first recommended that I continue my studies and acquire my doctorate degree (I thought he had to be

joking at the time!), Dr. Donna Murphy who has been a friend and mentor these many years of study, and Dr. Frank Corbett whose unique style of charm, honesty and friendship have been a personal inspiration.

## TABLE OF CONTENTS

Chapter		Page
ONE	THE PROBLEM.....	1
	Statement of the Problem .....	3
	Statement of Purpose .....	4
	Research Questions .....	5
	Significance of the Study .....	8
	Definition of Terms .....	9
	Design of Study .....	11
	Research Limitations .....	14
TWO	REVIEW OF THE LITERATURE.....	17
	The History of Learning at a Distance ....	18
	Self-efficacy as a Theoretical Framework .	44
	Dimensions of Computer Self-efficacy .....	54
	Computer Self-efficacy in Education .....	55
THREE	PROCEDURES AND METHODOLOGY.....	68
	Characteristics of the Population .....	68
	Participant Selection .....	69
	Participant Target Number .....	69
	Ethical Issues .....	70
	Research Methodology .....	71
	Phase One - (Quantitative) Survey .....	71
	Phase Two - (Qualitative) Interviews ...	72
	Procedure .....	73
	Data Collection .....	74
	Potential Threats to Internal Validity ...	78
	Generalizability of Findings .....	79
	Analysis Method .....	80
	Procedures for the Validation of the Findings .....	82
FOUR	FINDINGS.....	83
	Overview of Procedures .....	83
	Descriptive Statistics .....	86
	Analysis .....	94
	Independent <i>t</i> -test Analysis .....	95
	One-way ANOVA Analysis .....	100
	Qualitative Data Analysis .....	119
	Summary of Findings .....	141

FIVE	CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS.....	147
	Overview of the Study .....	147
	Conclusions Based on Key Findings .....	152
	Research Question One .....	152
	Research Question Two .....	154
	Research Question Three .....	158
	Implications of the Findings .....	161
	Recommendations for Future Research .....	163
	Technology Trends in Education .....	165
	Distance Learning as an Instructional Tool .....	167
	Final Thought .....	170
	REFERENCES.....	172
	APPENDICIES.....	186
	Appendix A - Faculty Attitudes Toward Information Technology (FAIT) .....	187
	Appendix B - Permission to Adapt FAIT ...	193
	Appendix C - Adapted Survey Instrument ..	195
	Appendix D - Voluntary Consent Form .....	201
	Appendix E - Cover Letter to Dean of Education .....	203
	Appendix F - Cover Letter to Faculty ....	207
	Appendix G - Faculty Interview Questions .....	212

LIST OF TABLES

Table	Page
1 A List of Concerns Voiced by One DL Provider.....	35
2 The Reasons for Non-Completion of DL Program.....	39
3 Factors That Would Have Helped Completion.....	40
4 Descriptive Characteristics and Demographics Statistics of Sample.....	87
5 Descriptive Statistics- Technological Proficiency - Design a Webpage with Embedded Links.....	90
6 Descriptive Statistics- Technological Proficiency - Save PowerPoint Presentations as WebPages.....	90
7 Descriptive Statistics- Technological Proficiency - Create On-line Course Components for On-line Shells Such as WebCT®, BlackBoard®, e-College®, etc.....	91
8 Descriptive Statistics- Technological Proficiency - Create an email distribution list.....	91
9 Descriptive Statistics- Technological Proficiency - Create an Adobe PDF file.....	92
10 Descriptive Statistics- Proficiency Groupings.....	92
11 Descriptive Statistics- Technological Self-efficacy - I Use Computer Technology Regularly in my Classroom Instruction.....	93
12 Descriptive Statistics- Technological Self-efficacy - Computers in the Classroom Have Helped me Improve my Teaching.....	93

Table	Page
13 Descriptive Statistics- Technological Self-efficacy - I Feel Prepared to Instruct my Students on How to Successfully Implement Meaningful Technology Usage into Their Instructional Pedagogy.....	94
14 Descriptive Statistics- Self Efficacy Groupings.....	94
15 A <i>t-test</i> Comparison of Faculty Who Have Taught Distance Learning Courses With Those Who Have Not.....	95
16 Faculty Attitudes Towards Distance Education in Higher Education Based Upon Levels of Efficacy and Proficiency.....	101
17 One-way ANOVA - A Comparison of the Groups (HP, HE, LE) Regarding Faculty Attitudes Towards Distance Education in Higher Education.....	106
18 Post Hoc Analysis - Multiple Comparisons the Groups (HP, HE, LE) Regarding Faculty Attitudes Towards Distance Education in Higher Education.....	108
19 Descriptive Statistics - Faculty Attitudes Towards the Hiring of DL Graduates as Education Faculty Based Upon Levels of Efficacy and Proficiency.....	109
20 One-way ANOVA - A Comparison of the Groups (HP, HE, LE) Regarding Faculty Attitudes Towards the Hiring of DL Graduates as Education Faculty.....	116
21 Post Hoc Analysis - Multiple Comparisons of the Groups (HP, HE, LE) Regarding Faculty Attitudes Towards the Hiring of DL Graduates.....	118

## CHAPTER ONE

### THE PROBLEM

There is evidence of rapid growth in the utilization of web-based distance education in America's institutions of higher education. Research conducted by Allen and Seaman (2005) for the Sloan Consortium shows the following three advances:

1. "The overall percent of schools identifying on-line education as a critical long-term strategy grew from 49% in 2003 to 56% in 2005 (p.2).
2. The largest increases were seen at institutions offering associate degrees where 72% now agree that it is part of their institution's long-term strategy, up from 58% in 2003 (p.2).
3. The smallest schools, private nonprofit institutions and baccalaureate degree granting colleges remain the least likely to agree that on-line education is part of their long-term strategy (p.2).

According to Twigg (2001) research has historically focused upon two questions regarding non-traditional web-based education:

1. Are the two formats (the traditional classroom approach and the distance learning approach to teaching) equitable? Media Comparison Studies (MCS)

in Education such as No Significant Difference (NSD) indicate that the two different approaches are quantitatively equivalent, with some indication that distance learning may actually be superior to traditional classroom instruction (Russell, 1999). Shearer (2002) contends that, although much of the prevailing wisdom agrees with NSD findings, when comparing outcomes, the researches in these studies have historically concentrated on basic knowledge test performance rather than the assessment of higher level thinking skills.

2. What are attitudes and the causes for these attitudes of both students and instructors in regards to the distance learning model? In the beginning, a majority of the faculty members were found to be resistant to distance learning, often viewing it as nothing more than an upscale version of a correspondence course (Shearer, 2002). (Codeway, 1986, Brown, 2000, Gist & Mitchell, 1992) have discovered that as more universities have adopted the distance educational model, many university faculty now express a more positive attitude to distance learning.

Bandura (1982, 1986, 1997) developed a Social Learning Theory which states that teachers and educators tend to utilize techniques, pedagogy and tools with which they possess a comfortable level of self-efficacy. In terms of the expanding role of technology, it may only be logical to assume that some current faculty members become overwhelmed (Gist et al., 1992). The researchers also observed that today's university faculty must be not only experts in the content area for which they were hired, but also possess an ever expanding degree of technical expertise as well.

Feelings of inefficacy may translate into resistance to change and actually may impact upon the development and deployment of distance learning programs.

#### Statement of the Problem

Research has shown that the individual attitudes of faculty members in regards to technological self-efficacy and competence can have an effect upon their view regarding the effectiveness of distance learning programs (Gist et al., 1992). The main concern of my study is an analysis of how these attitudes impact upon faculty and administrative decisions regarding the hiring of distance education graduates as faculty in departments of higher education. With so many public and private universities offering graduate degrees via distance learning, an issue needing

further examination is the acceptance of these degrees by the higher education job market. At the same time, many in higher education are more accepting of distance education as a means of course delivery (Codeway, 1986, Brown, 2000, Gist et al., 1992), are these more tolerant attitudes being carried over into making pragmatic hiring decisions regarding faculty applicants? Research studies such as this can begin to examine the possibility that a dual nature exists in higher educators' attitudes towards distance learning. Attitudes vary greatly from opinions of course deliver effectiveness to the more pragmatic recognition of the hiring of graduates of such programs in one's own department.

#### Statement of Purpose

This study examines some of the possible influences that affect attitudes of technological self-efficacy, particularly those factors which cause faculty members to have varying levels of self-efficacy in regards to the utilization of technology. This study should be of interest to individuals who are considering teaching via distance education, current educators, school administrators, university education administrators and of particular interest to those considering the pursuit of an advanced degree in education via distance learning.

Hopefully, this study will identify some of the causes of faculty resistance to distance education. Once identified, universities can use these data to aid in the develop of plans of action such as increased professional development opportunities and possibly participate in the development of technological standards for those faculty asked to teach in this computer rich environment.

#### Research Questions

There has been an expansion of technology over the past 20 years that now permits college level courses and even full degrees to be offered at a distance via the Internet (Adams and DeFleur, 2006). A major selling point used to promote distance education programs is the promise of bringing education to individuals who would not otherwise be able to attend college.

Who are the college and university instructors who are more inclined to utilize this evolving technology? Surely, it may be assumed that one of the first requirements would be the ability to competently operate a computer. Other considerations may include a faculty members' level of self-efficacy and confidence in the pedagogical design and implementation of instruction at a distance. Clearly, technologically phobic faculty members may find themselves 'shut out' of this new modality and may, therefore, be

resistant to supporting its deployment or fully accepting its value as an educational alternative.

When considering on-line programs, even those institutions offering rigorous traditional programs, what is the perception of the academic job market (faculty members who often serve on departmental search committees) as to to the legitimacy of these on-line degrees? Are they given the same amount of weight as degrees granted from the more traditional classroom approach?

The questions that this study intends to address:

1. Are faculty members who possess higher levels of technological levels of self-efficacy and proficiency more likely to embrace distance education than those faculty members who possess lower levels of technological levels of self-efficacy and proficiency? The null hypothesis for this question would contend that faculty members who possess higher levels of technological levels of self-efficacy and proficiency would not significantly be more likely to embrace distance education than those faculty members who possess lower levels of technological levels of self-efficacy and proficiency.

2. Do faculty members who have taught courses on-line express a greater sense of self-efficacy in regard to the use of technology than do their traditional colleagues who teach only using traditional classroom based instruction? The null hypothesis for this question would contend that faculty members who have taught courses on-line would not express a significantly greater sense of self-efficacy in regard to the use of technology than do their traditional colleagues who teach only using traditional classroom based instruction.
3. Do members of the education faculty who possess higher levels of technological self-efficacy and proficiency significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues? The null hypothesis for this question would contend that members of the education faculty who possess higher levels of technological self-efficacy and proficiency would not significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues

## Significance of the Study

Glahn and Gen (2002) report that the characteristics of traditional college students are changing with many individuals delaying university goals until later in life. The traditional campus environment is not easily accessible to these individuals because of job, family and personal commitments. The authors further illustrate that at this time the cost of maintaining educational resources is also on the rise. Yet, the competitive need for producing trained individuals, particularly in the area of education, is expanding at an alarming rate. Many universities are turning to distance learning as a means to meet this need. This is in part due to the emphasis that the new global community is placing on highly trained individuals. As educational institutions rush to fill this expanding void, they must be cognizant of the faculty who are being asked to fill the roles as instructors. This study will identify factors which cause faculty members to have varying levels of self-efficacy when confronted with technology use. Feeling of inefficacy may translate into resistance to change and actually may impact upon the development and deployment of distance learning programs. This study will identify the causes of resistant attitudes which universities can use to develop plans of action including

increased professional development opportunities and the possible development of technological standards for those faculty asked to teach in this technologically rich environment. As this debate continues, will distance education graduates find acceptance of their degrees in the marketplace or will graduates of distance education programs be shut out of the higher education job market?

#### Definition of Terms

Correspondence Schools - First generation in the evolution of distance education; with the advent of postal delivery in the mid 1880s, interaction between learners and teachers at a distance was possible for the first time. In the United States, correspondence became known later as "independent study" and "home study" before becoming recognized as part of the expanding field of "distance education." Interaction by surface mail is still widely used, especially in less developed countries (Moore & Shattuck, 2001, p.1).

Distance Education (DE) - Teaching and learning in which learning normally occurs in a different place from teaching (Moore & Shattuck, 2001).

Distance Learning - Term often used as synonymous with distance education, not strictly correct since distance

education includes teaching, as well as learning (Moore & Shattuck, 2001).

On-line Classes - Classes delivered via Distance Education (Moore & Shattuck, 2001).

Self-Efficacy - refers to the perceptions about one's capabilities to organize and implement actions necessary to attain a designated performance skill for the specific tasks (Compeau, Higgins & Huff, 1999)... in the case of this study... performance skills in regards to the use of technology in the classroom.

High Self-Efficacy - having a positive attitude in regards to one's capabilities to organize and implement actions necessary to attain a designated performance skill for the specific tasks (Compeau et al., 1999).

Low Self-Efficacy - having a negative attitude in regards to one's capabilities to organize and implement actions necessary to attain a designated performance skill for the specific tasks (Compeau et al., 1999).

High Proficiency - Having a feeling of confidence at the implementation of higher level performance skills necessary for the performance of specific tasks (Compeau et al., 1999). In the case of this research, a high proficiency designation is given to those who express a mean confidence score in the use of software at either the

"I can do this alone" or the "I can teach others to do this."

Low Proficiency - Lacking a feeling of confidence at the implementation of higher level performance skills necessary for the performance specific tasks (Compeau et al., 1999). In the case of this research, a low proficiency designation is given to those who express a mean confidence score in the use of software at either the "I can do this with assistance" or the "I cannot do this"

Traditional Classroom - Teaching and learning in which learning normally occurs in the same place as teaching (Moore & Shattuck, 2001).

Alternative Learning Environment - Teaching and learning in which learning occurs in a different place as teaching (Moore et al., 2001). Examples include correspondence education, home schooling, web-based instruction, etc.

#### Design of the Study

This study follows a mixed format research design. The first part of the study consists of an on-line survey instrument that will quantifiably measure education faculty expressions of self-efficacy, attitudes towards distance education, and attitudes towards the hiring of individuals matriculating from distance education programs of study.

The Likert scale survey instrument was utilized was inspired from a survey instrument developed for a doctoral dissertation written by Elizabeth Lee Gilmore (1998) at the University of North Texas, Denton. The original instrument which measures university faculty attitudes towards technology consists of 68 questions, only the form and style of questioning was adapted to measure attitudes regarding distance education related technology. The adapted survey instrument was refined, evaluated, and validated through the administration of a series of PILOT studies.

The deans of education at five participating Pennsylvania State Systems of Higher Education Universities (PSSHE) were contacted for permission to administer the survey to members of their departmental faculty. At the time of approval, an email message was generated inviting university instructors to participate. The email message provided the participant with a choice of administration methodology by requesting that they completed either as an on-line survey or a paper and pencil survey which was mailed to them. After 45 days, 150 individuals failing to respond was randomly selected and provided to the researcher by StudentVoice® Inc. An invitation to participate was mailed to those identified individuals with

a copy of the paper survey enclosed in a stamped self addressed envelope.

Participant characteristic and demographic data was gathered as part of the survey, but names, email addresses, and phone numbers of individual participants were made available to the researcher only if the participant had indicated a willingness to participate in a follow-up interview conducted at a later date. On-line survey collection was administered by StudentVoice® Inc., a private agency that provides research support for member universities. The survey was comprised of 23 Likert scale questions plus 10 demographic questions. The questions were divided in the following categories:

- Faculty understanding of technology typically used in distance learning delivery. (5 questions)
- Faculty expressions of self-efficacy in regards to educational technology. (5 questions)
- Faculty attitudes towards the use of technology in education in general. (3 questions)
- Faculty attitudes regarding distance learning (particularly as a vehicle for the awarding of advanced degrees in education). (5 questions)

- Faculty attitudes towards the hiring of distance education graduates as members of education faculty at public universities. (5 questions)

Follow-up qualitative interviews was conducted with 12 of the respondents. Interview participants were categorized into High and Low self-efficacy and High and Low proficiency categories. The semi-structured interviews focused upon perceptions of education in relation to professors proficiency in educational technology, perceptions of the strengths and obstacles of distance learning programs, personal perceptions regarding the impact of technology on education and finally, the perceived efficacy in regards to hiring practices in higher education for graduates of distance learning programs.

#### Research Limitations

This research study addresses several factors including education faculty expression of self-efficacy in regards to the use of technology, education faculty attitudes towards distance education as a vehicle for graduate study, education faculty willingness to consider applicants for higher education positions in their respective departments who have matriculated from distance education graduate programs.

The research was limited by the level of faculty members' candid reporting of attitudes of personal self-efficacy in regards to their use of technology as an integral part of their classroom experiences, attitudes towards distance education programs and, finally, attitudes regarding the hiring of higher education personnel in their respective departments who have graduated from distance education graduate programs of study.

A summary of the possible limitations of this study include:

1. The method of distance learning under investigated was limited to web based instruction only, did not include hybrid instructional designs and excluded consideration of private for-profit universities when discussing distance programs.
2. The willingness of participants to take part, to respond honestly and accurately, and to complete the survey in a timely manner that allows all completed surveys to be considered in the study.
3. Personal follow-up interviews were conducted with 10% - 15% of the survey respondents. A potential limitation of the study involved the willingness of the faculty to participate and to respond honestly.

4. A final limitation of this study is tied to the fact that it was conducted utilizing only 5 member schools of the Pennsylvania's State System of Higher Education with a sample of 98 faculty members which may or may not be adequate for generalization.

The information provided in this chapter describes the problem of self-efficacy factors as they relate to education faculty's perceptions of the effectiveness in regards to distance education, particularity when considering employability issues for graduates from such programs as faculty members of departments of higher education. The information sets the stage for the research study of education faculty members' perceived self-efficacy and the impact those perceptions have upon the pragmatic effectiveness of distance learning in regards to obtaining higher education jobs. Chapter Two presents a review of the literature as it relates to this study.

## CHAPTER TWO

### A REVIEW OF LITERATURE

Throughout history, education has been directly linked to changes in the technology used to communicate. For each advance in communication technology there has also been paradigmatic shifts in education (Frick, 1991). Berg and Collins (1995) have contended that for effective education to take place, not only must the role of the communication teacher and the student be considered, but also the environment in which that communication occurs. Moore (1990) further contended that all forms of education, including distance education, have been based on the content of a dialog between teacher and student and the effectiveness of the communication system utilized in the educational process. Hoffman (1996) referred to this dialogue as the capacity for both teacher and student to respond to each other.

The first part of this literature review will trace historically the changes that have taken place in the various modes of educational communication, some of the underlying forces that have prompted these changes, and, in particular, the attitudes of the established educational system in response to these changes. A particular emphasis towards changes that have taken education outside of the

formal classroom environment, i.e. education at a distance or distance education will also be examined.

### The History of Learning at a Distance

Distance education has been around for quite some time. It has taken many forms, usually dependent on the technology available at the time (Frick, 1991). One of the earliest attempts at distance learning occurred in 1873 when Anna Ticknor created a society to encourage educational opportunities for women of all classes through the use of correspondence courses (Gerrity, 1976). Ticknor used the communication system of the time, the U.S. Postal system, where printed materials were mailed to students and thus provided them with the opportunity to study at home. This Boston-based, largely volunteer effort provided instruction to 10,000 members over a 24-year period despite its resolutely low profile (Ticknor, 1891).

In 1833, Cornell University in New York failed to establish a Correspondence University (Gerrity, 1976). That same year, however, the first recognized program of correspondence education was established by Chautauqua College of Liberal Arts which operated from 1833 to 1891. The State of New York gave permission to the university to award degrees to students who successfully completed work at summer institutes and by correspondence during the

academic year (Watkins, 1991). As interest began to grow in study by correspondence, debates and academic discussions began to examine the viability and effectiveness of correspondence (Watkins, 1991). Watkins further goes on to quote Alfred Vincent from 1885,

...the day is coming when the work done by correspondence will be greater in amount than that done in the classrooms of our academics and colleges; when the students who shall recite by correspondence will far outnumber those who make oral recitations (p.25).

The National University Extension Association (NUEA) was established in 1915 to examine the growing role of distance education. Issues that were considered included the need for new pedagogical models, the establishment of new national guidelines, university policies regarding the acceptance of credit from correspondence courses, credit transfer policies, and a standard of quality for correspondence educators (Nasseh, 2004).

A University of Chicago faculty survey findings in 1933, suggested that correspondence study should be justified on an experimental basis, generating innovations and research data leading to improvements in teaching

methodology (Gerrity, 1976). The research gathered in these studies greatly helped to expand the knowledge base in this field. The primary delivery system for correspondence courses at this time was the mail service, but that began to change as new technologies became available. Among these was the use of radio.

In the years between the World Wars (1918-1946), the federal government granted radio broadcasting licenses to 202 colleges, universities, and school boards (Watkins, 1991). Yet, with all the demands and popularity of instructional radio, by the year 1940 there was only one college-level credit course offered by radio and that course failed to attract student enrollment (Watkins, 1991). Even though this idea failed with radio, it did serve to be the model of educational television which emerged in the mid 20th century.

Despite this setback, support continued to develop for distance education around the country. Packing companies, railroads, the American Banking Association, Labor Unions, Army and Navy, and state and national welfare associations recognized the merits of correspondence instruction (Watkins, 1991). With the growth of popularity and needs for correspondence study, new questions started to arise. These questions examined qualities such as learners'

characteristics, students' needs and the effectiveness of distance learning. In an attempt to find answers to these questions there emerged needed research initiatives (Green, 2001).

Nasseh (2004) has noted that even as late as the 1950s, most academic scholars looked upon distance education with an air of suspicion and contempt. It was therefore considered to be critical that continued research help to support the apparent and perceived strengths of the methodology, and help establish a sense of professional acceptance.

In 1956, with a Ford Foundation grant, a project was initiated by researcher Gayle Childs to study the application of television instruction in combination with correspondence study (Green, 2001). From this important study, Childs concluded that television instruction was not a method but rather, an instrument by means of which instruction could be transmitted from one place to another (Childs, 1973). This study was one of the first attempts that examined the effectiveness of distance learning in an empirical manner with a particular emphasis to outcomes and instructional pedagogy (Green, 2001). Childs (1973) found no appreciable differences in regular classroom outcomes when compared with those receiving instruction by means of

television, or by a combination of correspondence study and television.

Green (2001) reported that during the 1960s and 1970s, a number of alternatives to traditional higher education began to be explored in the United States. Key factors included rapidly escalating costs of traditional residential education, a growing interest in informal and nontraditional education, and an increasingly mobile American population. An atmosphere of public dissatisfaction with educational institutions in general and the early success of Britain's Open University resulted in people exploring alternative educational options.

The first United States Open University was New York State's Empire State College (NYSES), which began operation in 1971 and strove to make access to higher education degrees more accessible to non-traditional learners (Gerrity, 1976). The program in NYSES created a new category of academic credits which was much more flexible in regards to degree requirements.

In the late 1970s and early 1980s, cable and satellite television came into use as a delivery medium for distance education courses (Watkins, 1991). During the 1980s, many quality broadcast course offerings were available by using cable and satellite delivery. In the fall of 1991,

eighteen institutions, including the University of California, the University of Oklahoma, Penn State, and Washington State, used the Mind Extension University (MEU), Educational Network to deliver video course materials for independent study courses (Green, 2001). Women's desire and participation in distance education helped the growth of distance education in the 1980s and 1990s. A report by the Instructional Telecommunication Consortium in 1984 which was based upon a survey of telecourse enrollments in five states showed 67% of the participants in the distance education were women (Green, 2001). The report further surmised the following

The participation of women in distance learning was directly related to political and social changes in women's position within the family and society, technological changes in the work place, and the economic necessity of participation, and the job market and new job opportunities (p.61).

Codeway (1986) observed that during the late 1970s and early 1980, there was little relevant research being done in regards to distance education primarily for the following reasons:

1. "Educational researchers were rarely present during the design of distance learning systems" (p.12).

2. "There was no clear paradigm for research in distance learning, and it is difficult to attract funds to develop one" (p.12).
3. "Some institutions were averse to defining boundaries and variables clearly" (p.12).
4. "Educational researchers often asked questions of no practical or even theoretical relevance" (p.12).
5. "Researchers in the distance learning tested variables that are really classes of variables (such as comparisons of distance and classroom learning)" (p.12).

Feasley (1991) predicted that advancement in telecommunications and computer technologies would speed up national and international cooperation in both research and documentation. With the increase in demand for distance education, the growing concerns were knowledge about effectiveness of distance education and changes in pedagogy enabled and required by the advancement of technology (Green, 2001).

In 1987, a cable network was established as collaboration between community colleges and universities, called Mind Extension University (MEU) was developed which used primarily cable television to offer college credit at a distance. MEU expanded to use the technology of the

Internet and offers degrees from Associates to PhD (Gorski, 1994).

The year 1989 marked the birth of the first on-line private university system with collaboration between Phoenix and Connect-Ed, which began offering on-line degrees at a distance. At first, the degrees were limited to MBA or business oriented degrees, but quickly expanded to include virtually all fields of study (Morabito, 1999).

The breakthrough in distance learning came in 1991, when Tim Berbers-Lee introduced a new form of communication called the World Wide Web (Gorski, 1994). This development overcame a substantial hurdle in distance education and opened the potential for varying methods of media and modes of presentation to be broadcast to all corners of the globe. Morabito (1999) observed that with the creation of the Internet, the use of television as the main instrument of distance learning slowly began to be replaced by the World Wide Web. The Internet provided tools available that were not as limiting as that of either mail or television.

In 1999, the U.S. department of Education established the Distance Learning Education Demonstration Program. This program was created as a pilot program for 15 post secondary schools and made access to federal aid available to distance learning programs (Morabito, 1999). A parallel

event which occurred in 1999 was the establishment of learning portals, programs such as HungryMinds™, Click2Learn™, eCollege™ and Blackboard™ began to offer universities the tools and the access to develop more interesting distance education components to their curricula (Won Kim, 2003). With the development of these Internet learning systems came an attempt to help standardize educational systems with the development of the Learning Content Management Systems (LCMS); packages that were created using a content management system(Downs, 2003). This system assisted the developer of course content locate and assemble learning objects into standards compliant learning packages or courses.

Downs (2003) explained that in using LCMS, a course designer may define the components of a course and set aside areas for topics and grades. The designer/instructor uses the LCMS to search a learning repository for related resources and reviews the material for inclusion in the course content.

Downs (2003) reported that some problems were identified in terms of utilizing the LCMS system: Proprietary standards often dictated that learning objects were developed in such a manner that only one kind of software could access them, thus restricting usage by other

systems. Downs (2003) further noted that in many cases, overly strict standards sometimes caused problems because the structure of the network was too limiting for widespread use. Additionally, many distance learning programs were bound to monolithic software bundles and therefore became cost restrictive. The researcher concluded that this restriction resulted in the production of a limited or closed marketplace where the users of learning content management systems would have limited content choices. Because of the proprietary nature of learning system software, Selective Semantics was identified as a problem where distance learning repositories acted as stand-alone services on the World Wide Web, with little or no integration with other resources and services (Wilson, 2004). The need of software integration became a very cumbersome aspect of proprietary software packages (Downs, 2003). The issue of digital rights management also contributed to the need to purchase expensive hardware in order to access items such as e-books and further hindered diffusion (Hall, Strangman & Meyer, 2005).

Another systematic problem illustrated by Downs (2003) was the lack of truly objective assessment and independent review to guide the user in selection of software packages.

He surmised that such a lack of quantitative guide toward program selection would often leave the purchaser at the mercy of the vendor.

With the establishment of "for profit" educational institutions, public institutions were beginning to feel the pressure of offering distance education in an attempt to compete with the profit world (Baer, 2000).

Allen and Seaman (2005), working for the Sloan Consortium, set out to answer some fundamental questions regarding the state of distance learning programs in the United States. What was reported by the Sloan Consortium in regards to their findings was that "almost two-thirds of all schools offering face-to-face courses also offered on-line courses" (p.20). With the continued growth of graduate school programs in the united states, "more than 40% of schools offering Master's degree programs also offered these programs on-line" (p.20). The researchers found that business programs seem to have the highest concentration of distance learning with 43% of schools that offer these as a face-to-face programs also offering at least one on-line business program" (p.20). When looking at post-secondary programs, "an overall growth rate of 18.2% for on-line enrollments was reported between fall 2003 and fall 2004" (p.20). This growth rate was reported

to be "over ten times the rate projected by the National Center for Education Statistics for the entire postsecondary student population" (p.20). The only exceptions to these statistics included private, nonprofit institutions and schools with fewer than 1,500 students or schools which were entirely Baccalaureate institutions.

Allen and Seaman (2005) also looked at attitudes and beliefs of academic leaders in schools across the United States. At the same time they found that most were neutral in the opinion that teaching on-line was more time intensive for faculty, one-third stated that they believed this to be true. On the other hand, a majority of these leaders believed that "the effort and discipline required of students to successfully complete an on-line course is greater than in face-to-face courses" (p.20)". When considering the assessment of the quality of on-line courses, the majority of schools believed that this process was "no more difficult than the evaluation of face-to-face courses" (p.20).

What Allen and Seaman (2006) found of faculty members was not as positive. Even though there has been a substantial increase in the number of on-line courses and programs available, "there continues to be only a small minority of academic leaders that agreed that their faculty

accept the value and legitimacy of on-line education”  
(Allen & Seaman, 2005, p.20).

One of the key discussions during the 1980s has been the significant differences that may exist between distance delivery modes as compared to the more traditional face to face classroom environment. During the 1980's much research has indicated that there is no significant difference (NSD) in regards to student outcomes (Russell, 1999). Shearer (2002) however, suggested that no significant difference may be a misnomer because many times the assessment method is directly tied to the instructional methodology. He further has noted that while testing outcomes may be the same for each group under study, the question has not been adequately answered as to the importance of personal interaction and social presence and its relationship to the entire process of learning. Other criticisms of NSD studies stem from the lack of control of all the variables involved, including the choice of randomly selected subjects, plus there are ongoing questions about the validity and reliability of the instruments used (Phipps & Merisotis, 1999; Joy & Garcia, 2000; Lockee, Moore & Burton, 2001). Brown (2000) contends that, as a population, individuals enrolling in distance

education programs may be more self motivated individuals who would do well in any educational setting.

Juwan (2003) noted that as distance education expands in its appeal, there are many roadblocks to consider that affect accessibility and functionality of such learning experiences for both the student and the instructor. Factors such as accessibility, economic and even social class have a profound effect on this model of education. The ease of technological access is considered to be a critical factor in the success or failure of distance educational efforts, at the same time it is important to understand the varying obstacles that can have such an impact. As technology continues to expand, Juwan reiterates the important of remembering the technological requirements needed for access; requirements that could open doors for the privileged and close doors for others.

Continued research must reach into the theoretical methodology of instruction and how it transfers to the student. The complexities of this process cannot avoid impact on the study of educational dynamics in both the traditional classroom and the further impact and implications to the distance learning classroom (Juwan, 2003).

Saba (2000) observed that in recent years, scientists have been developing new tools such as discourse analysis and in-depth interviewing of the learners. The idea of student interaction has been moving to the forefront. The initial studies reveal that differences in the distance educational classroom are more complex and involve elements such as social, economic and global issues that affect the field. Researchers are beginning to explore the interrelation dynamics that occur in the learning process.

Shearer (2002) further points out that the rush to incorporate new technologies into education may pose a risk, because there may be a tendency to abandon widely accepted technologies and pedagogy. Following upon this idea, Littman (2002) found that as students have increasingly become perceived more as customers; the quality of education may be at risk. Littman proceeded to examine various distance providers including private organizations such as the University of Phoenix on-line.

One particular issue that Littman (2002) reported involved the issue of instructor preparation. While an instructor may be an expert in their particular content area, they also need to be expert in the pedagogy of teaching at a distance. Other more logistic and pragmatic issues were also examined. For example, to be an on-line

instructor, it has always been assumed that the instructor has access to Internet connectivity; however, few schools examined covered the charges for such off campus access. Also Littman found that while preparation for Internet instruction is much more time intensive, few programs were willing to pay for prep time for their instructors. Although the education of instructors was considered as critical, so too was the instruction of administrators and policy makers.

Other concerns voiced in a 2000 report given to The American Federation of Teachers (AFT) by the Higher Education Program and Policy Council (2000) concluded that faculty at universities must retain academic control of courses being offered. Decisions, including the decision to award credit, should continue to be made at the departmental level. Faculty must also maintain intellectual property rights regarding all course material developed for use in their on-line courses.

The ATF report also suggested that that faculty considering teaching on-line course need to be not only trained and supported, but must also be prepared to meet the various special requirements involved in teaching at a distance. They must understand that preparing and teaching of on-line courses can be much more time intensive than

traditional classes. "Some estimates are 66% to over 100% longer" Higher Education Program and Policy Council (2000, p.7). Other Report findings included:

- Faculty must be aware of both the strengths and weaknesses of the medium of web-based instruction. "Instructors must not just replicate the traditional classroom, but must rather take full advantage of the tools available to present information in a new and effective manner, using the full medium provided" (p.8).
- Students studying at a distance should be given access to research materials and should have access college librarians trained to provide bibliographic instruction for digital resources.
- "Student assessments should be comparable to face to face courses" (p.9). While the method of administration may necessarily differ, the outcomes of the assessment process should be equivalent.
- Evaluation of distance coursework should be undertaken at all levels. "The process of establishing regulations and guidelines for the evaluation of distance education programs should become a priority concern of the federal government" (p.13).

Both Brown (2000) and Willis and Dickinson (1997) have cited significant outcomes of a Ball State study where it was determined that teachers needed better preparation, time and effort in course delivery on-line, the offering of shorter classes, making course related graphics simple and easier to read, fostering collegiality by asking students to share personal information, avoiding the presentation of superfluous media, and making use of a combination of asynchronous and synchronous instruction to introduce new material, make assignments and improve retention.

Table 1

*A List of Concerns Voiced by One DL Provider*

Concern	Description
1	Registration procedures/Financial Aid Forms
2	Student Isolation
3	Lack of "in-home/community" resources
4	Written mail requests are cumbersome and time intensive
5	Emails or Phone calls for help are very time intensive
6	Media compatibility issues
7	Technical issues with computers
8	Timelines for mail responses

Table 1 (continued)

Concern	Description
9	Limited Feedback
10	Bookstore issues
11	Incorrect materials provided
12	Start date issues when compared to face to face classes
13	Lab hours for distance students difficult to schedule
14	Procrastination

In an internal audit of distance courses, Table 1 Rendon (2001) refers to some of the concerns voiced by one college. The author contended that distance provided limitations in the realm of student to teacher and teacher to student communication. Email feedback can provide rapid response time; electronic communication often resorted to the quick answer which may not have been sufficient to adequately address the problem. In addition, the author illustrated that such communication has proven to be a very time intensive when dealing with a large class size. In a face to face class, such concerns are often addressed in a few moments of discussion, yet the same problem in a distance education class becomes a very time consuming process.

Outside of the use of electronic communication, limitations and delays encountered with the standard mail system have also been troublesome. Due to these time constraints, faculty have felt that there is often a delay in proper feedback to students. The final concern voiced by Rendon is the matter of procrastination. On-line student often work at their own pace and for those students who lack personal motivation, the illusion of limitless time to complete tasks can often cause the student to delay assignments to the last moment.

During the 1970s, 80s and 90s a great deal of research was conducted into various aspects of Distance Education. An examination of some of the land mark studies have provided greater insightful events shaping the current distance education attitudes.

Carey, Chrisholm and Irwin, (2000) conducted a study which focused on the primary concern regarding potential differences in outcomes between students taking courses at a distance as compared to those taking more traditional classes. In this study two groups of undergraduate business students were enrolled in a course offered at a small urban, upper-division university. One group of students took the class in the traditional classroom setting while others completed class requirements via the

Internet at a distance. Students in both groups demonstrated a grasp of technical jargon associated with information systems. Class requirements included the use of the Internet, CD-ROM, database, Microsoft Office products, the creation of a web page and a student generated individual application.

(Carey et al., 2000) findings concluded that there were no significant differences between the gain score between both groups. In addition, there was no significant difference found in the final grade scores between both groups. Finally, it was found that there was no significant difference between the satisfaction measures of both groups. While outcomes were examined, another dimension of the distance learning process involved the examination of student attitudes.

Canning (2002) conducted an extensive qualitative study to examine student attitudes regarding work based, vocational distance education. In this study, the students were employees and were given the opportunity to receive promotional awards for the completion of training offered on-line. The primary aims of the research were to:

1. Evaluate the efficiency and effectiveness of new technological approaches to distance work-based vocational education programs.

2. Evaluate the quality and extent of learning achieved by those participating in such programs.
3. Recommend how new technology in distance education can be integrated into future work-based learning programs.

Each of 14 students (10 women and 4 men) enrolled in the program was interviewed separately using a semi-structured questionnaire. Some candidates were interviewed one month after the start of the course, while others were interviewed three months into the program. The content of the analysis was grouped into four headings:

Of the 14 students, 4 fully completed the course, 2 completed units towards completion and 8 withdrew from the course. Table 2 and 3 provide some of the findings of this study (P.53).

Table 2

*The Reasons for Non-Completion of DL Program*

Reason Given	Percent
Pressure of work	25%
Lack of support and guidance from tutor	22%
Found program too time consuming	12%
Found technology difficult to use	12%

Table 2 (continued)

Reason Given	Percent
Failed to progress on program	9%
Change of employment	6%
Lack of support from employer	3%
Found the program boring	3%
Found the program a paper chase	3%

Table 3

*Factors That Would Have Helped Completion*

Factor Given	Percent
More extensive help from tutor	35%
More training in technology	15%
More support from employer	10%
Greater emphasis on development	10%
More knowledge input	10%
Better technical advice	10%
Less emphasis on assessment	5%
Less paperwork	5%

Rosenfeld (2005) conducted a quantitative study which made a comparison of the outcomes of distance learning students versus traditional classroom students in a

community college. The population was comprised of students enrolled at Indian River Community College in the following courses at a community college during the academic years 2001-2003: English Composition 1, Math for Liberal Arts, and American History. The classes were taught by the same instructor regardless of the mode of instructional delivery. The data collected consisted of the final course grades as a measure of student achievement and course completion rates as related to subject matter, age, race, gender, and previous college experience. The key findings are as follows:

In regards to achievement rates (final grades): The main effect of treatment did not have a significant effect upon achievement, however, in a two-way ANOVA it was found that the interaction between method of deliver and subject matter was found to be significant at  $p < .01$ . A comparison of final grades as represented by a 4 point scale in relation to delivery method was found to be significant a  $p < .05$  in the subject areas of English Composition and American History, but not significant in the subject area of Math.

The main effect of age was found to be significant in terms of achievement rates at  $p < .01$ . In a two-way ANOVA, it was found that the interaction between treatment and age

to be insignificant. It is noted that the age of significant difference in both modes of deliver occurred in the older student group (31 +).

The main effect of race was found to be significant in terms of achievement rates at  $p < .01$ . In a two-way ANOVA, it was found that the interaction between treatment and race to be insignificant. It is noted that the race of significant difference in both modes of delivery occurred in the white sample. On the other hand, the main effect of gender was found to be significant in terms of achievement rates at  $p < .05$ . In a two-way ANOVA, it was found that the interaction between treatment and gender to be insignificant.

The main effect of treatment did not have a significant effect upon achievement, however, it was found that past college experience was found to be significant at  $p < .05$ . In a two-way ANOVA it was found that the interaction between method of delivery and college experience was found to be significant at  $p < .01$ . In a post hoc analysis, it was found that the extensive college experience group had a significantly higher grade point average than members of the minimal college experience group at  $p < .01$ .

In terms of completion rates, it was found that subject matter, treatment and the interaction between subject matter and treatment on the two-way ANOVA were all found to be significant at  $p < .05$ . Completion rates by subject matter found that only American History offered via distance learning was found to be significant at  $p < .01$ . Finally, in terms of completion rates, there was no significant difference found in age, treatment or the interaction between treatment and age on the two-way ANOVA test.

In terms of completion rates, race was found to be significant at  $p < .01$ . No significant difference was found in regards to the interaction between treatment and race. Again, in terms of completion rates, there was no significant difference found in gender, treatment or the interaction between treatment and gender on the two-way ANOVA test.

In terms of completion rates, college experience was found to be significant at  $p < .05$ . No significant difference was found in regards to the interaction between treatment and college experience. A post hoc analysis found that both the extensive and medium college experience groups had a significantly higher completion rate at  $p < .01$ .

## Self-efficacy as a Theoretical Framework

Bandura (1991) defined self-efficacy as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (p.74). He further explained that self-efficacy beliefs determine "how people feel, think, motivate themselves and behave. Such beliefs produce these diverse effects through four major processes. They included cognitive, motivational, affective and selection processes" (p.74).

The third part of this literature review focuses upon the matter of self-efficacy, in particular, how efficacy issues impact the adoption and use of technology in education. This section sets the theoretical framework of this study.

Social Cognitive Theory, originally developed by Bandura (1982, 1986, 1989) in the 1970s, explains behavioral changes from dynamic interactions between personal, behavioral, and situational factors. Social Cognitive Theory maintains that personal cognitive factors, environmental factors, and behaviors are reciprocally determined. Individuals choose their environments but also are influenced by the environments in which they operate. Similarly, individuals' behaviors are affected by

environmental factors, which are, in turn, influenced by their behaviors. Finally, Bandura contended that, cognitive and personal factors are influenced by behavior, and, in turn, affect that same behavior.

A central feature of Social Cognitive Theory is self-efficacy. Self-efficacy was defined by Wood and Bandura (1989, p.408) as "Beliefs in one's capabilities to mobilize the motivation, cognitive resources and courses of action needed to meet given situational demands." This definition suggests that self-efficacy involves "a comprehensive summary or judgment of an individual's perceived capability to perform a specific task" (Gist et al., 1992, p.184). Self-efficacy is not concerned with component skills but generative capabilities. In other words, self-efficacy is a comprehensive assessment based on dynamic and reciprocal interactions between the individual, the environment, and the behavior. Individuals form their judgments about their "generative capabilities" based on information from a variety of personal, social, and situational sources.

Bandura (1986, 1989) distinguished two sets of expectations which influence the relationships that exist between the individual, their behaviors, and the eventual outcomes of those behaviors. The first of these sets is referred to as outcome expectations. He defined outcome

expectations as judgments about the likelihood that a particular behavior will produce either a desirable or undesirable consequence. Bandura (1986) explained that self-efficacy refers to what an individual may believe that they can accomplish using the skills that they possess rather than just possessing the skills themselves. In other words, self-efficacy beliefs are considered with the relationships that exist between the individual and their behaviors while outcome expectations refer to the association between behavior and outcome. According to Wood and Bandura (1989), the probability that individuals will undertake certain behaviors will be greater when they believe that those behaviors will result in valued outcomes. Kinzie, Delcourt, and Powers (1994) illustrate that in many cases educational technology is often viewed by educators as simply another task to be learned performed without any firm assurances that the time devoted to learn these tasks will yield an equitable increase in student outcome. Lee (2001) points out that "faculty motivation and commitment toward distance teaching as strong in general, however, faculty motivation and commitment has been found to be higher in the institutions with well-provided instructional support" (p.1).

Bandura's (1986) Social Cognitive Theory has recently been applied to a variety of information technology contexts such as computer skill training (e.g., Compeau et al., 1999; Gist et al., 1992; Yi & Davis, 2003), teleworking (Staples, Hulland, & Higgins, 1999) and computer usage (e.g., Igarria & Iivari, 1995). Venkatesh and Davis (1996) investigated the relationship between computer self-efficacy and individuals' reactions to new technologies, usage (e.g., Compeau et al., 1999), and system performance (Kelly, 2001).

The theoretical importance of computer self-efficacy and outcome expectations have been illustrated by several streams of research including the social cognitive model (SCM) (Compeau et al., 1999); the Technology Acceptance Model (TAM) (Davis, Bagozzi, & Warshaw, 1992); and the Theory of Planned Behavior (TPB) model (Taylor & Todd, 1995).

Compeau et al. (1999) applied Bandura's Social Cognitive Theory to the study of technology acceptance and introduced two cognitive predictors of an individual's reaction to computer technologies, computer self-efficacy, and outcome expectations. Consistent with Bandura's definition, computer self-efficacy is defined as an individual's beliefs about his or her capabilities to use

computers (Compeau et al., 1999, p.147). Compeau et al. (1999) further defined outcome expectations as the perceived potential consequences arising from the use of computers which includes two additional considerations including personal outcome expectations and performance outcome expectations.

Compeau et al. (1999) hypothesized three relationships from the Social Cognitive Models of technology acceptance. First, that computer self-efficacy can have a positive effect upon outcome expectations. The individuals with higher confidence levels about their computer skills tend to anticipate positive consequences from the use of computers. Secondly, computer self-efficacy influences individuals' affect (liking or disliking) and anxiety towards their use of computers. Finally, computer self-efficacy is a determining factor in ones use of computer technology. These hypothesized relationships between self-efficacy and outcome expectations, between computer self-efficacy and anxiety as they relate to computer use were supported through a longitudinal survey study (Compeau et al., 1999). This study indicated that there existed a strong relationship ( $r = .43$ ) between computer self-efficacy and self-reported computer use.

The theoretical importance of computer self-efficacy and the efficacy-outcome expectancy distinction is also supported by the Technology Acceptance Model developed by Davis (1986). Derived from the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) and applied to the context of computer technology (CT), the Technology Acceptance Model introduced two factors related to a user's behavioral intention of using new computer based technology: a person's perception of the ease of usage and their perceived usefulness as a factor of the effort put forth. Perceived ease of use has a similar, if not more pragmatic, definition of computer self-efficacy and is defined as "the degree to which the users expect using a target system to be free of effort" (Davis et al., 1989, p.985). However, perceived usefulness, closely corresponds to the concept of outcome expectations in social cognitive theory, and refers to a user's belief that using the target system will increase his or her job performance within an organizational context (Davis et al., 1989, p.985).

According to Davis et al. (1989), three propositions can be extracted from the Technology Acceptance Model (TAM): (1) An individual's actual intention to use technology is determined by that individual's attitude towards technology; (2) attitudes towards using technology

is jointly determined by the perception of usefulness and ease of use; and (3) the effects of various other factors (primarily system features, one's behavioral intention are fully dominated by the combination of the perceived ease of use and subsequent usefulness. While TAM is single minded and IT specific (Mathieson, Peacock, & Chin, 2001), it has been tested widely across diver technology application and user populations and has consistently yielded empirical support (e.g., Davis et al., 1989; Adams, Neilson, & Todd, 1992). Empirical tests of competing models conclude that TAM consistently outperforms other models (Mathieson, 1991; Taylor & Todd, 1995). Venkatesh and Davis, (1996) acknowledged that due to its simplicity, TAM offers little insight into how to improve technology acceptance. Agarwal and Prasad (1999) expanded TAM to consider how individual difference (role in regard to technology usage, work tenure, education, prior experience, training participation) influence technology use via perceived ease of use and usefulness benefits. This expanded version of TAM helped to provide a richer understanding of the end-user technology adoption process.

A study by Mathieson, Peacock and Chin (2001) began to address identified limitations of both the original and expanded Technology Acceptance Models. Drawing upon the

Theory of Planned Behavior (TPB) (Ajzen, 1991) and perceived behavioral control (attitudes based upon the influence of others in the environment i.e. peer pressure or coercion), Mathieson et al. (2001) propose a third factor: perceived resources defined the extent to which a person believes that he or she has the personal and organizational resources needed to be successful using technology. The perceived resources concept emphasizes the individuals' perceptions regarding the resources associated with their use of computer technologies. This viewpoint expands on the basic TAM focus on technology or perceived individual capabilities such as self-efficacy alone as defined in the Social Cognitive Theory model. This further extension of the model acknowledges the importance of an organization context by incorporating perceived resources as an additional key consideration in TAM (Mathieson et al., 2001).

Social Cognitive Theory (Compeau et al., 1999) considered the environment as a key factor that links cognition with behavior, the social cognitive model as applied to technology by some researches primarily focuses on the individual and their cognitions and thus largely ignore the environment (Taylor and Todd, 1995). The Technology Acceptance Model (TAM) was derived from the

Theory of Reasoned Action (TRA). It focused on a set of beliefs about the systemic features of technology and the individuals attitudes towards the use of the target technology. TRA however ignores other contextual factors that both Social Cognitive Theory and the Theory of Planned Behavior indicate also influence ones decision to adopt new information technologies (Ajzen, 1991).

The role of environment has been addressed by other researchers drawing upon the Theory of Planned Behavior, which introduced the concept of perceived behavioral control (Taylor & Todd, 1995; Mathieson, 1991; Mathieson et al., 2001). The inclusion of one's perception of (control over) the environment is the key addition to the Theory of Reasoned Action and the predecessor of the planned behavior model (Ajzen, 1991) which states that an individual's intention to use technology is co-determined by attitude, subjective norms, and perceived behavioral control.

Perceived behavioral control has been defined as a person's judgment of the ease or difficulty of performing a designated behavior (Ajzen, 1991, p.183) and is closely related to Bandura's concept of self-efficacy. Indeed, Ajzen (1991, p.184) refered to Bandura's concept when discussing the definition of perceived behavioral control as "most compatible with Bandura's concept of perceived

self-efficacy". Perceived behavioral control reflects both internal and external factors that either facilitate or impeded the use of information technology (Taylor & Todd, 1995). Taylor further explained that the internal component of perceive behavioral control consists of computer self-efficacy or the internal perception of being able to use the technology. The external aspect encompasses perceptions of resources and technology facilitation conditions which take into consideration the environmental context in which the individual is situated.

The integration of Social Cognitive Theory for the field of psychology with models of technology acceptance from the information science domain has suggested several key aspects regarding computer self-efficacy as a construct. First, the literature as presented shows that computer self-efficacy as a significant predictor of information technology use behaviors, possibly including the users perceptions as to the effectiveness and efficacy of that technology. Second, there are conceptual similarities between computer self-efficacy, perceived ease of use, and perceived behavioral control. A synthesis of the related constructs provides a broader view of computer self-efficacy that incorporates individual perceptions of competence with perceptions of a target information

technology and environmental contextual factors, such as found in web-based distance education. Third, other Technology Acceptance Models (e.g., the Theory of Planned Behavior model) emphasize the importance of perceptions of task and environmental contexts in influencing behavioral intention and action.

#### Dimensions of Computer Self-efficacy

Drawing upon the research of Bandura (1991), Gist et al. (1992) reported a need of a multi-dimensional approach to computer self-efficacy. They proposed to expand the definition to include individual, task, and situational components. Gist et al. (1992, p.210) further divided these components into four dimensions:

1. Preparatory efficacy - an individual's judgment of how well they can utilize established skills and knowledge to manage using a new technology to perform a particular task.
2. Performance efficacy - An individual's judgment of how much effort is required to execute a target course of action during the development and learning stages.
3. Resource efficacy - An individual's judgment of the extent to which they are dependent on situational support or external resources to execute a target course of action.

4. Generative efficacy - An individual's judgment about how well they can draw upon similar past experiences, common skills, and shared competence across domains and activities to execute a target course of action.

Building upon the ideas presented by Gist et al.

(1992), Edin (2001) attempted to make a distinction between internal efficacy and external efficacy. He has re-termed external efficacy as "means efficacy", which was defined as an "individual's belief in the utility of the means available for performing the job" (p.14). Edin (2001) considered means efficacy and internal efficacy as being two distance dimensions of efficacy. He indicated that individuals could have a high means efficacy, but lack in confidence regarding their own capabilities.

#### Computer Self-Efficacy in Education

When considering the field of education, a teachers' belief that they possess the ability and power to influence student learning and achievement for students is commonly referred to as teacher self-efficacy (Bandura, 1997; Guskey, 1987). When applied to educational technology, this premise may hold true if technology is one of the methods by which the teacher communicates the lesson to the student. Borrowing from Bandura's definition, it may be implied that if teachers perceives themselves to be

ineffective or even threatened by the use of educational technology, or any other tool for that matter, then their attitudes regarding effectiveness may be negative. Teacher efficacy positively impacts the following: achievement of an instructional goal; the willingness of the teacher to make necessary adjustments during the course of the lesson; student achievement; and, continued use of instructional tools and methods (in this case technology) (Smylie, 1990).

Research has shown that there is evidence which supports the role of self-efficacy as an effective predictor of technological trends, attitudes and eventual usage (Oliver & Shapiro, 1993). Bandura's theory of self-efficacy has been shown to provide the basis for the understanding of an individual's decision to accept or reject technology (Oliver & Shapiro, 1993). Faseyitan, Libii, and Hirschbuhl (1996) indicated in their study of computer self-efficacy among faculty, individuals who do not perceive themselves as efficient and confident users of computers will resist the use of this technology even when the hardware and software are provided. In addition, faculty who do not use computers in their classrooms have significantly lower computer self-efficacy scores than those who make regular use of computers (p.215). Marcinkiewicz (1994) in a study of factors influencing

computer use in the classroom reported that the selection of self-competence as an aspect of motivation contributes to one's pursuit or avoidance of computer usage.

Marcinkiewicz added that, the variable of self-competence, which is related to self-efficacy, was a significant predictor of behavior related to the use of computer. It was also noted that the shared element of self-efficacy and self-competence is the individual's expectation of competence in controlling personal behavior (p.232).

Technology has placed a great deal of stress on educational process in both our public schools and universities. According to Glahn (2002), there are two components to this rapid evolution: Product Innovation - The development and execution of new technologies and tools for the educational community; and Process Innovation - The refinement and application of those tools in an effective and efficient manner. Glahn (2002) further contended that the growth rates of these two powerful factors are not synchronous. In fact, product innovation is on a much faster track than process innovation. Once a new "toy" appears on the market, there is a rush to purchase it, even though full thought has never been given as to "how" to use it.

Littman (2002) provided greater insight into the nature of the dilemma that colleges and universities face in the implementation of distance learning programs. As students are perceived more as customers, there is a danger in the quality of education that is provided. In this article, Littman investigated at various distance providers including for-profit organizations such as the University of Phoenix on-line.

Littman (2002) continued to highlight the fact that while an instructor may be an expert in their particular field, they are not experts when it comes to teaching at a distance. In particular, this study looked at the actions taken by Mark Zupan, dean of Eller College of Business and Public Administration at the University of Arizona in an effort improve the college's graduate business programs. Littman also examines the benefits of on-line programs when executed by trained instructors. Other factors examined in this article tend to be more logistic and pragmatic in nature. For example, to be an on-line instructor, it was assumed that you have Internet connectivity; however, few schools cover the charges for the instructors' net access. Also, preparation for Internet instruction was reported as being much more time intensive, yet few programs saw paid prep time for their

instructors. The education of instructors was critical, but so too is the instruction of the administrators and policy makers at the university.

Littman (2002) has suggested that experimentation with a broad variety of subjects should be encouraged, including a viable assessment component. Institutions should not continue to offer classes that have been unsuccessful, at least not until the problems have been identified and overcome. The evaluation of distance coursework should be undertaken at all levels. Littman (2002) has concurred with Willis and Dickinson (1997) in stating that the process of evaluation of distance education programs should become a priority concern of the federal government.

In a Ball State University study, Brown (2002) examined two types of virtual classrooms: asynchronous and synchronous. Brown defined asynchronous classrooms not being in real time while still providing the opportunity for students to participate in activities and discussions at a time of their own choosing. Synchronous classrooms provided the opportunity for students to interact in real time in venues such as chats. Brown contended that those skills that require personal interaction often suffer since the Internet is not always conducive to this form of

learning interaction. In the end, Brown concluded that web-based courses tend to be no more effective than self paced learning. It was further concluded that it is contingent upon the instructor to facilitate learning, not in a fact based assessment, but rather in a more generalized application based methodology when considering program design.

Brown (2002) reported the economic and time management appeal for distance programs, but also warned that the on-line study approach is best suited to students with focused study skills. He further characterized the typical distance learner as between the age of 25 and 50 who are taking courses to learn new skills or to update old skills and who are experienced in participating in the educational process.

One of the significant outcomes of the Ball State study noted by Brown was that teachers need better preparation, time, and effort in course delivery on-line. The section on tips included the following recommendations: Offer shorter classes; make course related graphics simple and easier to read; foster collegiality by asking students to contribute personal information; avoid the presentation of superfluous media; and make use of a combination of asynchronous and synchronous instruction to introduce new

material, create assignments and improve retention (Brown, 2002, p.47).

Saba (2000) drew attention to the idea of student interaction as a concept that is moving to the forefront. Researchers are beginning to explore social interrelation dynamics which may occur in the learning process.

As distance education expands in its appeal, there are many roadblocks to consider that affect accessibility and functionality of such learning experiences for both the student and the instructor. Factors such as accessibility, economic and even social class have a profound effect on this model of education (Valentine, 2002). Ease of access has been shown to be a critical factor in the success or failure of distance educational efforts therefore it is important to understand the varying obstacles that may have such an impact. Valentine further concluded that as technology continues to expand, it is important to remember the technological requirement needed for access; requirements that could open doors for the privileged and close doors for others.

"The real depth of research must reach into the theoretical methodology of instruction and how it transfers to the student" (Juwana, 2003, p.5). Juwana (2003) contended that the complexities of this process cannot avoid impact

on the study of educational dynamics in both the traditional classroom and the further impact and implications to the distance learning classroom. The author stated that when comparing traditional vs. distance education; it becomes abundantly clear that the differences are greater than just classroom presentation or teaching strategies. Juwan (2003) concluded that there are considerable factors to consider which impact not only the student, but the instructor and institution as well and that everyone needs to be aware of these differences enabling them to offer the highest level of educational services to students of all economic and social classes, and learning styles. Consideration as to instructor preparedness and institutional preparedness is critical for the success of any distance education program. Distance education offers a unique challenge in the area of assessment.

Montell (2003) stated that the academic profession is not ready to embrace distance education as being equal when confronted with hiring faculty and staff at the university level. Some revealing comments from the article included the following:

"I don't really like them," says one business professor at a private college in the South. (He

asked for anonymity in case he ever has to hire one because applicants are scarce in his field.)

"I sense that these schools try to make it easy for you to get a Ph.D., and therefore, they must not be all that good." (Montell, 2003, p.3)

"Our department perceives these degrees as substandard," says a psychology-department chairman at a state university in the West. "In fact, it is not unusual for graduate students who are still in graduate programs at traditional universities to receive higher rankings than applicants who have already completed nontraditional degrees" (Montell, 2003, p.3).

"The dirty little secret is most professors went to graduate school for 8 to 10 years, and now all their friends have nice houses and cars, and they have debt and a not-very-good-paying job," says Mr. Fant. "If they were willing to sacrifice to get a Ph.D., then you ought to be willing to do whatever it takes to get one. I think, to many professors, it comes down to paying your dues" (Montell, 2003, p.3).

Carnevale (2007) conducted a series of interviews with potential employers in both the business and

academic worlds. He discovered a reluctance to consider distance learning graduates as equivalent to students graduating from a more traditional classroom setting. When given the choice of hiring two individuals with similar qualifications and experience, the respondents expressed a strong tendency to give preference to students who graduated from face-to-face programs. One reason offered was the image of distance learning programs as being a technological extension of diploma mills of the past.

Adams and DeFleur (2006) conducted a national study which examined the attitudes of potential employers across the country in regards to hiring graduates of distance learning programs. The procedure included the distribution of a questionnaire sent in response to job advertisements which appeared in eight major metropolitan newspapers throughout the United States. Hypothetical applicants were described in one of three ways: graduates of a traditional university setting, graduates from a virtual on-line university setting, and graduates of a mixed virtual on-line/traditional university setting. The question of this study was if a job applicant who earned his/her degree entirely or partially from a virtual

on-line program was given the same consideration for employment as one whose degree was completed through traditional coursework. The findings of the study indicated that equal consideration is not given graduates of on-line or mixed programs and that traditional graduates clearly have the advantage.

Adams and DeFleur (2005) had similar results when examining the attitudes found in higher education. Questionnaires were sent to hiring committee chairpersons which involved the same three hypothetical individuals making application for faculty positions:

1. Graduates of traditional doctorate programs.
2. Graduates of doctorate programs which employed mixed combination of virtual and traditional instruction.
3. Graduates of doctorate programs delivered totally on-line.

The findings reported that the applicant with a traditional degree was preferred over the other two hiring scenarios while the applicant with a mixed degree was preferred over the one graduating from a program offered totally on-line. An examination of the respondent's comments revealed five primary

considerations that were instrumental in making their decisions: academic experiences, institutional quality, face-to face interaction, socialization and mentoring (Adams & DeFleur, 2005, p.80). It was perceived that degrees on-line lacked in four of these categories.

As the tools for distance learning have increased, the development of training and development of faculty expertise has lagged behind (Jeffries, 2006; Adams and DeFleur, 2005; Merisotis & Phipps, 1999).

Although it is clear that highly qualified and trained instructors can teach such on-line classes effectively, it is equally demonstrated that such instructors are not in great supply and that issues of self-efficacy play an important role in the availability of such individuals. Meanwhile, market forces are pressuring universities and even public school boards to increase their participation in distance education curricula (Merisotis & Phipps, 1999). This may often force faculty who possess lower levels of computer self-efficacy into the role of distance educator. Distance learning may not be for everyone considering both the instructor and the student.

The need for ongoing studies in the area of Distance learning is critical. It is important that these studies

are not tied to the business aspirations of the private and public institutions involved. Government regulation is required to regulate both the infrastructure and the quality of distance education programs and make information as to program effectiveness readily available to all potential students (Bonk, 2002).

In this world of accelerated technology and accelerate living, perhaps it is not such a bad idea to slow down just a bit and take time to examine all the ramifications of our actions as educators, especially when it comes to one of the most important social responsibilities educators have... the equal access to quality education. In the next chapter, the procedures and methodology of this study will be discussed in greater detail.

## CHAPTER THREE

### PROCEDURES AND METHODOLOGY

"The task of creating learning environments conducive to development of cognitive competencies rests heavily on the talents and self-efficacy of teachers" (Bandura, 1997, p.240).

#### Characteristics of the Population

The participants for this study consisted of education faculty at one of five Pennsylvania State Systems of Higher Education Universities (Edinboro University of PA, Clarion University of PA, Shippensburg University of PA, Slippery Rock University of PA, and California University of PA.) Each of these public universities provides an effective education program and each university also offers graduate degrees in education almost entirely on-line with most requiring just one summer session course in residence.

The setting and sample were appropriate for this study because the respondents represent a cross section of education faculty found at public universities in Pennsylvania. Each of the universities selected conduct classes and degree programs in education in both the traditional and distance learning models. Education faculty teaching in arts-based programs such as music and art, plus physical education faculty were not included in

this study due to the fact that distance education would not lend itself as an effective tool in such programs of study.

#### Participant Selection

Education faculty teaching at the university sites were each sent an email requesting their voluntary participation in an on-line survey administered by StudentVoice® Inc., a contracted service agency which oversees data collection for various educational institutions. Those choosing to participate did so by self-selection and by completing the survey instrument. In addition, 50 faculty members who had not responded to the initial email were randomly selected to receive an invitation to complete a paper and pencil survey so as to include participation from those faculty members who may not be as comfortable with computer access. Faculty members were asked to volunteer for a follow-up face-to-face interview by supplying contact information.

#### Participant Target Number

- Member university faculty - 20 education faculty for each of the 5 target universities.

- Faculty participating in follow-up interviews - 2 to 3 from each institution for a total maximum number of 12-15.
- Total anticipated population - 100 education faculty members.

#### Ethical Issues

Data was collected from education faculty at five Pennsylvania States Systems of Higher Education Universities. Participation was voluntary and un-coerced. Data collection was conducted by StudentVoice® Inc. (a private company serving the research needs of the university community and whose service is provided through the Applied Research Lab at the university). Contact and personally identifying information such as names, e-mail addresses, and phone numbers was reported to the researcher for only those faculty members agreeing to participate in the interview process at a later date. All other participants were identified only by means of randomly assigned case numbers which were assigned to each survey.

Following the in-depth interviews, personally identifying information was deleted from each survey by StudentVoice® Inc. and was identified only by case numbers. The researcher agreed to assure the confidentiality of all

participants. Deans and departments of education at the participating universities were unaware of which members of the faculty have agreed or declined to participate. All participants in the survey were given the option of receiving the final data analysis of this study upon request. The study poses no serious ethical problems because of the aforementioned safeguards.

### Research Methodology

The study incorporates a mixed format research design involving the administration of a quantitative survey and then qualitative follow-up interviews with a 10% percent of the survey respondents. Campbell and Stanley (1963) and Cook, and Campbell, (1979) contends that the mixed design format is effective when examining data involving respondent attitudes.

#### *Phase One - (Quantitative) Survey*

On-line survey collection was administered by StudentVoice® Inc. The survey was comprised of 23 Likert scale questions plus 10 demographic questions. The questions were divided in the following groupings:

- 5 questions to measure self reported technology proficiency;

- 3 questions to measure self reported technology efficacy;
- 5 questions to measure personal attitudes towards technology in education;
- 5 questions to measure personal attitudes towards the efficacy of distance learning;
- 5 questions to measure personal attitudes of faculty towards the hiring of distance learning graduates in faculty positions in higher education;
- 10 questions identifying matters of population characteristics and demographics.

#### *Phase Two - (Qualitative) Interviews*

Semi-structured interview questions were generated based upon observations of the primary survey data.

Questions were based on the following domains:

- Personal attitudes towards distance learning;
- Strengths of distance learning;
- Weaknesses of distance learning;
- Causes for possible faculty apprehension regarding aspects of distance learning;
- Attitudes toward the value of graduate degrees earned via distance learning;

- Attitudes towards the hiring of faculty in education departments who have graduated from universities by way of distance learning programs either blended, or totally at a distance.

#### Procedure

The Institutional Review Board of each perspective university was contacted and a protocol for the study was presented, as was a request for permission to conduct the study. Once IRB permission was received, the Deans of Education for each of the participant institutions were contacted for permission to invite the faculty in the various schools of education to participate in the study. Each school of education supplied email distribution lists of faculty members teaching at the university. Once the on-line survey was ready, an invitation was distributed to the various faculty members via email.

Two weeks later, a follow-up email was generated as a reminder to participate in the study. At the four week mark, 50 paper and pencil surveys were mailed to unresponsive participants from a list randomly generated by StudentVoice® Inc. Finally, at the six week mark, a final invitation was emailed to all unresponsive participants. Following the close of the survey instrument appointments were scheduled for follow-up interviews.

## Data Collection

Survey questions were adapted from, Elizabeth Gilmore's (1998) dissertation entitled Impact of Training on the Information Technology Attitudes of University Faculty. The survey instrument was titled Faculty Attitudes Toward Information Technology (FAIT) which provided an assessment of university and college faculty attitudes toward new information technologies. In the Gilmore study, the instrument was used to assess attitudes of faculty towards technology before and after in-service training sessions.

Three separate pilot surveys were administered to assess the impact of the adaptations upon internal consistency. The participants in the first PILOT survey consisted of members of a doctoral cohort and the instrument was administered via paper and pencil. The participants were asked not only to complete the survey but offer constructive criticism of the instrument. Feedback included statements that the instrument was too long and was not focused enough in regards to the primary research questions. An analysis for internal reliability yielded a Cronbach's alpha of 6.1 and was deemed inadequate.

The participants of the second PILOT were members of the university faculty who taught classes in the field of

education. In this case, the survey had been shortened to 35 questions and the questions became more focused. Again, participants not only responded to the survey, but were also given the opportunity to provide critical feedback by means of email. There were 25 respondents in this case. Feedback included statements that the topic of distance education was a bit ambiguous since public, private, and commercial universities offered on-line degrees and that responses may vary in regards to the type of university being considered. An analysis for internal reliability yielded a Chronbach's alpha of 8.3 and was deemed to be acceptable; however, one final adjustment was required which focused the question of "university type" more clearly.

The participants of the third PILOT study consisted of 10 volunteer faculty members of the Department of Professional Studies in Education. In this pilot, the nature of the university was more clearly defined and the final version of the questionnaire was used. An analysis for internal reliability yielded a Chronbach's alpha of 8.7. In addition, three expert members of the research faculty evaluated the final instrument and found it to be acceptable.

A semi-structured interview was constructed to expand upon the questions asked in the questionnaire. The respondents were asked to answer questions in regards to distance learning programs as produced by traditional universities and colleges and ignore those commercial entities such as the University of Phoenix. The interview was structured around the following questions:

1. Over the past 15 years, there has been a tremendous change in the infusion of technology into all levels of American culture including business and industry. Do you feel that professors of education at universities and colleges across this country have kept pace with the changing tide of technology? Follow-up question: Do you feel that the educational community is preparing teachers to function in the classroom of the next 25 years, given the continued growth in technology?

2. In the survey 33% of responding professors expressed a low to moderate level of self-efficacy when it involves utilizing technology in the classroom, while 20% of those surveyed felt a high level of the competence in the utilization of slightly more advanced technology other than just PowerPoint, email and word processing. What do you believe that the educational system needs to do to

help close this gap? Follow-up question: What obstacles do you envision in implementing this process?

3. While research has shown that most professors at universities feel that distance learning is a viable means of course delivery for students seeking graduate degrees, what are some of the strengths and weaknesses you see that are inherent in the system?

4. Research has shown, as has the survey instrument administered in this study, that there is a strong relationship between a professors feeling of technical self-efficacy and their view of the viability of on-line degrees. Given the diverse levels of technological comfort among university faculty, how do you see this impacting teacher preparation programs in the coming years? Do you have any apprehensions?

5. Many institutions of higher education are now offering graduate level programs almost entirely on-line including M.Ed.'s and even some Doctorates of Education degrees. How accepting are higher education faculty at recognizing these degrees as being equivalent to traditional graduate degrees when it comes to hiring departmental faculty? How might you explain these attitudes?

6. Research has shown that universities are not alone in their favoritism towards graduates of traditional graduate programs over their distance learning counterparts, business and industry also tends to favor the more traditional student. What steps do you feel need to be taken to help distance programs earn an equal footing with more traditional programs, particularly in the consideration of faculty positions in higher education?

7. When thinking about distance education in general, what is your personal "gut reaction" to the idea of graduate degrees in education currently being issued at a distance?

#### Potential Threats to Internal Validity

1. Mortality - As all faculty members' participation was voluntary, there was no way to guarantee that all participants would complete the survey and volunteer for the subsequent follow-up interviews.
2. Testing - The survey instrument used was administered both on-line and by paper and pencil. There was no formal measure as to inconsistencies in validity based upon administration protocol.

### 3. Experimenter Effect -

a. Observer bias - as the researcher was conducting the qualitative interview process, and has had experience in distance learning environments, it cannot be ruled out that the interpretation of the narrative data may have become subject to some observer bias; however, each interview will be quantified using prescribed qualitative measures to keep such bias at a minimum.

b. Hawthorne Effect - As the interview was part of a total dissertation project, faculty members, hoping to be helpful may try to be "helpful" in the process in terms of their responses; however, this was minimized by avoiding the discussion of the details of the project with the perspective interview participants.

#### Generalizability of Findings

While this study was restricted to five public universities in Pennsylvania, it was believed that certain aspects of this study will generalize to other sites and similar subjects. Individual institutional attitudes towards distance learning instructional methods have a wide impact on the staff perceptions of the efficacy of the distance learning educational mode of delivery. However,

certain pervasive points should emerge, especially in the areas of perceived effectiveness and potential higher educational employability.

Basic advantages, obstacles and/or barriers to the distance educational idiom can be considered by instructors when designing future criteria to either maximize or minimize their impact through creative use of instructional methodologies. This study can be used as a tool in conjunction with other like investigations through other instructional venues in order to provide a cross comparison of similarities and differences. In particular, this research should help in the planning and construction of future on-line programs offered by universities at the graduate level while at the same time, remembering the limitations that may exist in regards to personal attitudes toward the hiring of program graduates.

#### Analysis Method

Based upon responses in the first two sections of the survey, respondents were placed into one of three separate groupings. A one-way ANOVA analysis of variance looked for significant differences between the three groups in regards to attitudes towards Distance Learning and attitudes towards the hiring of Distance Learning graduates in higher education. Group memberships were determined as follows.

High Proficiency (HP) respondents self-reported a mean composite of  $M \geq 3.0$  regarding their personal comfort level using computer software that is slightly more demanding than basic applications such as basic word processing, email or PowerPoint; i.e. creating a webpage, creating a PDF file, converting a PowerPoint presentation into HTML format, etc.

Those respondents who failed to meet the criterion the criterion for high proficiency users were then divided into two separate groups based upon scores self-reported in regards to perceived computer self-efficacy. Those scoring a composite of  $M \geq 2.5$  in self-efficacy were placed into the High Efficacy group (HE) while those scoring  $M < 2.5$  were placed into the Low Efficacy (LE) group.

A *t-test* analysis was conducted to measure levels of computer self-efficacy between those faculty members who have had experience teaching distance learning classes as compared to those who have not. The categories of analysis are as follows:

- High Proficiency/High Efficacy
- Low Proficiency/High Efficacy
- Low Efficacy
- Have taught DL/Have not taught DL

In an attempt to clarify attitudes regarding distance learning program graduates and their subsequent employability in higher education, qualitative analysis was conducted utilizing 12 survey respondents who agreed to participate in a semi-structured interview. These respondents were divided into the same self-efficacy and proficiency grouping as was the survey analysis. Finally, a summary analysis was conducted comparing the results of this study with the literature which examines hiring practices involving faculty members receiving advanced degrees from distance learning programs.

#### Procedures for the Validation of the Findings

The findings were validated through a comparison of the data collected in both a quantifiable and qualitative manner with literature that reports the current hiring trends of distance education graduates, particularly in the field of higher education. One of the key elements in this investigation came in the qualitative dialog that took place with 12 of the survey respondents.

This chapter has described the procedural methods used throughout this study. In Chapter Four the presentation of results collected are presented including survey data and interview data.

## CHAPTER FOUR

### FINDINGS

The purpose of this study was to examine the impact of education faculty attitudes regarding self-reported computer/technology self-efficacy and/or competence as they influence attitudes regarding the viability of graduate level distance learning programs. Secondly, the researcher examined the impact of these personal attitudes upon recommendations regarding the hiring of new education faculty members who received their advanced degrees from distance learning programs.

#### Overview of Procedures

The methods of analysis included independent *t-test* analyses of the questionnaire data comparing the attitudes of those faculty who have taught distance education classes as compared to those who have not. Analyses were performed at the  $p=.05$  level of significance. Two one-way ANOVA tests were conducted which calculated the differences in faculty attitudes towards distance education and the hiring of distance education graduates broken down into three self-efficacy categories: high proficiency, high efficacy and low efficacy. It must be noted that the high proficiency group is a subgroup of the high efficacy group and is differentiated by the expressed skill level of

responded in regards to utilizing more advanced computer applications other than basic email, word processing and PowerPoint.

Dates of Survey Data Collection - February 27, 2007 - March 12, 2007

Sample size: N=98 education faculty from 5 Pennsylvania PSSHE universities (See Table 3 for distributions). The total sample included faculty teaching in departments of education. Performance based, art education and physical education faculty were not included since their particular programs are not well suited for distance learning.

StudentVoice® Inc., a university contracted private data collection agency oversaw the on-line survey instrument.

Email invitations were sent to 323 faculty members at the participating institutions. Responses were tracked by StudentVoice® Inc. and two follow-up invitations were also sent at two week intervals. Additionally, invitations and paper surveys were sent to 50 faculty members who failed to respond to the email request. The response consisted of 70 on-line respondents and 28 paper respondents. Each participating faculty member was given a chance to volunteer to participate in a follow-up interview with the anticipation of selecting between 10 and 15 based upon their efficacy rating. Of the 35 participants who

volunteered, 15 were with 7 falling within the low efficacy group and 8 within the high efficacy group.

When examining the quantitative data from the survey it is important to note that the concept of technological self-efficacy is measured in two domains. The first domain refers to a level of self reported proficiency for tasks that go beyond just creating a PowerPoint or sending an email. These proficiencies referred to the actual ability as rated by the four point Likert scale of 1 = I cannot do this, 2 = I can do this with help, 3 = I can do this independently and 4 = I can teach others to do this in tasks that would typically be expected of faculty members teaching an on-line course For this study, the group was divided in half with those achieving an average score of 2.5 and above in the High proficiency group and those scoring less than 2.5 in the low proficiency group. The same process was utilized in establishing a rating of technological self-efficacy with each participant rating technology attitudes on a Likert scale of 1 = I Strongly Disagree, 2 = I Disagree, 3 = I Agree and 4 = I Strongly Agree. Again, for this study, the group was divided in half with those achieving an average score of 2.5 and above in the high self-efficacy group and those scoring less than 2.5 in the low Self-efficacy group. With these groups

established, each group of 5 questions was divided into three categories:

1. Attitudes towards technology in education
2. Attitudes towards the efficacy of distance learning program technology
3. Attitudes towards the hiring of distance learning graduates for faculty positions in Higher Education.

#### Descriptive Statistics

Table 4 presents the descriptive and demographic makeup of all the participants. The categories consist of site, educational background, age, gender, years of university teaching, levels of distance learning classes taught, instructional status, tenure status and academic department within the School/College of Education. In regards to the high proficiency group, 30 out of 42 have taught some level of distance learning class as compared with 14 out of 56 in the low proficiency group. In regards to the high self-efficacy group, 42 out of 65 have taught some level of distance learning class as compared to 2 out of 33 in the low proficiency group. Of the demographic data presented, the only category that demonstrated a significant difference at  $p \leq .05$  between the High and Low grouping of both proficiency and self-efficacy was found

between those individuals who have had experience in teaching distance education classes.

Table 4

*Descriptive Characteristics and Demographics Statistics of Sample*

		Frequency	Percent
Sites	Slippery Rock	19	19.4
	Shippensburg	22	22.4
	Clarion	19	19.4
	California	16	16.3
	Edinboro	22	22.4
Educational Background	Masters	7	7.1
	Terminal	91	92.9
Age Range	30 - 34	1	1.0
	35 - 39	9	9.2
	40 - 44	11	11.2
	45 - 49	15	15.3
	50 - 54	27	27.6
	55 and over	35	35.7
Gender	Male	26	26.5
	Female	72	73.5

Table 4 (continued)

	Frequency	Percent
University Teaching		
Less than a year	1	1.0
1 - 3 years	3	3.1
4 - 6 years	21	21.4
7 - 9 years	15	15.3
10 or more years	58	59.2
DL Courses Taught		
Graduate Level	28	28.6
Undergraduate Level	6	6.1
Both	10	10.2
Never taught DL classes	54	55.1
Instructional Status		
Full Time	96	98.0
Part time	2	2.0
Tenure Status		
Tenured	64	65.3
Tenure Track	29	29.6
Non-Tenure Track	5	5.1

Table 4 (continued)

	Frequency	Percent
Academic Department		
Professional Studies	11	11.2
ELED	23	23.5
Early Childhood	2	2.0
Reading	12	12.2
Secondary Education	10	10.2
Special Education	21	21.4
School Psychology	1	1.0
Other	17	17.3
Total	97	99.0
Missing	1	1.0

*N=98*

Tables 5 through 9 present the proficiency questions and the distribution of responses with Table 10 presenting participant grouping with 42 respondents in the high proficiency grouping and 56 respondents in the low proficiency grouping. Tables 11 through 13 present the self-efficacy questions and the distribution of participant responses. Table 14 presents a breakdown of participant grouping with 65 of the respondents falling into the high

self-efficacy group and 33 respondents in the low self-efficacy grouping.

Table 5

*Descriptive Statistics- Technological Proficiency - Design a Webpage with Embedded Links*

	Frequency	Percent
I cannot do this	38	38.8
I could do this with assistance	39	39.8
I can do this on my own	6	6.1
I can teach others to do this	15	15.3
Total	98	100.0

Table 6

*Descriptive Statistics- Technological Proficiency - Save PowerPoint Presentations as WebPages*

	Frequency	Percent
I cannot do this	22	22.4
I could do this with assistance	48	49.0
I can do this on my own	16	16.3
I can teach others to do this	12	12.2
Total	98	100.0

Table 7

*Descriptive Statistics- Technological Proficiency - Create On-line Course Components for On-line Shells Such as WebCT®, BlackBoard®, e-College®, etc.*

	Frequency	Percent
I cannot do this	20	20.4
I could do this with assistance	26	26.5
I can do this on my own	25	25.5
I can teach others to do this	27	27.6
Total	98	100.0

Table 8

*Descriptive Statistics- Technological Proficiency - Create an Email Distribution List*

	Frequency	Percent
I cannot do this	15	15.3
I could do this with assistance	28	28.6
I can do this on my own	25	25.5
I can teach others to do this	30	30.6
Total	98	100.0

Table 9

*Descriptive Statistics- Technological Proficiency - Create an Adobe PDF file*

	Frequency	Percent
I cannot do this	19	19.4
I could do this with assistance	48	49.0
I can do this on my own	14	14.3
I can teach others to do this	17	17.3
Total	98	100.0

Table 10

*Descriptive Statistics- Proficiency Groupings*

	Frequency	Percent
High Proficiency	42	42.9
Low Proficiency	56	57.1
Total	98	100.0

Table 11

*Descriptive Statistics- Technological Self-Efficacy - I Use  
Computer Technology Regularly in my Classroom Instruction*

	Frequency	Percent
I strongly disagree	14	14.3
I disagree	12	12.2
I agree	26	26.5
I strongly agree	46	46.9
Total	98	100.0

Table 12

*Descriptive Statistics- Technological Self-Efficacy - Computers  
in the Classroom Have Helped me Improve my Teaching*

	Frequency	Percent
I strongly disagree	11	11.2
I disagree	21	21.4
I agree	26	26.5
I strongly agree	40	40.8
Total	98	100.0

Table 13

*Descriptive Statistics- Technological Self-Efficacy - I Feel Prepared to Instruct my Students on How to Successfully Implement Meaningful Technology Usage into Their Instructional Pedagogy*

	Frequency	Percent
I strongly disagree	11	11.2
I disagree	35	35.7
I agree	29	29.6
I strongly agree	23	23.5
Total	98	100.0

Table 14

*Descriptive Statistics- Self Efficacy Groupings*

	Frequency	Percent
High Efficacy	65	66.3
Low Efficacy	33	33.7
Total	98	100.0

#### Analysis

The *t-test* presentations are presented in two separate categories: Having taught distance education versus have only taught in a traditional classroom setting. The two one-way ANOVA tests were calculated by using three groups; high proficiency/high efficacy, low proficiency/high efficacy, and low efficacy. The questions in the ANOVA

tests deal with faculty attitudes regarding (1) distance education as a viable method of course delivery and (2) the hiring of distance education program graduates (from recognized and accredited universities) for faculty positions in higher education.

### *Independent t-test Analysis*

This section, an analysis of data for the research question two: *Do faculty members who have taught courses on-line express a greater sense of self-efficacy in regard to the use of technology than do their traditional colleagues who teach only using traditional classroom based instruction*, was conducted. An Independent Samples *t*-test was employed to test the null hypothesis for questions Q7, Q8, Q9, Q11, Q12, and Q13 which dealt with self reported faculty attitudes towards technology in general.

Table 15

*A t-test Comparison of Faculty Who Have Taught Distance Learning Courses With Those Who Have Not*

		df	N	Mean	SD	t	p
Q7. I like using computers.	Taught	96	44	3.64	0.65	7.30***	0.000
	Not		54	2.98	0.78		
Q8. Computers in classroom help teaching.	Taught	92	44	3.64	0.65	4.42***	0.000
	Not		54	2.43	0.98		

Table 15 (continued)

		df	N	Mean	SD	t	p
Q9. I feel	Taught	96	44	2.77	1.05	2.01*	0.047
threatened by	Not		54	2.39	0.83		
technology.							<sup>a</sup>
Q11. Technology is a	Taught	96	44	2.80	0.77	1.54	0.128
gimmick in	Not		54	2.57	0.66		
education.							<sup>a</sup>
Q12. Students receive	Taught	96	44	3.14	0.70	3.27**	0.001
richer Experience	Not		54	2.63	0.81		
w/technology							
Q13. I assign more	Taught	70	44	2.93	0.90	4.40*	0.025
intense papers with	Not		54	2.57	0.57		

WWW

*Note:* <sup>a</sup> Q9 and Q11 have been inversely coded due to the fact that the questions were phrased in a negative manner. A higher mean score indicates a more favorable attitude towards the use of technology.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

When examining Q7: "I like to using computers", an independent samples *t-test* analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be significant

( $t_{(96)} = 4.42, p < 0.001$ ). Those respondents who had taught expressed a greater level of agreement with the statement ( $M = 3.64, SD = .65$ ) than those who had not taught. Therefore, for Q7, the null hypothesis that there is no difference between the two groups of faculty is rejected.

When examining Q8: "Computers in the classroom have helped me improve my teaching", an independent samples *t*-test analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be significant ( $t_{(92)} = 7.30, p < 0.001$ ). Those respondents who had taught expressed a greater level of agreement with the statement ( $M = 3.64, SD = .65$ ) than those who had not taught. Therefore, for Q8, the null hypothesis that there is no difference between the two groups of faculty is rejected.

When examining Q9: "I sometimes feel professionally threatened by the rapid changes occurring in technology", an independent samples *t*-test analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be significant ( $t_{(96)} = 2.01, p < 0.05$ ). Those respondents who had taught expressed a greater level of comfort with the changes

occurring in technology ( $M=2.77$ ,  $SD= 1.05$ ) than those who had not taught. Therefore, for Q9, the null hypothesis that there is no difference between the two groups of faculty is rejected.

When examining Q11: "Technology is forced upon educators as a gimmick without regard to the impact that such technology has upon the quality of education being offered to the students", an independent samples *t*-test analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not taught) was found to be not significant ( $t_{(96)}= 1.54$ ,  $p<0.05$ ). Those respondents who had taught expressed a greater level of comfort that technology is not a gimmick ( $M=2.80$ ,  $SD=.77$ ) than those who had not taught, however, not significantly so. Therefore, for Q11, Therefore, for Q8, the null hypothesis that there is no difference between the two groups of faculty is not rejected.

When examining Q12: "With the advancement of both communication and educational technologies I feel that students today receive a richer educational experience than that of their parents", an independent samples *t*-test analysis was conducted. The mean difference between faculty who have had experience in teaching web-based

distance learning classes (taught) and those who have not (not taught) was found to be significant  $t_{(96)} = 3.27$ ,  $p = 0.001$ . Those respondents who had taught expressed a greater level of agreement with the statement ( $M = 3.14$ ,  $SD = .70$ ) than those who had not taught. Therefore Q12, the null hypothesis that there is no difference between the two groups of faculty is rejected.

When examining Q13: "Since the advent of the Internet, I am comfortable with assigning more intense research papers for my classes", an independent samples *t*-test analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have not (not Taught) was found to be significant ( $t_{(70)} = 2.29$ ,  $p < 0.05$ ). Those respondents who had taught expressed a greater level of agreement ( $M = 2.93$ ,  $SD = .90$ ) with then statement than those who had not taught. Therefore, for Q13, the null hypothesis that there is no difference between the two groups of faculty is rejected.

When examining the comparison of the composite mean of all the questions in this section, an independent samples *t*-test analysis was conducted. The mean difference between faculty who have had experience in teaching web-based distance learning classes (taught) and those who have

not (not taught) was found to be significant ( $t_{(96)} = 4.40$ ,  $p < 0.001$ ). Those respondents who had taught expressed a greater level of agreement ( $M = 3.05$ ,  $SD = .49$ ) with the statement than those who had not taught. Therefore, for a composite comparison of all the questions in this section, the null hypothesis that there is no difference between the two groups of faculty is rejected.

#### *One-way ANOVA Analysis*

This section describes the results of an analysis of variance in regards to the research question one: *Are faculty members who possess higher levels of technological self-efficacy (HE) and proficiency (HP) more likely to embrace distance education than those faculty members who possess lower level (LE) of technological self-efficacy and proficiency?* A one-way ANOVA was employed to test the null hypothesis for questions Q14, Q15, Q16, Q17, and Q18, which dealt with self reported faculty attitudes towards the use of distance education in higher education. The respondents were divided into subgroups: high proficiency (HP) for those individuals who achieved a mean score  $> 2.5$  on the self reported proficiency questions, high self-efficacy (HE) which were those individuals who achieved a mean score  $\geq 2.5$  on the self reported efficacy questions, but did not meet the standard for high proficiency and the low efficacy

group (LE) who achieved a mean score < 2.5 on the self reported efficacy questions. The cutoff point of 2.5 was selected for these groupings because 2.5 fell into the upper 50 percentile of both efficiency and proficiency responses. For the proficiency category, this meant that respondents indicated that they could do a task independently the majority of the time. For the self-efficacy category, it meant that a respondent had a greater than neutral attitude towards the usage of technology.

Table 16

*Faculty Attitudes Towards Distance Education in Higher Education Based Upon Levels of Efficacy and Proficiency*

		N	Mean	SD
Q14. An Education class via distance learning, for the student, is less rigorous than the traditional classroom. <sup>a</sup>	LE	32	1.81	0.64
	HE	24	2.83	1.05
	HP	42	3.10	0.79
	Total	98	2.61	0.99
Q15. I have serious concerns about public universities awarding post graduate degrees in education at a distance. <sup>a</sup>	LE	32	1.78	0.61
	HE	24	2.25	0.99
	HP	42	2.36	0.96
	Total	98	2.14	0.90

Table 16 (continued)

		N	Mean	SD
Q16. Educational pedagogy is equally effective in distance learning as it is in face to face instruction.	LE	32	1.78	0.61
	HE	24	2.08	0.78
	HP	42	2.45	0.92
	Total	98	2.14	0.84
Q17. Verifiable assessment is a serious problem for distance education programs. <sup>a</sup>	LE	32	1.50	0.57
	HE	24	2.33	0.96
	HP	42	2.62	0.94
	Total	98	2.18	0.97
Q18. Distance education is a viable means for individuals to receive post graduate degrees in education.	LE	32	2.16	0.77
	HE	24	2.67	0.82
	HP	42	2.81	0.86
	Total	98	2.56	0.86
Composite Mean attitudes towards the efficacy of Distance Education.	LE	32	1.81	0.40
	HE	24	2.43	0.73
	HP	42	2.27	0.66
	Total	98	2.33	0.71

Note: HP=High Proficiency/High Efficacy; HE=Low Proficiency/High Efficacy; LE= Low Efficacy. <sup>a</sup> Q14, Q15, Q17 Reverse coded due to negative voice of question. A higher mean score indicates a more favorable attitude towards distance education.

A one-way ANOVA was conducted to examine differences in faculty expressed attitudes towards distance education in higher education (Table 17). Based upon their responses to targeted survey questions, respondents were placed into one of three groups: high proficiency/high self efficacy level (HP), the low proficiency/high self-efficacy level (HE) and the low self-efficacy level (LE).

When examining Q14: "An Education class via distance learning, for the student, is less rigorous than the traditional classroom", the groups were found to be significantly different ( $F_{(2,95)} = 23.40, p < 0.001$ ). Therefore for Q14, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at  $p < .001$  between (LE) ( $M = 1.81, SD = .64$ ) and (HE) ( $M = 2.83, SD = 1.05$ ) as well as (LE) ( $M = 1.81, SD = .64$ ) and (HP) ( $M = 3.10, SD = .79$ ). Differences between the (HP) ( $M = 3.10, SD = .79$ ) and (HE) ( $M = 2.83, SD = 1.05$ ) subgroups were not found to be significant.

When examining Q15: "I have serious concerns about public universities awarding post graduate degrees in education at a distance", the groups were found to be significantly different ( $F_{(2,95)} = 4.24, p < 0.001$ ). Therefore for Q15, the null hypothesis contending that there is no

significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at  $p < .001$  between (LE) ( $M=1.76, SD=.99$ ) and (HP) ( $M=2.36, SD=.96$ ). Differences between the (HP) ( $M=2.36, SD=.96$ ) and (HE) ( $M=2.25, SD=.99$ ) subgroups were not found to be significant. Differences between the (LE) ( $M=1.76, SD=.99$ ) and (HE) ( $M=2.25, SD=.99$ ) subgroups were not found to be significant.

When examining Q16: "Educational pedagogy is equally effective in distance learning as it is in face to face instruction", the groups were found to be significantly different ( $F_{(2,95)} = 6.60, p=0.002$ ). Therefore for Q16, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at  $p < .001$  between (LE) ( $M=1.78, SD=.61$ ) and (HP) ( $M=2.45, SD=.92$ ). Differences between the (HP) ( $M=2.45, SD=.92$ ) and (HE) ( $M=2.08, SD=.78$ ) subgroups were not found to be significant. Differences between the (LE) ( $M=1.78, SD=.61$ ) and (HE) ( $M=2.08, SD=.78$ ) subgroups were not found to be significant.

When examining Q17: "Verifiable assessment is a serious problem for distance education programs", the groups were found to be significantly different ( $F_{(2,95)} =$

16.57,  $p < 0.001$ ). Therefore for Q17, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at  $p < .001$  between (LE) ( $M=1.50$ ,  $SD=.57$ ) and (HE) ( $M=2.33$ ,  $SD=.96$ ) as well as (LE) ( $M=1.50$ ,  $SD=.57$ ) and (HP) ( $M=2.62$ ,  $SD=.94$ ). Differences between the (HP) ( $M=2.62$ ,  $SD=.94$ ) and (HE) ( $M=2.33$ ,  $SD=.96$ ) subgroups were not found to be significant.

When examining Q18: "Distance education is a viable means for individuals to receive post graduate degrees in education", the groups were found to be significantly different ( $F_{(2,95)} = 6.01$ ,  $p = 0.002$ ). Therefore for Q17, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at  $p < .001$  between (LE) ( $M=2.16$ ,  $SD=.77$ ) and (HP) ( $M=2.81$ ,  $SD=.86$ ). Differences between the (HP) ( $M=2.81$ ,  $SD=.86$ ) and (HE) ( $M=2.67$ ,  $SD=.82$ ) subgroups were not found to be significant. Differences between the (LE) ( $M=2.16$ ,  $SD=.77$ ) and (HE) ( $M=2.67$ ,  $SD=.82$ ) subgroups were not found to be significant.

When examining the composite mean variances of the composite responses towards the efficacy of Distance Education, the groups were found to be significantly

different ( $F_{(2,95)} = 6.01, p=0.002$ ). Therefore for the overall composite means of all questions in this section, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis using the Scheffe' post hoc criterion (see table 18) for significance indicate that (LE) ( $M=1.81, SD=.40$ ) was significantly less accepting of distance education overall than either of the remaining groups, (HE) ( $M=2.43, SD=.73$ ) and (HP) ( $M=2.27, SD=.66$ ) which, in the final analysis were not significantly different from each other. Of interest was the fact that high efficacy respondents were more accepting of distance education than high proficiency respondents, although not significantly so.

Table 17

*One-way ANOVA - A Comparison of the Groups (HP, HE, LE)  
Regarding Faculty Attitudes Towards Distance Education in  
Higher Education*

		df	MS	F	p
Q14	Between Groups	2	15.72	23.40***	.000
	Within Groups	95	0.67		
	Total	97			

Table 17 (continued)

		df	MS	F	p
Q15	Between Groups	2	3.19	4.24*	.017
	Within Groups	95	0.75		
	Total	97			
Q16	Between Groups	2	4.15	6.60**	.002
	Within Groups	95	0.63		
	Total	97			
Q17	Between Groups	2	11.73	16.57***	.000
	Within Groups	95	0.71		
	Total	97			
Q18	Between Groups	2	4.05	6.01**	.003
	Within Groups	95	0.67		
	Total	97			

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Table 18

*Post Hoc Analysis - Multiple Comparisons the Groups (HP, HE, LE)  
Regarding Faculty Attitudes Towards Distance Education in Higher  
Education*

Dependent Variable	(I) Overall Groupings	(J) Overall Groupings	Mean Difference (I-J)	Sig.
Q14	LE	HE	-1.02***	.000
		HP	-1.28***	.000
	HE	HP	-0.26*	.461
Q15	LE	HE	-0.47	.141
		HP	-0.58*	.022
	HE	HP	-0.11	.890
Q16	LE	HE	-0.30	.373
		HP	-0.67**	.002
	HE	HP	-0.37	.197
Q17	LE	HE	-0.83**	.002
		HP	-1.12***	.000
	HE	HP	-0.29	.418
Q18	LE	HE	-0.51	.076
		HP	-0.65**	.004
	HE	HP	-0.14	.794
Means	LE	HE	-0.63**	.001
		HP	-0.86***	.000
	HE	HP	-0.23	.325

*Note:* HP=High Proficiency/High Efficacy; HE=Low Proficiency/High Efficacy; LE= Low Efficacy. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Table 19

*Descriptive Statistics - Faculty Attitudes Towards the Hiring of  
DL Graduates as Education Faculty Based Upon Levels of Efficacy  
and Proficiency*

		N	Mean	SD
Q19. Two applicants have applied for tenured track faculty positions in your department. Both have graduated from the same prestigious university where one received his/her terminal degree via distance learning and the other from the more traditional classroom	LE	32	1.75	0.72
	HE	24	2.46	0.83
	HP	42	2.69	0.87
	Total	98	2.33	0.91
Q20. Two applicants have applied for tenured track faculty positions in your department. Both have graduated from the same prestigious university where one received his/her terminal degree via distance learning and the other from the more traditional classroom	LE	30	2.13	0.68
	HE	24	2.58	0.78
	HP	42	3.05	0.80
	Total	96	2.65	0.85

Table 19 (continued)

		N	Mean	SD
Q21. In the field of higher	LE	30	1.73	0.52
education, I feel that applicants	HE	24	2.25	0.74
graduating from a distance learning	HP	42	2.33	0.87
graduate program at a public	Total	96	2.13	0.79
university will be given the same				
consideration for employment as the				
traditional student.				
Q22. Tenured faculty members in	LE	30	2.30	0.60
public universities should have	HE	24	2.21	0.78
received their advanced degrees from	HP	42	2.57	0.83
traditional institutions. <sup>a</sup>	Total	96	2.40	0.76
Q23. Faculty applicants who have	LE	31	2.13	0.76
received their doctorates from	HE	24	2.58	0.72
distance learning universities often	HP	42	2.88	0.67
lack the people skills necessary to	Total	97	2.57	0.78
be effective instructors. <sup>a</sup>				

Table 19 (continued)

		N	Mean	SD
Composite Mean of the attitudes	LE	32	1.92	0.47
related to the hiring of Distance	HE	24	2.42	0.59
Education graduates in higher	HP	42	2.71	0.67
education	Total	98	2.38	0.68

Note: HP=High Proficiency/High Efficacy; HE=Low Proficiency/High Efficacy; LE= Low Efficacy.

<sup>a</sup> Q22, Q23, reverse coded due to negative voice of question . A higher mean score indicates a more favorable attitude towards distance education.

This section describes the results of a one way ANOVA considering research question three: *Do members of the education faculty who possess higher levels of technological self-efficacy and proficiency significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues?* (Table 20). Based upon their responses to targeted survey questions, respondents were placed into one of three groups: high proficiency/high self efficacy level (HP), the low proficiency/high self-efficacy level (HE) and the low self-efficacy level (LE).

When examining Q19: "Two applicants have applied for tenured track faculty positions in your department. Both have graduated from the same prestigious university where one received his/her terminal degree via distance learning and the other from the more traditional classroom", the groups were found to be significantly different ( $F_{(2,95)} = 12.54, p < 0.001$ ). Therefore for Q19, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at  $p = .005$  between (HP) ( $M = 2.69, SD = .87$ ) and (HE) ( $M = 2.46, SD = .83$ ). Significant differences between (HE) ( $M = 2.46, SD = .83$ ) and (LE) ( $M = 1.75, SD = .72$ ) were found at  $p < .001$ . Differences between the (LE) ( $M = 1.75, SD = .72$ ) and (HE) ( $M = 2.46, SD = .83$ ) subgroups were not found to be significant.

When examining Q20: "Two applicants have applied for tenured track faculty positions in your department. Both have graduated from the same prestigious university where one received his/her terminal degree via distance learning and the other from the more traditional classroom", the groups were found to be significantly different ( $F_{(2,95)} = 12.89, p < 0.001$ ). Therefore for Q20, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified

significant differences at  $p < .001$  between (HP) ( $M=3.05$ ,  $SD=.80$ ) and (LE) ( $M=2.13$ ,  $SD=.68$ ). Differences between the (LE) ( $M=2.13$ ,  $SD=.68$ ) and (HE) ( $M=2.58$ ,  $SD=.78$ ) subgroups were found to be significant at  $p < .05$ . Significant differences between (HP) ( $M=3.05$ ,  $SD=.80$ ) and (HE) ( $M=2.58$ ,  $SD=.78$ ) were not found to be significant.

When examining Q21: "In the field of higher education, I feel that applicants graduating from a distance learning graduate program at a public university will be given the same consideration for employment as the traditional student", the groups were found to be significantly different ( $F_{(2,95)} = 6.12$ ,  $p=0.003$ ). Therefore for Q21, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at  $p < .05$  between (HP) ( $M=2.33$ ,  $SD=.87$ ) and (HE) ( $M=2.25$ ,  $SD=.74$ ). Differences between the (LE) ( $M=1.73$ ,  $SD=.52$ ) and (HP) ( $M=2.33$ ,  $SD=.87$ ) subgroups were found to be significant at  $p < .005$ . Significant differences between (HE) ( $M=2.25$ ,  $SD=.74$ ) and (LE) ( $M=1.73$ ,  $SD=.524$ ) were not found to be significant.

When examining Q22: "Tenured faculty members in public universities should have received their advanced degrees from traditional institutions", the groups were found to be

not significantly different ( $F_{(2,95)} = 2.14, p > 0.05$ ).

Therefore for Q22, the null hypothesis contending that there is no significant difference among the three groups is not rejected. Post Hoc analysis identified no significant difference between each of the subgroups. All respondents appeared neutral to the statement (HP) ( $M=2.57, SD=.83$ ), (HE) ( $M=2.21, SD=.78$ ), (LE) ( $M=2.30, SD=.60$ ).

When examining Q23: "Faculty applicants who have received their doctorates from distance learning universities often lack the people skills necessary to be effective instructors", the groups were found to be significantly different ( $F_{(2,95)} = 9.94, p < 0.001$ ). Therefore for Q23, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis identified significant differences at  $p < .001$  between (HP) ( $M=2.88, SD=.67$ ) and (LE) ( $M=2.13, SD=.76$ ). Differences between the (HE) ( $M=2.58, SD=.72$ ) and (HP) ( $M=2.88, SD=.67$ ) subgroups were not found to be significant. Significant differences between (HE) ( $M=2.58, SD=.72$ ) and (LE) ( $M=2.13, SD=.76$ ) were not found to be significant.

When examining the composite mean variances of the responses related to the hiring of Distance Education graduates in higher education, the groups were found to be

significantly different ( $F_{(2,95)} = 16.20, p < 0.001$ ). Therefore for the overall composite means of all questions in this section, the null hypothesis contending that there is no significant difference among the three groups is rejected. Post Hoc analysis using the Scheffe' post hoc criterion (see table 21) for significance indicate (LE) ( $M=1.92, SD=.47$ ) was significantly less accepting of distance education overall than either of the remaining groups, (HE) ( $M=2.42, SD=.59$ ) and (HP) ( $M=2.71, SD=.67$ ) which, in the final analysis were not significantly different from each other. (HP) respondents were more accepting of distance education (HE) respondents, although not significantly so.

Table 20

*One-way ANOVA - A Comparison of the Groups (HP, HE, LE)  
Regarding Faculty Attitudes Towards the Hiring of DL  
Graduates as Education Faculty*

		df	MS	F	p
Q19	Between	2	8.31	12.54***	.000
	Groups				
	Within	95	0.66		
	Groups				
	Total	97			
Q20	Between	2	7.38	12.89***	.000
	Groups				
	Within	95	0.57		
	Groups				
	Total	97			

Table 20 (continued)

		df	MS	F	p
Q21	Between	2	3.40	6.12**	.003
	Groups				
	Within	95	0.56		
	Groups				
	Total	97			
Q22	Between	2	1.21	2.14	.124
	Groups				
	Within	95	0.57		
	Groups				
	Total	97			
Q23	Between	2	5.05	9.94***	.000
	Groups				
	Within	95	0.51		
	Groups				
	Total	97			
Mean	Between	2	5.64	16.20***	.000
	Groups				
	Within	95	0.35		
	Groups				
	Total	97			

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$

Table 21

*Post Hoc Analysis - Multiple Comparisons of the Groups (HP, HE, LE) Regarding Faculty Attitudes Towards the Hiring of DL Graduates*

Dependent Variable	(I) Overall Groupings	(J) Overall Groupings	Mean Difference (I-J)	Sig.
Q19	LE	HE	-0.71**	.005
		HP	-0.94***	.000
	HE	HP	-0.23	.507
Q20	LE	HE	-0.45	.081
		HP	-0.91***	.000
	HE	HP	-0.46*	.048
Q21	LE	HE	-0.52*	.035
		HP	-0.60**	.003
	HE	HP	-0.08	.900
Q22	LE	HE	0.09	.897
		HP	-0.27	.291
	HE	HP	-0.36	.148
Q23	LE	HE	-0.45	.055
		HP	-0.75***	.000
	HE	HP	-0.30	.237
Means	LE	HE	-0.50**	.007
		HP	-0.79***	.000
	HE	HP	-0.29	.142

*Note:* HP=High Proficiency/High Efficacy; HE=Low Proficiency/High Efficacy; LE=Low Efficacy. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

### *Qualitative Data Analysis*

Interviews were held with survey respondents from each participating school. Teachers were selected for a pool of volunteers so that representations of the efficacy/proficiency sub-groups were present. The final representative numbers were achieved: HP - 4 respondents, HE - 5 respondents, LE - 3 respondents. The distribution of respondents per university were 3 respondents - Slippery Rock University, 2 respondents - Clarion University, 3 respondents - Edinboro University, 2 respondents - California University, 2 respondents - Shippensburg University.

Each interview began with introductions and basic interview guidelines. Participants were told that they would be asked a series of questions relating to computer technology and distance education. The interviewer remained silent while the participant responded to each question. If an answer was found to be unique or ambiguous, an attempt to clarify the response was made by asking a follow-up or probing question. Respondents were asked to exclude for-profit programs such as the University of Phoenix on-line and think only of established universities with respected traditional components when answering. The

interviews provided qualitative data which expanded upon the questions illustrated by the survey instrument.

While seven separate questions were asked, the primary focus of the interviews was to investigate the views of the respondents in regards to the current state of technology in education, including the technological state of those currently teaching technology courses. It was hoped to arrive at some indication as to perceived strengths and potential weaknesses that are evident in the system. The responses were examined in context of the respondents survey score as to self-efficacy and proficiency.

The second focus included respondent attitudes towards distance learning as a viable alternative to the traditional classroom approach for education students studying primarily at the post graduate level. Not only were the general attitudes examined, but there was an attempt to understand the reasoning behind those attitudes in both the areas of strengths and weaknesses that are perceived to be inherent in the distance education system.

The final focus of the questioning surrounded respondents' attitudes towards the hiring of faculty in higher education. An attempt was made to examine whether or not inconsistencies existed when it came time to make

the pragmatic decision to recommend the hiring of distance learning graduates.

As programs of education are preparing future teachers to teach not only in today's classrooms, but classrooms of the future over the next 20 to 25 years, respondents commented upon how well professors of education are keeping up with the rapidly evolving technological requirements of the professions. F8 (HE) made the following comment:

... I believe that professors are doing a fairly good job, I believe that it depends on the personality of the person. I do not see how a professor can maintain their status if they do not come to understand the technology (F8, 4-12).

F8 (HE) further commented:

... no, as far as preparing teachers for the future. We are stuck on the present... who knows what is going to be there 25 years from now... it's hard for professors to keep up, they try, but trying to prepare our future teachers... for 25 years down the road... that is very difficult (F8, 4-12).

F6 (LE) commented:

... some have and some haven't. Well, at my own university there are some of us who are working

very hard to keep up and find ways to integrate (technology) in beneficial ways, where it is useful, and there are others who won't think of it and won't do it. So...I think that you will find that the same everywhere. ... what is it going to look like in 20 years, who knows? But out student teachers are often useful as instructors for their cooperating teachers because they are more versed at using the technology than their cooperating teacher (F6, 4-10).

F4 (HP) commented:

Well, probably, it depends what your standard is... if it's an ideal standard I'd say 'no', but they have reluctantly kept pace with what they had to. ... No, I don't think they are looking down the road. My experience is that the students, often times, are more savvy than the professors (F4, 4-5).

The comments noted above represent the ambiguity regarding the preparation of teachers of the future to operate in a technologically rich environment. F1 (LE) made a comment that was rather revealing and very pragmatic:

It is interesting because some of the things that we teach our pre-service teachers are not even available in the schools... so there are some areas where we are ahead of the curve mostly because of the rural area where our students do their student teaching...I find that our student teachers are disappointed that they cannot do the things that they have been taught to do here because the technology is not available in the schools (F1, 4-4).

When asked about possible suggestions to overcome obstacles and begin to improve technological competence at universities, several explanations were offered. The first explanation was to address the lack of resources available, both in terms of equipment and in terms of time. A comment from F10 (LE) respondent illustrates this point.

... A lot of it has to do with the hardware... The availability of hardware. I know that a lot more classrooms are getting the (pause), we call ours the Prometheus system, a high technology system, and that you also need professional development... but ...professors, there are just so many demands on them it becomes a matter of just what you choose to do considering other obligations that

are necessary, focusing on student achievement, their classrooms, service to the community and university... when do you have time to keep up with all the changes in technology? It is a real problem... (F10, 4-12).

F3 (HE) further commented:

... (pause)... we can learn if we want to... so those of us who want to learn and keep up are keeping up, and we find ways of support. So, how do you motivate someone to do it who isn't self motivated is the issue... ... there are just not any rewards. There are not enough rewards for doing it, not enough encouragement and if a professor can get by doing what they have been doing and feel successful at it then there is no motivation or reward to change, because it's a lot of work (F3, 4-5).

F11 (HP) made the comment:

... Well it needs to be a priority from the higher levels of the administration. What they can do to show that it's a priority is to have adequate support staff, which in my experience they don't. The people they have are usually good, but they are stretched way too thin and you get sort of

pawned off to GA's and stuff who are just cutting their teeth. ... they could do is to require ongoing trainings on a regular basis... and they could do it with incentives to participate so that people don't feel put out... An obstacle though I think could be laid on the shoulders of the professors which is resistance, you know, old dogs not wanting to learn new tricks. But again, the only way to overcome that obstacle falls on the part of the administration (F11, 4-13).

A general feeling of ambivalence in regards to graduate degrees being offered via distance education began to emerge. There seemed to be a politically correct response that suggested that the faculty respondents were accepting of distance learning programs, but after some more in depth probing there began to emerge some of the underlying, unspoken concerns. The following comments can begin to illustrate this. The first comment comes from F1 (LE):

... we consider ourselves to be a residency school... (pause)... it is something we take pride in... I certainly have gotten that impression. Obviously, not having the one on one contact with the student would be a detriment to learning.. I

talk to some students as well as faculty and they want to see their professors, they want to have interactions, they want to see their face and, you know the eyes, they get an idea... they glaze over when they don't get the idea. ...Certainly, the advantage would be the convenience... we're trying to... get all kinds of diverse students to receive the education that we would want them to get and it is hard to earn a career and keep your family and go to school. So if you require your students to come to [campus] you are most certainly eliminating a certain percentage of the population you could make a selection from (F1, 4-4).

F7 (HE) demonstrated the apprehension that many faculty members may have regarding distance learning programs:

Graduate school on-line? Yes... we are putting several of our courses on-line and considering putting one or two programs on on-line and we are all having second thoughts and third thoughts... do we know what we are doing? Are we sure this is going to work? And you don't know if it's going to work until you try it... but there are certain components of graduate school that we are having

difficulty seeing how we would replace with using technology (F7, 4-10).

This respondent continued to illustrate concern regarding various aspects of graduate classroom that may not be suitable for the on-line environment. These concerns were mirrored by various respondents.

The richness of a small group in a seminar... Can you really replicate that in an on-line discussion board setting? I've seen it both ways, I've seen some on-line conversations that are very rich and people who would actually offer their opinions more quickly on-line because they are less confident in face to face than they are on-line... so there is an advantage (F7, 4-10).

F12 (HE) added:

... I guess it depends on what level the program is, M.Ed. for a working teacher... that seems more practical than a doctoral candidate who also has to learn about university life, and you can't do that unless you are there (F12, 4-13).

F10 (LE) further commented:

Yea... I always hear them talk about how assessment needed be compromised in any way, or changed, but to me... I have yet to figure out how it's not...

things are not always going to be, by nature, open book, thinks like that... so. One limitation I think is in the area of assessment. The other is in the area of sort of comfortable, impromptu, two way communication with the students. I know that there are means to address that, but they are not as good as face to face classroom experiences (F10, 4-12).

Given the diverse levels of technological comfort among university faculty one of the themes centered upon a discussion of individual comfort (self-efficacy) levels in using, and in some cases, acknowledging the usefulness of this technology. Some interviewers suggested that universities need to take a passive role and permit attrition to take care of the problem. This idea is illustrated F9 (HP):

... (very long pause)... I am clearly thinking that those individuals who are not comfortable with technology will eventually retire, while those who are coming in are more comfortable with technology because it has been part of our everyday lives. And therefore, within time, (pause), there is going to be less and less of a feeling of uncomfortable-ness with technology, so

again, through time I believe that both the self-efficacy of professors is going to increase and of course they are going to feel that technology is an important perspective in education (F9, 4-12).

An observation presented F6 (LE) made the following point:

It seems like that the only people who can keep up with the technology are the people who are creating the technology (F6, 4-10).

Still another respondent F10 (LE) represents a view put forth by several other respondents that suggest the problem as possibly being related to globalization.

... maybe in other countries like Japan where people seem to be a little more technologically accepting... students have these cell phones we are just starting to get into our society. So we might be in trouble globally with preparing our teachers to go out into the schools, again, it is a financial issue... I don't think that there are too many schools that are keeping up with technology, so when teachers do go out there, if they are even a few years behind, they are still going to be relatively advanced in that particular school (F10, 4-12).

F9 (HP) illustrated the frustration expressed by many of the respondents in an attitude that it doesn't matter what people think, it's something that is here, for good or bad, and people just will have to learn to deal with:

... well, there are going to be a few brave folks who are going to try it and drag the rest along kicking and screaming, that's what's happening right here now. ...We are developing an on-line post baccalaureate certification program so at a graduate level which could lead to a Masters degree. (Pause), and there are a few of us to get brave and try it and, you don't know if it's going to work if you don't try it and what are the technologies that are going to be effective and can we learn to integrate them effectively, so we have decided to go out on a limb and try it with the caveat that if it doesn't work we are going to pull back. We are not going to leave something out there isn't working (F9, 4-12).

This attitude is further expressed by a second respondent F5 (HP):

... I think that the market is requiring that universities go distance ed. because that is what the consumers want. So, whether or not they like

it, whether or not they feel self-efficacious, they are either going to acquire the skills or they are going to be increasingly marginalized. I think, to a certain extent, the very resistant professor, they are going to have less to do and become less significant, I think in the future. ...people are uncomfortable with recognizing the reality of it... there is no running away from it, they are either going to get up to snuff or they are going to be sort of pushed to the side (F5, 4-10).

On three occasions a probing question was asked... What keeps faculty members who are pressed into teaching distance education classes from leaning just the minimum to get by? F2 (HE) sums up a shared attitude with the following comment:

We have to make sure that we get good feedback from the students about the quality of the experience and have discussions, almost like if someone were not pulling their weight in the classroom, there would be a system in place to hopefully identify that person and take corrective action (F2, 4-4).

There was an overall expressed sense of wariness when it came to programs granting distance graduate degrees. Much of this may be related to attitudes held regarding the perceived reputations of for-profit programs such as the University of Phoenix which continuously spam mailboxes and are sometimes viewed as diploma factories. It sometimes became a matter of guilt by association where on-line programs are often viewed as being all the same. F7 (HE) presented the candid view of the majority of the respondents on this issue but at the same time was open minded enough to consider on-line degrees from established institutions.

... I believe that we are wary of the lesser known universities; I think that if a reputable university has an on-line degree... a reputation of producing quality instruction. ...Although, I asked another professor in the education department and she said that it is a fallacy that these on-line degrees are looked at in the same way that traditional degrees are, so I know that some faculty do not take the on-line degrees as seriously as traditional degrees (F7, 4-10).

F3 (HE) made comments that expanded on this idea in a more pragmatic manner:

I would think that they would not be as accepting of those... if we all came through traditional programs and it is very hard to visualize how that candidate for a job, how they would have the same knowledge base as you would if their program is so different than yours (F3, 4-5).

A theme that was mentioned by individuals from all three groups was the idea that graduate study was a 'rite of passage', in particular doctoral programs. As a part of traditional graduate programs, there was the perception that residency was an important component particularly at the doctorate level. The following comment by F11 (HP) illustrates this attitude:

...I would think that there is going to be a lot of negative views. I think it is the traditional thinking that you need to... it's the reasoning that you need a kind of residency.. why is that residency rule there? Until you do it, you do not realize why they have residency rules. So, how do you replace the working relationship between you and your advisor if you are not on campus? (pause) in that research group (F11, 4-13).

F11 (HP) continues:

... you know the residency is a difficult thing and it's stressful and a lot of people don't make it because of it, especially returning adults. I wasn't young when I got my graduate degree so it's often difficult, but there is a reason for it... there are advantages for the student... (F11, 4-13).

In regards to the residency issue F8 (LE) respondent illustrated some of the benefits to the university community as a justification of having on campus residency requirements:

... they (the universities) get a lot of teaching assistants and cheap labor. But educationally, I think there are reasons... (F6, 4-10).

F4 (HP) further contended that it actually may be a disadvantage for the graduate student to obtain a degree on-line:

... I've watched colleagues struggle to finish a degree because they are not there with their advisor, with their committee, working all the time (F4, 4-5).

The undercurrent of negative feelings toward graduates of distance education graduate programs is summed up by F8 (HE):

... I think that there is kind of quite bias against people who get their degrees on-line... You said not to consider University of Phoenix sort of place...so if we push them aside... there is no way one would necessarily know, if the job candidate said they did it entirely on-line, they would run the risk of maybe taken quite as seriously, but I don't think anyone would come right out in the open and say that, but I think that is might be an undercurrent for a while (F8, 4-12).

F9 (HP) took a more clinical attitude towards distance education with the following statement:

I'm fine with it, the issue that I have, if you are going to do it, you shouldn't do it lightly. The concern, I mean, design your program, invest in the program, I think that these distance education programs run the risk of being used as cash cows, in saying... Ohhh, we got to get a piece of that market share and I really think that the administration invents a way to look at it as a way to get money coming in and they can, if anything, be reluctant to really kind of design and... it's kind of like, let's get the thing up

and running first and then we'll ... if it works we'll give you...well that's not the way it works in a face to face program. You have to make it substantial and an initial commitment to it and then in time it bears fruit. I think unfortunately that urgency becomes a matter of money (F9, 4-12).

This *cash-cow* concern was voiced by several respondents and there appeared to be a kind of resistance from having distance education components forced on them from administration. Academic control emerges as an undercurrent.

F2 (HE), in retrospect took one of the more optimistic attitudes toward the future of on-line degrees with this comment:

I fully anticipate that bias, which is evident, will disappear because there will be a certain amount of cognitive dissonance when your own university is offering these programs and yet you are looking at someone else and saying 'Oh you were just distance ed.' (F2, 4-4).

Because of this answer, I probed further for more information with the following question...How do you think you could explain this bias, this quiet resistance towards

distance degrees? The response is as follows, which actually bring us back to the matter of trust:

... I think that people value very highly their own personal experiences and if someone does something different than the way they did it then it's probably not as good... I see no reason why the quality of people who go through distance education should be any different, and eventually the stigma will dissipate as they start to make their place (F2, 4-4).

One unexpected viewpoint came from two (HP) respondents who coincidentally both taught classes on-line and also were educational technology specialists at their respective universities. F11 (HP) took the following position:

...absolutely not! It is insane to think that entire programs are offered at the graduate level entirely at a distance. There are still limitations... err... things that need to be examined. Don't get me wrong, distance education is a great tool, but it is just not ready, nor are those teaching it, to assure that the quality and rigor are the same. There are many questions that need to be answered first. I have no

problem at teaching a class or so on-line, but at some point, there needs to be some kind of human interaction between student and professor (F11, 4-13).

F4 (HP) tended to mirror F11 but made the following additional observations:

... To some, all students and professors are created equal. Administration just assumes that if you can teach a class face to face, you can teach it on-line. I see professors every day taking their notes and just pasting them on-line with a few PowerPoint's and that is a class. I don't think so! There is pedagogy at teaching on-line that we are barely addressing. We have just started to explore how to perform self-assessment of our instruction at a distance (F4, 4-5).

One primary focus of this research study was to assess the perceptions of faculty members in making decisions regarding the hiring of departmental faculty, particularly those who have matriculated from distance learning graduate programs. What was found was a general reluctance to give an distance education applicant the same consideration for employment as a graduate from a more traditional program

One explanation that was offered was the newness of distance education. Education tends to be very conservative and resistant to change.

An (HE) respondent noted, as did several other respondents, that there is a general suspicion when it comes to accepting anything that falls outside the traditional range of what is thought to be graduate education. Nearly 10% of the respondents agreed that this attitude appears to be one of the key factors influencing decisions on hiring distance learning candidates in higher education. F8 (HE) noted that the profession needs time to adjust to new ideas:

Obviously the biggest issue is time... any change takes a while for people to accept. (Pause)... I am sure the doctoral program that is done as a weekend cohort is probably looked down upon by some faculty who did not work while they did their doctorate work... so there is a change that has to take place and time is certainly a factor. I believe that also that an on-line program needs to have a mix on on-line courses and on-site course... I think that would benefit and maybe help the transition (F8, 4-12).

F5 (HP) further commented:

...It's going to take time and experience with the animal. How many years ago was it that we wouldn't consider using calculators in the classroom? We didn't see the value of using computer for learning. So we have to get used to the technology first. Not all on-line instruction is created equal. I myself have taken a few on-line courses and some of there were sadly constructed, and I didn't see the value... they weren't valuable experiences. Others were extremely well constructed by somebody that knew what they were doing instead of someone who tries to just type their lectures and give quizzes on-line. Not effective (F5, 4-10).

F1 (LE) reiterated the 'time' supposition:

...It's going to take time and it's going to take experience and it's going to take a few high level leaders. It's going to take research and universities to step forward and say we can do this well and we are going to model how you can do this well. When a university with a reputation puts it out, then, you know, the smaller universities and colleges might follow along and the opinions will lag behind that.

They are going to have to see successful graduates of these programs before they are going to accept them (F1, 4-4).

F5 (HP) gave some insight as to what he/she believes needs to happen with the following statement:

That's... (pause) I think to sort of showcase them, maybe... to be sure that people have an opportunity to compete for various types of awards and funding and scholarships to kind of fully include them in the first place so that when they leave they have a resume that is very impressive. In our program... I am always pushing the idea of us encouraging the on-line students to do an optional thesis. I think people see a kind of a barrier there... as long as your going to kind of cut back or make it not, in your own program, not as fully vested, then there is going to be a risk that you are going to think of people who graduate from them less (F5, 4-10).

#### Summary of Findings

When examining both the qualitative and quantitative data in relation to the research questions, the following common themes emerge.

*Are faculty members who possess higher levels of technological levels of self-efficacy and proficiency more likely to embrace distance education than those faculty members who possess lower levels of technological levels of self-efficacy and proficiency?*

The quantitative data derived from ANOVA analysis demonstrated at  $p < .05$  a significant difference between the various efficacy/proficiency groups. The significant difference existed between Low Efficacy ( $M=1.81$ ) respondents and both High Efficacy ( $M=2.43$ ) respondents and High Proficiency ( $M=2.67$ ) respondents in regards to the acceptance of distance education as a viable method of course and program delivery. Although High Proficiency respondents were more accepting than High Efficacy respondents, the difference between the two subgroups was not significant. High Proficiency and High Efficacy respondents were significantly more accepting of distance education than were their Low Proficiency colleagues.

Qualitative analysis reflected that members of all subgroups expressed concerns regarding distance learning, but the nature of those concerns differed. High Proficiency respondents tended to focus on more internal factors related to instructor competence and motivation

to acquire requisite skills than did Low Proficiency respondents who looked for external considerations such as the lack of equipment or time, administrative shortcomings, of a lack of sufficient support.

*Do faculty members who have taught courses on-line express a greater sense of self-efficacy in regard to the use of technology than do their traditional colleagues who teach only using traditional classroom based instruction?*

The quantitative data derived from *t-test* analysis demonstrated at  $p < .05$  a significant difference between the two groups. Those who have taught at a distance expressed a significantly greater sense of technological self-efficacy and confidence ( $M=3.06$ ) than those who have not taught distance education classes ( $M=2.63$ ).

Qualitative analysis demonstrated that members of both subgroups expressed concerns regarding distance learning, but the nature of those concerns differed. In fact, the two respondents who taught distance learning classes were the most critical of granting of degrees at a distance than any of the other respondents. Assessment, faculty preparation at teaching at a distance, specialized pedagogy requirements and rigor

were some of the concerns voiced by the distance learning respondents.

*Do members of the education faculty who possess higher levels of technological self-efficacy and proficiency significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues?*

The quantitative data derived from ANOVA analysis, demonstrated at  $p < .05$  a significant difference between the various efficacy/proficiency groups. The significant difference existed between Low Efficacy ( $M=1.92$ ) respondents and both High Efficacy ( $M=2.42$ ) respondents and High Proficiency ( $M=2.71$ ) respondents in regards to attitudes toward the hiring of on-line degree graduates for tenured track positions. Although High Proficiency respondents were more accepting than the High Efficacy respondents, the difference between the two subgroups was not significant. High Proficiency and High Efficacy respondents were significantly more accepting of hiring distance education graduates than were their Low Proficiency colleagues, however, no group reached the threshold of ( $M= 3.00$ ) that would indicate a willingness to hire such individuals. The best that can be said of the results is that the High Proficiency group was just

slightly more than neutral ( $M=2.50$ ). Such results lack a strong endorsement of the hiring of distance education distance education graduates as faculty in higher education.

Qualitative analyses indicated several factors that may account for this attitude. One of the primary factors illustrated was that distance learning programs tend to fly in the face of tradition. There is a perception that distance learning is somehow a shortcut. Another factor that was mentioned was the prevalence of for profit on-line programs that are looked upon as being "diploma mills". This perception may be generalized to all distance learning programs. A final factor is the perception that graduate programs need to be built around residency components so as to develop interpersonal skills at both the departmental and university level. The perception is that without these skills, a candidate would be missing out on one of the critical ingredients found in quality graduate programs. Other factors included unanswered questions in regards to pedagogy, instructor readiness and technical competence, assessment and face-to face communication.

This chapter has presented the findings of both the quantitative data analysis form questionnaire and an examination of the semi-structured interviews. In Chapter five, how these data compare with prior research together with issues addressed in the literature will be discussed. Conclusions and implications will also be explored, including possible avenues for future study.

## CHAPTER FIVE

### CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

This chapter summarizes computer self-efficacy and proficiency and its impact upon attitudes related to the use of technology in education, the efficacy of distance education as a vehicle of graduate instruction, and the employability of graduates in higher education from distance education programs. This chapter also presents findings and makes recommendations for future research.

#### Overview of the Study

The growth of on-line instruction is continuing at a steadily increasing rate in the United States (Allen & Seaman, 2005; Allen & Seaman, 2006; Jeffries, 2006). Issues such as ease of access and convenience are often cited as explanations. Proponents are quick to identify studies such as No Significant Difference when providing evidence of the effectiveness of the programs. Yet, perceptions often challenge this alleged reality. Research has shown that the majority of faculty members give some measure of value to on-line instruction (Allen & Seaman, 2005), there is still an underlying bias that appears when it comes to actually putting attitude into practice (Carnevale, 2007). Researchers have also shown a general reluctance in the acceptance of graduates of distance

learning programs into the job market in all sectors, but this is especially true in higher education (Adams & DeFleur, 2005; Carnevale, 2007). This is even more true when there are viable applicants available for hire who have graduated from the more traditional programs (Carnevale, 2007).

The contradiction that exists between faculty members' expression of comfort with the provision of course delivery, via the Internet, and the reluctance of hiring candidates who have graduated from such programs may be directly linked to the individual's level of computer efficacy and proficiency. Research demonstrates that teachers revert and use those tools and techniques for which they possessed a personal feeling of competence and effectiveness (Bandura, 1982; Bandura 1986; Bandura 1989; Bandura 1991; Bandura 1997). Educators would also tend to avoid the use of tools for which they lacked efficacy. Further examination shows that teachers' and instructors' acceptance of computer technology is linked to their own personal impression of competence in using such devices. More importantly, there is a strong indication that the perception of the usefulness of the new skill plays an important role in their decisions. There is a constant comparison taking place between their perception of the

learning curve in mastering this new technique and the perceived outcomes (Compeau et al., 1999). A perfect example comes in the use of PowerPoint. If teachers, or faculty members, are unsure of their skills in the use of this application, and it is their perception that they can just as easily convey the required information using the chalk board, such an individual would default to what they already know; i.e. the chalkboard. Only when they could see big enough outcomes to warrant the time required in learning the new technology, would they be more inclined to learn it. An interesting dynamic is that the gained effect must be directly related to specific classroom effectiveness. Instructors may think it is wonderful that PowerPoint presentations are colorful. They may think that the idea of teaching students at a distance is a great idea for reaching more students. When it comes time for the same instructor to learn a new skill, the overwhelming considerations that are involved concern their own perception regarding the difficulty of the learning curve as it relates to the benefits to their own students and class, not necessarily the benefits to the university (Venkatesh, Morris, Davis, & Davis, 2003). University faculty members often take a very pragmatic look at new technology when considering benefits that are immediate and

personal. It is great that teaching on-line can attract more students to the university. It is great that I can teach 50 students at once instead of 30. Do I teach these students better? Is there any in teaching 50 students? Are the efforts of learning new skills able to positively affect measured student outcomes?

Researchers indicate that the answers to many of these questions depend upon the individuals perceptions of the time and energy required to acquire these new skills in relation to their perceived personal and professional benefits (Venkatesh et al., 2003). Instructors who already possess a greater level of comfort and self efficacy regarding the use of technology and computers will perceive the task as being less labor intensive and as a result, more willing to accept its usage (Compeau et al., 1999).

Faculty members' perceptions regarding the usefulness of technical skills are dependent upon their expression of self-efficacy and proficiency in the use of this technology (Olivier & Shapiro, 1993). This attitude extends to the perceived effectiveness of distance learning programs. An interesting dynamic is the conflict that often exists between external perceptions and expressions and internal perceptions and expressions. Externally, a faculty member espouses the company policy that distance learning is good

for university enrollment; distance learning provides a means for quality education for a greater number of potential students. In order to remain competitive in the current climate, the university must offer on-line programming to students. Internally, the perceptions often differ dramatically. If the instructor does not have a full understanding of the process, then there is a tendency to distrust that which is not understood. Even if the individual has been pressed into training to teach on-line courses, the level of comfort with the technology involved may tend to color internal perceptions. If faculty members who have self-efficacy issues with technology are teaching a distance education class and constantly encountering technological issues with class management, connectivity, student access, etc., they will be much more inclined to conclude that the entire system is flawed and internally develop a more negative view of the process (Compeau et al., 1999).

The remainder of this chapter will present various conclusions based upon and interpretation of the findings. An examination of the findings indicating the wide diversity that exists in regards to computer self-efficacy and proficiency among university faculty is presented. Faculty thoughts in regards to the state of technology and

its future growth higher in education is discussed, including the use of distance learning as an instructional tool in education.

#### Conclusions Based on Key Findings

Conclusions are based upon responses to survey data as well as a sample of in-depth semi structured interviews. An additional attempt to compare the results of data compiled from the survey and interviews with the literature is presented.

#### *Research Question One*

Are faculty members who possess higher levels of technological levels of self-efficacy and proficiency more likely to embrace distance education than those faculty members who possess lower levels of technological levels of self-efficacy and proficiency? While the quantifiable data indicate there is a significant difference among the various efficacy and proficiency groups, this difference is expressed differently by the interview respondents. What is clear, the level of computer understanding influences attitudes towards distance learning by virtue of what an individual actually knows, what they do not know, or what they think that they know.

Anecdotally, it is interesting to note that technological comfort levels among university faculty are

widely diverse with some individuals feeling quite comfortable with base computer tasks, while others grudgingly agree to use basic email and word processing and often delegate more intensive technical tasks to student workers or graduate assistants. This observation is one that is also supported by the data gathered.

Based upon responses in the first two sections of the survey, respondents were placed into one of three separate groups; high proficiency (HP), low efficacy (LE) and high efficacy (HE). Because of the nature of this study, it was predicted that more individuals expressing higher levels of self-efficacy or proficiency would be more inclined to participate.

As expected, a greater percentage of HP and HE respondents participated in the study (a combined total of 66 HP and HE respondents as compared to 32 LE respondents). While the numbers are encouraging in regards those faculty expressing a degree of comfort with the use of computer technology, it is hypothesized that the distribution is somewhat skewed. Potential respondents who possess low computer self-efficacy are less likely to participate despite the fact that they were given the option of completing the survey via paper and pencil.

### *Research Question Two*

Do faculty members who have taught courses on-line express a greater sense of self-efficacy in regard to the use of technology than do their traditional colleagues who teach only using traditional classroom based instruction? A clear significant difference is expressed. The vast majority of those who taught DL were in the High Proficiency group with only one falling in the Low Efficacy group. The interview revealed a low self efficacy attitude, not by virtue of what they knew, but rather, what they did not know. They expressed the concern that they were having difficulty keeping up with new innovations. Despite the fact that they felt comfortable with those tasks they currently had to do with technology, they were well aware of more that they could be doing.

There was apprehension expressed by virtually all of the interview respondents regarding factors related to distance education such as verifiable assessment and levels of instructor expertise, the majority supported the idea of limited course delivery at a distance for some courses. However, when it came to a discussion of graduate degrees

in education being offered entirely on-line, 8 out of the 12 respondents expressed opposition.

An interesting phenomenon developed when examining responses to this issue in relation to the various sub-groups based upon technical self-efficacy and proficiency. The most skeptical groups were predictably those who possessed the lowest levels of technical self-efficacy. Individuals are suspicious of a technology that they did not truly understand.

A theme that occurred in a majority of the responses related to the issue of rigor. It was stated that distance programs lacked research intensity, potential for meaningful communication and a missing element of university culture from which traditional students would benefit.

The group that was most accepting of the awarding of graduate degrees at a distance comprised those individuals who existed in the middle group of high efficacy, but not high proficiency. This group was able to see the potential advantages that technology could bring to the field of education and appeared eager to explore its potential to a greater level, including the development of distance education programs for graduate study. While more accepting, this group of respondents tended to agree that

it would be preferred that a residency component be included, even if it were for just a summer session. While they did identify issues such as the potential for contract cheating, "...the submission of work by students for academic credit which the students have paid contractors to write for them" (Clarke & Lancaster, 2007, p.1). It was thought that safeguards could be developed to minimize this possibility. Another concern that was voiced surrounded the aspect of verifiable assessment and developing meaningful assessment tools for distance learning environments. It was felt that assessment is an obstacle because the student could not be seen.

The High Proficiency group produced some of the most intense attitudes towards the awarding of full graduate degrees at a distance. A majority of the individuals in this group were also technology instructors in their various departments and were veteran distance educators. Their emphasis was on doing distance education correctly. A common theme voiced by 50% of the respondents was concerning the state of distance education as not yet ready to offer high quality programs. They identified two elements of distance instruction as obstacles such as faculty competence and infrastructure preparedness. The first element is that many education faculty members are

more than qualified in the content areas of their respected disciplines. However, the expertise necessary to take full advantage of the technical tools is often lacking. Once universities begin pressing traditional classroom instructors into teaching on-line classes, there is a danger of poorly designed and implemented instruction.

... Administration just assumes that if you can teach a class face to face, you can teach it on-line. I see professors every day taking their notes and just pasting them on-line with a few Power Points and that is a class. (F4, 4-5)

The second element involves the state of the Internet infrastructure. Because there are large pockets of the World Wide Web (WWW) that operate at different levels of efficiency, there is a concern that much of the content may not be equally accessible to all individuals. Slow connection speeds and Internet congestion are some of the situations that a trained distance instructor must consider when planning a course. In addition to this situation is the issue of software compatibility.

... this year Microsoft VISTA and Internet Explorer7 were thrust upon the world. Many of the functions of web-based classes were inaccessible. There was a several month lag. We have Macs, we have PC's, we

have Linux. These all pose problems to the student and as a result to the instructor. Can you imagine an instructor who has only been trained to address minor difficulties trying to address all these problems via chat or on a phone call? Help desks are usually closed when instructors and students need them... they are on their own... (F10, 4-12)

High Proficiency respondents understand the limitations that currently exist in distance learning. In that other forms of distance learning are available utilizing video and advanced telecommunications, the WWW appears to be the vehicle of choice for now.

### *Research Question Three*

Do members of the education faculty who possess higher levels of technological self-efficacy and proficiency significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues? Again, in both the quantifiable data and the qualitative data, a significant difference emerged. What is unexpected is the nature of that difference with both High Efficacy participants and Low Efficacy participants being the most critical or suspicious. It was those who expressed a level of High Efficacy, but not High Proficiency who appeared to be the

most open minded expressing only that they and the profession needed time to adjust to the changing landscape of higher education.

As presented in the review of literature, there is a reluctance to hire individuals who have graduated from distance education programs when more traditional candidates are available (Carnevale, 2007). This resistance is even stronger when it comes to the hiring of university faculty (Adams, Nelson & Todd, 1992; Adams & DeFleur, 2005; Adams & DeFleur, 2006; Carnevale, 2007)

While the High Efficacy group expressed a greater level of acceptance when it came to hiring DL faculty, there was an admission that such graduates would have a hard time in securing such a position. In one case, it was explained that a faculty member had been accepted by the departmental faculty but had been eliminated by the provost of the university:

... it is interesting that you ask that question. This university is very active in offering Masters level degrees on-line. We had a candidate last year who had applied to teach almost exclusively on-line in our Masters of Education program. It was a long review, and in the end, the faculty voted to hire him. We felt that his qualifications (graduate of an

on-line doctoral program) make him uniquely qualified. He had a great deal of classroom experience in the public sector and it was decided to give him a chance. When our recommendation was sent to the provost, he was categorically denied. The reason that was given to the department was that his degree was unacceptable (F3, 4-5).

One other concern that was voiced on various occasions involved the inexperience with the university culture. One key element that faculty members and administrators look for in a candidate is the ability to function as a member of an academic department. It is preferred that a candidate actually have some teaching experience at the college level, but lacking that, should possess a history of in-person interaction skills with departmental faculty. It is anticipated that face-to-face classes would give instructors and students that kind of valuable experience.

A reoccurring theme concerned the matter of time. It was stated that while the world keeps moving very fast, higher education tends to be more deliberate in what it embraces. There is a tradition to higher education and the manner in which one receives acceptance into the profession. There is a strong reluctance to change those traditions which are based on time tested experiences. It

was expressed that on-line degrees may be just too much of a possible shortcut.

#### Implications of the Findings

When this study began, there was an attempt simply to investigate attitudes towards technology and distance learning through the lens of computer self-efficacy and proficiency. What has developed is a complex set of issues that continue to face universities, administrators, and department faculty concerning the next potential evolution in the state of education. The rapid advancement of technology, the shrinking global community, and the highly competitive business of higher education are all factors that are driving these changes. As with all change, there are risks, but in the case of the training of the next generation of educators, these risks cannot be taken lightly. The one aspect that must be considered at the forefront is a line from a very wise instructor who asked the question "In whose interest?" (V. Helterbran, personal communication, June, 2006). As educators, this must be the primary consideration.

I begin to see a moral dilemma developing for universities as they begin to venture into the awarding of advanced degrees, at a distance. The essential question must be if the institution is going to grant advanced

degrees and in some cases terminal degrees, at a distance and at the same time not respect these degrees in their own hiring practices, are they misrepresenting the degree in the first place?

What makes this question so difficult is the fact that there are many students who can access advanced education who would have been excluded with traditional residential programs. There is a market that cannot be ignored. Many universities resort to a highly controversial practice of hiding the manner in which a degree was granted on their transcripts (Adams & DeFleur, 2006). A majority of the individuals who participated in the interview process found this practice to be unacceptable and expressed the idea that it is the right of the potential employer to know how the degree was obtained.

Due to the contradictory nature regarding attitudes expressed towards the hiring of distance learning graduates in higher education, several issues must be examined:

1. If graduate and terminal degrees are to be granted at a distance, should universities be required to explain to potential students the status of the higher education attitudes (both actual and implied) toward the hiring of DL graduates?

2. If universities profit from the added business that DL brings, should it not be required to invest a large portion of those dollars into the training and compensation of current faculty, recruitment of technologically competent faculty with DL experience, and provide public education of both the benefits and shortcomings of on-line programs?
3. Considering the expansion of on-line programs, both public and private, should there not be an independent certifying body established to provide licensure for such programs with oversight and input from representative faculty?

#### Recommendations for Future Research

Future studies should expand this investigation to a national sample of universities grouped by ranking, including one category defined as private, for-profit online only universities. The data gathered could then be cross-referenced to identify trends in not only self-efficacy issues with education faculty members at the various university levels, but also attitudes towards distance learning and the hiring of distance graduates.

Studies should include investigations regarding faculty attitudes regarding the blended hybrid use of technology. Based upon the responses generated in this

study, one may anticipate that blended programs may be more accepted than pure distance learning programs.

As much of the previous research has focused upon the examination of potential significant differences that may exist in regards to outcomes between traditional and distance learning programs, there is now a need to also expand that research into some of the more intangibles that may exist. An analysis of the pedagogical methods employed in DL course instruction is in need of closer examination. If the assumption that distance education is a fact of life and is here to stay, it is incumbent upon researchers to establish meaningful research leading to recommendations as to the most effective use of this medium. Just because one can do something does not necessarily mean that one should. Future research may indicate that there is a need for a total paradigm shift in educational thinking when it comes to the Distance Learner. There also needs to be a revisiting of research to the distance learner themselves. There may be a tendency, when you cannot see your student, to provide generic instruction. The tools that technology brings to the field need to be qualified and used effectively. Studies need to be conducted to examine the effectiveness of such tools, not only on-line, but in the traditional classroom as well.

## Technology Trends in Higher Education

The growth of on-line instruction among today's public and private institutions on higher education is astounding. Nearly 3.2 million students were taking at least one on-line course during the fall 2005 (over 2.3 million reported the previous year) (Allen & Seaman, 2005). The factors that contribute to this growth include accessibility, a cultural change in educational makeup of today's college students, competition pressures that exist between commercial virtual colleges and universities and public and private institutions, and customer demand (Littman, 2002). The final factor is the most disturbing. As universities become more focuses on quest for the elusive dollar, there is a growing disconnection between theory and practice. In the business office, it may make sense to broaden the customer base. More students equate to more financial resources for the institution. Virtual students mean that there is less of a need to spend resources on new classroom building and dormitories (Allen & Seaman, 2005).

From the instructor's point of view, the issue may not be as clear cut as it appears to be to the business office. In distance classrooms, instructors may be asked to teach a greater and greater number of students without a corresponding increase in compensation. In the traditional

classroom, one is limited by space and the number of seats. In the virtual classroom, this limitation becomes meaningless. With larger and larger populations of students to teach virtually, it may only be natural that instructors will resort to more automated systems of assessment. During the course of the interviews, assessment was one of the foremost concerns of the respondents. As college faculty begin to rely more and more on the automated tools found in most distance education shells such as WebCT® and BlackBoard®, there is a tendency to primarily use true/false and multiple choice forms of assessment, particularly if distance learning class sizes grow to unmanageable numbers.

While there seems to be a great deal of anticipation and enthusiasm among many of the respondents in regards to distance education, there is also the hint of apprehension, as well. As one respondent explained it in the interview session...

It really doesn't matter. Distance education is here to stay. It is an economic reality and some may say a necessity to be competitive. The question that must be answered... how are we going to make it effective and useful for our students?

(F5, 4-10)

### *Distance Learning as an Instructional Tool*

Allen and Seaman (2005, p.3) highlighted various reported strengths and weaknesses associate with distance learning:

#### Advantages of On-line Education

- Save commuting time and expenses
- Some employers view distance learners as self-motivated and independent
- Those that already have a job have the opportunity to 'learn while you earn'
- Easy to find "hard to find" classes
- Convenient and flexible
- Allows interaction with students from around the country

#### Disadvantages of On-line Education:

- No live face to face contact with instructor/professor.
- Requires motivated and hardworking students.
- Requires discipline to work independently.
- Basic understanding of technology is required.

During the course of the interviews, respondents mirrored many of the items listed above. Particularly mentioned were issues of convenience, flexibility, the ability to continue gainful employment while going to

school, and cost and time savings from commuting. The primary negative impressions that were mentioned included instructor contact, technological issues and one that did not appear in the Sloan list, the experience of the university culture.

The majority of the respondents agreed that courses offered at a distance may be practical and even useful; there were still some issues that cause some hesitancy and reservation. Less than 30% of the interview participants were comfortable with the notion that an individual could earn an entire degree at a distance. This number improved about 10% when there was some sort of residency requirement included in the program. Reservations, however, manifested themselves more intensely when the discussion continued into greater detail. Over 86% of the responses expressed concerns or apprehensions with various components of distance education courses. These apprehensions fell into two categories: Those that did not know enough about the technology and were, therefore, apprehensive about endorsing it fully, and those that were well informed about the technology and were well aware of various pitfalls that may exist in the hands of the inexperienced on-line instructor.

One of the basic themes that emerge includes the need for more training and support for those preparing and those teaching courses at a distance. This support is not only limited to training, but also tied to incentives and enhanced compensation. This continual call for training and support further implies the connection between technical self-efficacy and acceptance of the distance learning model. There is a difference noted in regards to the impetus of the support required based upon a respondents level of proficiency. The majority of the (HP) respondents placed the responsibility of acquiring support in the hands of the individual faculty member. They expressed that, as an academic, a faculty member who was assigned a distance education class had the responsibility to seek out the support that the university offers. It is asserted by the (HP) group that most faculty fail to take advantage of what training and support already exists.

(HE) and (LE) faculty tend to counter this argument with assertions that the trainings are inaccessible because of scheduling and the instructors already "have enough on their plate" (F9, 4-12). These respondents advocate release time and/or financial compensation for their efforts. One respondent offered a third alternative. Faculty members are often reluctant to admit to their peers

that they lack certain technological skills. They may make the assertion publically among departmental friends, but "to attend a training group and be embarrassed before academic strangers is difficult for them to endure" (F9, 4-12).

#### Final Thought

Bandura (1986) points out that how people feel about their effectiveness in any task affects both their attitudes and behavior towards that task. He further points out that teachers (faculty members) who do not feel comfortable with a particular pedagogy approach will often avoid the approach in their classrooms and in their own attitudes begin to devalue that approach. It is this researcher's supposition that it may be easier for some to blame the method rather than examining those personal issues one may have with the implementation of the method. In other words, issues of personal self-efficacy. This is not minimized by the fact that there appear to be significant discussions taking place regarding potential shortcomings of the method itself.

As many interview respondents stated, time is required to change attitudes. During this time, (1) training and education of educators, administrators, and the public in the new methodology must take place, (2) appropriate

compensation and incentives must be offered for participation in computer aided instructional design and implementation training, and finally (3) time to observe consistent research based outcomes which support this new method.

The changes in technology have been extremely rapid. Just thirty years ago there was no Internet, no powerful desktop computers, and no fiber optic communication networks. Higher education faculty, for the most part, taught in the age old manner of their predecessors. During the tenure of many university professionals, changes have occurred in rapid succession creating a sense of cognitive and professional vertigo in many. One can be assured, for good or bad, this ride is just beginning.

## References

- Adams, D. A., Nelson, R. R., & Todd, P. A. (1992). Perceived usefulness, ease of use, and usage of information technology: A replication. *MIS Quarterly*, 16(2), 227-247.
- Adams, J. & DeFleur, M., (2005). The acceptability of a doctoral degree earned on-line as a credential for obtaining a faculty position. *The American Journal of Distance Education*, 19(2), 71-85.
- Adams, J. & DeFleur, M., (2006). The acceptability of on-line degrees as a credential for obtaining professional employment. *Communication Education*. 55(1), 32-45.
- Agarwal, R & Prasad, J. (1999). Are individual differences germane to accepting of new information technologies? *Decision Sciences*, 30(2), 361-391.
- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Process*, 50, 179-211
- Ajzen, I. & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

- Allen, E., & Seaman, J. (2006). *Making the Grade: Online Education in the United States*. Babson Survey Research Group, Sloan Consortium: Needham, MA.
- Allen, E., & Seaman, J. (2005). *Growing by degrees: On-line education in the United States*, Babson Survey Research Group, Sloan Consortium: Needham, MA.
- Baer, W. S. (2000). Competition and collaboration in on-line distance learning. *Information, Communication and Society*, 3(4), 457-473.
- Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist*, 37(2), 1122-1147.
- Bandura, A. (1986). *Social foundations of thought and action: A social theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44(9), 1175-1184.
- Bandura, A. (1991). Social Cognitive Theory of self-regulation. *Organizational Behavior and Human Decision Processes*, 50, 248-287.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.
- Berg, Z. L., & Collins, M. P. (Eds.). (1995). *Computer-mediated communication and the on-line classroom* (Vol. 1, II, III). Cresskill, NJ: Hampton Press Inc.

- Bonk, C.J. (2002). *Online teaching in an online world* (executive summary), *USDLA Journal*, Vol. 16, No. 3, March 2002, Retrieved October 12, 2005, from [http://WWW.usdla.org/html/journal/MAR02\\_Issue/article02.html](http://WWW.usdla.org/html/journal/MAR02_Issue/article02.html).
- Brown, B. L. (2000). *Web-based training*, ERIC Digest No. 218. Columbus OH.: Eric Clearinghouse on Adult Career and Vocational Education.
- Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Boston: Houghton Mifflin.
- Canning, R. (2002). Distance or dis-tancing education? A case study in technology based learning. *Journal of Further and Higher Education*, 26(1), 29-43.
- Carey, J., Chisholm, I.M., & Irwin, L. H. (n.d.). (2000). *The impact of access on perceptions and attitudes towards computers: An international study*. Retrieved on July 15,2006, from [http://WWW.ed.psu.edu/acsde/deos/deosnews/deosnews11\\_9.asp](http://WWW.ed.psu.edu/acsde/deos/deosnews/deosnews11_9.asp)
- Carnevale, D. (2007). Employers often distrust on-line degrees. *The Chronicle of Higher Education*, 18, A28.

- Childs, G. B. (1973). *Correspondence study: Concepts and comments*, Meeting of the National University Extension Association. Omaha, NE.
- Clark, R., Lancaster, T. (2007). *Eliminating the successor to plagiarism? Identifying the usage of contract cheating sites*. Retrieved on August 15, 2007, from <http://dev.northumbrialearning.co.uk/documents/papers/2006Papers05.doc>
- Coldeway, D. O. (1986). Recent research in distance learning. In J. S. Daniel, M. A. Stroud, & J. R. Thompson, *Learning at a distance: A world perspective*, 29-37. Edmonton: Athabasca University.
- Compeau, D., Higgins, C.A., & Huff, S. (1999). Social Cognitive Theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly*, 23(2), 145-158.
- Cook, T. D., & Campbell, D. T. (1979). *Quasi-experimentation: Design & analysis for field settings*. Chicago: Rand McNally.
- Davis, F.D. (1986). *A technology acceptance model for empirically testing new end-use information systems: Theory and results*. Unpublished doctoral dissertation, Massachusetts Institute of Technology, Cambridge, MA.

- Davis, F.D., Bagozzi, R.P, Warshaw, P.R., (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982-1003.
- Davis, F.D., Bagozzi, R.P, Warshaw, P.R., (1992). Extrinsic and Intrinsic Motivation to Use Computers in the Workplace, *Journal of Applied Social Psychology*, 22(14), 111-132.
- Downes, S. (2003). Design and reusability of learning objects in an academic context: A new economy of education? *USDLA Journal: A Refereed Journal of the United States Distance Learning Association*, 17(1). Retrieved October 15, 2006, from [http://WWW.usdla.org/html/journal/JAN03\\_Issue/article01.html](http://WWW.usdla.org/html/journal/JAN03_Issue/article01.html)
- Eden, D. (2001). Means efficacy: External sources of general and specific efficacy. In M. Erez & U. Kleinbeck (Eds.), *Work motivation in the context of a globalizing economy*, 73-85. Mahwah, NJ: Lawrence Erlbaum.
- Faseyitan, S., Libii J. N, & Hirschbuhl, J. (1996). An in-service model for enhancing faculty computer self-efficacy. *British Journal of Educational Technology*, 27, 214-216.

- Feasley, C. (1991). *Does evaluation = research lite?* Second American Symposium on Research in Distance Education. University Park, PA: Pennsylvania State University.18
- Frick, T. W. (1991). *Restructuring education through technology*. Fastback, 326. Bloomington, Ind.: Phi Delta Kappa Educational Foundation.
- Gerrity, T. W. (1976). *College-sponsored correspondence instruction in the United States: A comparative history of its origin (1873-1915) and its recent development (1960-1975)*. Unpublished Dissertation, Teachers College, Columbia University, New York.
- Gilmore, E. (1998). *Impact of Training on the Information Technology Attitudes of University Faculty*. Unpublished Dissertation, University of North Texas, Denton.
- Gist, M.E. & Mitchell, T.R. (1992). Self-efficacy: A theoretical analysis of its determinants and malleability. *Academy of Management Review*, 17(2), 183-211.
- Glahn, R., & Gen, R. (2002). Progenies in education: The evolution of Internet teaching. *Community College Journal of Research & Practice*, 26(10), 777-786.

- Gorski, S. (1994). Credits by cable: The mind extension university. *Educom Review*, 29(6), Retrieved March 11, 2006, from <http://WWW.educause.edu/pub/er/review/reviewArticles/29626.html>
- Green, K. (2001). Distance learning: lessons from the early years. *Converge*, 4(10), 60-62.
- Guskey, T. R. (1987). Rethinking Mastery Learning Reconsidered *Review of Educational Research*, 57(2), 225-229.
- Hall, T., Strangman, N., & Meyer, A. (2005). *Differentiated instruction and implications for UDL implementation*. NCAC (National Center on Accessing the General Curriculum).
- Higher Education Program and Policy Council (2000). *Distance education: Guidelines for good practice*: American Federation of Teachers - Higher Education Department. Retrieved on July 14, 2006, from [http://WWW.aft.org/pubs-reports/higher\\_ed/distance.pdf](http://WWW.aft.org/pubs-reports/higher_ed/distance.pdf)
- Hoffman, B. (1996). Distance education: The elusive definition. *The Distance Educator*, (1), Retrieved March 11, 2006, from [http://WWW.coe.uh.edu/insite/elec\\_pub/html1996/01divers.htm](http://WWW.coe.uh.edu/insite/elec_pub/html1996/01divers.htm)

- Igbaria, M. and Iivari, J. (1995). The effects of self-efficacy on computer usage, *Omega International Journal of Management Science*, 23(6), 587--605.
- Jeffries, M, (2006), *Research in distance education*. Retrieved February 1, 2006, from [http://WWW.digitalschool.net/edu/DL\\_history\\_mJeffries.html](http://WWW.digitalschool.net/edu/DL_history_mJeffries.html)
- Joy, E. H. & Garcia, F. E. (2000) Measuring learning effectiveness: A new look at no-significant-difference findings." *Journal of Asynchronous Learning Networks*, 4(1), 33-39.
- Juwan, C. (2003). Using peer assessment to develop skills and capacities [Electronic Version]. *USDLA Journal*, 17. Retrieved on December 12, 2005, from [http://WWW.usdla.org/html/journal/JAN03\\_Issue/article04.html](http://WWW.usdla.org/html/journal/JAN03_Issue/article04.html).
- Kelley, H. (2001) *Attributional analysis of computer self-efficacy*. Unpublished doctoral dissertation, The University of Western Ontario, London, Ontario.
- Kinzie, M. B., Delcourt, M. A. B., & Powers, S. M. (1994). Computer technologies: Attitudes and self-efficacy across undergraduate disciplines. *Research in Higher Education*, 35(6), 745-768.

- Lee, J. (2001) Instructional support for distance education and faculty motivation, commitment, satisfaction. *British Journal of Educational Technology* 32 (2), 153-160.
- Littman, M. (2002). Distance ed. instructors aren't born, they are made, then they are quality controlled: Is this any way to run a university? *University Business* (September 2002).
- Lockee, B., Moore, M., & Burton, J. (2001) Old concerns with new distance education research. *EDUCAUSE Quarterly*, 24(2): 60-62.
- Marcinkiewicz, H. R. (1994). Computers and teachers: Factors influencing computer use in the classroom. *Journal of Research on Computing in Education*, 26(2), 220-237.
- Mathieson, K. (1991). Predicting user intention: Comparing the Technology Acceptance Model with the Theory of Planned Behavior. *Information Systems research*, 2, 171-191.
- Mathieson, K., Peacock, E., & Chin, W. (2001). Extending the Technology Acceptance Model: The influence of perceived user resources. *The Database for Advances in Information Systems*, 32(3), 86-112.

- Merisotis, J. P., & Phipps, R. A. (1999). *What's the difference?(college-level distance and classroom-based education)*. Washington D.C.: Heldref Publications.
- Montell, G. (2003). Battling the stigma of nontraditional credentials [Electronic Version]. *The Chronicle of Higher Education: Chronicle Careers*. Retrieved November, 12, 2006, from <http://chronicle.com/jobs/2003/08/2003080601c.htm>.
- Moore, M.G. (1990). Background and overview of contemporary American distance education. In M. Moore (Ed.), *Contemporary Issues in American Distance Education* , New York : Pergamon.
- Moore, M.G. & Shattuck, K. (2001). *Glossary of distance education terms*. Penn State World Campus-Faculty Resources. Retrieve July 14, 2006, from <https://courses.worldcampus.psu.edu/public/faculty/DEGlossary.shtml>.
- Morabito, M. G. (1999). *On-line distance education: Historical perspective and practical application*. Universal Publishers/uPUBLISH.com.

- Nasseh, B. (2004). *Internet-generation & adult learners will create major challenges for higher education institutions in the 21st century*. Retrieved October 14, 2005, from <http://WWW.bsu.edu/classes/nasseh/study/learners.html>
- Olivier, T.A. & Shapiro, F. (1993). Self-efficacy and computers. *Journal of Computer -based Instruction*. 20(3), 81-85.
- Phipps, R. & Merisotis, J. (1999) *What's the Difference? A Review of Contemporary Research on the Effectiveness of Distance Learning in Higher Education*. The Institute for Higher Education Policy, Washington, D.C.
- Rendon, M. E. (2001). *Pitfalls and Success of Distance Learning*. (Paper presented at the National Institute for Staff and Organizational Development (NISOD) Conference (Austin, TX, May 27-30, 2001). (ERIC Document Reproduction Service No. ED 464 (699)
- Rosenfeld, G. (2005). *A comparison of the outcomes of distance learning students versus traditional classroom students in the community college*. Unpublished Dissertation, Florida Atlantic University, Boca Raton, Fl.

- Russell, T. L. (1999). *The no significant difference phenomenon*. Raleigh, NC: North Carolina State University.
- Saba, F. (2000). *Research in distance education: A status report*. *International Review of Research in Open and Distance Learning*, 1(1), 1-9.
- Shearer, R. (2002). *No significant difference and distance education*. Retrieved on July 1, 2006, from <http://WWW.distance-educator.com/elearning/modules.php?op=modload&name=News&file=article&sid=7507&mode=thread&order=0&thold=0>
- Smylie, M.A. (1990). Teacher efficacy at work. In P. Reyes (Ed.), *Teachers and Their Workplace*. (pp. 48-66). Newbury Park: Sage.
- Staples, S., Hullman, J.S., & Higgins, C. (1999). A self-efficacy theory explanation for the management of remote workers in virtual organizations. *Organizational Science*, 10(6), 758-777.
- Taylor, S. & Todd, P.A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, 6, 144-176.
- Ticknor, A. E. (1891). A precursor of university extension. *Book News*, pp. 351-352.

- Twigg, C. A. (2001) *Innovations in On-line Learning: Moving Beyond No Significant Difference*. The Pew Symposia in Learning and Technology 2001. Center for Academic Transformation at Rensselaer Polytechnic Institute, Troy, NY.
- Valentine, D. (2002). *Distance learning: Promises, problems and possibilities*. Retrieved on October 17, 2003, from <http://WWW.westga.edu/~distance/ojdla/fall53/valentine53.html>.
- Venkatesh, V. & Davis, F.D. (1996). A model of antecedents of perceived ease of use: Development and test. *Decision Sciences*, 27(3), 451-480.
- Venkatesh, V., Morris, M., Davis, G., & Davis, F (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425-478.
- Watkins, B. L. (1991). A quite radical idea: The invention and elaboration of collegiate correspondence study. In B. L. Watkins & s. J. Wright (eds.). *The foundations of American distance education: A century of collegiate correspondence study*, 1-35.
- Willis, B., & Dickinson J. (1997). Distance education and the world wide web. In H. H. Badrul (Ed.), *Web-based instruction*. Englewood Cliffs. NJ: Educational Technology Publication.

- Wilson, G. (2004). Online interaction impacts on learning: Teaching the teachers to teach online. *Australasian Journal of Educational Technology*, 20(1), 33-48.
- Won K., (2003). Distance education: The status and challenges. *Journal of Object Technology*, 2(6), 35-43.
- Wood, R. & Bandura, A. (1989). Social Cognitive Theory of organizational management, *Academy of Management Review*, 14(3), 361-384.
- Yi, M.Y. & Davis, F.D. (2003). Developing and validating an observational learning model of computer software training and skill acquisition. *Information Systems Research*, 14(2), 146-169.

## APPENDICIES

Appendix A

FACULTY ATTITUDES TOWARD INFORMATION TECHNOLOGY (FAIT)

## Survey of Faculty Attitudes Toward Information Technology

The purpose of this survey is to gather general information concerning knowledge of and attitudes toward information technology.

1. Age:  21-24  25-29  30-34  35-39  40-44  45-49  50-54  55+
2. Education:  Bachelors degree  Master's degree  Doctorate or professional degree
3. Gender:  Male  Female
4. Do you own a computer at home:  Yes  No
5. How often do you use a computer?  
 Daily  Once a week  Once a month  Never
6. How often do you use a word processor (Microsoft Word, Word Perfect, etc)?  
 Daily  Once a week  Once a month  Never
7. How often do you use a spreadsheet program (Microsoft Excel, Lotus 123, etc)?  
 Daily  Once a week  Once a month  Never
8. How often do you use a presentation program (Microsoft Power Point, Freelance Graphics, etc)?  
 Daily  Once a week  Once a month  Never
9. How often do you use electronic mail (e-mail)?  
 Daily  Once a week  Once a month  Never
10. How often do you use the Internet?  
 Daily  Once a week  Once a month  Never
11. Have you ever received any type of computer training?  Yes  No
12. Where did you receive your training (check all that apply)?  
 Self taught  Computer store  College or University  other  
(specify:)

13. Are you \_\_\_\_\_ part-time or \_\_\_\_\_ full-time faculty?  
 14. How long have you been teaching at the University level? \_\_\_\_\_

15. Department: \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_

(Please Print)

Instructions: Please read each statement and then circle the number which best shows how you feel.

	1	2	3	4	5			
	D=Strongly Disagree	D=Disagree	U=Undecided	A=Agree	SA=Strongly Agree			
				SD	D	U	A	SA
1	I think that working with computers would be enjoyable and stimulating.			1	2	3	4	5
2	I want to learn a lot about computers.			1	2	3	4	5
3	The challenge of learning about computers is exciting.			1	2	3	4	5
4	Learning about computers is boring to me.			1	2	3	4	5
5	I like learning on a computer			1	2	3	4	5
6	I enjoy learning how computers are used in our daily lives.			1	2	3	4	5
7	I would like to learn more about computers.			1	2	3	4	5
8	I would like working with computers.			1	2	3	4	5
9	A job using computers would be very interesting.			1	2	3	4	5
10	I enjoy computer work.			1	2	3	4	5
11	I will use a computer as soon as possible.			1	2	3	4	5
12	Figuring out computer problems does not appeal to me.			1	2	3	4	5
13	If given the opportunity, I would like to learn about and use computers.			1	2	3	4	5
14	Computers are not exciting.			1	2	3	4	5

15	Computer lessons are a favorite subject for me.	1	2	3	4	5
16	I get a sinking feeling when I think of trying to use a computer.	1	2	3	4	5
17	Working with a computer makes me feel tense and uncomfortable.	1	2	3	4	5
18	Working with a computer would make me very nervous.	1	2	3	4	5
19	Computers intimidate and threaten me.	1	2	3	4	5
20	Computers frustrate me.	1	2	3	4	5
21	I have a lot of self-confidence when it comes to working with computers.	1	2	3	4	5
22	I sometimes get nervous just thinking about computers.	1	2	3	4	5
23	A computer test would scare me.	1	2	3	4	5
24	I feel apprehensive about using a computer.	1	2	3	4	5

1	2	3	4	5
D=Strongly Disagree	D=Disagree	U=Undecided	A=Agree	SA=Strongly Agree

		SD	D	U	A	SA
25	Computers are a tool much like a hammer or lathe.	1	2	3	4	5
26	Computers could enhance remedial instruction.	1	2	3	4	5
27	Computers will relieve teachers of routine duties.	1	2	3	4	5
28	Computers can be used successfully with courses which demand creative activities.	1	2	3	4	5
29	I have become familiar with computers through my previous experience.	1	2	3	4	5
30	High school students should understand the role computers play in society	1	2	3	4	5
31	High school students should have some understanding about computers.	1	2	3	4	5
32	I feel qualified to teach computer literacy	1	2	3	4	5

33	Computers can be a useful instructional aid in almost all subject areas.	1	2	3	4	5
34	Use of computers in education almost always reduces the personal treatment of students.	1	2	3	4	5
35	I feel at ease when I am around computers.	1	2	3	4	5
36	I feel comfortable when a conversation turns to computers.	1	2	3	4	5
37	Teacher training should include instructional applications of computers.	1	2	3	4	5
38	Computers would motivate students.	1	2	3	4	5
39	Computers would significantly improve the overall quality of my students' education.	1	2	3	4	5
40	Computers would help students improve their writing.	1	2	3	4	5
41	Computers would stimulate creativity in students.	1	2	3	4	5
42	Computers would help students work with one another.	1	2	3	4	5
43	Computers would help me organize my work.	1	2	3	4	5
44	Computers would increase my productivity.	1	2	3	4	5
45	Computers would save me time.	1	2	3	4	5
46	Computers would help me learn.	1	2	3	4	5
47	Computers would help me organize my finances.	1	2	3	4	5
48	Computers solve more problems than they cause.	1	2	3	4	5

1	2	3	4	5
D=Strongly Disagree	D=Disagree	U=Undecided	A=Agree	SA=Strongly Agree

		SD	D	U	A	SA
49	I will probably never learn to use a computer.	1	2	3	4	5
50	I see the computer as something I will rarely use in my daily life as an adult.	1	2	3	4	5
51	Not many people can use computers.	1	2	3	4	5

52	Learning to operate computers is like learning any new skill - the more you practice, the better you become.	1	2	3	4	5
53	Knowing how to use computers is a worthwhile skill.	1	2	3	4	5
54	I do not think that I could handle a computer course.	1	2	3	4	5
55	I would never take a job where I had to work with computers.	1	2	3	4	5
56	If given the opportunity, I would like to learn about and use computers.	1	2	3	4	5
57	You have to be a "brain" to work with computers.	1	2	3	4	5
58	The use of e-mail makes the student feel more involved.	1	2	3	4	5
59	The use of e-mail helps provide a better learning experience.	1	2	3	4	5
60	The use of e-mail makes the course more interesting.	1	2	3	4	5
61	The use of e-mail helps the student to learn more.	1	2	3	4	5
62	The use of e-mail increases motivation for the course.	1	2	3	4	5
63	More courses should use e-mail to disseminate class information and assignments.	1	2	3	4	5
64	The use of e-mail creates more interaction between students enrolled in the course.	1	2	3	4	5
65	The use of e-mail creates more interaction between student and instructor.	1	2	3	4	5
66	E-mail provides better access to the instructor.	1	2	3	4	5
67	E-mail is an effective means of disseminating class information and assignments.	1	2	3	4	5
68	I prefer e-mail to traditional class handouts as an information disseminator.	1	2	3	4	5

Please make any comments:  
Thank You!

Appendix B

PERMISSION TO ADAPT FAIT

**From:** Rhonda R Christensen [rchris@coe.unt.edu]  
**Sent:** Friday March 3, 2006 1:12 PM  
**To:** l.s.tinnerman@iup.edu  
**Subject:** Use of FAIT &/or TAT instruments in dissertation

Good afternoon Mr. Tinnerman,

I am flattered that you wish to use all of, or parts of my survey instruments in your dissertation. You certainly have my permission. You will need to contact Elizabeth Gillmore (e\_gilmore@hotmail.com) and Gerald Knezek (knezek@unt.edu) to obtain their permission as well. They aided in the development of the instruments. Best of luck on your research, and please keep me informed of your findings.

---

**From:** Elizabeth Gilmore [e\_gilmore@hotmail.com]  
**Sent:** Monday March 6, 2006 10:12 AM  
**To:** l.s.tinnerman@iup.edu  
**Subject:** Use of surveys

Hello Larry,

Your topic sounds very interesting. Please, by all means, you can use the surveys. Also, feel free to adapt them as you see fit. I would be very interested in hearing your results. Best of luck.

Elizabeth

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**From:** Gerald Knezek[knezek@unt.edu]  
**Sent:** Monday March 6, 2006 3:00 PM  
**To:** l.s.tinnerman@iup.edu  
**Subject:** FAIT & TAT

Hello Larry,

You are more than most welcome to use the survey instruments in your study. I was speaking to Rhonda today, and your study seems quite timely. Please keep us informed of your results.

Dr. Gerald Knezek  
knezek@unt.edu

Appendix C  
ADAPTED SURVEY INSTRUMENT

**Voluntary Consent Statement:**

I understand that participation in this study is voluntary. I further understand that collected data will not be officially linked to any specific faculty member or university. I give my consent by virtue of completing and submitting this survey.

Please rate the following statements using the following scale:

- 1 – I cannot do this
- 2 – I could do this with some assistance
- 3 – I can do this on my own
- 4 – I can teach others to do this

1. Design a webpage with embedded links.
2. Save PowerPoint presentations as WebPages.
3. Create online course components for online shells such as WebCt, Blackboard, e-College, etc.
4. Create an email distribution list.
5. Create an Adobe PDF file.

Please indicate your level of agreement with the following statements using the following scale:

- 1 - I Strongly Disagree
- 2 - I Disagree
- 3 - I agree
- 4 - I Strongly Agree

6. I use computer technology regularly in my classroom instruction.
7. I like using computers.
8. Computers in the classroom have helped me improve my teaching.
9. I sometimes feel professionally threatened by the rapid changes occurring in technology.
10. I feel prepared to instruct my students on how to successfully implement meaningful technology usage into their instructional pedagogy.
11. I use computer technology regularly in my classroom instruction.
12. I like using computers.

13. Computers in the classroom have helped me improve my teaching.
14. I sometimes feel professionally threatened by the rapid changes occurring in technology.
15. I feel prepared to instruct my students on how to successfully implement meaningful technology usage into their instructional pedagogy.
16. An education class via distance learning, for the student, is less rigorous than a traditional face-to-face class.
17. I have serious concerns regarding public universities use of distance learning as a means of awarding post-graduate degrees in education.
18. Educational Pedagogy is equally effective in distance learning as it is in face to face classroom instruction.
19. Verifiable assessment is a major serious problem for distance education programs. Distance Education is a viable means for individuals to receive post graduate degrees in education.
20. Given the fact that two applicants have applied for tenured track faculty positions in your department. Both have graduated from the same prestigious university whereas one received their terminal degree via distance learning and the other from the more traditional classroom approach. Both have identical academic credentials and both have the same level of teaching experience. Please indicate your level of agreement with the following statement: I would have no difficulty in recommending the hiring of the applicant who graduated from the distance education doctoral cohort to become a member of the faculty of my department.
21. Given the fact that two applicants have applied for tenured track faculty positions in your department. Both have graduated from the same prestigious university whereas one received their terminal degree via distance learning and the other from the more traditional classroom approach. While both have identical academic records the applicant graduating from the traditional program has only 4 years of actual teaching experience while the distance learning applicant has over 10 years. Please indicate your level of agreement with the following statement: I would be inclined to recommend the hiring of the more experienced applicant who graduated from the distance education doctoral cohort to become a member of the faculty of my department.

22. In the field of higher education, I feel that applicants graduating from a distance learning graduate program at a public university will be given the same consideration for employment as the traditional student.
23. Tenured faculty members in public universities should have received their advanced degrees from traditional institutions.
24. Faculty applicants who have received their doctorates from distance learning universities often lack the people skills necessary to be effective instructors.

Demographics (10 questions)

All identifying information from the demographic section will be kept confidential and private.

25. Where do you currently teach?
  - a. Slippery Rock University of PA
  - b. Shippensburg University of PA
  - c. Clarion University of PA
  - d. California University of PA
  - e. Edinboro University of PA
26. Education – Please indicate highest degree attained:
  - a. Bachelors
  - b. Masters
  - c. Doctorate/Terminal degree
27. Age:
  - a. Under 21
  - b. 21 – 24
  - c. 25 – 29
  - d. 30 – 34
  - e. 35 – 39
  - f. 40 – 44
  - g. 45 – 49
  - h. 50 – 54
  - i. 55 +
28. Gender
  - a. Male
  - b. Female

29. How long have you been teaching at the university level?
- a. Less than 1 year
  - b. 1 – 3 years
  - c. 4 – 6 years
  - d. 7 – 9 years
  - e. 10 or more years
30. Please indicate the level of distance education classes you have taught (if any).
- a. Graduate Level
  - b. Undergraduate Level
  - c. Both
  - d. Not Applicable – I have never taught a distance education class
31. Are you a full time or part instructor?
- a. Full time
  - b. Part time
32. Please indicate your status.
- a. Tenured
  - b. Non-tenured, but tenured track
  - c. Non-tenured track
33. Department.
- a. Professional Studies
  - b. Elementary Education (Eled.)
  - c. (Eled.) Early Childhood
  - d. (Eled.) Reading
  - e. Secondary Education
  - f. Special Education
  - g. School Psychology
  - h. Other (please specify) \_\_\_\_\_

Please note that personal information will be stripped by StudentVoice Inc™ and a participant case number will be assigned so as to protect confidentiality. The following information will be used to remove you from follow-up emails\*.

34. \*Name \_\_\_\_\_  
\*Email Address \_\_\_\_\_  
\*Phone \_\_\_\_\_

I will be asking 10% of my survey respondents to participate in a brief follow-up face to face interview at a time and location mutually agreeable to both myself and at the discretion of the respondent. If you would be willing to participate in the follow-up interview, please indicate by authorizing the release of your personal contact information at the time of selection so that you may be contacted for the purpose of this interview.

- a. I agree to participate in a follow-up interview and give permission to have my personal contact information released to the researcher. I understand that this information will be used only for the purpose of contacting me to arrange a time for the interview and will otherwise remain confidential and private.
- b. I do not wish to participate in a follow-up interview and wish to have my personal contact information remain undisclosed to the researcher.

Appendix D  
VOLUNTARY CONSENT STATEMENT

### Voluntary Consent Statement

I understand that participation in this study is voluntary.  
I further understand that collected data will not be  
officially linked to any specific faculty member or  
university. I give my consent by virtue of completing this  
survey.

Appendix E

COVER LETTER TO DEAN OF EDUCATION

February 20, 2006

Dear Dean of Education,

Please accept this letter as my written request for permission to implement a doctoral dissertation research study that will be conducted utilizing education faculty members from your institution as one of five Pennsylvania States Systems of Higher Education Universities. This spring, members of the faculty will be asked to complete a researcher created technology attitude survey. The survey is a Likert scale questionnaire comprised of 24 questions plus a demographic element comprised of 10 additional questions which should take no more than 20 minutes to complete. After the review of this collected data, two faculty members from each of the five participant universities will be asked to participate in follow up interviews based upon their survey responses.

The main purpose of this study is to look at how attitudes of technological self-efficacy influence university faculty members' views in regards to distance learning.

- Are faculty members who possess higher levels of technological levels of self-efficacy and proficiency more likely to embrace distance education than those

faculty members who possess lower levels of technological levels of self-efficacy and proficiency?

- Do faculty members who have taught courses on-line express a greater sense of self-efficacy in regard to the use of technology than do their traditional colleagues who teach only using traditional classroom based instruction?
- Do members of the education faculty who possess higher levels of technological self-efficacy and proficiency significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues?

If granted permission to conduct this study, an email correspondence will be forwarded to all members of the faculty who teach education courses. The content of the email is attached. Participants will be made aware that participation is strictly voluntary and that participation or lack thereof is made entirely at their own discretion. They will also be assured that data collected will be kept confidential. Those indicating their willingness to participate in a follow up interview will do so by simply including their contact information as part of the survey. Those declining to participate in the follow up interview

do so by simply leaving that item blank on the questionnaire. Any faculty member who wishes to withdraw their survey from the study may do so at any time by simply contacting me and identifying their data with the four digit survey code which will be their unique participant identifier.

If you have any questions, or require additional information, I can be reached via email at [l.s.tinnerman@iup.edu](mailto:l.s.tinnerman@iup.edu), or at my home number at (724)599-1496. Your approval and cooperation in helping me implement this study is greatly appreciated.

Principal Investigator:  
Mr. Larry S. Tinnerman  
Doctoral Candidate  
Professional Studies in  
Education Department  
Indiana University of  
Pennsylvania  
426 Davis Hall  
Indiana, PA 15705  
(724)375-2400

Faculty Advisor:  
Dr. George Bieger  
Indiana University of  
Pennsylvania  
Professional Studies in  
Education Department  
114 Davis Hall  
Indiana, PA 15705  
(724)357-3285

This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724/357-7730)

Appendix F  
COVER LETTER TO FACULTY

February 20, 2006

Dear University Educator:

You are invited to participate in a dissertation research study that will attempt to determine attitudes toward the use of technology, and particularly distance learning in education. The following information is provided to you in order to help you make an informed decision regarding your participation. You have been chosen because you teach education courses at one of the selected Pennsylvania State Systems of Higher Education Universities identified to participate in this study.

Goals of this research include looking at how feelings of technological self-efficacy influence university faculty members' views in regards to distance learning.

- Are faculty members who possess higher levels of technological levels of self-efficacy and proficiency more likely to embrace distance education than those faculty members who possess lower levels of technological levels of self-efficacy and proficiency?
- Do faculty members who have taught courses on-line express a greater sense of self-efficacy in regard to the use of technology than do their traditional

colleagues who teach only using traditional classroom based instruction?

- Do members of the education faculty who possess higher levels of technological self-efficacy and proficiency significantly differ in their attitudes towards the hiring of on-line degree graduates for tenured track positions than do their colleagues?

Participation in the initial portion of this study requires the completion of a Likert scale questionnaire comprised of a 44 questions plus a demographic element comprised of 10 additional questions which should take no more than 30 minutes to complete. The survey will be accessible either online or in hard copy upon request. After the review of this collected data, two faculty members from each of the five participant universities will be asked to participate in follow up interviews base upon their survey responses. These interviews should only take about thirty minutes, will be audio-taped for clarity, and will be conducted by the researcher listed below in a time and place convenient to you. All personal and identifying data collected in regards to this study will be kept strictly confidential.

If you are willing to participate in a follow up interview you will do so by simply including your contact information

as part of the survey. If you wish to decline participation in the follow up interviews, do so by simply leaving that item blank on the questionnaire.

This project has been approved by Indiana University of Pennsylvania's Institutional Review Board for the protection of Human Subjects (724-357-7730) which supports the practice of protection for human subjects that participate in research. Participation requires that you initially volunteer approximately 30 minutes of your time. There are no known risks or discomforts associated with participation in this research. You are free to withdraw at any time by contacting me at the contact information below and supplying your unique participant identifier.

The information obtained in this study may be compiled for publication in academic journals or for presentations at conferences, but your identity will not be revealed. Names associated with any data will be replaced with pseudonyms in order to conceal identities. A summary of the findings will be made available to you upon request. If you have any questions, would like additional information regarding this study, or would like to withdraw your information in the future, please feel free to contact me at the contact

information provided below. Your time and cooperation in this study is greatly appreciated.

If you have any questions, or require additional information, I can be reached via email at

l.s.tinnerman@iup.edu, or at my home number at (724) 599-

1496. Your approval and cooperation in helping me

implement this study is greatly appreciated.

Principal Investigator:  
Mr. Larry S. Tinnerman  
Doctoral Candidate  
Professional Studies in  
Education Department  
Indiana University of  
Pennsylvania  
426 Davis Hall  
Indiana, PA 15705  
(724) 375-2400

Faculty Advisor:  
Dr. George Bieger  
Indiana University of  
Pennsylvania  
Professional Studies in  
Education Department  
114 Davis Hall  
Indiana, PA 15705  
(724) 357-3285

This project has been approved by the Indiana University of  
Pennsylvania Institutional Review Board for the Protection  
of Human Subjects (Phone: 724/357-7730)

Appendix G  
FACULTY INTERVIEW QUESTIONS

## Faculty Interview Questions

Please let me preface that when answering these questions, please exclude for-profit programs such as the University of Phoenix online and think only of established universities with respected traditional components.

1. Over the past 15 years, there has been a tremendous change in the infusion of technology into all levels of American culture including business and industry. Do you feel that professors of education at universities and colleges across this country have kept pace with the changing tide of technology?

Follow-up question: Do you feel that the educational community is preparing teachers to function in the classroom of the next 25 years, given the continued growth in technology?

2. In the survey, many professors, 33%, expressed a low to moderate level of self-efficacy when it comes to utilizing technology in the classroom, while only 20% of those surveyed felt a high level of competence in the utilization of slightly more advanced technology other than just PowerPoint, email and word processing. What do you believe that the educational system needs

to do to help close this gap? Follow-up question:  
What obstacles do you envision in implementing this process?

3. While research has shown that most professors at universities feel that distance learning is a viable means of course deliver for students seeking graduate degrees, what are some of the strengths and weaknesses you see that are inherent in the system?
4. Research has shown, as has the survey instrument administered in this study, that there is a strong relationship between a professors feeling of technical self efficacy and their view of the viability of on-line degrees. Given the diverse levels of technological comfort among university faculty, how do you see this impacting teacher preparation programs in the coming years? Do you have any apprehensions?
5. Many institutions of higher education are now offering graduate level programs almost entirely online including M.Ed.'s and even some Doctorates of Education degrees. How accepting are higher education faculty at recognizing these degrees as being equivalent to traditional graduate degrees when it

comes to hiring departmental faculty? How might you explain these attitudes?

6. Research has shown that universities are not alone in their favoritism towards graduates of traditional graduate programs over their distance learning counterparts, business and industry also tends to favor the more traditional student. What steps do you feel need to be taken to help distance programs earn an equal footing with more traditional programs, particularly in the consideration of faculty positions in higher education?
7. When thinking about distance education in general, what is your personal "gut reaction" to the idea of graduate degrees in education currently being issued at a distance?