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A Comparison of Teachers' Attitudes Towards Technology and Computer Anxiety Between Traditional and Magnet Schools

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A COMPARISON OF TEACHERS' ATTITUDES TOWARDS TECHNOLOGY AND COMPUTER ANXIETY BETWEEN TRADITIONAL AND MAGNET SCHOOLS

DISSERTATION

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ABSTRACT

A COMPARISON OF TEACHERS' ATTITUDES TOWARDS TECHNOLOGY AND COMPUTER ANXIETY BETWEEN TRADITIONAL AND MAGNET SCHOOLS

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Barry University, 2007

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The purpose of this study was investigate the differences in attitudes toward technology and computer anxiety within traditional and magnet settings of public senior high school teachers in an Urban South Florida School District. The General Attitudes Toward Computer Scale (GATCS), the Computer Anxiety Rating Scale (CARS), and the Educational History and Computer Training Profile surveys were used to collect data related to statements addressing general attitudes toward computers, statements that address experiences that may cause computer anxiety or apprehension, and 12 demographic items. Descriptive statistics were calculated for each group (magnet and traditional) on years of teaching experience, educational level, and technophobia. Independent sample t-tests were then used to test for significance between the independent variables (magnet and traditional) and dependent variables (GATCS and CARS). Results of the study suggested traditional schoolteachers had more positive attitudes about computers and technology than magnet schoolteachers. Results of the study also suggested traditional schoolteachers were more computer anxious than magnet schoolteachers.

TABLE OF CONTENTS

	Page
APPROVAL PAGE	ii
COPYRIGHT PAGE	iii
ACKNOWLEDGEMENTS *	iv
ABSTRACT	v
Chapters	
I. THE PROBLEM	1
Introduction	1
Statement of the Problem	2
Purpose of the Study	3
Significance of the Study	4
Research Questions	5
Hypotheses	5
Definition of Primary Terms	5
Definition of Secondary Terms	6
Assumptions of the Study	7
Limitations of the Study	7
Organization of Dissertation	8
II. REVIEW OF THE LITERATURE	10
Introduction	10
Education Reform	14
School Choice	17
Benefits of Using Technology in Education	22
Technology Pedagogy	28
Technology Use in Education	32
Anxiety and Attitudes in Technology	32
Training for Technology	34
Anxiety, Attitudes, and Training in Technology	36
Summary	37
III. METHODOLOGY	41
Introduction	41
Research Design	43
Participants	43

Instrumentation 45
“Computer Anxiety Rating Scale” 46
“General Attitudes Toward Computer” 47
“Educational History and Computer Training Profile” 49
Procedures 50
Data Analysis 52
Summary 53

IV. RESULTS ' 55

Introduction 55
Description of Subjects 55
“Years of Teaching Experience” 57
“Education Level” 58
“Technophobia” 59
Analysis of Research Questions 61
Hypothesis One 61
Hypothesis Two 73
Hypothesis Three 78
Hypothesis Four 82
Summary 85
Hypothesis One 85
Hypothesis Two 86
Hypothesis Three 87
Hypothesis Four 87

V. DISCUSSION 88

Introduction 88
Summary 88
Review of the Literature 88
Purpose of the Study 90
Participants 92
Instrumentation 92
Analysis of Findings 95
Hypothesis One 95
Hypothesis Two 95
Hypothesis Three 96
Plypothesis Four 96
Conclusion 97
Plypothesis One 97
Plypothesis Two 98
Plypothesis Three 98
Hypothesis Four 100
Discussion 101
Hypothesis One 101

I Iypothesis Two 102
Limitations of the Study 103

REFERENCES 105

APPENDIX A Computer Anxiety Rating Scale 128

APPENDIX B General Attitudes Toward Computer Scale 129

APPENDIX C Educational History and Computer d raining Profile 130

APPENDIX D Cover Letter 132

APPENDIX E Informed Consent Form 133

CHAPTER I

THE PROBLEM

Introduction

During the 1990s, communication had been the key contender in the betterment of education. Technology was becoming omnipresent throughout the educational system (Altbach, Berdahl, and Gumport, 1999). Former President Clinton's (1997) Call to Action for American Education in the 21st Century required every classroom and library to have access to the Internet by the year 2000 and to help all students become technology literate. The drive to increase technology in the classroom was maintained by President George W. Bush's (2002) Preparing the Classroom for the 21st Century, Enhancing Education through Technology—No Child Left Behind Act. The Act promoted schools using technology as a tool to improve academic achievement.

The advancement in educational technology, societal phenomena in technology, and the global competition and emerging technologies had allowed school districts to create new and aggrandize existing educational institutions. Raywid (1994) stated that choice schools, such as magnet schools, represented the most promising approach to solving the complex problems facing public education. The purpose of educational magnet public senior high schools was to attract students from all parts of the district who were interested in pursuing a challenging career among a vast number of fields such as technology, medicine, fine arts, and the like. These schools offered career-related programs that would prepare young minds in America to succeed in academia and that would lead them to be competitive citizens in their work environment in the fast moving and ever-changing Information Age.

In order to improve the quality of education for all students by enlightening student learning through a long-term, broad-based effort to promote coherent and coordinated enhancements in the educational system throughout the nation at the state and local levels, Former President Clinton signed into law a federal education program—Goals 2000: Educate America Act (H.R. 1804, 1994). This act provided resources to improve each state’s entire elementary and secondary education system, including professional development (Clinton, 1994). One pertinent ramification of the Goals 2000: Educate America Act was to develop effective educational programs that infused and promoted technology (14.R. 1804 Section 231, 1994). The Goals 2000: Educate America Act would improve learning and teaching in educational magnet public secondary schools by providing a national scheme for education reform. In the Urban South Florida Public School District, technology magnet schools were more likely to introduce and maintain technology in the current educational setting than traditional schools.

Statement of the Problem

In order to improve the quality of education, public school technology magnet schools utilized alternative ways of teaching and evaluation, different from teaching and evaluation methods used in traditional school settings (Magnet Schools of America, 2003). Magnet schools represented an effort to enhance educational quality (Rossell, 1990). They offered alternative ways of teaching and evaluation, a unique focus not available at a traditional school (Checkley, 1997). The Enhancing Education through Technology— No Child Left Behind Act promoted schools using technology as a tool to improve academic achievement. The advancement in educational technology allowed districts to create new and enhance existing educational institutions.

In this study, the researcher will investigate the differences in attitudes toward technology and computer anxiety of public senior high schoolteachers in traditional and magnet school settings in the Urban South Florida School District to determine the extent the quality of education benefits from educational technology magnet schools.

Purpose of the Study

The purpose of this study was to investigate the differences in attitudes toward technology and computer anxiety of public senior high schoolteachers in traditional and magnet school settings in the Urban South Florida School District. This study compared and contrasted the differences in rating scale scores of traditional public senior high schoolteachers and magnet public senior high schoolteachers on their attitudes toward technology and computer anxiety. In analyzing the rating scale scores, the researcher determined whether a significant difference existed between the rating scale scores of teachers within traditional and magnet public senior high school settings.

Because of the homogeneity of the schools, data was collected from only one traditional public senior high school and one magnet public senior high school. Data was collected from a purposive sample of classroom senior high schoolteachers (n=60) from two public schools in the Urban South Florida School District. Thirty teachers were selected as volunteers from a traditional public senior high school and 30 teachers were chosen as volunteers from a computer technology magnet public senior high school.

During the 2000-2001 school year, when the researcher began investigating this study, the magnet public senior high school was the only educational computer technology magnet school in the district. The traditional public senior high school was chosen based on a convenience sample from nine other traditional schools and had comparable teacher demographics. The Urban South Florida Public School System Office of Educational Evaluation and Research granted the researcher the opportunity to survey these 60 classroom senior high schoolteachers for this study. Each participant completed an Educational History and Computer Training Profile and two surveys, the Computer Anxiety Rating Scale (CARS- Form C) and the General Attitudes Toward Computers Seale (GATCS- Form C). The researcher collected the data at the beginning of the 2006-2007 school term.

Significance of the Study

Educators, administrators, teachers, students, parents, and the community at-large benefited from this research because the outcome of the study determined whether there was a difference in the attitudes of teachers in traditional and magnet public secondary schools toward technology and computer anxiety. The researcher determined if a significant difference existed between both groups' rating scale scores. This documentation not only assisted Urban South Florida Public Schools in evaluating aspects of the curriculum, but also facilitated magnet as well as traditional schools in employing classroom teachers for preparation and planning of a curriculum that addresses the academic demands of technology. Furthermore, in the future, public school systems will be encouraged to generate more magnet school environments to better educate students in the fast moving and ever-changing Information Age. To stay abreast with the Information Age, schoolteachers need to have minimal computer anxiety and positive attitudes toward computers and technology.

Research Questions

1. Is there a difference in the attitudes of teachers in traditional and magnet public secondary schools toward technology?
2. Is there a difference in the level of computer anxiety experienced by teachers in traditional and magnet public secondary schools?

Two other questions were examined:

3. Is there a difference between teachers' years of experience and teachers' attitudes toward technology?
4. Is there a difference between teachers' years of experience and teachers' computer anxiety?

Hypotheses

Hod There is no difference in the attitudes of teachers in traditional and magnet public secondary schools toward technology.

Ho_2: There is no difference in the level of computer anxiety experienced by teachers in traditional and magnet public secondary schools.

Ho_3: There is no difference in teachers' years of experience and teachers' attitudes toward technology.

H_{04}: There is no difference in teachers' years of experience and computer anxiety.

Definition of Primary Terms

Attitudes Toward Technology. Attitudes Toward Technology is a score on the General Attitudes Toward Computer Scale- GATCS (Form C).

Computer Anxiety. Computer Anxiety is a score on the Computer Anxiety Rating Scale- CARS (Form C).

Magnet schools. Institutions for teaching and learning which offer courses not available in the regular school district and that are designed to attract students on a voluntary basis from an entire school district.

Traditional schools. Schools characterized by a traditional, conventional, and non-innovative approach to education.

Years of teaching experience. The number of years a teacher has had active involvement in a classroom.

Definition of Secondary Terms

Cognitive. Mental characteristics related to intellect (Gay and Airasian, 2003).

Construct. Construct is a concept related to computer anxiety and general attitudes toward computers.

Master teacher. A master teacher is a teacher who has more than three years of experince.

Novice teacher. A novice teacher is a teacher who has one through three years of experince.

Rating scale. An instrument with a number of items related to a given variable, each item representing a series of categories between two extremes (Gay, 1985).

School choice. School choice allows individualized selection of public or private schools, alternative programs, or different school systems such as magnet programs.

School desegregation. School desegregation is the process of bringing students of different ethnic or racial groups into the same school.

Technophobia. Technophobia is a fear of talking about computers or computer-related technology.

Technophobic. One who fears computers or computer-related technology.

Assumptions of the Study

The following assumptions were made for this study:

1. All teachers from both the traditional and magnet secondary schools in the Urban South Florida Public School District responded truthfully to both surveys.
2. All teachers from both the traditional and magnet secondary schools in the Urban South Florida Public School District were equally motivated.
3. All teachers from both the traditional and magnet secondary schools in the Urban South Florida Public School District had equal years of experience.
4. Ail participants had comparable technology training, expectations may be different between traditional and magnet schools.

Limitations of the Study

The following limitations apply to this study:

1. Due to time constraints, only one traditional secondary school out of nine traditional secondary schools in the Urban South Florida Public School District was selected for this investigation.
2. The timing of the results of the research could be skewed because surveys were conducted during the middle of the school year. The results of the study could be different if the study was conducted at the beginning, middle, or the \ end of the school year. At the end of the school year, teachers could be bringing closure to the use of new teaching strategies in the classroom and getting ready to begin their summer vacation rather than concentrating on

thoroughly completing the surveys and remembering the technology training they received. At the beginning or middle of the school year, teachers are more motivated and enthusiastic in implementing innovative teaching techniques in technology and will carefully complete the surveys without reservations.

3. Due to sampling techniques, the results from the teachers selected to complete the survey at the magnet public senior high school, an educational computer technology magnet school, may not be generalizable.
4. The selection of both schools was based on a non-random sampling. The school selection was based on a convenience or purposive sample. The magnet public senior high school was the only educational computer technology public magnet school in the Urban South Florida Public School District at the time of the study. Due to comparable teacher demographics, the traditional public senior high school was chosen from nine other traditional schools in the Urban South Florida Public School District.

Organization of Dissertation

In Chapter One, the conditions, statement of the problem, purpose of the study, and significance of the study have been established. In addition, research questions, hypotheses, definitions of terms, assumptions, and limitations of the study have been communicated. A study to investigate the differences in attitudes toward technology and computer anxiety between two groups of public senior high schoolteachers in the Urban South Florida Public School District, one in a traditional school setting and one in an educational computer technology magnet school setting, was acknowledged as the main point of this investigation. In Chapter Two, a review of the literature related to education reform, school choice, benefits of using technology in education, technology pedagogy, technology use in education, anxiety and attitudes in technology, training for technology, and anxiety, attitudes, and training in technology will be presented. Chapter Three presents the research design, which will include the population sample, a description of the sample, a discussion of the instruments that were used in gathering the data, and an explanation of the process used in examining the data. Chapter Four presents the data analysis. Chapter Five presents the conclusions of the study, a discussion of the results, and recommendations for further research.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Public Law (103-227, 20 USC 5801, 1994) stated that the purpose of the Goals 2000: Educate America Act was to promote coherent, nationwide, and systemic educational change. In addition, Goals 2000 improved learning and teaching by providing a national plan for education reform.Goals 2000 estructured America's educational system. During the early nineties, one of the foremost problems in education was providing schools in which quality education was offered (Florida Commission on Education Reform and Accountability, 1993). The Urban South Florida Public School System offered a variety of programs county-wide to ensure quality education, ia c a iii

Alternative schools became the single most effective practice to reform and improve public education that has ever been examined (Barr and Parret, 1997). One such school program was a magnet school. In essence, a magnet school was a public school that offered opportunities that were different from those at traditional public schools (Magnet Schools of America, 2003). Magnet schools were developed in the 1970s, primarily as an aid in desegregating schools (Magnet Schools of Texas, Inc., 2003). These schools were created to draw a racial cross-section of students out of the segregated neighborhood boundaries, avoiding the political opposition engendered by mandatory busing (Inger, 1991). According to Peter Schmidt (1994), between 1980 and 1990 [ACAi2jdecade, magnet schools became a significant part of our nation’s efforts to desegregate its schools.

Magnet schools offered a unique focus—a program not available at a traditional neighborhood school (Checkley, 1997). They represented an effort to promote school desegregation and enhance educational quality (Rossell, 1990). As a result, students were not only racially balanced, but also equally balanced within their area of interest (Magnet Schools, 2003).

Magnet schools were created in 1978 by the Temple Independent School District in Texas as a pilot program to relieve overcrowding in three schools in the district. In the beginning, magnet schools were called Curriculum Offering Modern Educational Techniques (COMET) schools (Magnet Schools of America, 2003). These special schools were viewed as the testing ground for new and innovative ideas in education. According to Kitchell (1994), magnet schools offered a distinctive curriculum or instructional approach to attract students from outside the community. Magnet schools were designed to provide equity and choice (Checkley, 1997). Not only were students treated with equal respect, but they also had the option of applying to any magnet school. Once accepted, each student had to comply with the goal/mission/vision of his or her magnet school to continue enrollment until graduation. If the schools' regulations were not met, then the students were asked to return to their home, traditional school and exited from the magnet school. Since students chose to attend a magnet school, voluntary participation was a powerful mechanism. Active involvement encouraged commitment and developed ownership by the student in the school as well as its surroundings. Choice promoted a positive atmosphere for teachers and students leading to successful development of both academic and social skills. In retrospect, educators, administrators, teachers, parents, students, and the community at-large aspired to do what was best for each individual student. Not only did students excel in their special field of study, but also in their core/basic requirements. Everyone who was associated with the school believed in the motto “one for all and all for one.”

Why were magnet schools more beneficial than traditional schools? Magnet schools provided the same quality education in academic subjects, while also focusing on specific teaching methods and/or an interest area (Magnet Schools of America, 1997). Celina Ottaway (1997) stated that magnet schools were designed to attract children of all ethnic backgrounds through special programs and activities such as computers, science programs, and performing arts classes. Magnet schools were used to help desegregate schools while also improving the quality of education by offering a distinctive curriculum to attract students from outside the neighborhood (Kitchell, 1994). Altbach, Berdahl, and Gumport (1999) proclaimed that students were able to enroll in classes that provided dual credit options and where they could work with leaders in business and industry as well as with university pedagogues. Furthermore, magnet schools provided incentives for families to remain in public schools and to send their children to integrated schools (Kitchell, 1994).

In magnet schools, student achievement on standardized tests was above the average norm (Magnet Schools of America, 1997). During a recent research study, students in magnet schools scored higher on achievement tests than their counterparts in private, religious, or comprehensive high schools (Gamoran, 1996). Likewise, magnet school graduates attended college at much higher rates than students in either assigned public schools or Catholic schools (Viadero, 1994). By attending magnet schools, students received a more comprehensive and focused course of studies (Magnet Schools of Texas, Inc., 2003). Students took basic skills classes as well as several classes in their specialization, such as technology, medicine, fine arts, and the like.

A magnet school reflected the best current research in effective education (Magnet Schools of America, 2003). Moreover, faculty members utilized alternative ways of teaching and evaluation, different from teaching and evaluation methods used in a traditional school setting (Magnet Schools of America, 2003). For example, a magnet school teacher prepared his/her lesson plans following Howard Gardner's (1993) Multiple Intelligences. The Eight Intelligences are: Linguistic, Logical-Mathematical, Spatial, Musical, Kinesthetic, Interpersonal, Intrapersonal, and Naturalistic. According to Howard Gardner (1993), teachers continued to hold the major responsibility for developing other individuals. Educators also encouraged students to think critically. Therefore, in an effort to improve student development, teachers grew professionally. Magnet schoolteachers were better at obtaining useful resources and using them effectively to enhance student learning (Gamoran, 1996). In a magnet school setting, teachers were regarded as professionals. The vocation of a magnet school teacher was more appealing to the beholder because administrators welcomed, initiated, and encouraged growth. In a magnet environment, a principal provided release time so teachers could attend workshops, conferences, training sessions, and other developmental activities.

The Urban South Florida Public School System offered a variety of school programs county-wide—including the magnet program. One type of magnet program offered was an educational computer technology program. The magnet public senior high school was an educational computer technology magnet high school that drew its student population from the Urban South Florida Public School District. At the time of this study, in 2006, this magnet public senior high school had a student population of 3,020; 58.9% of the students received free or reduced lunch; there were 116 classroom teachers with a regular program pupil-to-teacher ratio of 22 to one; there were 50 male and 66 female classroom teachers; 32% of the teachers were White Non-FIispanic, 44% were Black Non-Hispanic, 17% were Hispanic, and seven percent were Asian/American Indian; their number of years of teaching in Florida averaged 11 years; 20.8% of teachers were new to the school; and the average salary for instructional staff was $45,270.85 (Urban Magnet South Florida Senior High School Profile, 2006).

The intent of magnet schools was to produce students who were thinking, caring, well-informed, skilled, prepared to solve problems in a natural environment, and to contribute to their community. According to Gamoran (1996), magnet school students learned more and out-performed their counterparts in other traditional public schools. Based on the premise that magnet schools provided more release time so teachers could attend workshops, conferences, training sessions, and other developmental activities than traditional schools, this study investigated the differences in attitudes toward technology and computer anxiety between two groups of teachers, those in a traditional school setting and those in an educational computer technology school setting.

Education Reform

During 1983, the National Commission on Excellence in Education brought public attention to our serious educational problems and the critical need for reforms (Boyd and Walberg, 1990). According to Finn, Jr. and Rebarber (1992), schools failed to produce literate and numerate graduates because they were characterized by intellectual softness, a lack of expectations and standards, inadequate leadership, a dysfunctional organizational structure, conditions of employment that were inconsistent with professional work, and the absence of meaningful accountability arrangements. The educational system needed a complete overhaul. Changes were considered necessary in order to devise a plan conducive to the betterment of the educational school system. The school system was suffering from paradigm paralysis; it needed to be restructured as soon as possible to prevent further deterioration. The foundation for transformation in education had to be established.

How was change going to be implemented? The Association for Supervision and Curriculum Development (1986) stated that:

> Power distribution was a strategy that assumes the schools can be improved by distributing political power among the various groups who have legitimate interests in the nature and quality of educational services. Reforms that seek to reallocate power and authority among various stakeholders are based on the belief that when power was in the right hands, school will improve, (p. 13)

The cry now was for local involvement and reforms that improved what happened in the classroom itself (Green, 1987). In doing what was best for each child, the rethinking in education must begin at the heart (center) of each child—tomorrow's resource. Power must first be distributed to those individuals who were truly genuine advocates of doing what was best for each student. Stakeholders, in turn, created subgroups that addressed specific needs for each child. In due time, with hard work and perseverance, schools became better facilitators in educating each student for the 21st century.

Restructuring began with a basic fundamental change in our view of the relationship between the school and its environment (Finn, Jr. and Rebarber, 1992). School officials not only needed to think of schools as separate entities, but how schools contributed to the community at-large and society in general. Schools needed to renew or revise existing management. Awareness of the community allowed schools to be restructured according to the wants and needs of the community that encompassed them. Schools originally designed to produce results consistent with the normal distribution of student performance were being redesigned to ensure equal opportunity and success for all learners (Miller and Brookover, 1986). School success was no longer defined primarily in terms of providing services, but rather in terms of product quality, student-learning outcomes (Murphy and Hart, 1988). As attention was diverted to active student learning, independent student work and competition was slowly receding in favor of more cooperative relationships (David, 1989).

In magnet schools, students are more inspired, motivated, and involved in mastering a skill (goal) when they work cooperatively (Gamoran, 1996). By working together to achieve the same skill (goal), a vast number of ideas, thoughts, and feelings are communicated throughout the group. Exposing students to different teaching/learning styles allowed them to master more skills (goals) at any given time. Education restructuring generally focused on systemic changes in one or more of the following: institutionalized and governance structures, work roles and organizational milieu, core technology (the teaching-learning process), and connections between the school and its larger environment (Finn, Jr. and Rebarber, 1992).

School Choice

Chester Finn, Jr. (1989) stated six reasons why choice was needed:

1. The alternative was incompatible with American democracy.
2. Choice fostered equality of opportunity.
3. Choice helped parents play their proper roles with respect to the education of their children.
4. Choice stimulated autonomy among schools, professionalism among teachers, and good leadership on the part of principals.
5. Schools of choice were more effective educational institutions where students learned more in them.
6. Choice was a potent mechanism for accountability, (p. 45)

The United States is a democratic society. With this in mind, Americans were given the opportunity to educate their children in a school of preference, especially if such an institution enhanced their children's education. With school choice, the family, rather than the government, selected the school for their child from among all schools—public, private, or parochial (Floridians for School Choice, 2003). According to Gardner (1993), education was the process whereby children established the importance of their culture. Parents/guardians wanted what was best for the educational betterment of their children. The goal of every parent/guardian was for each child to seek status in life. Children may be more qualified in securing a better paying job by being educated. Since American society welcomed opinions, alternatives in education were initiated, stated, heard, and made known so that every child received the best education possible.

At-risk low-income and minority students were less likely to have access to choice in education. These individuals were at a disadvantage because they lacked support and funds to cultivate educational choice schools. If students were able to select a school of preference, then monetary stability was irrelevant to student performance. School choice allowed low-income students to have equal access and opportunity to attend any school which met their needs.

Moreover, by allowing choice, parents and guardians had more control over their children's education. Not only were parents and guardians heard, but also actions occurred as a result of their involvement. Parent/guardian involvement encouraged administrators, teachers, and other education professionals to work toward one mission/vision/goal—to do what was best for the student. Parents became individuals who could demand quality (Boyd and Walberg, 1990). Schools became better entities as a result of the full participation of parents/guardians.

According to Rudy Perpich, choice brought about greater parental involvement in the education of their children (Boyd and Walberg, 1990). Parents had a great deal to offer a school by supporting the education of their children (Heckman, 199.6). In general, parents would do what was best for their children. Quintessentially, every parent played a part in selecting the most appropriate school conducive to his/her child's learning modalities.

Choice allowed professionals in the school to be more in control of their work environment and school culture. Self-governance encouraged professionalism on the part of the teachers as well as the students. This uniqueness motivated parents and students alike to choose the most pertinent school that satisfied the student's educational wants and needs. For example, if a child was interested in pursuing a career in technology, then he or she had the opportunity to choose a school suitable to his/her wishes.

Throughout life, individuals have been inclined to do better in places and/or situations in which they have willingly positioned themselves, rather than in places and/or situations where they had no choice (Boyd and Walberg, 1990). If human beings were satisfied with their environment, then they became better and more productive citizens. According to Raywid (1989), magnet schools and other “schools of choice” were more effective educational institutions because students appeared to learn more. Since students were actively involved in a school of choice, they were extremely willing to become better learners.

Finally, choice allowed schools to be more responsible in how they delivered learning. Alternative or magnet schools delivered learning in a manner that encouraged student participation (Gamoran, 1996). By encouraging student involvement, schools of choice promoted student survival in the educational process. If a school of choice failed to promote student participation over a period of time, then such a school of choice had to change in order to remain operational. If schools of choice wanted to continue to operate, then they always needed to be accountable for their actions in the delivery of the educational process. Therefore, schools of choice would be able to swim (remain open) rather than sink (close).

Furthermore, in schools of choice, three sets of individuals were central to the choice phenomenon: clients, providers, and policy makers. Clients (parents and students) provided the unprocessed substance for schools. According to client choices, clients delivered vital signals about their preferences for what was learned in school. Providers (teachers and administrators) imparted the knowledge of content and pedagogy necessary to capitalize on the talents and preferences of clients (consumers). Policymakers (board members and legislators) held the alternative for the public at large; they provided the money and authority to make the school of choice work. Policies were more likely to operate effectively when they complemented and supported the unique interests and resources of clients, providers, and policymakers (Boyd and Walberg, 1990).

The Urban South Florida Public School System offered the following choices in public education: charter schools, satellite learning centers, and magnet school programs. Charter schools were schools operated by nonprofit organizations, usually governed by a group of parents, teachers, a municipality, institutions, universities and/or a combination of more than one group. These schools were funded in part by the Florida Department of Education like all other public schools. These schools also received grants and private donations. A charter school was open to those students living in the school district in which the charter school was situated. Students completed an application during the open enrollment period. If there were more eligible students than there were available seats, then students were randomly selected. Techworld Public Charter School was an example of a secondary public charter school in the Urban South Florida Public School District. (Charter Schools, 2003). According to the National Education Association (National Education Association: Charter Schools, 2001), charter schools were deregulated, autonomous, and independent of the rules and regulations that governed traditional public schools. Charter schools participated in the state writing examination, national norm testing, and high school competency assessments. These schools were judged by how well they educated children in a safe and responsible surrounding to meet academic and operational goals (Allen, 2000).

Satellite learning centers (SLC) were schools operated at a workplace; they were the ultimate business/education partnership, fostering numerous benefits for taxpayers, industries, schools, parents, and children. In the SLC model, the business provided the classroom space and any other operational space on its property, while the school system provided the teachers, instructional materials, and any pertinent educational program services. In 1987, the nation’s first SLC opened to serve the children of employees of American Bankers Insurance Group’s (ABIG) corporate headquarters in South Florida. Satellite Learning Centers helped reduce transportation costs, while contributing to student integration based on the heterogeneous parent population work force. (Satellite Learning Centers, 2003)

Urban South Florida Public Schools Magnet Programs were schools of choice that offered unique courses of study focusing on special and common interests, aptitudes, and abilities of students (Magnet Programs of Urban South Florida Public Schools, 2003). Magnet programs were available at no cost to any student in the Urban South Florida Public School System. Applications for admission to a magnet program were accepted from October through February to be considered for the following school year. The application process consisted of an application, an aptitude examination related to the magnet program, and an interview with school instructional personnel. After an application was submitted and processed, students received notification stating whether they met the program’s acceptance requirements. The criterion of racial balance was considered when selecting students for such magnet programs. Urban South Florida

Public Schools offered a variety of magnet programs to students under the following six themes of study: Communications and Humanities; Mathematics, Science, and Technology; International Education; Visual and Performing Arts; and Careers and Professions (Division of Schools of Choice, 2003). The magnet public senior high school was an example of an Urban South Florida Public School Magnet Program in Educational Computer Technology.

Benefits of Using Technology in Education

The first national educational technology plan, Getting America's Students Ready for the 21st Century: Meeting the Technology Literacy Challenge, was released by the former United States Secretary of Education Richard Riley (1996). This plan was the premise for effective use of technology in elementary and secondary education to assist school children to be better educated and prepared in America's fast moving and ever-changing Information Age. Because of schools' progress toward achieving the 1996 national educational technology goals, the need to move beyond those goals became apparent. In the fall of 1999, the United States Department of Education (1999), with the assistance of educators, teachers, administrators, researchers, policymakers, students, parents, industry, and the community at-large, reviewed and amended the national educational technology goals and generated five new national educational technology goals:

> Goal 1: All students and teachers will have access to information technology in their classrooms, schools, communities, and homes.
>
> Goal 2: All teachers will use technology effectively to help students achieve high academic standards.

> Goal 3: All students will have technology and information literacy skills.
>
> Goal 4: Research and evaluation will improve the next generation of technology applications for teaching and learning.
>
> Goal 5: Digital content and networked applications will transform teaching and learning, (p. 1)

Goal One

First of all, in order for all teachers and students to have access to information technology in their schools and classrooms, schools must be equipped with computers that have Internet access. During the fell of 2000, 98% of all public schools in the United States had access to the Internet (Cattagni, Farris, and Westat, 2001). The Digest of Education Statistics (2001) stated that 98% of all public schools and school classrooms had access to the Internet in the United States and that 97% of all elementary schools had access to the Internet, while 100% of all secondary schools had access to the Internet. This access must be provided with the latest means of communication to guarantee the best Internet connection possible. In doing so, schools furnished their computers with the appropriate hardware to allow quality Internet access.

Moreover, schools equipped their computers with software that did not allow access to unacceptable Internet sites. By practicing "safe computing," Internet users probably never accessed an inappropriate Internet site (Rosen, 2002). For example, the Urban South Florida Public Schools System used X-Stop as a deterrent to unacceptable Internet locations.

Furthermore, with schools providing Internet connections, low-income and less fortunate student populations had an opportunity to achieve the same technology education goals and objectives as affluent students. Since every student was guaranteed the best quality Internet connection, Technology access in students' communities and homes gave them the best possible access to the Internet.

Schools benefited from increased funding from private, public, profit, and/or non-profit organizations. Through any one of these organizations, teachers, as well as students, could be provided with money-saving incentives such as computer loaner programs, free computers, grants, low-interest loans, and the like. Numerous corporations and industries were willing to assist in preparing students to participate in the emerging information technology work force, thereby increasing the number of students who had equal opportunities to access and use technology.

Goal Two

Not only was having access to information technology imperative in ensuring implementation of the national educational technology goals for students and teachers, it was also imperative to ensure that teachers used technology effectively to assist students in achieving high educational standards. In schools, computers should be used to enhance teaching and learning. To achieve this, teachers incorporated technology effectively into their lesson plans. Subsequently, teachers not only considered using computers as a word processing tool, but also as a database, spreadsheet, presentation, publishing, electronic messaging, and/or Internet tools. Hence, teachers enhanced their traditional courses with an array of information technology (Rickman and Grudzinski, 2000).

According to the U. S. Congress, Office of Technology Assessment (1995), teachers used technology in both traditional "teacher-centered" ways, and in non-traditional "student-centered" approaches. By supporting more student-centered approaches to instruction, teachers allowed students to inquire and conjecture on their own while teachers facilitated the learning. Teachers as coaches promoted higher-order thinking in students. In accordance with Bloom's Taxonomy (1956), students who not only have knowledge, comprehension, and application of educational technology, but who also have the ability to analyze, synthesize, and evaluate such educational technology objectives, achieved higher academic standards.

Technology use was positively influenced by the amount of access and teacher training in schools (*T.H.E. Journal Online*, December, 2000). In order for teachers to use technology effectively in assisting students, the U. S. Department of Education (1999) increased the quantity and quality of technology-focused activities aimed at the professional development of teachers and improved the instructional support available to teachers using technology. Teachers needed training and support to offer more technology-assisted enhanced courses to help students attain high academic standards (Rickman and Grudzinski, 2000).

Goal Three

Students not only needed to achieve high academic standards, but also needed to become technology and information literate to be successful in the Information Age. Based on the Web-based Commission (2000), new designs in learning were needed to create better and effective technology workers who would define the Information Age. The Secretary of Labor appointed the Secretary's Commission on Achieving Necessary Skills (SCANS) to determine the basic skills students needed to succeed in the work force (Academic Innovations, 2000). Students meeting such skills would have a solid educational foundation in basic technology literacy, as well as the ability to work with a variety of technologies (U. S. Department of Labor, 2001). According to the Center on Education and Work (2002), ensuring that all students had access to technology and information literacy skills was critical to sustaining education in a democracy. In order to guarantee success in the Information Age, industries will depend on the availability of well-educated information workers who are continuous innovators and life-long-learners (Evans, 2001).

Goal Four

Once students had the necessary technological skills, research and evaluation of such skills assisted in the enhancement of technology functions for teaching and learning. According to C. Kulik and J. Kulik (1991), student-learning studies suggested that computer-based instructional materials have a positive effect on student performance. Me Millan, Culp, Hawkins, and Honey (1999) stated that even though during the time that there was very little learning-appropriate software, studies were able to conclude that technology could have had a positive impact on students' educational experiences and researchers began to identify factors affecting the student computer interaction. As technology developments continued to accelerate and modify educational settings, these developments were making possible the production of technologies that addressed some of the intractable problems in education (Glennan, 1998). During the 1990s, information technologies had the ability to make tremendous advances in the next generation of technology education applications for teaching and learning as these applications reshaped society and created new learning opportunities (Tinker, 1996).

Goal Five

In addition, Tinker (1996) alluded to the fact that computers and networks offered an infinite amount of resources to students and teachers. Teachers were able to interact with other educators and students locally, nationally, and globally with the use of a computer, modem, telephone line, and Internet connection. The Internet offered instructional, non-instructional, and professional development resources to teachers. On the World Wide Web, teachers accessed instructional resources such as lesson plans, projects, and portfolios on a specific objective and/or goal to enhance the curriculum being taught.

Teachers could also surf the Internet for non-instructional information such as an appropriate rubric to use in class so that students could evaluate each other on an oral presentation regarding an alternative assessment project assignment. Moreover, teachers could go on-line to research best practices on how to convey a particular objective in the curriculum and could access additional resources outside the realm of the content-area textbook to enhance student learning. Digital content and networked applications offered direct opportunities to supplement learning by assisting students with comprehending complex concepts (U.S. Department of Education, 1999). Informational technologies helped students become motivated and engaged in the learning process. The Internet represented a new environment for learning and teaching. In the near future, every teacher and student would need access to the information superhighway on the World Wide Web in order to be competitive in his or her line of work and in his or her day-to-day life (Hardin and Ziebarth, 2000).

Technology Pedagogy

Pedagogy is the art and science of teaching children. The pedagogy of technology explored the transition from traditional forms of learning to more constructivist approaches. Technology supported instructional delivery models that promoted authentic learning, constructivism, active learning, collaborative learning, and building communities of learning (B.A. Kerlin, S. P. Kerlin, and Obrien, 2000).

Authentic learning tasks were school assignments that had a real-world application and required students to apply a broad range of knowledge and skills (North Central Regional Educational Laboratory, 2002). An authentic pedagogy model offered teachers an approach to instruction that was simple, adaptable to a variety of teaching styles, and applicable across the curriculum and content areas for engaging students in meaningful intellectual work (Louis, 2000). Some examples of authentic tasks included designing a budget for a single parent with two school-aged children, making decisions on where in South Florida to invest in a single-family home, and creating and producing a program for the school performance. Authentic tasks required students to employ higher order thinking skills such as comprehension, design, analysis, and problem solving. While students used higher order thinking, old and new knowledge was constructed as a result of cognitive processes within the human mind (University of Massachusetts Physics Education Research Group, 2001).

The constructivist paradigm was based upon the work of psychologists Piaget (1963) and Vygotsky (1978) who questioned whether or not direct teaching methods were responsible for student learning. According to the North Central Regional

Educational Laboratory (2002), the fundamental beliefs underlying this paradigm for learning have been generally summarized as follows:

1. All knowledge was constructed through a process of reflective abstraction.
2. Cognitive structures within the learner facilitated the process of learning.
3. The cognitive structures in individuals were in a process of constant development.
4. If the notion of constructivist learning was accepted, then the methods of learning and pedagogy must agree, (p. 1)

Consequently, constructivism, a theory of cognitive growth and learning, has reformed education by allowing changes in the curriculum and effective use of technology as part of these changes (Strommen, 1992). Since knowledge, according to constructivism, was constructed, learners constructed new understandings based on what they already knew, and prior knowledge influenced what new or modified knowledge they constructed from new learning occurrences (Southwest Educational Development Laboratory, 1996). Students learned by scaffolding new information together with what they already knew (Constructivism, 2003). Learning was active rather than passive. Students were engaged in the learning process, while teachers assisted students with understanding new experiences based on past experiences, allowing them to build new knowledge. Constructivist teachers acted as “guides on the side” who provided students with opportunities to test the adequacy of their existing understandings rather than acting as “sages on the stage” (Southwest Educational Development Laboratory, 1996).

According to Rallis, Rossman, Phlegar, and Abeille (1995), dynamic teachers could make a difference by creating and facilitating learner-centered learning environments in which students' individual needs and aptitudes are recognized and fostered, preparing them to succeed in a changing technology world. Rallis, Rossman, Phlegar, and Abeille (1995) stated that dynamic teachers take on at least these seven roles:

1. The Steward, recognizing the worth, capabilities, and rights of their students;
2. The Constructor, who understands the subject matter and knows different ways to teach it in order to accommodate students' various ways of learning;
3. The Philosopher, who reflects critically about what was and was not working in the classroom and makes midcourse corrections as necessary;
4. The Facilitator, creating conditions in which students feel safe to take risks and make mistakes and have time to try again;
5. The Inquirer, who depends heavily on assessment to find out what students have learned and what they need to learn more about;
6. The Bridger, a partner with parents, other teachers, and the community to ensure that their classrooms are responsive to the community's needs and wishes;
7. The Changemaker, actively pursuing change in classrooms, schools, districts, professional associations, and policy arenas, (p. xi)

Dynamic teachers allow students to become actively involved in the learning process. Traditional approaches to teaching, such as teacher-centered instructional methods, were found inferior to instruction that involves active learning in which students solve problems, answer questions, formulate questions of their own, discuss, explain, debate, or brainstorm during class (Felder, 2003). Active learning involved exposing students in situations that compel them to read, speak, listen, think critically, and write (Dodge, 2002).

If students were to develop these skills effectively, they would be actively involved with any particular subject matter and learning process (Seeler, Turnwald, and Bull, 1994). While students were actively constructing their individual ideas, if they worked with other students, then they were able to reflect on and elaborate not just their own ideas, but also those of their peers (Strommen, 1992).

Cooperative or collaborative learning allowed students to work in teams on problems and projects under conditions that assured both positive interdependence and individual accountability (Felder, 2003). According to Piaget (1963), collaborative learning had a major role in constructive cognitive development. Collaborative learning presented an environment in which a student interacted with one or more cooperating peers to solve a given problem (Kumar, 1996). Moreover, active exchange of ideas within small collaborative groups not only increased interest among participants, but also promoted critical thinking (Gokhale, 1995). According to Vygotsky (1978), students were capable of performing at higher intellectual levels when asked to work in collaborative situations than when asked to work individually.

Students shared ideas and defended their point-of-view when any given problem or problems were solved incorrectly. Also, students were more likely to accept constructive criticism from their peers rather than from their teachers. Since the advances in technology and changes in organizational communications have placed an increased emphasis on teamwork within the work force, one of the primary goals of technology education was the development and enhancement of critical-thinking skills through collaborative learning (Gokhale, 1995). Technology education had blossomed from being a mere tool for the means-end purpose of solving problems, to an agent in the evolution of practices that bind individuals together in intellectual communities (Middleton, 2000).

Technology Use in Education

Because the United States was in a major communication revolution during the early 1990s, the success of every individual depended on his or her ability to function in a technological society (Bollentin, 1995). Technology advancement created stress for humans, but the answer was to overcome technological barriers by embracing the future (Hayes, 2000). In the United States, the National Institute for Occupational Safety and Health (1999) stated that 40% of workers reported that their jobs were very or extremely stressful. In 2000, the Gallup Poll, sponsored by the Marlin Company, found that 80% of workers felt stress on the job, and nearly 40% said they needed help in learning how to manage stress (The American Institute of Stress, 2002). A subsequent study, the 2000 Integra Survey, similarly reported that 65% of workers felt stress on the job (The American Institute of Stress, 2002). In 2001, Harris Interactive, sponsored by the Marlin Company, established that 82% of American workers felt stress on the job (The Marlin Company, 2001). Due to the rapid increase in the use of technology, a vast majority of working-age American adults experienced workplace stress (Rosen, November/December, 2000).

Anxiety and Attitudes Toward Technology

Initially, technophobia was classified as computerphobia. Jay (1981) defined computerphobia as a resistance to talking about computers or even thinking about computers; fear or anxiety toward computers; and hostile or aggressive thoughts about computers. Later, Weil, Rosen, and Sears (1987), who were experts in the psychology of using computers and who provided support for technophic individuals, defined technophobia as one or more of the following: an anxiety about present or future interactions with computers or computer-related technology; negative global attitudes about computers, their operation, or their societal impact; and/or specific negative cognitions or self-critical internal dialogues during actual computer interaction or when contemplating future computer interaction (Bollentin, 1995). Dell Corporation conducted a survey that revealed that 55% of the population harbored some form of fear of technology (Hogan, 1994). Moreover, Bollentin (1995) stated that 85% to 90% of the population was not eagerly adopting technology; 50% to 60% of the population needed to know what technology did for them before they were willing to use it; while 30% to 40% of the population resisted technology. Furthermore, a study of attitudes toward technology by Rosen and Weil (2000) stated that 30% of the clerical/support staff and 40% of managers/executives were eager adopters, while 60% of the clerical/support staff and 55% of managers/executives were hesitant “prove-its,” and 11% of the clerical/support staff and four percent of the managers/executives were resisters. This means that 15% of the clerical/support staff and managers/executives feared technology.

Since the web is a wonderful tool, you must control it and not let it control you (Rosen, September/October, 1999). Technology was included in almost every segment of a person’s day; technology was everywhere (Rosen, November/December, 1999). Ironically, individuals must overcome technophobia in order to survive in the fast-moving and ever-changing Information Age. The Internet generation was here to stay.

Training for Technology

"Positive teacher attitudes toward computing, therefore, were critical if computers were to be effectively integrated into the elementary and secondary curriculum" (Mueller, Husband, Christou, and Sun, 1991, p. 23). Hence, in order for teachers to overcome the fear of using technology in the classroom and beyond, teachers needed to be trained to integrate technology into the curriculum (Simonson and Thompson, 1994). Teacher education programs needed to address the concerns of teachers using technology for personal tasks as well as a tool for teaching (Benson, 2001). Professional technology development of teachers allowed teachers to not only know how to use the computer, but also know how to apply the technological knowledge to the teaching and learning of academic subjects (Technology and Learning 1999 District Profile Urban South Florida Public Schools, 1999).

In 2000-2001, due to an increase in Internet access, 87% of public schools reported that professional development on how to integrate the use of the Internet into the curriculum was available to teachers (Kleiner and Lewis, 2003). Moreover, in a recent study, 47% of teachers who received no technology training rated the availability of professional technology development as insufficient, while 65% of teachers who received 16 hours of technology training stated that the availability of technology training was sufficient (Lanahan and Boysen, 2005). Therefore, if teachers received technology training, they regarded the availability of technology for their classrooms as being sufficient.

Since teacher technology training was often lacking, some teachers still had difficulty incorporating technology into instruction, even though most schools had computer and Internet access (Lonergan, 2001). Teachers needed a staff development continuum, that took them from non-users of technology to skillful users and then on to integrating technology into content (Nussbaum-Beach, 2003). Once teachers received technology training, teachers needed to share the lessons they learned with their classroom students (Martin, Kanaya, and Crichton, 2004). Teachers not only needed hardware and software applications, but also integration and implementation of technology to assist with the delivery of instruction in the classroom (Willis and Cifuentes, 2002). Effective technology training consisted of a well-balanced plan that prepared teachers with basic technical capabilities in addition to strategies for content infusion (Thurlow, 1999).

Intel Teach to the Future was a worldwide professional development program designed to deal with the concerns of technology training. The Intel Teach to the Future curriculum consisted of a 40-hour course that trained classroom teachers to promote constructivist approaches of learning and effective integration of technology in classroom instruction (Intel, 2005). Curriculum modules included the following: getting started, locating resources for unit portfolios, creating student multimedia presentations, creating student publications, creating student support materials, creating student web sites, creating teacher support materials, developing plans for implementation, putting unit portfolios together, and showcasing unit portfolios (Intel, 2005, p. 1). Teachers gained technology training in Microsoft Windows, Powerpoint, and Publisher to assist with delivery of instruction in their classrooms as well as to help students achieve technology-related goals (Martin, Kanaya, and Crichton, 2004). Moreover, the Intel 'Peach to the Future program not only offered the ability to increase the effective use of technology

technology are positively correlated with teachers' degree of experience with technology. As teachers' positive attitudes toward technology increase, teachers' levels of experience in technology also increase. Positive teacher attitudes toward technology are the forefront for effective use of information technology in the classroom (Woodrow, 1992).

In respect to computer anxiety, Gardner, Discenza, and Dukes (1993) determined that computer anxiety is a major cause of resistance to using technology. V. Mclnerney, D. Mclnerney, and Sinclair (1994) stated that the ability to reduce anxiety might also depend on the type of technology experience to which schoolteachers are exposed. By reducing uncertainty, teachers will take the initiative to become confident and competent users of technology (V. Mclnerney, D. Mclnerney, and Sinclair, 1994).

Moreover, changing teachers' attitudes toward technology is the key factor in teachers using technology effectively in the classroom and fostering technology integration (Marcinkiewicz, 1993-1994). According to Hignite and Echter (1992), it is critical that teachers possess both positive attitudes toward technology and basic technology skills to effectively incorporate technology in the classroom. Therefore, if teachers have positive attitudes toward technology and basic technology training, then teachers will be less anxious in using technology.

Summary

In order to improve the quality of education, some institutions utilized alternative ways of teaching and evaluation, different from a traditional school setting (Magnet Schools of America, 2003). The drive to increase technology in the classroom, according to the Enhancing Education through Technology—-No Child Left Behind Act, promoted using technology as a tool to improve academic achievement (Bush, 2002). In order for teachers to stay abreast with the advancement of educational technologies, societal phenomena in technology, and the global competition and emerging technologies, school districts needed to create new and enhance existing educational organizations. Schools of choice were effective educational institutions since students appeared to learn more at these schools (Raywid, 1989). Urban South Florida Public Schools Magnet Programs were schools of choice that offered unique courses of study focusing on special and common interests, aptitudes, and abilities of students (Magnet Programs of Urban South Florida Public Schools, 2003). The Urban South Florida Public Magnet School Program in Educational Computer Technology was an example of a magnet public senior high school program.

In fall 1999, the United States Department of Education (1999), with the assistance of stakeholders, generated five new national educational technology goals: all students and teachers will have access to information technology; all teachers will use technology effectively; all students will have technology and information skills; research and evaluation will improve technology applications; and digital content and networked applications will transform teaching and learning. Further, students would be taught technology by the transition from traditional forms of learning to more constructivist approaches. Technology supported instructional delivery models that promoted authentic learning, constructivism, active learning, collaborative learning, and communities of learning (B. A. Kerlin, S. P. Kerlin, and Obrien, 2000).

Because the United States was in a major communication revolution, the success of every individual depended on his or her ability to function in a technological society (Bollentin, 1995). In order for individuals to survive in the fast-moving and ever-changing Information Age, they had to overcome technophobia. Hence, in order for teachers to overcome the fear of using technology in the classroom and beyond, teachers needed to be trained efficiently to integrate technology into the curriculum (Simonson and Thompson, 1994). Teachers needed a staff development continuum, taking them from non-users of technology, to skillful users, and then on to integrating technology into content (Nussbaum-Beach, 2003). Effective technology training consisted of a well-balanced plan that prepared teachers with basic technical capabilities in addition to strategies for content infusion (Thurlow, 1999).

Intel Teach to the Future was a worldwide professional development program that not only offered the ability to increase the effective use of technology resources in classroom instruction, but also used the train-the-trainer model to impact more classroom teachers and to guarantee that each participating teacher had the essential technology hardware and software to implement the effective use of technology in instruction (Metcalf and Jolly, 2002).

Moreover, changing teachers' attitudes toward technology is the key factor in teachers using technology effectively in the classroom and fostering technology integration (Marcinkiewicz, 1993-1994). According to Hignite and Echter (1992), it is critical that teachers possess both positive attitudes toward technology and basic technology skills to effectively incorporate technology in the classroom. Therefore, if teachers have positive attitudes toward technology and basic technology training, then teachers will be less anxious about using technology.

In the Computer Anxiety and Teachers Study, V. Mclnerney, D. Mclnerney, and Sinclair (1990) concluded that increased computer experience generally lowers computer anxiety. This theoretical research impelled the researcher in this present study to further investigate attitudes toward technology and computer anxiety.

In the following chapter on methodology, the researcher will investigate differences in attitudes toward technology and computer anxiety between two groups of public senior high schoolteachers in the Urban South Florida District, one in a traditional school setting and the other in an educational computer technology magnet public school setting. Following this investigation, the researcher will try to conclude that educational technology magnet schoolteachers are generally less computer anxious than traditional schoolteachers. Chapter Three, Methodology, will re-state the research questions and hypotheses, followed by a discourse on the research design, participants, instrumentation, procedures, data analysis, and summary.

CHAPTER III

METHODOLOGY

Introduction

The review of the literature in Chapter Two examined the premise for creating new and aggrandizing existing educational technology institutions for public senior high school students. In preparing students for the 21^{s1} century, public senior high school programs needed to develop choice schools such as magnet programs that included educational computer technology. To make technology omnipresent throughout the educational system, national goals were established. First, every classroom and library had access to the Internet by the year 2000 (Clinton, 1997). Second, schools used technology as a tool to improve academic achievement (Bush, 2002).

This study was designed to investigate differences in attitudes toward technology and computer anxiety between two groups of public senior high schoolteachers in the Urban South Florida Public School District. One group was located in a traditional school setting and the other group was located in an educational computer magnet school setting. The 60 participants in this study were Urban South Florida Public School classroom teachers. This study also compared and contrasted the differences between traditional public senior high schoolteachers’ and magnet public senior high schoolteachers’ rating scale scores on their attitudes toward technology and computer anxiety. Furthermore, this study answered the question: Is there a significant difference between the rating scale scores of teachers within traditional public secondary schools and magnet public secondary schools.

In this chapter, the presentation of the research questions and hypotheses are followed by a discourse on the research design, participants, instrumentation, procedures, data analysis, and summary.

Research Questions

1. Is there a difference in attitudes of teachers in traditional and magnet public secondary schools toward technology?
2. Is there a difference in the level of computer anxiety experienced by teachers in traditional and magnet public secondary schools?

Two other questions were examined:

3. Is there a difference between teachers' years of experience and teachers' attitudes toward technology?
4. Is there a difference between teachers' years of experience and teachers' computer anxiety?

Hypotheses

Ho,: There is no difference in the attitudes of teachers in traditional and magnet public secondary schools toward technology.

Ho_2: There is no difference in the level of computer anxiety experienced by teachers in traditional and magnet public secondary schools.

Ho_3: There is no difference in teachers' years of experience and teachers' attitudes toward technology.

Ho_4: There is no difference in teachers' years of experience and teachers' computer anxiety.

Research Design

This quasi-experimental design investigated differences in attitudes toward technology and computer anxiety between two groups of teachers, one in a traditional school setting and one in an educational computer technology magnet public school setting. Two groups of classroom teachers differing in their school setting, the independent variable, were compared on the dependent variables of attitude toward technology and computer anxiety. This design was appropriate for the study because the independent variable was not manipulated.

The Computer Anxiety Rating Scale (CARS- Form C) and the General Attitudes Toward Computers Scale (GATCS- Form C) were the two dependent variables scores used to determine differences in respondents' technological anxiety and a variety of attitudes toward computers and technology. This chapter discusses the processes that were used to collect and analyze data from 60 anonymous teacher respondents from two public senior high schools in the Urban South Florida area during the 2006-2007 school year. This chapter is divided into five parts: participants, sampling procedure, a description of the measurement instruments, a description of the procedures used in the data collection, and a description of the method used to analyze the data.

Participants

Participants in this study were classroom teachers from two public senior high schools in the Urban South Florida Public Schools during the 2006-2007 school year. The Urban South Florida Public School System is the fourth largest public school system in the nation. The participants in this study represent a sample of convenience. Participant selection for this study was based solely on teacher employment in a traditional or magnet school and their agreeing to volunteer as a participant in the proposed study.

The sample was composed of 60 participants: 30 classroom teachers from a traditional senior high school and 30 classroom teachers from an educational computer senior high school. According to Gay and Airasian (2003), a minimum of 30 participants in each group is recommended for research studies. The Office of Educational Evaluation and Research in the Urban South Florida Public School System granted the researcher the opportunity to survey these 60 participants. Thirty classroom teachers from an educational computer technology magnet public senior high school and 30 from a traditional public senior high school were contributors during the 2006-2007 school year.

During the 2000-2001 school year, the magnet public senior high school was the only computer technology magnet school in the district, and the traditional public senior high school was one of nine traditional schools. Both schools had comparable teacher demographics. During the 2006-2007 school year, the magnet public senior high school was still the only computer technology magnet in the district. This magnet public senior high school had a student population of 3,020; 58.9% of the students received free or reduced-cost lunch; there were 116 classroom teachers with a regular program pupil-to-teacher ratio of 22 to one; there were 50 male and 66 female classroom teachers; 32% of teachers were White Non-Hispanic, 44% were Black Non-Hispanic, 17% were Hispanic, and seven percent were Asian/American Indian; the number of years of teaching in Florida averaged 11 years; 20.8% of teachers were new to the school; and the average salary for instructional staff was $45,270.85 (Urban Magnet South Florida Senior High School Profile, 2006).

The traditional public senior high school had a student population of 3,002; 34.6% of the students received free or reduced-cost lunch; there were 108 classroom teachers with a regular program pupil-to-teacher ratio of 24 to one; there were 58 male and 50 female classroom teachers; 38% of teachers were White Non-Hispanic, 37% were Black Non-Hispanic, 26% were Hispanic, and one percent were Asian/American Indian; the number of years teaching in Florida averaged 12 years; 20.7% of teachers were new to the school; and the average salary for instructional staff was $45,947.45 (Urban Traditional South Florida Senior High School Profile, 2006).

The final study sample consisted of 60 participants.

Instrumentation

During the 2006-2007 school year, all purposely selected classroom teachers responded to two questionnaires and an Educational History and Computer Training Profile. Instrumentation for this study included the Computer Anxiety Rating Scale (CARS- Form C), the General Attitudes Toward Computers Scale (GATCS- Form C), and an Educational Flistory and Computer Training Profile that included an inquiry pertaining to the participant’s descriptive data, technology availability and usage, and prior technology training. Each participant completed two questionnaires—the Computer Anxiety Rating Scale (CARS- Form C) and the General Attitudes Toward Computers Scale (GATCS- Form C) —and the Educational History and Computer Training Profile. There were a total of 20 questions on each questionnaire, arranged in a five-point Likert scale. The demographic profile consisted of 12 major background information questions about the participants.

Computer Anxiety Rating Scale

The Computer Anxiety Rating Scale (CARS- Form A) was developed based on the Mathematics Anxiety Rating Scale (Richardson and Suinn, 1972). The CARS (Form A) included 54 statements rated on a five-point Likert scale indicating how nervous a person was at the moment the statement was read. Later, the CARS (Form A) was modified to the CARS (Form C). This modification consisted of 20 items, 16 from the original CARS (Form A) and four new statements reflecting changes in technology since the form's inception. Each question was rated on a five-point scale (1= not at all, 2=a little, 3=a fair amount, 4=much, 5=very much) indicating how anxious the statement made the person feel "at the point in time" the question was answered. The purpose of CARS (Form C) was to measure the technology anxiety of individuals.

According to Rosen and Weil (1992), the CARS (Form C) produced the Total Computer Anxiety Score and three Factor Anxiety Scores. The Total Computer Anxiety Score included items one through 20. The first Factor Score was Interactive Computer Learning Anxiety that consisted of the following items: 1, 3, 7, 10, 11, 12, 13, 14, 16, 17, and 20. The second Factor Score was Consumer Technology Anxiety that consisted of the following items: 2, 15, 18, and 19. The third Factor Score was Observational Computer Learning Anxiety that consists of the following items: 4, 5, 6, 8, 9, and 18. In general, higher scores revealed more computer anxiety. To compare subscales, totals for each scale were averaged. From this point forward, the researcher uses CARS to refer to CARS (Form C).

The CARS was to be widely used and carefully studied to distinguish individuals who are computer/technology anxious from those who are not (Rosen and Weil, 1992).

The content validity of the CARS was established by administering the test to sufficiently large samples of university students, schoolteachers, and school students from grades seven through nine. According to Rosen and Weil (1992), the CARS was not normalized to preserve the positively skewed distributional characteristics. Rosen and Weil (1992), in a sample of 473 respondents, reported that the CARS had a total Cronbach Alpha of 0.93. The total CARS was reliable. Since the CARS consisted of several subtests, the reliability of each subtest was evaluated. The following were average Alpha coefficients on each of the factors in the CARS questionnaire: Interactive Computer Learning Anxiety was 0.62; Consumer Technology Anxiety was 0.53; Learning Anxiety was 0.59 (Rosen and Weil, 1992). Rosen and Weil (1992) have shown acceptable reliabilities that range from 0.53 to 0.62.

In addition, if a respondent omitted a question, then the CARS missing response was two. If a respondent excluded more than eight questions on the CARS, then the entire CARS score should be discarded. In the clinical interpretation of the CARS, measurement was divided into three parts: No Technophobia, Low Technophobia, and Moderate/High Technophobia. On the CARS, the intervals were as follows: No Technophobia (20-41), Low Technophobia (42-49), and Moderate/High Technophobia (50-100) (Rosen and Weil, 1992). Hence, the higher the CARS score, the higher the level of computer/technology anxiety a participant felt “at the point in time” the question was answered.

General Attitudes Toward Computers

The General Attitudes Toward Computers Scale (GATCS- Form A) was developed in the same manner as the CARS. At first, the GATCS was titled the Attitudes

Toward Computers Scale (ATCS). The 26 statements of the GATCS (Form A) scale were created from a pool of attitudes toward computers and technology. After several studies, the GATCS (Form A) was modified and the GATCS (Form C) was developed. This condensed form consists of 20 items, 13 statements from the original GATCS (Form A) and seven new items. Each item was presented in a five-point Likert format (1= Strongly Agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly Disagree). The purpose of GATCS (Form C) was to measure a variety of attitudes toward computers and technology. In the GATCS (Form C), ten items are phrased in the positive direction (1,4, 6, 7, 10, 11, 13, 18, 19, and 20) and ten in the negative direction (2, 3, 5, 8, 9, 12, 14, 15, 16, and 17). In general, higher GATCS (Form C) scores indicate more positive general attitudes toward computers and technology. To compare scores, totals for each score were averaged. From this point forward, the researcher uses GATCS to refer to GATCS (Form C).

The GATCS was to be widely used and carefully studied to distinguish individuals who are computer/technology anxious from those who are not (Rosen and Weil, 1992). The content validity of the GATCS was established by administering the test to sufficiently large samples of university students, schoolteachers, and school students from grades seven through nine. According to Rosen and Weil (1992), the GATCS was not normalized to preserve the natural leptokurtic distributional characteristics. Rosen and Weil (1992), in a sample of 473 respondents, reported that the GATCS had a total Cronbach Alpha of 0.56. The total GATCS was reliable, but not as reliable as the total CARS. Since the GATCS consisted of several subtests, the reliability of each subtest was evaluated. The GATCS consisted of seven factors: Factor 1: Attitudes About Computers in Education; Factor 2: Attitudes About Computer Control;

Factor 3: Attitudes About Inequity in Computer Ability; Factor 4: Attitudes About Computers and Employment; Factor 5: Attitudes About Computers Solving Societal Problems; Factor 6: Attitudes About Computers and Future Jobs; Factor 7: Attitudes About Computers and Flealth. Even though the GATCS entire factor structure accounted for 58% of the variance, the factor structure was useful only as additional information for research purposes rather than for any clinical purposes due to a small number of items pertaining to each factor (Rosen and Weil, 1992).

In addition, if a respondent omitted a question, then the GATCS missing response was three. If a respondent excluded more than four questions on the GATCS, then the GATCS score should be discarded. In the clinical interpretation of the GATCS, each measure was divided into three parts: No Technophobia, Low Technophobia, and Moderate/High Technophobia. On the GATCS, the intervals were as follows: No Technophobia (64-100), Low Technophobia (56-63), and Moderate/High Technophobia (20-55) (Rosen and Weil, 1992).

Educational History and Computer Training Profile

The final questionnaire to be completed by the participants was an educational history and computer training data form that consisted of 12 questions related to schooling information, technology usage (i.e. computers as a tool), and technology training. The Educational History and Computer Training Profile (Appendix C) used in the study allowed collection of general information about the level of education, years of teaching, years at present school, classification of school, ownership and usage of technology, and the degree of technology training of each participant.

Procedures

The researcher first found a parallel study that had used the CARS and GATCS instruments. The researcher contacted the authors and copyright holders of the instruments and was permitted to use the instruments. After the author and copyright holders of the instruments granted permission, the researcher then needed approval to survey the participants from the Urban South Florida Public School System and Barry University's Institutional Review Board. After submission of the proposed research, the Office of Educational Evaluation and Research in the Urban South Florida County Public School System granted the researcher the opportunity to survey these 60 participants. The proposed research was then submitted to the Institutional Review Board at Barry University and was approved.

During the 2006-2007 school year, 116 classroom teachers from the magnet public senior high school and 108 classroom teachers from the traditional public senior high school were given the opportunity to participate. During the 2006-2007 school year, all classroom teachers from the traditional public senior high school and the magnet public senior high school were invited by their principals to participate in the study and to complete the two surveys and the profile.

During the 2006-2007 school year, survey provisions were hand-delivered to principals at both work locations so they could be administered to all classroom teachers. During a faculty meeting, the principals discussed the purpose of the study. At that time, the principals stated: " I will place a manila envelope in each teacher's mailbox. Each envelope consists of the following: (a) cover letter, (b) Informed Consent Form, (c) a copy of the Computer Anxiety Rating Scale, (d) a copy of the General Attitudes Toward

Computer Scale, and (e) a copy of the Educational History and Computer Training Profile. If you would like to participate in this study, then sign the Informed Consent Form and complete the two surveys and the profile. Return the Informed Consent Form, the two surveys, and the profile in the sealed manila envelope by placing it in a box for surveys in the school's mailroom."

The traditional and magnet schoolteachers who agreed to complete the Computer Anxiety Rating Scale, General Attitudes Toward Computers Scale, and the Educational History and Computer Training Profile were asked to read and sign the Informed Consent Form. The educational history and computer training data required no name or identification number. Therefore, the researcher had no way to identify the participants. The two surveys and the profile could be completed in less than 30 minutes. According to Rosen and Weil (1992), this was ample time to complete the questionnaires.

The participants who consented to participate in the study were asked to read and sign the Informed Consent Form. The survey requirements enclosed in the manila envelope consisted of the following: (a) a cover letter, (b) a copy of the Computer Anxiety Rating Scale, (c) a copy of the General Attitudes Toward Computers Scale, and (d) a copy of the Educational History and Computer Training Profile. In order to minimize participant inhibitions, participants could complete the surveys at their leisure and return them within a two-week period.

After completion, the participants were asked to return the completed surveys and the profile in a sealed, 9 X 1 2 inch manila envelope and to place the envelope in a box for surveys in the school's mailroom. When 30 participants from each school returned the sealed manila envelopes, the principal contacted the researcher. According to Gay and

Airasian (2003), a minimum of 30 participants in each group was recommended for research studies. All data collected will be stored in a locked file cabinet in the researcher's office for five years.

Data Analysis

Once the surveys were conducted, data was obtained from the CARS, the GATCS, and the profile, and was tabulated. The profile was used primarily to determine the differences between the two sample groups with respect to educational level, years at present school, technology usage (i.e. computers as a tool), and technology training. Moreover, this questionnaire was used to descriptive data from the teachers at each of the two public senior high schools to determine their current status with respect to schooling information, technology usage, and training (Gay, 1996). The description of the data was analyzed using quantitative statistics. The quantitative analyses involved both descriptive and inferential statistical procedures and included arithmetic means, standard deviations, ranges, and tests of significance types such as a one-sample t test. All data was checked for errors. Data was verified for accuracy and consistency. Corrections were made if necessary.

All data was analyzed using the Statistical Package for Social Sciences (SPSS). The arithmetic mean, standard deviation, range, skewness, and kurtosis were determined for the dependent variables (CARS and GATCS) as well as for the independent variable (magnet or traditional school setting). The dependent variable attitudes toward technology measured a variety of attitudes toward computers and technology, while the dependent variable computer anxiety measured technological anxiety. Once the mean score for each survey was determined, t-test inferential statistics were used to determine if there was a significant difference between the means of the two groups—traditional and magnet public schoolteachers—with respect to the CARS and the GATCS. The rating scale scores and profile results of respondents from an educational computer technology public magnet senior high school were analyzed and compared with the scores and results from respondents at a traditional senior high school. Each of the four hypotheses was analyzed using an independent t test. The level of significance for each independent t test was set at $p = .05$.

Summary

The research questions and hypotheses were investigated in this chapter. The chapter described the methodology of the research study. The participants—classroom teachers—and the instrumentation were described. The research design was discussed with the inclusion of the research procedures and the plans for the statistical analysis. The methodology of the research study was also summarized.

After the data from the two surveys and the profile was collected, compiled, and interpreted, the researcher determined the degree of significance between differences in the technology rating scale scores (CARS and GATCS) of magnet public secondary school classroom teachers and those of traditional public secondary school classroom teachers. This survey research study assisted in determining levels of knowledge needed to plan programs, evaluate aspects of curriculum or administrative procedures, form public policy, and evaluate courses and programs (Me Millan and Schumacher, 1989). Therefore, the findings of this study will provide educators, parents, and the community at-large with valuable knowledge pertaining to technology magnet high schools and their ability to while preparing them for the

21st century.

CHAPTER IV

RESULTS

Introduction

This chapter analyzes and summarizes the data collected according to the methodology discussed in Chapter Three and the purpose of the study presented in Chapter One. Both descriptive and inferential statistics were employed to examine the data gathered in the study. Inferential statistical procedures included independent sample t tests.

Description of the Subjects

At the beginning of the study, 224 classroom teachers were asked if they would voluntarily participate in the study. One-hundred and eight traditional schoolteachers who work at a traditional public senior high school in the Urban South Florida Public School District were invited to participate in the study. One-hundred and fourteen magnet schoolteachers who work at a magnet public senior high school in the Urban South Florida Public School District were invited to participate in the study.

Survey procedures were hand-delivered to the respective principals at both work locations to administer to potential participants. The survey requirements enclosed in a manila envelope consisted of the following: (a) a cover letter, (b) Informed Consent Form, (c) a copy of the Computer Anxiety Rating Scale, (d) a copy of the General Attitudes Toward Computer Scale, and (e) a copy of the Educational History and Computer Training Profile. Participation in this study was voluntary.

During a faculty meeting, each principal discussed the purpose of the study. At that time, the principals stated: “ I will place a manila envelope in each teacher’s mailbox. Each envelope consists of the following: (a) a cover letter, (b) Informed Consent Form, (c) a copy of the Computer Anxiety Rating Scale, (d) a copy of the General Attitudes Toward Computer Scale, and (e) a copy of the Educational History and Computer Training Profile. If you would like to participate in this study, then sign the Informed Consent Form and complete the two surveys and the profile. Return the Informed Consent Form, the two surveys, and the profile in the sealed manila envelope by placing it in a box for surveys in the school's mailroom."

Those traditional and magnet schoolteachers who participated in the study were asked to read and sign the Informed Consent Form as prevoiusly indicated. The educational history and computer training data required no name or identification number. Therefore, the researcher had no way to identify the participants. The two surveys and the profile could be completed in less than 30 minutes. The participants who consented to participate in the study were asked to return the completed surveys and the profile in the sealed manila envelope by placing the envelope in a box for surveys in the school's mailroom. When 30 participants from each school had returned the sealed manila envelopes, the principal contacted the researcher. All data collected by the researcher was stored in a locked file cabinet in the researcher's office and will remain stored for five years.

Of the 30 schoolteachers from a traditional public senior high school who consented to participate in the study and completed the surveys, only 29 completed the surveys properly. This accounted for 26.9% (29 out of 108) of the entire population. All of the 30 magnet schoolteachers from a magnet public senior high school, who consented to participate in the study, completed the surveys properly. This accounted for 26.3% (30 out of 114) of the entire population. The demographic data comes from the Educational History and Computer Training Profile and serves as general information for interpreting and understanding the analysis presented later in this chapter.

Years of Teaching Experience

The data in Table 1, page 58, show that that 27.6% of the traditional group had between one and five years of teaching experience; 27.6% of the traditional group had between six and 10 years of teaching experience; 13.8% of the traditional group had between 11 and 15 years of teaching experience; 13.8% of the traditional group had between 16 and 20 years of teaching experience; and 17.2% of the traditional group had more than 21 years of teaching experience.

The data in Table 1, page 58, also show that 48.3% of the magnet group had between one and five years of teaching experience; 13.8% of the magnet group had between six and 10 years of teaching experience; 13.8% of the magnet group had between 11 and 15 years of teaching experience; 6.9% of the magnet group had between 16 and 20 years of teaching experience; and 17.2% of the magnet group had more than 21 years of teaching experience.

Table 1

Distribution of Respondents by Years of Teaching

Years of Teaching	Traditional	Group	Magnet	Group
Experience	Number	%	Number	%
1 -5	8	27.6	14	48.3
6-10	8	27.6	4	13.8
11-15	4	13.8	4	13.8
15-20	4	13.8	2	6.9
>21	5	17.2	5	17.2
T otal	29	100.0	29	100.0

Education Level

The data in Table 2, page 59, show that 24.1% of the traditional group had a bachelor’s degree; 51.7% had a master’s degree; 24.1% had an educational specialist’s degree; zero percent had a doctoratal degree; and the traditional group had one missing value for educational level. In addition, this table shows that 48.3% of the magnet group had a bachelor’s degree; 44.8% had a master’s degree; 3.4% had an educational specialist’s degree; 3.4% had a doctorate’s degree; and the magnet group had one missing value for educational level.

Table 2

Distribution of Respondents by Education Level

Education Level	Traditional Group Number	%	Magnet Group Number	%
Bachelor's Degree	7	24.1	14	48.3
Master's Degree	15	51.7	13	44.8
Ed Specialist's Degree	7	24.1	1	3.4
Doctorate's Degree	0	0.0	1	3.4
Total	29	100.0	29	100.0

Teclmophobia

Table 3.1, page 60, shows the respondents' levels of technophobia by group as measured using the General Attitudes Toward Computers Scale (GATCS). For the traditional group, 86.2% had No Technophobia; 13.8% of the traditional group had Low Technophobia; and zero percent of the traditional group had Moderate/High Technophobia. For the magnet group, 76.7% had No Technophobia; 20.0% had Low Teclmophobia; and 3.3% had Moderate/High Technophobia.

Table 3.2, page 60, shows the respondents' levels of technophobia by group as measured by the Computer Anxiety Rating Scale (CARS). For the traditional group, 75.9% had No Technophobia; 13.8% had Low Technophobia; and 10.3% had Moderate/High Technophobia. For the magnet group, 80.0% had No Technophobia; 10.0% had Low Technophobia; and 10% had Moderate/High Teclmophobia.

Table 3.1

Distribution of Respondents by Technophobia as Measured by the General Attitudes Toward Computers Scale (GATCS)

Technophobia (GATCS)	Traditional Group Number	%	Magnet Group Number	%
No Technophobia	25	86.2	23	76.7
Low Technophobia	4	13.8	6	20.0
Moderate/ High Technonhobia	0	0.0	1	3.3
Total	29	100.0	30	100.0

Table 3.2

Distribution of Respondents by Technophobia as Measured by the Computer Anxiety Rating Scale (CARS)

Technophobia (CARS)	Traditional Group Number	%	Magnet Group Number	%
No Technophobia	22	75.9	24	80.0
Low Technophobia	4	13.8	3	10.0
Moderate/ High Technonhobia	3	10.3	3	10.0
Total	29	100.0	30	100.0

Analysis of Research Questions

Hypothesis One

H_{01}: There is no difference in the attitudes of teachers in traditional and magnet public secondary schools toward technology.

Table 4.1, page 62, shows the General Attitudes Toward Computer Scale (GATCS) mean score for the traditional group as 69.48 with a standard deviation of 5.67, while the magnet group had a mean score of 67.8, with a standard deviation of 5.97. The mean scores of the GATCS for the two samples differ by 1.68. The Levene's Test for Equality of Variances shows that p = 0.91. With a p value of 0.91 > 0.05, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 4.1 (Norusis, 1995). There is only a 27.2% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.27 and the t-value is 1.11. The t statistic is calculated by dividing the observed mean difference of 1.68 by 1.52. This indicates that only 27.2% of the time would you expect to see a sample difference of 1.68 points or greater on the General Attitudes Toward Computers Scale when the two sample means are equal. The appropriate value of t is 1.11 and the associated probability is 0.272. Since 27.2% is greater than 5%, one must not reject the null hypothesis that there is no difference in the attitudes of teachers in traditional and magnet public secondary schools toward technology.

Table 4.1

{- test for Independent Samples of Traditional and Magnet Schools as Measured by the General Altitudes Toward Computers Scale (GATCS)

Variable	Number of Cases	Mean	SD	SE of Mean
GATCS				
Traditional School	29	69.4828	5.673	1.054
Magnet School	30	67.8000	5.968	1.090

Mean Difference	Levene's Test for Eaualitv of Variances IF)	Significance (n)
1.6828	.013	.909

t-test for Equality of Means

Variances	t-value	df	2-Tail Siii	SEofDiff	95% Cl for Diff
Equal	1.11	57	.272	1.517	(-1.355,4.720)
Unequal	1.11	56.99	.272	1.516	(-1.352. 4.718)

Because there was no difference in the overall groups, the researcher analyzed the results of the General Attitudes Toward Computer Scale (GATCS) by subscales called factors. Table 4.2, page 63, shows the results of the GATCS by Factor 1: Attitudes About Computers in Education. The GATCS Factor 1 mean score for the traditional group was 20.28 with a standard deviation of 2.42, while the magnet group had a mean score of 18.9, with a standard deviation of 2.52. The mean scores of the GATCS Factor 1 for the two samples differ by 1.38. The Levene's Test for Equality of Variances shows that p = 0.96. With a p value of 0.96 > 0.05, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 4.2 (Norusis, 1995). There is only a 3.7% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.04 and the t-value is 2.14. The t statistic is calculated by dividing the observed mean difference of 1.38 by 0.64. This indicates that only 3.7% of the time would you expect to see a sample difference of 1.38 points or greater when the two sample means are equal. The appropriate value of t is 2.14 and the associated probability is .037. Since 3.7% is less than 5%, one must reject the null hypothesis that there is no difference in teachers' attitudes toward technology with respect to the GATCS Factor 1: Attitudes About Computers in Education between the traditional and magnet public secondary school groups. Hence, there is a difference in teachers' attitudes toward technology with respect to the GATCS Factor 1: Attitudes About Computers in Education between the traditional and magnet public secondary school groups.

Table 4.2

t- test for Independent Samples of Traditional and Magnet Schools as Measured by the General Attitudes Toward Computers by Factor 1: Attitudes About Computers in Education

Variable	Number of Cases	Mean	SD	SE of Mean
GATCS Factor 1				
Traditional School	29	20.2759	2.419	.449
Magnet School	30	18.9000	2.524	.461

Mean Difference	Levene's Test for Equality of Variances (F)	Significance (TO

t-test for Equality of Means

Variances	t-value	df	2-Tail Siu	SEofDiff	95% Cl for Diff
Equal	2.14	57	.037	.644	(.086, 2.665)
Unequal	2.14	57	.037	.643	(.087. 2.664)

Table 4.3, page 65, shows the results of the GATCS Factor 2: Attitudes About Computer Control. The GATCS Factor 2 mean score for the traditional group was 5.66 with a standard deviation of 1.95, while the magnet group had a mean score of 5.13 with a standard deviation of 1.96. The mean scores of the GATCS Factor 2 for the two samples differ by 0.52. The Levene's Test for Equality of Variances shows that p = 0.60. With a p value of 0.60 > 0.05, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 4.3 (Norusis, 1995). There is only a 31.0% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.31 and the t-value is 1.02. The t statistic is calculated by dividing the observed mean difference of 0.52 by 0.51. This indicates that only 31.0% of the time would you expect to see a sample difference of 0.52 points or greater when the two sample means are equal. The appropriate t value is 1.02 and the associated probability is 0.310. Since 31.0% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' attitudes toward technology with respect to Factor 2: Attitudes About Computer Control between the traditional and magnet public secondary school groups. Flence, there is no difference in teachers' attitudes toward technology with

respect to Factor 2: Attitudes About Computer Control between the traditional and magnet public secondary school groups.

Table 4.3

t- test for Independent Samples of Traditional and Magnet Schools as Measured by the General Attitudes Toward Computers by Factor 2: Attitudes About Computer Control

Variable	Number of Cases	Mean	SD	SE of Mean
GATCS Factor 2				
Traditional School	29	5.6552	1.951	.362
Maenet School	30	5.1333	1.961	.358

Mean Difference	Levene's Test for Equality of Variances (F)	Significance (d)
.5218	.280	.599

t-test for Equality of Means

Variances t-value	df	2-Tail Sig	SEofDiff	95% Cl for Diff
Equal 1.02	57	.310	.509	(-.498, 1.542)
Unequal 1.02	56.95	.310	.509	(-.498. 1.542)

Table 4.4, page 66, shows the results of the GATCS Factor 3: Attitudes About Inequity in Computer Ability. The GATCS Factor 3 mean score for the traditional group was 11.69 with a standard deviation of 2.17, while the magnet group had a mean score of 12.30 with a standard deviation of 1.75. The mean scores of the GATCS Factor 3 for the two samples differ by -0.61. The Levene's Test for Equality of Variances shows that p = 0.465. With a p value of 0.465 > 0.05, the researcher will not reject the null hypothesis at the 5% level. Flence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 4.4 (Norusis, 1995). There is only a 23.8%

chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.24 and the t-value is -1.19. lire t statistic is calculated by dividing the observed mean difference of -0.61 by 0.51. This indicates that only 23.8% of the time would you expect to see a sample difference of -0.61 points or greater when the two sample means are equal. The appropriate t value is -1.19 and the associated probability is 0.238. Since 23.8% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' attitudes toward technology with respect to Factor 3: Attitudes About Inequity in Computer Ability between the traditional and magnet public secondary school groups. Hence, there is no difference in teachers' attitudes toward technology with respect to Factor 3: Attitudes About Inequity in Computer Ability between the traditional and magnet public secondary school groups.

Table 4.4

t- test for Independent Samples of Traditional and Magnet Schools as Measured by the General Attitudes Toward Computers Factor 3: Attitudes About Inequity in Computer Ability

Variable	Number of Cases	Mean	SD	SE of Mean
GATCS Factor 3				
Traditional School	29	11.6897	2.173	.404
Magnet School	30	12.3000	1.745	.319

Mean Difference	Levene's Test for Eaualitv of Variances (F)	Significance *(v)*
-.6103	.541	.465

t-test for Equality of Means

Variances	t-value	df	2-Tail Sie	SEofDiff	95% Cl for Diff
Equal	-1.19	57	.238	.512	(-1.636, .415)
Unequal	-1.19	53.66	.240	.514	(-1.641..421)

Table 4.5, page 68, shows the results of the GATCS Factor 4: Attitudes About Computers and Employment. The GATCS Factor 4 mean score for the traditional group was 5.21 with a standard deviation of 1.86, while the magnet group had a mean score of 5.33 with a standard deviation of 1.85. The mean scores of the GATCS Factor 4 for the two samples differ by -0.33. The Levene's Test for Equality of Variances shows that p = 0.919. With a p value of 0.919 > 0.05, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 4.5 (Norusis, 1995). There is only a 50.0% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.50 and the t-value is -0.68. The t statistic is calculated by dividing the observed mean difference of -0.33 by 0.48. This indicates that only 50.0% of the time would you expect to see a sample difference of -0.33 points or greater when the two sample means are equal. The appropriate t value is -0.68 and the associated probability is 0.502. Since 50.0% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' attitudes toward technology with respect to Factor 4: Attitudes About Computers and Employment between the traditional and magnet public secondary school groups. Hence, there is no difference in teachers'

attitudes toward technology with respect to Factor 4: Attitudes About Computers and Employment between the traditional and magnet public secondary school groups.

Table 4.5

t- test for Independent Samples of Traditional and Magnet Schools as Measured by (he General Attitudes Toward Computers Factor 4: Attitudes About Computers and Employment

Variable	Number of Cases	Mean	SD	SE of Mean
GATCS Factor 4				
Traditional School	29	5.2069	1.859	.345
Magnet School	30	5.5333	1.852	.338

Mean Difference	Levene's Test for Eaualitv of Variances (F)	Significance *(v)*
-.3264	.010	.919

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SEofDiff	95% Cl for Diff
Equal	-.68	57	.502	.483	(-1.294, .641)
Unequal	-.68	56.92	.502	.483	(-1.294. .641)

Table 4.6, page 69, shows the results of the GATCS Factor 5: Attitudes About Computers Solving Societal Problems. The GATCS Factor 5 mean score for the traditional group was 6.21 with a standard deviation of 2.04, while the magnet group had a mean score of 5.33 with a standard deviation of 1.77. The mean scores of the GATCS Factor 5 for the two samples differ by 0.87. The Levene's Test for Equality of Variances shows that $p = 0.611$. With a p value of $0.611 > 0.05$, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must

use the results labeled equal variances in Table 4.6 (Norusis, 1995). There is only an 8.4% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.08 and the t-value is 1.76. The t statistic is calculated by dividing the observed mean difference of 0.87 by 0.50. This indicates that only 8.4% of the time would you expect to see a sample difference of 0.87 points or larger when the two sample means are equal. The appropriate value of t is 1.76 and the associated probability is 0.084. Since 8.4% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' attitudes toward technology with respect to Factor 5: Attitudes About Computers Solving Societal Problems between the traditional and magnet public secondary school groups. Hence, there is no difference in teachers' attitudes toward technology with respect to Factor 5: Attitudes About Computers Solving Societal Problems between the traditional and magnet public secondary school groups.

Table 4.6

/- *test for Independent Samples of Traditional and Magnet Schools as Measured by General Attitudes Toward Computers Factor 5: Attitudes About Computers Solving Societal Problems*

Variable	Number of Cases	Mean	SD	SE of Mean
GATCS Factor 5				
Traditional School	29	6.2069	2.042	.379
Maenet School	30	5.3333	1.768	.323

Mean Difference	Levene's Test for Equality of Variances (F)	Significance (TO
.8736	.262	.611

t-test for Equality of Means

Variances	t-value	df	2-Tail Sig	SE of Diff	95% Cl for Diff
Equal	1.76	57	.084	.497	(-.121, 1.868)
Unequal	1.75	55.27	.085	.498	(-.124. 1.87 D

Table 4.7, page 71, shows the results of the GATCS Faetor 6: Attitudes About Computers and Future Jobs. The GATCS Factor 6 mean score for the traditional group was 4.21 with a standard deviation of 0.73, while the magnet group had a mean score of 4.10 with a standard deviation of 0.85. The mean scores of the GATCS Factor 6 for the two samples differ by 0.11. The Levene's Test for Equality of Variances shows that p = 0.659. With a p value of 0.659 > 0.05, the researcher will not reject the null hypothesis at the 5% level. Flence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 4.7 (Norusis, 1995). There is only a 60.5% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.61 and the t-value is 0.52. The t statistic is calculated by dividing the observed mean difference of 0.11 by 0.21. This indicates that only 60.5% of the time would you expect to see a sample difference of 0.11 points or larger when the two sample means are equal. The appropriate value of t is 0.52 and the associated probability is 0.605. Since 60.5% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' attitudes toward technology with respect to Factor 6: Attitudes About Computers and Future Jobs between the traditional and magnet public secondary school groups. Hence, there is no difference in teachers'

altitudes toward technology with respect to Factor 6: Attitudes About Computers and Future Jobs between the traditional and magnet public secondary school groups.

Table 4.7

t- test for Independent Samples of Traditional and Magnet Schools as Measured by General Attitudes Toward Computers by Factor 6: Attitudes About Computers and Future Jobs

Variable	Number of Cases	Mean	SD	SE of Mean
GATCS Factor 6				
Traditional School	29	4.2069	.726	.135
Magnet School	30	4.1000	.845	.154

Mean Difference	Levene's Test for Equality of Variances (F)	Significance (n)
.1069	.197	.659

t-test for Equality of Means

Variances t-value	df	2-Tail Sig	SEofDiff	95% Cl for Diff
Equal .52	57	.605	.205	(-.304, .518)
Unequal .52	56.24	.604	.205	(-.303. .517)

Table 4.8, page 72, shows the results of the GATCS Factor 7: Attitudes About Computers and Health. The GATCS Factor 7 mean score for the traditional group was 3.03 with a standard deviation of 1.35, while the magnet group had a mean score of 2.83 with a standard deviation of 1.23. The mean scores of the GATCS Factor 7 for the two samples differ by 0.20. The Levene's Test for Equality of Variances shows that p = 0.634. With a p value of 0.634 > 0.05, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the

results labeled equal variances in Table 4.8 (Norusis, 1995). There is only a 55.2% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.55 and the t-value is 0.60. The t statistic is calculated by dividing the observed mean difference of 0.20 by 0.34. T his indicates that only 55.2% of the time would you expect to see a sample difference of 0.20 points or greater when the two sample means are equal. The appropriate value of t is 0.60 and the associated probability is 0.554. Since 55.2% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' attitudes toward technology with respect to Factor 7: Attitudes About Computers and Health between the traditional and magnet public secondary school groups. Hence, there is no difference in teachers* attitudes toward technology with respect to Factor 7: Attitudes About Computers and Health between the traditional and magnet public secondary school groups.

Table 4.8

t- lest for Independent Samples of Traditional and Magnet Schools as Measured by General Attitudes Toward Computers Factor 6: Attitudes About Computers and Health

Variable	Number of Cases	Mean	SD	SE of Mean
GATCS Factor 7				
Traditional School	29	3.0345	1.349	.251
Magnet School	30	4.1000	1.234	.225

Mean Difference	Levene's Test for Equality of Variances (F)	Significance (d)
.2011	.197	.634

t-test for Equality of Means

Variances	t-value	df	2-Tail Sie.	SE of Diff	95% Cl for Diff
Equal	.60	57	.552	.336	(-.473, .875)
Unequal	.60	56.15	.553	.337	(..4?4^8_76)

Hypothesis Two

H_{o2}: There is no difference in the level of computer anxiety experienced by teachers in traditional and magnet public secondary schools.

Table 5.1, page 74, shows the results of the Computer Anxiety Rating Scale (CARS) mean score for the traditional group as 35.34 with a standard deviation of 11.71, while the magnet group had a mean score of 31.87 with a standard deviation of 11.39. The mean scores of the CARS for the two samples differ by 3.48. The Levene's Test for Equality of Variances shows that p = 0.927. With a p value of 0.927 > 0.05, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in fable 5.1 (Norusis, 1995). There is only a 25.2% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.25 and the t-value is 1.16. The t statistic is calculated by dividing the observed mean difference of 3.48 by 3.00. This indicates that only 25.2% of the time would you expect to see a sample difference of 3.48 points or greater when the two sample means are equal. The appropriate value of t is 1.16 and the associated probability is 0.252. Since 25.2% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' attitudes toward technology between the traditional and magnet public secondary school groups.

Table 5.1

1- test for Independent Samples of Traditional and Magnet Schools as Measured by the Computer Anxiety Rating Scale (CARS)

Variable	Number of Cases	Mean	SD	SE of Mean
CARS				
Traditional School	29	35.3448	11.706	2.174
Magnet School	30	31.8667	11.389	2.079

Mean Difference	Levene's Test for Equality of Variances (F)	Significance (n)
3.4782	.008	.927

t-test for Equality of Means

Variances t-value	df	2-Tail Sig	SEofDiff	95% Cl for Diff
Equal 1.16	57	.252	3.007	(-2.542, 9.499)
Unequal 1.16	56.78	.252	3.008	(-2.546. 9.502)

Because there was no difference in the overall groups, the researcher analyzed the results of the Computer Anxiety Rating Scale (CARS) by subscales called factors. Table 5.2, page 75, shows the results of the CARS Factor 1: Interactive Computer Learning Anxiety. The CARS Factor 1 mean score for the traditional group was 21.14 with a standard deviation of 8.94, while the magnet group had a mean score of 19.87 with a standard deviation of 8.06. The mean scores of the CARS Factor 1 for the two samples differ by 1.27. The Levene's Test for Equality of Variances shows that $p = 0.449$. With a p value of $0.449 > 0.05$, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 5.2 (Norusis, 1995). There is only a 56.8% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.57 and the t-value is 0.57. The t statistic is calculated by dividing the observed mean difference of 1.27 by 2.22. This indicates that only 56.8% of the time would you expect to see a sample difference of 1.27 points or greater when the two sample means are equal. The appropriate value oft is 0.57 and the associated probability is 0.568. Since 56.8% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' computer anxiety with respect to Factor 1: Interactive Computer Learning Anxiety between the traditional and magnet public secondary school groups. Hence, there is no difference in teachers' computer anxiety with respect to Factor 1: Interactive Computer Learning Anxiety between the traditional and magnet public secondary school groups.

Table 5.2

t- test for Independent Samples of Traditional and Magnet Schools as Measured by the Computer Anxiety Rating Scale Factor 1: Interactive Computer Learning Anxiety

Variable	Number of Cases	Mean	SD	SE of Mean
CARS Factor 1				
Traditional School	29	21.1379	8.943	1.661
Magnet School	30	19.8667	8.063	1.472

Mean Difference	Levene's Test for Equality of Variances (F)	Significance (p)
1.2713	.582	.449

t-test for Equality of Means

Variances	t-value	df	2-Tail Sic	SE of Diff	95% Cl for Diff
Equal	.57	57	.568	2.215	(-3.165, 5.707)
Unequal	.57	55.94	.569	2.219	(-3.175. 5.7IT)

Table 5.3, page 77, shows the results of the CARS Factor 2: Consumer Technology Anxiety. The CARS Factor 2 mean score for the traditional group was 5.72 with a standard deviation of 2.15, while the magnet group had a mean score of 5.53 with a standard deviation of 2.46. The mean scores of the CARS Factor 2 for the two samples differ by 0.19. The Levene's Test for Equality of Variances shows that p = 0.813. With a p value of 0.813 > 0.05, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 5.3 (Norusis, 1995). There is only a 75.3% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.75 and the t-value is 0.32. The t statistic is calculated by dividing the observed mean difference of 0.19 by 0.60. This indicates that only 75.3% of the time would you expect to see a sample difference of 0.19 points or greater when the two sample means are equal. The appropriate value of t is 0.32 and the associated probability is 0.753. Since 75.3% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' computer anxiety with respect to Factor 2: Consumer Technology Anxiety between the traditional and magnet public secondary school groups. Hence, there is no difference in teachers' computer anxiety with respect to Factor 2:

Consumer Technology Anxiety between the traditional and magnet public secondary school groups.

Table 5.3

t- test for Independent Samples of Traditional and Magnet Schools as Measured by the Computer Anxiety Rating Scale Factor 2: Consumer Technology Anxiety

Variable	Number of Cases	Mean SD	SE of Mean
CARS Factor 2			
Traditional School	29	5.7241 2.153	.400
Magnet School	30	5.5333 2.460	.449

Mean Difference	Levene's Test for Eaualitv of Variances (F)	Significance (n)
.1908	.057	.813

t-test for Equality of Means

Variances t-value	df	2-Tail Sie	SEofDiff	95% Cl for Diff
Equal .32	57	.753	.603	(-1.016, 1.398)
Unequal .32	56.46	.752	.601	6-1.013. 1.395)

Table 5.4, page 78, shows the results of the CARS Factor 3: Computer Learning Anxiety. The CARS Factor 3 mean score for the traditional group was 8.48 with a standard deviation of 4.15, while the magnet group had a mean score of 6.47 with a standard deviation of 3.20. The mean scores of the CARS Factor 3 for the two samples differ by 2.02. The Levene's Test for Equality of Variances shows that p = 0.04. With a p value of 0.04 < 0.05, the researcher must reject the null hypothesis at the 5% level. Because 0.040 is less than 0.05, the difference between the two means is statistically significant at the 0.05 level. Since 4.0% is less than 5%, one must reject the null hypothesis that there is no difference in teachers' computer anxiety with respect to Factor

3: Observational Computer Learning Anxiety between the traditional and magnet public secondary school groups. Hence, by rejecting the null hypothesis, there is a difference in teachers' computer anxiety with respect to Factor 3: Observational Computer Learning Anxiety between the traditional and magnet public secondary school groups.

Table 5.4

l- test for Independent Samples of Traditional and Magnet Schools as Measured by the Computer Anxiety Rating Scale Factor 3: Observational Computer Learning Anxiety

Variable	Number of Cases	Mean	SD	SE of Mean
CARS Factor 3				
Traditional School	29	8.4828	4.146	.770
Maenet School	30	6.4667	3.203	.585

Mean Difference	Levene's Test for Equality of Variances (F)	Significance (n)
2.0161	4.422	.040

t-test for Equality of Means

Variances	t-value	df	2-Tail Sis	SE ol'Diff	95% Cl for Diff
Equal	2.09	57	.041	.963	(.089, 3.944)
Unequal	2.09	52.69	.042	.967	(.077. 3.955)

Hypothesis Three

$H_{q\,3}$: There is no difference in teachers' years of experience and teachers' attitudes toward technology.

Table 6.1, page 79, shows the results of the General Attitudes Toward Computers Scale (GATCS) by Years of Experience for teachers in the traditional public school group. According to the Florida Department of Education, a Florida Department of Education Temporary Teaching Certificate is valid for three school years. Based on this, the researcher categorized the participants by novice and master teachers. The Years of Experience were grouped in two categories: 1) A novice teacher had one through three years experience, inclusive; and 2) a master teacher had more than three years of experience. The GATCS by Years of Experience mean score for novice teachers in the traditional group was 69.67 with a standard deviation of 2.81, while the master teachers in the traditional group had a mean score of 69.43 with a standard deviation of 6.26. The mean scores of the GATCS for the two traditional samples differ by 0.23. The Levene's Test for Equality of Variances shows that $p = 0.042$. With a p value of $0.042 < 0.05$, the researcher must reject the null hypothesis at the 5% level. Because 0.042 is less than 0.05, one must reject the null hypothesis that the two sample variances are equal based on the Levene test. Since 4.2% is less than 5%, one must reject the null hypothesis that there is no difference in teachers' years of experience and teachers' attitudes toward technology for the traditional group. Therefore, there is a difference in teachers' years of experience and teachers' attitudes toward technology by novice and master teachers within the traditional group. Of the 29 traditional teachers who responded to the GATCS, six were novice teachers, while 23 were master teachers.

Table 6.1

t- test for Independent Samples of Novice and Master Teachers Within the Traditional Public School Group as Measured by the General Attitudes Toward Computers Scale (GATCS)

Variable	Number of Cases	Mean	SD	SE of Mean
Traditional GATCS				
Novice Teacher	6	69.6667	2.805	1.145
Master Teacher	23	31.8667	6.258	1.305

Mean Difference	Levene's Test for Equality of Variances (F)	Significance (p)
.2319	4.555	.042

t-test for Equality of Means

Variances	t-value	df	2-Tail Sia	SE of Diff	95% Cl for Diff
Equal	.09	27	.931	2.648	(-5.202, 5.665)
Unequal	.13	19.10	.895	1.736	(-3.400. 3.864)

Table 6.2, page 81, shows the results of the General Attitudes Toward Computers Scale (GATCS) by Years of Experience for teachers in the magnet public school group. According to the Florida Department of Education, a Florida Department of Education Temporary Teaching Certificate is valid for three school years. Based on this, the researcher categorized the participants by novice and master teachers. The Years of Experience were grouped in two categories: 1) A novice teacher had one through three years experience, inclusive; and 2) a master teacher had more than three years of experience. The GATCS by Years of Experience mean score for novice teachers in the magnet group was 69.14 with a standard deviation of 3.93, while the master teachers in the magnet group had a mean score of 67.32 with a standard deviation of 6.62. The mean scores of the GATCS for the two magnet samples differ by 1.82. The Levene's Test for Equality of Variances shows that $p = 0.125$. With a p value of $0.125 > 0.05$, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 6.2 (Norusis, 1995). There is only a 49.8% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.50

and the t-value is 0.69. The t statistic is calculated by dividing the observed mean difference of 1.82 by 2.66. This indicates that only 49.8% of the time would you expect to see a sample difference of 1.82 points or greater when the two sample means are equal. The appropriate t value is 0.69 and the associated probability is 0.498. Since 49.8% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' years of experience and teachers' attitudes toward technology for the magnet group. Hence, there is no difference in teachers' years of experience and teachers* attitudes toward technology by novice and master teachers within the magnet group. Of the 29 magnet teachers who responded to the GATCS, seven were novice teachers, while 22 were master teachers.

Table 6.2

t- test for Independent Samples of Novice and Master Teachers Within the Magnet Public School Group as Measured by General Attitudes Toward Computers Scale (GATCS)

Variable	Number of Cases	Mean	SD	SE of Mean
Magnet GATCS				
Novice Teacher	7	69.1429	3.934	1.487
Master Teacher	22	67.3182	6.622	1.412

Mean Difference	Levene's Test for Eaualitv of Variances *(¥)*	Significance (d)
1.8247	2.507	.125

t-tesl for Equality of Means

Variances	t-value	df	2-Tail Sia	SEofDiff	95% Cl for Diff
Equal	.69	27	.498	2.659	(-3.631,7.280)
Unequal	.89	17.61	.385	2.050	G2.490. 6.139)

Hypothesis Four

H_{04}: There is no difference in teachers' years of experience and teachers' computer anxiety.

Table 7.1, page 83, shows the results of the Computer Anxiety Rating Scale (CARS) by Years of Experience for teachers in the traditional public school group. According to the Florida Department of Education, a Florida Department of Education Temporary Teaching Certificate is valid for three school years. Based on this, the researcher categorized the participants by novice and master teachers. The Years of Experience were grouped in two categories: 1) A novice teacher had one through three years experience, inclusive, and 2) a master teacher had more than three years of experience. The CARS by Years of Experience mean score for novice teachers in the traditional group was 33.00 with a standard deviation of 9.23, while the master teachers in the traditional group had a mean score of 35.96 with a standard deviation of 12.38. The mean scores of the CARS for the two traditional samples differ by -2.96. The Levene's Test for Equality of Variances shows that p = 0.617. With a p value 0.617 > 0.05, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 7.1 (Norusis, 1995). There is only a 59.1% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.59 and the t-value is -0.54. The t statistic is calculated by dividing the observed mean difference of -2.96 by 5.44. This indicates that only 59.1% of the time would you expect to see a sample difference of -2.96 points or larger when the two sample means are equal. The appropriate t value is -0.54 and the associated probability is 0.59. Since 59.1% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' years of experience and teachers' computer anxiety for the traditional group. Hence, there is no difference in teachers' years of experience and teachers' computer anxiety by novice and master teachers within the traditional group. Of the 29 traditional teachers who responded to the CARS, six were novice teachers, while 23 were master teachers.

Table 7.1

t- test for Independent Samples of Novice and Master Teachers Within the Traditional Group as Measured by the Computer Anxiety Rating Scale (CARS)

Variable	Number of Cases	Mean	SD	SE of Mean
Traditional CARS				
Novice Teacher	6	33.0000	9.230	3.768
Master Teacher	23	35.9565	12.375	2.580

Mean Difference	Eevene's Test for Equality of Variances (F)	Significance (n)
-2.9565	.256	.617

t-test for Equality of Means

Variances	t-value	df	2-Tail Sie	SEofDiff	95% Cl for Diff
Equal	-.54	27	.591	5.435	(-14.108, 8.195)
Unequal	-.65	10.27	.532	4.567	(-13.096. 7.183)

Table 7.2, page 85, shows the results of the Computer Anxiety Rating Scale (CARS) by Years of Experience for teachers in the magnet public school group. According to the Florida Department of Education, a Florida Department of Education Temporary Teaching Certificate is valid for three school years. Based on this, the

researcher categorized the participants by novice and master teachers. The Years of Experience were grouped in two categories: 1) A novice teacher had one through three years experience, inclusive, and 2) A master teacher had more than three years of experience. The CARS by Years of Experience mean score for novice teachers in the magnet group was 32.29 with a standard deviation of 13.11, while the master teachers in the magnet group had a mean score of 32.14 with a standard deviation of 11.23. The mean scores of the CARS for the two magnet samples differ by 0.15. The Levene's Test for Equality of Variances shows that $p = 0.978$. With a p value of $0.978 > 0.05$, the researcher will not reject the null hypothesis at the 5% level. Hence, one must not reject the null hypothesis that the two sample variances are equal based on the Levene test. Therefore, the researcher must use the results labeled equal variances in Table 7.2 (Norusis, 1995). There is only a 97.7% chance of observing a mean difference at least this large if the null hypothesis is true. The observed two-tailed significance level is 0.98 and the t-value is 0.03. The t statistic is calculated by dividing the observed mean difference of 0.15 by 5.07. This indicates that only 97.7% of the time would you expect to see a sample difference of 0.15 points or larger when the two sample means are equal. The appropriate t value is 0.03 and the associated probability is 0.977. Since 97.7% is greater than 5%, one must not reject the null hypothesis that there is no difference in teachers' years of experience and teachers' computer anxiety for the magnet group. Hence, there is no difference in teachers' years of experience and teachers' computer anxiety by novice and master teachers within the magnet group. Of the 29 magnet teachers who responded to the CARS, seven were novice teachers, while 22 were master teachers.

Table 7.2

t- test for Independent Samples of Novice and Master Teachers Within the Magnet Group as Measured by the Computer Anxiety Rating Scale (CARS)

Variable	Number of Cases	Mean	SD	SE of Mean
Magnet CARS				
Novice Teacher	7	32.2857	13.111	4.956
Master Teacher	22	32.1364	11.230	2.394

Mean Difference	Levene's Test for Equality of Variances (F)	Significance (p)
.1494	.001	.978

t-test for Equality of Means

Variances t-value	df	2-Tail Sia	SEofDiff	95% Cl for Diff
Equal .03	27	.977	5.066	(-10.246, 10.544)
Unequal .03	8.99	.979	5.504	(-12.303. 12.602)

Summary

Hypothesis One

In summary, the General Attitudes Toward Computer Scale (GATCS) scores indicated that the traditional and magnet public school groups are not significantly different. Therefore, the researcher decided to analyze the subscales (factors) of the GATCS. The GATCS scores for the following factors indicated that the two groups, traditional and magnet, are not significantly different: Factor 1: Attitudes About Computers in Education, Factor 2: Attitudes About Computer Control, Factor 3: Attitudes About Inequity in Computer Ability, Factor 4: Attitudes About Computers and Employment, Factor 5: Attitudes About Computers Solving Societal Problems, Factor 6: Attitudes About Computers and Future Jobs, and Factor 7: Attitudes About Computers and Health. On the other hand, the GATCS Factor 1: Attitudes About Computers in Education scores indicated that the traditional and magnet groups are significantly different. The statements within this subscale are: 1) Computers can save people a lot of work; 2) Computers increase the amount of time we have for other activities; 3) Computers are good teaching tools; 4) Computers prepare students for the future; and 5) There is an overemphasis on computer education in this society. Thus, the researcher can conclude that the traditional and magnet groups' attitudes toward computers do differ with respect to education.

Hypothesis Two

The Computer Anxiety Scale (CARS) scores indicated that the traditional and magnet groups are not significantly different. Therefore, the researcher decided to analyze the CARS subscales (factors). The CARS scores for the following factors indicated that the traditional and magnet groups are not significantly different: Factor 1: Interactive Computer Learning Anxiety and Factor 2: Consumer Technology Anxiety.

On the other hand, the CARS scores for Factor 3: Observational Computer Learning Anxiety indicated that the traditional and magnet groups are significantly different. The statements within this subscale are: 1) Sitting in front of a home computer; 2) Watching a movie about an intelligent computer; 3) Looking at a computer printout; 4) Getting "error messages" from the computer; 5) Using an automated bank teller machine; and 6) Visiting a computer center. So, the researcher can conclude that computer anxiety within the traditional and magnet groups differs with respect to observational computer learning anxiety.

Hypothesis Three

The results of the General Attitudes Toward Computer Scale (GATCS) by Years of Experience for novice and master teachers within the traditional public school group are significantly different. Of the 29 traditional teachers who responded to the GATCS, six were novice teachers while 23 were master teachers. The results of the GATCS by Years of Experience for novice and master teachers within the magnet public school group are significantly different. Of the 29 magnet teachers who responded to the GATCS, seven were novice teachers while 22 were master teachers.

Hypothesis Four

The results of the Computer Anxiety Rating Scale (CARS) by Years of Experience for the novice and master teachers within the traditional public school group are not significantly different. Of the 29 traditional teachers who responded to the CARS, six were novice teachers, while 23 were master teachers. The results of the CARS by Years of Experience for novice and master teachers within the magnet public school group are not significantly different. Of the 29 magnet teachers who responded to the CARS, seven were novice teachers while 22 were master teachers.

CHAPTER V

DISCUSSION

Introduction

This chapter summarizes the study and the findings of the data presented in Chapter Four. It makes conclusions based on the findings from the data. Moreover, this chapter makes recommendations for implementation of the findings from the data and for additional research.

Summary

In the following sections, the researcher will summarize the topics discussed in the first three chapters and the findings portion of Chapter Four. The researcher will re-examine the review of the literature, the purpose of the study, the participants, the instrumentation of this study, and the analysis of the findings.

Review> of the Literature

In order to improve the quality of education, institutions utilized alternative ways of teaching and evaluation, different from those used in a traditional school setting (Magnet Schools of America, 2003). The drive to increase technology in the classroom according to the Enhancing Education through Technology—No Child Left Behind Act promoted using technology as a tool to improve academic achievement (Bush, 2002). In order for teachers to stay abreast of the advancement of educational technologies, societal phenomena in technology, and the global competition and emerging technologies, school districts needed to create new and enhance existing educational organizations. “Schools of choice” were effective educational institutions since students appeared to learn more (Raywid, 1989). Urban South Florida Public Schools Magnet Programs were schools of choice that offered unique courses of study focusing on special and common interests, aptitudes, and abilities of students (Magnet Programs of Urban South Florida Public Schools, 2003). The magnet public senior high school was an example of an Urban South Florida Public School Magnet Program in Educational Computer Technology. In the fall of 1999, the United States Department of Education (1999), with the assistance of stakeholders, generated five new national education technology goals: all students and teachers will have access to information technology, all teachers will use technology effectively, all students will have technology and information skills, research and evaluation will improve technology applications, and digital content and networked applications will transform teaching and learning. Students would be taught technology by the transition from traditional forms of learning to more constructivist approaches. Technology supported instructional delivery models that promoted authentic learning, constructivism, active learning, collaborative learning, and communities of learning (B. A. Kerlin, S. P. Kerlin, and Obrien, 2000). Because the United States was in a major communication revolution, the success of every individual depended on his or her ability to function in a technological society (Bollentin, 1995). In order for individuals to survive in the fast-moving and ever-changing Information Age, they had to overcome technophobia.

Hence, in order for teachers to overcome the fear of using technology in the classroom and beyond, teachers needed to be trained efficiently to integrate technology into the curriculum (Simonson and Thompson, 1994). Teachers needed a staff development continuum that would take them from non-users of technology to skillful users, and then on to integrating technology into content (Nussbaum-Beach, 2003).

Effective technology training consisted of a well-balanced plan that prepared teachers with basic technical capabilities in addition to strategies for content infusion (Thurlow, 1999). Intel Teach to the Future was a worldwide professional development program that not only offered the ability to increase the effective use technology resources in classroom instruction, but also used the train-the-trainer model to impact more classroom teachers and to guarantee that each participating teacher had the essential technology hardware and software to implement the effective use of technology in instruction (Metcalf and Jolly, 2002).

Moreover, changing teachers' attitudes toward technology was the key factor in teachers using technology effectively in the classroom and fostering technology integration (Marcinkiewicz, 1993-1994). According to Hignite and Echter (1992), it is critical that teachers possess both positive attitudes toward technology and basic technology skills to effectively incorporate technology in the classroom. Therefore, if teachers have positive attitudes toward technology and basic technology training, then teachers will be less anxious about using technology.

In the Computer Anxiety and Teachers Study, V. Mclnerney, D. Mclnerney, and Sinclair (1990) concluded that increased computer experience generally lowers computer anxiety. This theoretical research impelled the researcher in this present study to further investigate attitudes toward technology and computer anxiety.

Purpose of the Study

The purpose of this study was to investigate the differences in attitudes toward technology and computer anxiety of public senior high schoolteachers in traditional and magnet school settings in the Urban South Florida School District. This study compared and contrasted the differences in rating scale scores of traditional public senior high schoolteachers and magnet public senior high schoolteachers on their attitudes toward technology and computer anxiety. In analyzing the rating scale scores, the researcher determined whether a significant difference existed between the rating scale scores of teachers within traditional and magnet public senior high school settings. Because of the homogeneity of the schools, data was collected from only one traditional public senior high school and one magnet public senior high school.

Data was collected from a purposive sample of classroom senior high schoolteachers (n=60) from two public schools in the Urban South Florida Public School District. Thirty teachers were selected from volunteers from a traditional public senior high school and 30 teachers were chosen from volunteers from an educational computer technology magnet public senior high school. During the 2000-2001 school year, when the researcher began investigating this study, the magnet public senior high school was the only educational computer technology magnet school in the district. The traditional public senior high school was chosen from nine other traditional schools based on a convenience sample and had comparable teacher demographics to the magnet school.

The Urban South Florida Public School System Office of Educational Evaluation and Research and Barry University's Institutional Review Board granted the researcher the opportunity to survey these 60 classroom senior high school teachers for this study. Each participant completed two surveys, the Computer Anxiety Rating Scale (CARS-Form C) and the General Attitudes Toward Computers Scale (GATCS- Form C), and an Educational History and Computer Training Profile. The researcher collected data at the middle of the 2006-2007 school term.

Participants

Participants in this study were classroom teachers from two public senior high schools in the Urban South Florida Public School District during the 2006-2007 school term. The Urban South Florida Public School System was the fourth largest public school system in the nation at that time. The participants in this study represented a sample of convenience. Participant selection for this study was based solely on teacher employment in a traditional or magnet school and their agreeing to volunteer as a participant in the proposed study.

The sample was comprised of 60 participants: 30 classroom teachers from a traditional senior high school and 30 classroom teachers from an educational computer senior high school. According to Gay and Airasian (2003), a minimum of 30 participants in each group was recommended for research studies. The Office of Educational Evaluation and Research in the Urban South Florida Public School System and the Institutional Review Board of Barry University granted the researcher the opportunity to survey these 60 participants. Thirty classroom teachers from a computer technology magnet public senior high school and 30 from a traditional senior high school were participants during the 2006-2007 school year.

Instrumentation

During the 2006-2007 school year, all purposely selected classroom teachers responded to two questionnaires and an Educational Flistory and Computer Training Profile. Instrumentation for this study included the Computer Anxiety Rating Scale (CARS- Form C), the General Attitudes Toward Computers Scale (GATCS- Form C), and an Educational History and Computer Training Profile that included an inquiry pertaining to the participant's descriptive data, technology availability, and usage of and prior technology training. There were a total of 20 questions in each questionnaire arranged in a five-point Likert scale. The demographic profile was comprised of 12 major background information questions pertaining to the participants.

The Computer Anxiety Rating Scale (CARS- Form C) consisted of 20 items. Each question was rated on a five-point scale (1= not at all, 2=a little, 3=a fair amount, 4=much, 5=very much) indicating how anxious the statement made the person feel "at the point in time" the question was answered. The purpose of CARS (Form C) was to measure technology anxiety of individuals. According to Rosen and Weil (1992), the CARS (Form C) produced the Total Computer Anxiety Score and three Factor Anxiety Scores. The Total Computer Anxiety Score included items one through 20. The first Factor Score was Interactive Computer Learning Anxiety. The second Factor Score was Consumer Technology. The third Factor Score was Observational Computer Learning Anxiety. In general, higher scores revealed more computer anxiety. To compare subscales, totals for each scale were averaged. The CARS was to be widely used and carefully studied to distinguish individuals who were computer/technology anxious from those who were not (Rosen and Weil, 1992). The content validity of the CARS was established by administering the test to sufficiently large samples of university students, schoolteachers, and school students from grades seven through nine. The CARS had a total Cronbach Alpha of 0.93. Since the CARS was comprised of several subtests, the reliability of each subtest was evaluated. The following were average Alpha coefficients on each of the factors in the CARS questionnaire: Interactive Computer Learning Anxiety: 0.62; Consumer Technology Anxiety: 0.53; Learning Anxiety: 0.59 (Rosen and

Weil, 1992). In addition, if a respondent omitted a question, then the CARS missing response was two. In the clinical interpretation of the CARS, the intervals were as follows: No Technophobia (20-41), Low Technophobia (42-49), and Moderate/High Technophobia (50-100) (Rosen and Weil, 1992).

The General Attitudes Toward Computers Scale (GATCS Form C) consisted of 20 items. Each item was presented in a five-point Likert format (1= Strongly Agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Strongly Disagree). The purpose of GATCS (Form C) was to measure a variety of attitudes toward computers and technology. In general, higher GATCS (Form C) scores indicated more positive general attitudes toward computers and technology. To compare scores, totals for each score were averaged. The content validity of the GATCS was established by administering the test to sufficiently large samples of university students, schoolteachers, and school students from grades seven through nine. The GATCS had a total Cronbach Alpha of 0.56.

Since the GATCS was comprised of several subtests, the reliability of each subtest was evaluated. The GATCS consisted of seven factors: Factor 1: Attitudes About Computers in Education; Factor 2: Attitudes About Computer Control; Factor 3: Attitudes About Inequity in Computer Ability; Factor 4: Attitudes About Computers and Employment; Factor 5: Attitudes About Computers Solving Societal Problems; Factor 6: Attitudes About Computers and Future Jobs; Factor 7: Attitudes About Computers and Health. Even though the GATCS entire factor structure accounted for 58% of the variance, the factor structure was useful only as additional information for research purposes rather than for any clinical purposes due to a small number of items pertaining to each factor (Rosen and Weil, 1992). In the clinical interpretation of the GATCS, the intervals were as follows: No Technophobia (64-100), Low Technophobia (56-63), and Moderate/High Technophobia (20-55) (Rosen and Weil, 1992).

The final questionnaire completed by the participants was an educational history and computer training data form that consisted of 12 questions related to schooling information, technology usage (i.e. computers as a tool), and technology training. The Educational History and Computer Training Profile used in the study collected general information about the level of education, years of teaching, years at present school, classification of school, ownership and usage of technology, and the degree of technology training of each participant.

Analysis of Findings

Hypothesis One

The General Attitudes Toward Computer Scale (GATCS) Factor 1: Attitudes About Computers in Education scores indicated that the traditional and magnet school groups are significantly different. Therefore, the researcher concluded that the traditional and magnet school groups' attitudes toward computers do differ with respect to education. Based on the results from the study, it is apparent that traditional and magnet schoolteachers exhibit a statistically significant difference in the GATCS with respect to Factor 1: Attitudes About Computers in Education. The traditional group had more positive attitudes about computers than the magnet group.

Hypothesis Two

Moreover, the Computer Anxiety Rating Scale (CARS) Factor 3: Observational Computer Learning Anxiety scores indicated that the traditional and magnet school groups are significantly different. Therefore, the researcher concluded that the traditional and magnet school groups' levels of computer anxiety differ with respect to observational computer learning anxiety. Based on the results from the study, it is apparent that traditional and magnet schoolteachers exhibit statistically significant differences in their scores on the CARS with respect to Observational Computer Learning Anxiety. The traditional group was more anxious about observational computer learning than the magnet group.

Hypothesis Three

The results of the General Attitudes Toward Computer Scale (GATCS) by Years of Experience for the teachers in the traditional public school group indicated that the novice and master teachers are significantly different. Of the 29 traditional teachers who responded to the GATCS, six were novice teachers while 23 were master teachers. The results of the GATCS by Years of Experience for teachers in the magnet public school group indicated that novice and master teachers are not significantly different. Of the 29 magnet teachers who responded to the GATCS, seven were novice teachers while 22 were master teachers. Based on the results from the study, it is apparent that novice and master schoolteachers in the traditional public school group exhibit statistically significant differences in their scores on the GATCS by Years of Experience. Based on the results from the study, it is apparent that novice and master schoolteachers within the public school magnet group exhibit no statistically significant difference in their scores on the GATCS by Years of Experience.

Hypothesis Four

The results of the Computer Anxiety Rating Scale (CARS) by Years of Experience for teachers in the traditional public school group indicated that novice and master teachers are not significantly different. Of the 29 traditional teachers who responded to the CARS, six were novice teachers while 23 were master teachers. The results of the CARS by Years of Experience for teachers in the magnet public school group indicated that novice and master teachers are not significantly different. Of the 29 magnet teachers who responded to the CARS, seven were novice teachers while 22 were master teachers. Based on the results from the study, it is apparent that novice and master schoolteachers within the traditional public school group exhibit no statistically significant difference in their scores on the CARS by Years of Experience. Based on the results from the study, it is apparent that novice and master schoolteachers in the magnet public school group exhibit no statistically significant difference in their scores on the CARS by Years of Experience.

Conclusions

In the following sections, the researcher will draw conclusions about the topics discussed in the analysis of data in Chapter Four. In doing so, the researcher will further assess the facts of the findings. Furthermore, the researcher will restate the hypotheses as evidence in providing a final summary of rejecting or not rejecting the null hypotheses.

Hypothesis One

Hypothesis One stated that there is no difference in the attitudes of teachers in traditional and magnet public secondary schools toward technology. In accordance with the total score of the General Attitudes Toward Computers Scale (GATCS), this hypothesis was not supported by the t-test. Because there was no difference in the overall groups, the researcher analyzed the results of the GATCS by factors. The results of the GATCS Factor 1: Attitudes About Computers in Education showed that there is a difference in the attittudes of teachers in traditional and magnet public secondary schools toward technology. This implies that traditional and magnet public secondary schoolteachers' general attitudes about computers in education were different. The traditional teachers' mean scores were slightly higher than the magnet schoolteachers' mean scores, indicating that traditional public secondary schoolteachers had more positive attitudes toward technology than magnet public secondary schoolteachers.

Hypothesis Two

Hypothesis Two stated that there is no difference in the level of computer anxiety experienced by teachers in traditional and magnet public secondary schools. In accordance with the total score of the Computer Anxiety Rating Scale (CARS), this hypothesis was not supported by the t-test. Because there was no difference in the overall groups, the researcher analyzed the results of the CARS by factors. The results of the CARS Factor 3: Observational Computer Learning Anxiety showed that there is a difference in the level of computer anxiety experienced by teachers in traditional and magnet public secondary schools. This implies that traditional and magnet public secondary schoolteachers' levels of observational computer learning anxiety were different. The traditional teachers' mean scores were higher than the magnet schoolteachers' mean scores, indicating that traditional public secondary schoolteachers were more computer anxious than magnet public secondary schoolteachers.

Hypothesis Three

Hypothesis Three stated that there is a difference in novice and master teachers' years of experience and attitudes toward technology within the traditional public school group. A novice teacher had one through three years of experience and a master teacher had more than three years of experience. Of the 29 teachers from the traditional public school group who responded to the General Attitudes Toward Computer Scale (GATCS), six were novice teachers and 23 were master teachers. The results of the GATCS showed that novice and master schoolteachers in the traditional public school group were different. The novice teachers in the traditional group had higher mean scores than the master teachers in the traditional group, indicating that novice teachers in the traditional public school group had more positive general attitudes toward computers and technology than master teachers in the traditional public school group. Since technology was positively influenced by the amount of access to technology and teacher training in schools, novice teachers have positive attitudes about technology (The Journal Online, December, 2000).

Hypothesis Three also stated that there is no difference in the years of experience and teachers' attitudes toward technology between novice and master teachers in the magnet public school group. A novice teacher had one through three years of experience and a master teacher had more than three years of experience. Of the 29 magnet teachers who responded to the GATCS, seven were novice teachers and 22 were master teachers. The results of the GATCS showed that novice and master schoolteachers in the magnet public school group were not significantly different. The novice teachers in the magnet school group had slightly higher mean scores than the master teachers in the magnet school group, indicating that novice teachers in the magnet public secondary school group were slightly more computer and technology anxious than master teachers in the magnet public secondary group.

Hypothesis Four

Hypothesis Four stated that there is a difference in novice and master teachers' years of experience and teachers' computer anxiety within the traditional public school group. A novice teacher had one through three years of experience and a master teacher had more than three years of experience. Of the 29 traditional teachers who responded to the Computer Anxiety Rating Scale (CARS), six were novice teachers and 23 were master teachers. The results of the CARS showed that novice and master teachers in the traditional public school group were not significantly different. The novice teachers in the traditional public school group had lower mean scores than the master teachers in the traditional public school group, indicating that novice teachers in the traditional public secondary school group were less anxious about computers and technology than master teachers in the traditional public secondary group.

Hypothesis Four also stated that there is no difference in the years of experience and teachers' computer anxiety between novice and master teachers in the magnet public school group. A novice teacher had one through three years of experience and a master teacher had more than three years of experience. Of the 29 magnet teachers who responded to the CARS, seven were novice teachers and 22 were master teachers. The results of the CARS showed that novice and master teachers in the magnet public school group were not significantly different. The novice teachers in the magnet school group had slightly but insignificantly higher (by 0.1494) mean scores than master teachers in the magnet public school group, indicating that novice teachers in the magnet public school group were minimally more computer and technology anxious than master teachers in the magnet public school group.

Discussion

Hypothesis One

The overall analysis on each scale showed similar statistical results. Even though the General Attitudes Toward Computers Scale (GATCS) entire factor structure accounted for 58% of the variance, the factor structure was useful only as additional information for research purposes rather than for any clinical purposes due to a small number of items pertaining to each factor (Rosen and Weil, 1992). Moreover, the analysis on each factor scale showed mixed statistical results. On the GATCS Factor 1: Attitudes About Computers in Education, traditional schoolteachers had more positive attitudes about computers and technology than magnet schoolteachers. However, according to the Educational History and Computer Training Profile, 62.1% (18 out of 29) of the traditional school respondents stated that technology training had changed their general attitudes about computers, while 70% (21 out of 30) of the magnet school respondents stated that technology training had changed their general attitudes about computers. Therefore, technology training had changed magnet schoolteachers' general attittudes about computers by 7.9% more than it changed traditional schoolteachers' general attitudes about computers. Furthermore, not only magnet schoolteachers but also traditional schoolteachers enhanced their traditional courses with an array of information technology (Rickman and Grudzinski, 2000).

These results might impact how teachers teach. Teachers who have more positive attitudes about computers and technology will be more willing to incorporate computers and technology when planning their lessons. Teachers emulating positive attitudes about computers and technology will better prepare students for the Information Age.

Based on the findings of the Web-based Commission (2000), new designs in learning are needed to create better and more effective technology workers who will define the Information Age. The researcher recommends that student learning be active rather than passive. Cooperative learning groups allow students to inquire and conjecture on their own while teachers facilitate the learning. This group work allows for better and more effective technology-saavy individuals.

Hypothesis Two

The analysis on each factor scale in the Computer Anxiety Rating Scale (CARS) also showed mixed statistical results. In the CARS Factor 3: Observational Computer Learning Anxiety, traditional schoolteachers were more computer anxious than magnet public secondary schoolteachers. According to the Educational History and Computer Training Profile, 55.2% (16 out of 29) of the traditional school respondents stated that technology training had changed their computer anxiety levels about computers, while 70% (21 out of 30) of the magnet school respondents stated that technology training had changed their computer anxiety levels about computers. Hence, technology training had changed magnet schoolteachers' computer anxiety levels about computers by 14.8% more than it changed traditional schoolteachers' computer anxiety.

V. Mclnerney, D. Mclnerney, and Sinclair (1990) examined the effects of increased computing experience on the computer anxiety of teachers. This study used the Computer Anxiety Rating Scale (CARS) and the General Attitudes Toward Computers Scale (GATCS). Moreover, in the Computer Anxiety and Teachers Study the researchers concluded that increased computer experience generally lowers computer anxiety. In this present study, the researcher reaffirmed that since schoolteachers at an educational technology magnet school generally had more computer experience than teachers at a traditional school, magnet schoolteachers are less computer anxious than traditional schoolteachers.

These results might impact how school districts train teachers. Districts need to incorporate more computer and technology training. Teachers need training and support to offer more technology-assisted enhanced courses to help students attain high academic standards (Rickman and Grudzinski, 2000). The researcher recommends that teachers be trained efficiently to integrate technology in their curriculums. Proffesional technology development allows teachers to apply their technological knowledge to the teaching and learning of academic subjects (Technology and Learning 1999 District Profile Urban South Florida Public Schools, 1999). By training teachers to efficiently integrate technology, students will be better prepared for the Information Age.

Limitations of the Study

The participants in this study were teachers in public secondary traditional and educational computer magnet schools in the Urban South Florida Public School District. The two groups were homogenious. The subjects voluntarily chose to participate in the study. The following limitations were noted based on this research:

1. Due to time constraints, only one traditional secondary school out of nine traditional secondary schools in the Urban South Florida Public School District was selected for this investigation. If all nine traditional secondary schools were chosen, then the results of this investigation would have had a different outcome.

2. The timing of the research was probably skewed because surveys were administered at the middle of the school year. The results of the study would be different if the study was conducted at the beginning, middle, or the end of the school year. At the end of the school year, teachers would be bringing closure to employing new teaching strategies in the classroom and getting ready to begin their summer vacation rather than concentrating on thoroughly completing the surveys and remembering the technology training they received. At the beginning or middle of the school year, teachers are more motivated and enthusiastic in implementing innovative teaching techniques in technology and will carefully complete the surveys without reservations.
3. Due to sampling techniques, the results from the teachers selected to complete the survey at the magnet public senior high school, an educational computer technology magnet school, may not be generalizable. At a magnet school, there are schoolteachers who teach the basic core curriculum and there are schoolteachers who teach the specialized magnet curriculum.
4. The selection of both schools was based on a non-random sampling. The school selection was based on a convenience or purposive sample. The magnet public senior high school was the only educational computer technology magnet in the Urban South Florida Public School district at the time of the study. Due to comparable teacher demographics, the traditional public senior high school was chosen from nine other traditional schools in the Urban South Florida Public School District. The results of the study could have been different if all nine traditional schools had been surveyed.

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Appendix A

COMPUTER ANXIETY RATING SCALE

(Form C)

The items in this questionnaire refer to things and experiences that may cause anxiety or apprehension. For each item, place a check (V) under the column that describes how anxious (nervous) each one would make you at this point in your life.

	Not at All	**A Little**	**A Fair Amount**		**Very Much**
1. Thinking about taking a course in a computer language.					
2. Taking a test using a computer scoring sheet.					
3. Applying for a job that requires some computer training.					
4. Sitting in front of a home computer.					
5. Watching a movie about an intelligent computer.					
6. Looking at a computer printout.					
7. Getting ‘"error messages” from the computer.					
8. Using an automated bank teller machine.					
9. Visiting a computer center.					
10. Being unable to receive information because the “computer is down.”					
11. Learning to write computer programs.					
12. Thinking about buying a new personal computer.					
13. Erasing or deleting material from a computer file.					
14. Taking a class about the use of computers.					
15. Re-setting a digital clock after the electricity has been off.					
16. Learning computer terminology.					
17. Reading a computer manual.					
18. Watching someone work on a personal computer.					
19. Programming a microwave oven.					
20. Learning how a computer works.					

Appendix B

GENERAL ATTITUDES TOWARD COMPUTERS SCALE (Form C)

The following statements address general attitudes toward computers. Place a check (V) under the column that describes your level of agreement (Strongly Agree, Agree, Neutral, Disagree or Strongly Disagree) to each statement.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Computers can save people a lot of work.					
2. It takes a good math background to learn to use a computer.					
3. You need to know how to use a computer to get a good job.					
4. Computers can help solve society's problems.					
5. Computers are taking over.					
6. Computers can increase control over your own life.					
7. Computers increase the amount of time we have for other activities.					
8. Men are better with computers than women.					
9. Computers may eventually act independently of people.					
10. In the future there will still be jobs that don't require computer skills.					
11. Computers are good teaching tools.					
12. Use of computers can cause physical health problems.					
13. Computers prepare students for the future.					
14. Computers are taking jobs away from people.					
15. Some ethnic groups are better with computers than others.					
16. There is an overemphasis on computer education in this society.					
17. Computers can ruin interpersonal relationships.					
18. In five years everyone will need to know how to operate a computer..					
19. Computers create new jobs for people.					
20. Computers will never be smarter than people.					

Appendix C

Educational History and Computer Training Profile

Please complete the following Educational History and Computer Training Profile consisting of 12 questions and return it in the envelope with the Computer Anxiety Rating Scale, and the General Attitudes Toward Computers Scale surveys.

1. What is your highest level of education?
_____ Bachelor's ______Master's ______ Ed Specialist's ______Ph.D./Ed.D.

2. What is your area of specialization of your degree?_____________________

3. Are you teaching in the area of your degree/certification?_____Yes _____ No

4. How many years have you taught?___________________________

5. Do you have a computer in your classroom?_____Yes _____ No

6. If you answered yes to question 5, then how many hours a week, on an average week, do you use the computer in your classroom as a teaching tool?
_____0 _____I _______2 _____ 3 _____4 _____5 +

7. How many computer (technology) training contact hours do you have?

8. Do you think that the technology training has changed your anxiety levels about computers (technology) in the classroom?_____Yes _____No

9. Do you think that the technology training has changed your general attitudes about computers (technology) in the classroom?_____Yes _____No

10. If you answered question 7, then select the computer (technology) training by title (wording can vary slightly) and also select or write the number of contact hours by title. Note: This includes undergraduate, graduate, teacher education center (TEC), and professional development courses involving technology. For TEC courses, 3 credit hours are equivalent to 60 mpp (master plan points).

Course by Title	Number of Contact Hours	
1. Advanced Implementation of the DV4	1. _	(Usually 6mpp)
2. Advanced Implementation of the Dynavox	2. _	(Usually 6mpp)
3. Edusoft Training	3. _	(Usually 4mpp)
4. Technology for New Teachers	4. _	(Usually 6mpp)
5. Computers & Classrooms	5. _	(Usually 60mpp)
6. Technology for Teachers	6.	(Usually 60mpp)

7. Web-Enhanced Applied Linguistics 7. _ (Usually 60mpp)
8. Web-Enhanced Methods of Teaching ESOL 8. _ (Usually 60mpp)
9. Web Interface for Special Educators- ESE 9. _ (Usually3 or 6mpp)
10. Web Interface for Special Educators- Gifted 10. _ (Usually3 or 6mpp)
11. Excelsior Gradebook- Electronic Gradebook 11.
12. Electronic Portfolio 12.
13. Multimedia in the Classroom- Education 13.
14. Web Design & Development 14.
15. Desktop Publishing 15.
16. Microsoft Office Training- Word Processing, Database, Spreadsheet 16.
17. Computers in Mathematics Education 17.
18. Computers in English & the Language Arts 18.
19. Teaching Reading by Computer 19.
20. Learning Technologies in Science Education20.
21. Using the Graphing Calculator in the Classroom 21.

11. After receiving the computer (technology) training, have you consistently had availability of computers (technology) at your school to incorporate what was learned in your training?_____ Yes _____ No

12. If you answered question 8, then circle the number that best describes the degree to which you use computers (technology).
5 = always, 4 = almost always, 3 = about half the time, 2 = rarely,
1 = never.

1. word processing:---------------------------------- 1 2 3 4
2. spreadsheet:-- 1 2 3 4
3. database:--- -1 2 3 4
4. Internet:-------------------------------------- -— 1 2 3 4
5. e-mail:-- 1 2 3 4
6. printer:-- 1 2 3 4
7. scanner:---1 2 3 4
8. digital photography:------------------------------ 1 2 3 4
9. web page development:-------------------------- 1 2 3 4
10. portable multimedia projector:---------------- 1 2 3 4
11. overhead projector:---------------------------- 1 2 3 4
12. graphing calculator:---------------------------- -1 2 3 4
13. video conferencing:------------------------------1 2 3 4
14. desktop (newsletters, flyers) publishing: — 1 2 3 4
15. tutorials:---1 2 3 4
16. presentations (powerpoint, etc...)----------- 1 2 3 4

Appendix D

Barry University
Cover Letter

Dear Research Participant:

Your participation in a research project is requested. The title of the study is A Comparison of Teachers' Attitudes Towards Technology and Computer Anxiety between Traditional and Magnet Schools. The research is being conducted by Gemma M. Gonzalez-Alberto, a student in the Educational Technology department at Barry University, and is seeking information that will be useful in the field of educational technology. The aims of the research are to examine attitudes toward technology and computer anxiety of teachers in our public school system. In accordance with these aims, the following procedures will be used: the General Attitudes Toward Computer Scale, the Computer Anxiety Rating Scale, and an Educational History and Computer Training Profile. We anticipate the number of participants to be 30 from each a traditional school and 30 from a magnet school.

If you decide to participate in this research, you will be asked to do the following: complete the two scales and the profile in a timely manner. The two surveys should not exceed more than 30 minutes to complete. If you prefer to complete the surveys and the profile at your leisure, then please return within a two-week period.

Your consent to be a research participant is strictly voluntary and should you decline to participate or should you choose to drop out at any time during the study, there will be no adverse effects on your employment.

There are no known physical or psychological risks to you associated with this study. Although there are no direct benefits to you, your participation in this study may help our understanding of technology as it pertains to public secondary schoolteachers.

As a research participant, information you provide will be kept anonymous, that is, no names or other identifiers will be collected on any of the instruments used. Data will be kept in a locked file in the researcher's office for five years. By completing and returning the Informed Consent Form, the two surveys and the profile you have shown your agreement to participate in the study.

If you have any questions or concerns regarding the study or your participation in the study, you may contact me, Gemma M. Gonzalez-Alberto, at (786) 293-9171, my supervisor, Dr. Joel Levine, at (305) 899-3608, or the Institutional Review Board point of contact, Ms. Nildy Polanco, at (305) 899-3020.

Thank you for your participation.

Sincerely,

Appendix E

Barry University
Informed Consent Form

Your participation in a research project is requested. The title of the study is A Comparison of Teachers' Attitudes Towards Technology and Computer Anxiety between Traditional and Magnet Schools. The research is being conducted by Gemma M. Gonzalez-Alberto, a student in the Educational Technology department at Barry University, and is seeking information that will be useful in the field of educational technology. The aims of the research are to examine attitudes toward technology and anxiety of teachers in our public school system. In accordance with these aims, the following procedures will be used: the General Attitudes Toward Computer Scale, the Computer Anxiety Rating Scale, and an Educational History and Computer Training Profile. We anticipate the number of participants to be 30 from each a traditional and a magnet school.

If you decide to participate in this research, you will be asked to do the following: complete the two scales and the demographic profile in a timely manner. The two surveys should not exceed 30 minutes to complete.

Your consent to be a research participant is strictly voluntary and should you decline to participate or should you choose to drop out at any time during the study, there will be no adverse effects on your employment.

There are no known physical or psychological risks to you associated with this study. Although there are no direct benefits to you, your participation in this study may help our understanding of technology as it pertains to public secondary schoolteachers.

As a research participant, information you provide will be held in confidence to the extent permitted by law. Any published results of the research will refer to group averages only and no names will be used in the study. Data will be kept in a locked file in the researcher's office for five years. Your signed consent form will be kept separate from the data. All data will be destroyed alter five years.

If you have any questions or concerns regarding the study or your participation in the study, you may contact me, Gemma M. Gonzalez-Alberto, at (786) 293-9171, my supervisor, Dr. Joel Levine, at (305) 899-3608, or the Institutional Review Board point of contact, Mrs. Nildy Polanco, at (305) 899-3020. If you are satisfied with the information provided and are willing to participate in this research, please signify your consent by signing this consent form.

Voluntary Consent

I acknowledge that I have been informed of the nature and purposes of this experiment by Gemma M. Gonzalez-Alberto and that I have read and understand the information presented above, and that I have received a copy of this form for my records. I give my voluntary consent to participate in this experiment.

Signature of Participant Date

Researcher *Date* *Witness* *Date*

(Witness signature is required only if research involves pregnant women, children, other vulnerable populations, or if more than minimal risk is present.)