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**An investigation of perceived anxiety toward new software technologies among teachers in a Mississippi rural city school district**

Matilda Miller

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AN INVESTIGATION OF PERCEIVED ANXIETY TOWARD NEW SOFTWARE  
TECHNOLOGIES AMONG TEACHERS IN A MISSISSIPPI  
RURAL CITY SCHOOL DISTRICT

By

Matilda Miller

A Dissertation  
Submitted to the Faculty of  
Mississippi State University  
in Partial Fulfillment of the Requirements  
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in the Department of Instructional Systems and Workforce Development

Mississippi State, Mississippi

May 2010

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Title of Study: AN INVESTIGATION OF PERCEIVED ANXIETY TOWARD NEW SOFTWARE TECHNOLOGIES AMONG TEACHERS IN A MISSISSIPPI RURAL CITY SCHOOL DISTRICT

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Technological standards have existed for years encouraging the use of computer technology as a teaching tool. By increasing technology use in the classroom, educators are able to address teaching and learning opportunities for all students. The need for these opportunities is essential in the rural areas of the U. S.

The purpose of this study was to determine if teachers in a rural city school district in Mississippi experience computer anxiety in using new and emerging software technologies for instructional purpose; examine the level of computer anxiety teachers experience in using computers; and explore if relationships exist in the level of computer anxiety experienced by teachers based on the following demographic variables: gender, age, years of teaching, subject area taught, and educational attainment. The population consisted of 110 teachers with a minimum of bachelor's degree and certified to teach in their respective areas of specialization.

Findings from descriptive statistics revealed that the majority of the participants were female teachers with 43% of participants possessing either a Master's or Ph.D. degree. A large portion of these teachers had one year or more experience with learning about or working with computers with access to a computer at home.

The means revealed that when teachers have a moderate degree of confidence, liking, and usefulness when using new and emerging software technology there is a low degree of anxiety. Pearson Correlations were used to examine the relationships between the subscales (anxiety, confidence, liking, and usefulness) and demographic variables (gender, age, years of teaching, subject area taught, and educational attainment). Results confirmed that there were significant relationships between age and anxiety, gender and confidence, gender and liking, and years of teaching and anxiety. However, there were no significant relationships between the other variables.

Findings of this study have the potential to contribute to the development of a profile that could be used to identify teachers who need exposure to technological training and professional development to help reduce computer anxiety and minimize resistance to computer usage. Additionally, findings of this study can serve as a growing baseline of literature that relates to computer anxiety among teachers.

## DEDICATION

This dissertation is dedicated to my late brother, Clifford Earl Johnson; father, Milan Jerome Johnson; mother, Luvenia Johnson, and husband, Sedrick Deon Miller. Even though my brother did not get to see me complete my doctorate, I am sure he is looking down on me and smiling because I finally made it. I am truly blessed to have wonderful parents and a praying mother. I am especially grateful for my husband who encouraged me to continue my education and supported me in my efforts to achieve my doctorate.

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To my parents who are a constant in my life. I owe you both so much. Mom, I would like to thank you for all of your prayers and encouraging words. I would also like to thank you for teaching me how to pray and depend on the Lord. Dad, I would like to thank you for instilling in me the drive to endure hard work. I would like to thank my mother-in-law, Maudie Pearl Eichelberger for all her encouraging words. Thanks to my nieces, Shannicka and Matoshia, for their prayers, concern, and encouragement. A special thanks to my family members who offered encouraging words to motivate me to finish my doctorate.

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## CHAPTER I

### INTRODUCTION

Research has revealed that the integration of technology into public school systems received a great deal of publicity among the academic and business field (Kaye, Jacobs, Aschbacher, & Judd, 1996; U. S. Congress, Office of Technology Assessment, 1995); however, the total amount of technology in schools in the United States (U. S.) has greatly increased since 1995 (Becker, 2000; Reiser, 2001). According to Becker, using the computer for instructional purposes stirred society's imagination, and thus began a desire to wire virtually all schools in the public system.

Research indicated the U. S. as one of the leading technologically advanced countries with almost all schools across the country equipped with new instructional technologies (Williams, 2001). According to the National Center for Educational Statistics (2007), in the year of 2005, nearly every public school in the U.S. had Internet access and that 89% of the schools stated that the majority of their teachers were using computers on a daily basis for planning and/ or teaching, which is a moderate increase compared to 78% in 2001(National Center for Educational Statistics, 2007).

Although the U. S. government contributes millions of dollars into the school system for technology advancement, educators continue to face the challenge of integrating computers and related technologies into their instruction in a manner that will enhance students learning and achievement. According to U. S. Congress, Office of

Technology Assessment (1995), 5.8 million computers have been made available for instruction in schools nationally. The ratio of computers has increased, but in contrast, the ratio of students to computers has decreased from one computer to every 12.1 students in 1998 to one computer to every 4.4 students in 2003, and 3.8 students in 2005 (National Center for Educational Statistics, 2007).

Along with the increase in computer usage, different software has also been updated. Some typically new and emerging software technologies used in classrooms are Excel Spreadsheets (Microsoft Excel), Advanced Word Processing (Microsoft Word), Graphics Manipulation (Desktop Publishing), PowerPoint Presentation Design (Microsoft PowerPoint), Electronic Grade Book, E-mail, and the Internet, which can be helpful for teaching preparation. Using these technologies can be helpful for teaching as well as teaching preparation.

Nevertheless, research indicated teachers are still reluctant to incorporate the new technology into their classroom activities (Cuban, 2001; Reiser, 2001). According to Asan (2003), teachers with positive attitudes toward computers and computing skills are recognized by researchers as being an essential component for effective use of computer technology. Previous research findings from Tseng, Tiplady, Macleod, and Wright (1997) have shown that the feeling of anxiety toward computers usage has already affected 30 to 40% of society's population. Findings from Stephens' (2001) and Desai's (2001) research revealed that when computer anxiety is present, the issue should be considered a significant and relevant concern.

Helping teachers overcome their fears, concerns, and anxiety is crucial to the success of implementing new and emerging software technologies into the classroom. If school administrators, educational leaders, and decision-makers recognize and address the situation of computer anxiety, chances of the percentage of individuals experiencing computer anxiety will likely decrease as the hi-tech computer revolution continues.

In a study conducted by Martin, Stewart, and Hillison (2001), findings displayed computer anxiety existed in Cooperative Extension employees due to having to use computers to carry out job-related activities. In another study, Tullous and Jones (2006) examined the differences between men and women with respect to anxiety and involvement levels and in their attitudes toward technology with women expressing more anxiety toward technology than the men.

The previous studies illustrated how computer anxiety affected cooperative extension workers and personnel in the business world. However, further research showed that computer anxiety also exists among educators. Hong and Koh (2002) investigated computer anxiety and attitudes concerning computers among rural secondary school teachers in Malaysia. Findings revealed that 18% of the teachers experienced some type of computer anxiety. In a study conducted by Asan (2003), 252 elementary teachers located in Turkey were investigated in regards to computer usage and technology awareness. The results revealed that only 39% of the teachers were computer users, whereas, the remaining 61% of the teachers were not computer users and 98% of the 39% of teachers who use computers felt that they were not effective computer users.

Research showed that computer anxiety is not only affecting teachers in the United States but teachers in other countries.

In addition, a study conducted by Emmons (2003), found that demographic variables, gender, age, computer experience, and level of education do influence computer anxiety. However, Anderson (2005) reported age, gender, and the level of educational attainment do not statistically relate to computer anxiety. Although research is evident concerning computer anxiety, very limited research has investigated perceived anxiety toward new software technologies among teachers.

### **Statement of the Problem**

Chen (2004) stated, “The emergence of computers and information systems is certainly the single biggest factor impacting education during the past couple of decades” (p. 50). Unfortunately, the high demand for computer integration in the school curriculum causes a large population of teachers to feel uncomfortable (Bohlin, 2002; Cradler & Cradler, 2001; United States Department of Education, 2001). Teachers, in their effort to incorporate technology into classroom instruction, are faced with constant changes and transformations associated with software technologies. While teachers are being reluctant to use new and emerging software technologies, new technologies are constantly being introduced into the market. The issue teachers are faced with regarding integration of technology into the classroom raises the question of whether mandated introduction of new and emerging technology into the school curriculum contributes to teachers’ anxiety. As Chen stated, “The millions of dollars being poured into the

purchase of computers for schools may be wasted if large numbers of teachers avoid using computers”(p. 50).

This study explored if teachers in a rural city school district in Mississippi experience computer anxiety in using new and emerging software technologies for teaching. This study also examined the level of computer anxiety, if any, these teachers experienced in using computers. In addition, this study explored whether relationships existed in the level of computer anxiety experienced by teachers in a rural city school district in Mississippi in using new and emerging software technologies based on gender, age, years of teaching, subject area taught, and educational attainment.

### **Research Questions**

1. What are the attitudes of Mississippi teachers in three rural city schools when using new and emerging software technologies for instructional purpose as measured by the Computer Attitude and Anxiety Scale?
2. What is the level of Mississippi teachers' anxiety in three rural city schools when they use computers as measured by the Computer Attitude and Anxiety Scale?
3. Do Mississippi teachers in three rural city schools feel confident in using new and emerging software technologies for instruction as measured by the Computer Attitude and Anxiety Scale?
4. Do Mississippi teachers in three rural city schools express likeness in using new and emerging software technologies for instruction as measured by the Computer Attitude and Anxiety Scale?

5. Do Mississippi teachers in three rural city schools perceive new and emerging software technologies as being useful for instruction as measured by the Computer Attitude and Anxiety Scale?
6. Do relationships exist in the level of anxiety experienced by Mississippi teachers in three rural city schools as they use new and emerging software technologies for instructional purposes based on gender, age, years of teaching, subject area taught, and educational attainment as measured by the Computer Attitude and Anxiety Scale?

### **Significance of the Study**

This study contributed useful information to school administrators and training personnel by enabling them to better understand the level of computer anxiety teachers are experiencing. The findings of this study can help school administrators and training personnel to identify certain characteristics of teachers who need exposure to technological training and professional development to help reduce computer anxiety and minimize resistance to computer usage. Additionally, the findings of this study contributed to the growing baseline of information and literature that relates to computer anxiety among teachers as well as serve as a guide to develop and improve teachers' technology skill levels in the classroom.

### **Limitations**

1. The results of the study only applied to the teachers that volunteered during the 2006-2007-school term in a rural city school district in Mississippi.

2. The findings of the study were limited to the validity and reliability of the instrument.
3. The findings generalized to the unique population of Mississippi teachers in three rural city schools.

### **Delimitations**

1. Data for the study was collected during the 2006-2007-school term.
2. The participants in the study are made up public elementary, middle, and secondary teachers in three rural city schools in Mississippi.
3. Only teachers who volunteered to participate in the study are included.

### **Definitions of Terms**

*The following terms will be defined for the purpose of this study:*

1. Anxiety - “An abnormal and overwhelming sense of apprehension and fear often marked by physiological signs (sweating, tension, and increased pulse), by doubt concerning the reality and nature of the threat, and by self-doubt about one's capacity to cope with.” (Merriam-Webster Online Dictionary, 2006, p. 1).
2. Computer anxiety – For purposes of this study, computer anxiety is defined as having negative feelings toward computers and computer use. Individuals who suffer from computer anxiety often have decreased use of the computer or completely avoid them. Also, these individuals encounter physiological reactions such as sweaty palms, shortness of breath, and dizziness when using the computer (Doyle, Stamouli, & Huggard, 2005).

3. New and emerging software technologies – A variety of technologies that are typically used among teachers for teaching preparation such as Excel Spreadsheets (Microsoft Excel), Advanced Word Processing (Microsoft Word), Graphics Manipulation (Desktop Publishing), PowerPoint Presentation Design (Microsoft PowerPoint), Electronic Gradebook, E-mail, and the Internet.
4. Rural school – A school with at least 2,500 students in a community of 25,000 people or less located 25 miles or more from an urban center (The National Association for Music Education, 2006).
5. Technology – “The hardware and software that result from the application of technological processes.” (Heinich, Molenda, Russell, & Smaldino, 2002, p. 47).
6. Technology integration – Including a combination of technology resources, such as computer hardware and software, and technology-based practices into the daily routines, work, and management of schools for enhancing learning. Some examples of technology-based practices are collaborative work and communication, Internet-based research, and retrieval of data (National Center for Education Statistics, 2003).

## CHAPTER II

### LITERATURE REVIEW

This literature review examines the impact of computer anxiety on teachers who use new and emerging software technologies in their classroom. It is divided into eighteen sections: the challenge for student's success by the 21<sup>st</sup> century, computer use in education, barriers to computer use, factors that facilitate computer use, teachers' attitudes toward computer use, anxiety, computer anxiety, age and computer anxiety, gender and computer anxiety, years of teaching and computer anxiety, subject area taught and computer anxiety, educational attainment and computer anxiety, training and computer anxiety, administrative support and computer anxiety, new and emerging software technologies, rural schools, computer attitude scale, and summary.

The chapter begins with the challenge for students' success by the 21<sup>st</sup> century. Computer use in education will be presented next followed by barriers, facilitating factors, and teachers' attitudes in relation to computer use in education. Next will be computer anxiety along with demographic predictors of computer anxiety such as age, gender, years of teaching, subject area taught, and educational attainment. The chapter will further discuss issues pertaining to computer anxiety in regards to teachers' training, and administrative support. Finally, new and emerging software technologies, rural schools, and the computer attitude scale will be addressed along with a summary.

## **The Challenge for Students' Success by the 21<sup>st</sup> Century**

Over the past several decades, computers and related technologies have become well-incorporated into today's society. Increasingly, more people are using computers and computer software on a daily basis for recreational, educational, and vocational purposes, and comprehending how to use computers has become a basic, seemingly required skill. Perhaps one area of society that is significantly subjective by computer technology is education, particularly as educational systems further recognize the essentiality for students to be computer literate to achieve success in a technologically-advanced workforce.

The United States Department of Education issued an all-inclusive report in 1996 entitled, "Getting America's Students Ready for the 21<sup>st</sup> Century" under the leadership of Richard Riley, then Secretary of Education. The report called for educational leaders to commence a change in the schools and classrooms that would prepare the students for success in the 21<sup>st</sup> century. The report was established as a response to and in support of the Technology Literacy Challenge prepared by then President Bill Clinton. The challenge included the following four objectives to ensure future efforts:

1. All teachers in all schools would have sufficient training and support in order to help students learn how to use computers and the information superhighway.
2. Up-to-date multimedia computers would be available to all students and teachers in all classrooms.
3. All classrooms would be linked to the Internet.

4. The school curriculum would include software and online learning resources (Bitter & Pierson, 1999).

### **Computer Use in Education**

The computer plays an important role in education because of its potential to enhance students' learning. The Challenge for Students' Success by the 21<sup>st</sup> Century mandated by President Clinton in 1996 resulted in millions of dollars being invested by the federal government into the school system nationwide to make this challenge possible. However, in order to meet this demand, teachers must integrate new and emerging software technology into their curriculum. Research showed that the percentage of teachers accomplishing this task is low (U. S. Congress, Office of Technology Assessment, 1995).

According to McCannon and Crews (2000), because computer use is constantly increasing in society, teachers at all levels of education must effectively incorporate the use of computers effectively within the classroom. Research findings from Mumtaz (2000) showed that many teachers, at every grade level, have limited expertise and even less confidence in using the computer as well as computer software.

The way teachers feel about the use of computers in the classroom plays a vital role in the integration of computers in their teaching (Mcgrail, 2005). Many teachers vigorously resist using computers. Francis-Pelton and Pelton (1996) revealed that teachers' lack of knowledge and experience with computers lead to a lack of confidence, which in turn leads to anxiety and reluctance to the use of computers. Although teachers believe that computers will lead to improved teaching and learning, teachers may choose

not to use computers if they experience computer anxiety, possess low confidence in their abilities to use computers, or simply do not like computers (Delcourt & Kinzie, 1993; Jones, 2001).

Although teachers are given technology availability and essential skills and knowledge to use it, performance may not occur without positive attitudes about computers, high computer confidence, and low computer anxiety. According to Ropp (1999), if teachers lack positive attitudes or beliefs toward the use of the computer in the classroom, there is a great possibility that they will not incorporate the use of computers in their instruction. Abbott and Faris (2000) stated when student teachers are required to use technology to complete assignments and activities, positive attitudes toward the use of computers to enhance students' learning are shown. Positive attitudes toward integration of technology in classrooms and increased skill in technology use are considered benefits to student teacher outcomes from using an integrated approach to instructional technology. Hence, it is very important to amplify teachers' knowledge of computer use in education in order to help teachers utilize technology best in classrooms.

Having access to a computer at home also can be a contributing factor to computer use in education. Teachers with computer access at home are more acceptable to implementing new and emerging software technologies into their curriculum. According to Dusick and Yildirim's (2000) research, teachers having access to computers at home had a positive correlation with technological competency and computer use in the classroom.

In addition, Flood and Conklin (2003) examined 68 agricultural and extension education faculty members to see if they were using emerging educational technologies within their instruction. Correlations were conducted to identify the relationships between computer use and the variables, age gender, years of teaching experience, training, and access to a computer at home. Of the 68 faculty members, 81% of the participants were male and 19.1% were female. Nearly 84% of the participants were white with the next largest ethnic group reported as Hispanic with 5.9% followed by Asian with 4.4%. Fifty-five percent of the participants were in the range of 40 -60 years of age with the youngest participant being 30 year of age and the oldest 79 year of age. Eighty-nine percent of the participants reported that they had access to a computer at home. Approximately 94% of the participants indicated they participated in 0 to 10 hours of training in using educational technology; however none reporting more than 30 hours of training. Findings revealed no relationship between age and computer use, gender and computer use, years of teaching experience and computer use, training, and computer use. However, there was a moderate positive association between participants having access to a computer at home and computer use for instruction. Results showed that participants with access to computers at home are more likely to implement educational technologies within their instruction.

### **Barriers to Computer Use**

In the attempt to discover reasons for limited use of computer technology, three main categories were discussed. The categories are as follow: lack of hardware, software, and technical support; lack of time; and lack of training.

The Office of Technology Assessment (OTA) reported that a lack of hardware and software unavoidably limited the use of computer technology (OTA, 1995).

Whitworth and Berson stated that barriers to effective implementation of computers are associated with limited technological resources (Whitworth & Berson, 2003). VanFossen (1999) reported teachers' reluctance to the use of computers involved lack of training and/or support to resolve technological problems. He further stated that the most common factor that prohibited teachers from increasing the use of computers in the classroom was associated with Internet access (VanFossen, 1999).

Diem (2000) concluded that delivering the technology in the terms of hardware and software to the teachers is the easy part. To get them introduced and comfortable as well as proficient with the technology will require time and effort (Diem, 2000).

Statistics reported by the NCES (2002) indicated the number of computers in the public schools seems to be sufficient for effective use. The data found in the report revealed a ratio of students to computers as being 4 to 5 students per computer. In addition, 99% of public schools in the United States had access to the Internet in the Fall 2001. According to these statistics, technical problems seemed to be not the main problem associated with teachers' computer use anymore (NCES, 2002).

The lack of time has been conveyed as another barrier to using computer technology in the classroom. Time is needed for training and finding resources used to prepare material to teach the students in the classroom (Cummings, 1998).

Cunningham (2001) made a prediction of over 2 million new teachers being hired over the next decade. He pointed to studies that revealed teachers in the first five years of

their teaching career are “no more likely to integrate technology into their teaching than are twenty year veterans” (p.3). Teachers that are starting off their careers generally have good intention to incorporate technology into their new teaching assignments; however, overwhelmed with new content, materials, resources, and classroom management causes the teacher to be constrained and with little energy for using computers to teach (Cunningham). Improving behavior management techniques, becoming familiar with the curriculum, adapting to the school culture, and becoming familiar with the assessment systems has left most beginning teachers with little time to plan effective integration of technology with their ongoing teaching activities (Russell et al., 2003).

Lack of training has also been listed as a component for the lack of computer use by teachers. Leu (2000) reported that 80% of the K-12 teachers in the United States did not feel sufficiently ready to use technology in their classrooms. The feeling of inadequacy was reported to be due to the lack of staff development offered to the teachers. Findings showed that only 20% of staff development budgets in most school systems were dedicated to technology training for teachers. Furthermore, the National Council of Accreditation of Teacher Education (NCATE), the major accreditation body for post secondary institutions in the United States, also expressed concern about the inadequate and inconsistent technology training in the nation’s colleges of education and teacher preparation programs (Leu, 2000).

Some scholars have the belief that when pre-service teachers enter the classrooms, the teaching strategies and methods acquired while in their teacher preparation courses will be heavily used (Diem, 2000; Whitworth & Berson, 2003). In order for the teachers

to use technology in the classroom, they must obtain appropriate technological training in methods and other education courses. Only through effective training programs will the full potential of using computers in the classroom be realized by teachers.

From the point of view of Mason et al. (2000), using technology effectively calls for an on-going and stable training program. This is a necessity and should not be treated as a luxury and training should start as part of a pre-service teacher program and be carried throughout a teacher's instructional profession. To put things in perspective, the technology classes and training offered to students at the undergraduate pre-service level may be outdated by the time they graduate and take their first teaching position (Mason et al, 2000).

### **Factors that Facilitate Computer Use**

Many researchers believe that removing the barriers mentioned above will be enough to increase the use of computers in the classroom (Bell & Tai, 2003; Bennett, 2000; Cuban, 2001; Russell et al., 2003; VanFossen, 1999). However, there is a conflict among educators in how to remove these barriers. Some educators perceived the barriers as being a single, generic element and would like to treat these problems with a single solution (Bell & Tai; Bennett). Other educators view these problems as being more complex and would like to propose a multi-dimensional solution (Cuban; Russell et al.).

There is mutual agreement among many educators in the area that teachers need increased training to help motivate the use of computers in the classroom (Bell & Tai, 2003; Bennett, 2000; Cuban, 2001). They profess that pre-service teaching experiences can affect the implementation of computer use in classrooms, and they believe teacher

education coursework should combine computer training with curriculum and instructional courses. According to Bennett (2000):

Pre-service teachers need to apply technological information and skills within teacher education programs. The mixture of technology into course work needs to be spiraled and sequenced within courses and across teacher education programs. Students must exhibit competence within courses and in field experiences. To be certified, a pre-service teacher should reveal the technology competencies outlined by the International Society of Technology in Education (ISTE) standards for all teachers. (p.3).

Bell and Tai (2003) pointed out different reasons for the importance of pre-service teacher education programs and teaching experience:

As the new teacher workforce becomes more and more technology-competent, inventive uses of technology will enter the classroom not by way of a top-down model of professional development, but through a more grassroots model of hiring technology-competent teachers who can then begin to influence their peers by modeling inventive technology use and acting as resources. Pre-service teachers over the next decade will be completing their formal education during a period when more and more technology is being used in content courses at schools and colleges. These pre-service teachers potentially will be introduced to instructional uses of technology. (p.45)

Even though these educators have shown valuable solutions to remove these barriers, studies show that these single solutions are not enough for complex issues (Cuban, 2001; Russell et al., 2003). Cuban believed adding more resources and teacher training will not solve any problems in regards to computer use. The solutions for effective computer use mentioned by Cuban are:

- Strategies would have to be planned now for fundamental changes in how elementary and secondary schools are structured, time is allocated, and teachers are prepared.
- Hardware manufacturers, software firms, and telecommunication companies would need to produce software and equipment exclusively designed for teachers and students.
- They would have to enhance product reliability to limit the defects in their wares, amplify technical support to teachers, and test software on consumers before marketing it to district and state administrators.
- The unique needs of urban schools and the low-income communities in which these schools reside would require sustained attention to the links between the economic, social, housing, and political structures of the neighborhood and the quality of schooling. (p.23)

### **Teachers' Attitudes Toward Computer Use**

Dupagne and Krendl (1992) reviewed literature from the mid-1980's on teachers' attitudes toward computers. This study focused on the following three areas: (1) perceptions of computers; (2) impact of computer use on attitudes; and (3) impact of

personal and learning environment characteristics. Results indicated that teachers who are familiar with computers are more confident about using them for instruction; therefore, indicating positive attitudes toward computer use. The teachers who lack confidence may remain unable to facilitate computers in their instruction due to the lack of knowledge of computers causing the researcher to recommend schools to invest time and training for teachers.

In addition, other research has shown that teachers with positive attitudes toward technology use technology in teaching (Lam, 2000; Vannatta & Beyerbach, 2000). Vannatta and Beyerbach's ongoing Goals 2000 Pre-service Technology Infusion Project attempted to teach higher education faculty, K-12 teachers, and pre-service teachers to incorporate technology into their instruction. The research objectives were to (a) enhance technology proficiencies among higher education faculty and K-12 teachers; (b) enhance technology integration and experiences in education courses; and (c) provide pre-service teachers the opportunity to monitor technology-rich classrooms through videoconferencing. Quantitative and qualitative methods and pretreatment and post-treatment surveys were given out to the participants. The participants included 12 higher education faculty and K-12 teachers and 122 pre-service teachers. Findings showed that technology integration of instructional methods from pretreatment to post-treatment increased from 33.4% to 93.3%. In addition, more than half of the faculty and teachers included computer presentations, content-specific software, email, the Internet, electronic references, and word processing for student and instructor use. Vannatta and Beyerbach

(2000) concluded that technology integration training for higher education faculty is a crucial component to developing technology-using pre-service teachers.

Bahr (2004) examined the attitudes of teachers regarding the use of software applications for instructional purposes during a field experience. The study consisted of 62 pre-service elementary teachers that attended Utah Valley State College. For the purpose of the study, Bahr used one instructor that taught all the teacher candidates. The faculty member was instructed to pair the candidates into three groups and assign the candidates a task to teach a science content course using a hands-on approach in one of three ways: instructing with the support of multi-media, instructing with the support of the Internet, and instructing without the support of software technology (control group). A pretest-posttest experimental control design was used. The instrument used for this study was called Attitude Towards Technology and Learning (ATTL). ATTL measured the attitude of the teacher candidates prior to the field experience as a pretest, and then immediately after as a posttest. Results from the survey indicated that teacher candidates that used software technology for instructional purposes in the field experiment had a better attitude than the group that did not use software technology.

According to Bahr (2004), teacher's attitudes have been understood for a long period of time as an important factor in the progress of education. Bahr states that if teachers and future teachers do not have positive attitudes toward the usefulness of software technology for instructional purposes, then it is most likely such application will not take place in the classroom. However, if teachers discover the effectiveness of the use of software technology in the classroom, then the impact of teaching with this

technology will increase. In other words, the attitudes of teachers plays a vital role in incorporating software technology into the classroom (Bahr, 2004).

### **Anxiety**

Anxiety is defined as “an abnormal and overwhelming sense of apprehension and fear often marked by physiological signs (as sweating, tension, and increased pulse), by doubt concerning the reality and nature of the threat, and by self-doubt about one's capacity to cope with” (Merriam-Webster Online Dictionary, 2006). Researchers in the medical field compiled the following list of disorders relating to anxiety: (a) Generalized Anxiety Disorder (GAD), (b) Panic Disorder, (c) Phobias (e.g., social, agoraphobia, and claustrophobia), (d) Post-traumatic Stress Disorder (PTSD), and (e) Obsessive-Compulsive Disorder (OCD) (Jain, 2005; SAMHSA’S National Mental Health Information Center, 2006; The National Center for Health and Wellness, 2006). An individual suffering from GAD lacks the capability to elude unwarranted worries. A person suffering from panic disorder often experience heart-pounding tension, shortness of the breath, and feelings of unreality that strikes suddenly.

Jain (2005) defines phobia as “an abnormal fear and avoidance of an everyday situation” (p. 1). There are three types of phobia - social, agoraphobia, and claustrophobia. Social phobia is associated with the fear of being extremely embarrassed or humiliated in front of a crowd. The most common type of social phobia is public speaking. An individual experiencing agoraphobia is inflicted with “the fear of being in a situation that might trigger a panic attack and from which escape might be difficult” (SAMHSA’S National Mental Health Information Center, 2006, p. 4). Lastly,

claustrophobia, the fear of being in enclosed spaces, is often linked to agoraphobia. An individual with post-traumatic stress disorder suffers with persistent thoughts and memories of traumatic occurrence (e.g., rape, kidnapping, natural disasters, war). The impact of this disorder causes a person to feel emotionally numb. Obsessive-compulsive disorder involves an individual who has anxious thoughts or rituals that cannot be controlled. This individual continuously encounters unwelcome thoughts or images and possesses the desire to engage in certain rituals. According to National Institutes of Mental Health (2002), “The disturbing thoughts or images are called obsessions, and the rituals that are performed to try to prevent or get rid of them are called compulsions” (p. 6).

### ***Computer Anxiety***

Due to expansions in technology and a new era of high-tech advancement, a new category of anxiety has surfaced (Keen, 1998). This new anxiety disorder has become known as computer anxiety. Medcalf-Davenport (1998) stated that teachers’ reluctance to use the computer for instructional purposes could be contributed to computer anxiety. Computer anxiety affects the general usage and the implementation of common tasks involving the computer. According to Howard and Smith (1986), computer anxiety is defined as the “fear of impending interaction with a computer that is disproportionate to the actual threat presented by the computer” with research showing a linkage between computer anxiety and terms such as “computer avoidance” and “computer anxious”. Bohlin (2002) defined computer avoidance as “an overall feeling of aversion to using computers based upon the emotions, attitudes, and motivation levels of the individual” (p.

1). In Fajou's study (as cited in Orr, 1997, p.3) "Those who are computer anxious may experience fear of the unknown, feeling of frustration, possible embarrassment, failure and disappointment."

Orr (1997) states that researchers Rosen and Weil (1995, 1997) use the term "technophobia" in relation to fear of new technology. The fear of new technology is another aspect of computer anxiety. According to Orr, Rosen and Weil established three levels of technophobia in relation to anxiety. An individual who possesses the traits of sweaty hands, heart pounding, and headaches when using technology exhibits anxious technophobe. An individual, who appears to be calm on the outside but battles with negative feelings, such as worrying about hitting the wrong key or damaging the computer, exhibits cognitive technophobe. An uncomfortable user is the last level of technophobia. This individual is slightly anxious about technology but still experience some negative feelings. Findings from Rosen and Weil have shown that computer anxiety exists among business people in the workplace.

According to a study conducted by Worthington and Zhao (1999), "There have been growing concerns that computer anxiety or negative attitudes towards computers among teachers and students will prevent them from reaping the pedagogical, social, and economical benefits of computer technology" (p. 299). Researchers contribute teachers' reluctance to use new and emerging software technology to computer anxiety (Bradely & Russell, 1997; Gardner, Discenza, & Dukes, 1993; Medcalf-Davenport, 1998). Experiencing anxiety is a reflection of an individual's capability to carry out a task. According to Francis-Pelton and Pelton (1996), teachers who experience computer

anxiety and are afraid of using computers are likely to be reluctant to use computers, whereas teachers who feel comfortable with computers and have positive attitudes toward the use of computers are more likely to incorporate technology into their curriculum.

Because of teachers' reluctance, millions of dollars invested by the government for technology integration will be wasted and perhaps jeopardize the chances of enhancement in student's learning. School administrators, educational leaders, and decision-makers should not continue ignoring the evidence that computer anxiety exists among teachers as it may increase with the expansion of computer technology. It is important for leaders in education to find out what is contributing to teachers' computer anxiety and determine a way to rectify the problem so the percentage of teachers integrating technology into the school classroom can increase.

### ***Age and Computer Anxiety***

Age is often used as a predictor of whether or not a teacher has computer anxiety. However, research results have been inconsistent in regards to the relationship between age and computer anxiety.

Many studies show age has no significant effect on computer anxiety (Dusick & Yildirim, 2000; Van Braak, Tondeur & Valcke, 2004). According to Fletcher and Deeds (1994), age should not be used as a factor for computer anxiety. Kellenberger and Hendricks (1998) investigated teachers' use of computers for their own needs, teaching, and student learning from five groups of factors such as demographics, self-confidence, self-competence, value, and computer-related experience. The results showed that neither demographics such as age or gender nor computer-related experience are

significant predictors for teachers' use of computers for their own need, teaching, and student learning.

Yang, Mohamed, and Beyerbach (1999) examined computer anxiety among 202 vocational technical teachers in Dade County, Florida. The findings revealed that there were no significant difference between computer anxiety and age. In addition, research by Butchko (2001) shows there is a significant relationship between computer experience and computer anxiety, but age has no effect on computer anxiety. In a study by Migliorino and Maiden (2004), teachers' attitudes and age were examined toward integrating electronic grading software into the school curriculum in two suburban school districts in the Midwestern United States. The sample population examined in this study consisted of 770 secondary teachers, 333 educators in school district one and 437 educators in school district two. The findings revealed that age of educators were not significantly related to the teachers' attitudes for either of the two school districts.

On the contrary, other studies indicated that age is a factor in determining whether or not a teacher has computer anxiety (Harris & Grandgenett, 1996; Ryan, Szechtman, & Bodkin, 1992). In addition, a study conducted by Blankenship (1998), findings revealed that age was one of the best predictors of computer use in the classroom.

However, Ocak (2005) investigated the effects of gender, age, and racial, and ethnicity on computer anxiety and confidence level of mathematics teachers. The participants included 50 mathematics teachers who work in a wide-range of New York public schools. The age of the participants consisted of two categories: less than 38 years of age or over 38 years of age. The results indicated that teachers under the age of 38 had

a higher confidence level in using the computer than teachers over 38. In contrast, Dyck and Smither (1994) investigated the effect age, gender, and computer experience has on computer anxiety. Results revealed that older adults had more positive attitudes towards computers than the younger adults.

The previous literature shows that many researchers have thoroughly examined the relationship between age and computer anxiety. However, the findings of the studies indicated that inconsistencies still exist.

### *Gender and Computer Anxiety*

Like age, gender has also been a predictor of whether or not a teacher experiences computer anxiety. The research literature conflicts with regard to gender and computer anxiety. Numerous researchers have explored the effect gender has on computer anxiety. According to Geissler and Horridge (1993), males dominate in the use of computers while research from Liao (1999) further supported this statement. The researcher used a meta-analysis method to examine gender differences on attitudes toward computers. A total of 106 studies used by the researcher were located from three sources. Nine variables were selected for coding and the results suggested that males have slightly higher or more positive attitudes toward computers than females.

Kadijevich (2000) stated that males use technology more frequently than females. In addition, Young (2000) revealed that usually the male is more readily to participate in technology than a female. Research has also found that males are exposed to technology both in school and at home more than females (Kirkpatrick & Cuban, 1998). Further research has found that as new technologies emerge, initial users tend to be young, male,

educated, and urban (Norris, 2001). According to Van Braak, Tondeur, and Valcke (2004), male teachers integrate computers in their classrooms more often than female teachers. Morahan-Martin (1998) stated that evidence has shown that “hackers” and “computer geeks” are typically male. Many studies have found that males are better at computing, have more positive attitudes, and experience lower anxiety (Chen, 1986; Durndell & Haag, 2002).

Massound (1991) revealed that males had more positive attitudes towards computer use in all the subscales measured, which were anxiety, confidence, and liking. Mathews (1998) revealed that gender was a predictor of teachers’ attitudes toward the use of technology for instruction. The participants consisted of 5,862 teachers in 55 rural school districts in southeastern Idaho. Males were perceived to possess higher ability in technology use than females. Khine (2001) conducted a study on attitudes toward computers among teachers in State of Brunei Darussalam with participants consisting of 104 first-year teachers with ages ranging from 18 to 22 years. Findings from this study revealed that males have less anxiety and more confidence toward the use of computers than females. Females were reported to have more computer liking and computer usefulness than males.

In contrast, Loyd, Loyd, and Gressard (1987) and Parish and Necessary (1996) revealed that females demonstrate more confidence and liking for computers. Findings from research conducted by McInerney, McInerney, and Sinclair (1994) revealed that females with advanced computer usage were found to be more anxious than advanced males on the computer anxiety scale.

According to Shashaani (1993), females have less computer interests and self-confidence in their ability to use computers than males. The findings agree with Schumacher and Morahn-Martin (2001) stating that females hold more negative views about technology than do males. In addition, Jackson, Ervin, Gardner, and Schmitt (2001) found that females experience more computer anxiety, have less computer self-efficacy and computer usage than males. Chou (2003) revealed in his study that female teachers had significantly higher anxiety than male teachers. He surveyed 136 teachers from rural and urban areas in Taiwan. A review of literature was conducted by Chou to see what past researchers had discovered in regards to computer anxiety based on age, gender, background differences and prior computer experience. Because the results indicated that these variables were crucial, he took these variables as correlates when examining the teachers' in Taiwan. The instrument used in this study was Internet Anxiety Scale (IAS). The data analysis performed was multivariate analysis of variance (MANOVA).

Czaja and Sharit (1998) examined a sample of 384 adults ranging from 20 to 75 years in regards to the impact age has on computer usage. The results indicated that older people perceived to be less comfortable and efficient than the younger people. The study also found that there were no gender effects on attitudes toward computers. The results agree with the findings of Shapka and Ferrari (2003) and Yuen and Ma (2002) that no significant gender differences were found in teachers' attitudes toward computers. In addition, Yaghi and Abu-Saba (1998) stated in their findings that gender has no significant impact on computer anxiety. Yang, Mohamed, and Beyerbach (1999)

investigated computer anxiety among 202 vocational technical teachers in Dade County, Florida. The findings showed that there is no significant difference among computer anxiety and gender.

Hong and Koh (2002) investigated a sample of 200 secondary teachers from rural schools in Malaysia. This study examined the computer anxiety levels and attitudes of rural secondary school teachers toward computers, the relationship between anxiety and attitudes toward computers, and differences in anxiety levels and attitudes based on demographic variables. Findings indicated that the level of computer anxiety among male teachers was not significantly different from the level of computer anxiety of female teachers. Furthermore, the findings revealed no significant difference between male and female teachers' attitudes toward the use of computers.

In addition, Sam, Othman, and Nordin (2005) conducted a study in Unimas examining participants' use of the Internet. In this study, computer self-efficacy, computer anxiety, and attitudes toward the use of the computer to explore the Internet were measured by the use of a survey. There were 81 females and 67 males participating in this study with ages ranging from 19 to 43 with the majority of the participants in the age range of 19 to 23. Findings revealed that there were no significant difference in computer anxiety levels, attitudes toward the Internet, and computer self-efficacy based on gender. Although, several researchers have constantly examined gender and computer anxiety, the issue still remains unresolved.

### *Years of Teaching and Computer Anxiety*

There have been few studies attempting to investigate the impact of years of teaching has on computer anxiety. The National Center for Education Statistics (2000) reported that teachers with nine or less years of teaching experience are most likely to use the computer or Internet in their classroom than teachers with twenty years or more experience. A study conducted by Adams (2002) revealed that teachers with three years of teaching experience had a high level of computer integration. Findings from the survey also showed that teachers with 10 to 19 years of teaching experience used less computer integration in their teaching. These findings are in agreement with Dorman (2001), who stated that teachers who have few years of teaching experience are more inclined to use computers than teachers who have more experience in the classroom.

Shegog (1997) investigated the attitudes of 255 teachers concerning the use of computers. Participants consisted of 145 white teachers, 80 black teachers, 19 Hispanic teachers, 6 Asian teachers, and 5 teachers from other minorities. The study took place in Chicago involving three public schools. The participating secondary teachers were selected randomly. Teachers' attitudes toward computers and technology integration in the classrooms were investigated based on age, gender, teaching experience, ethnicity, and computer experience. Findings revealed that teaching experience was not a good predictor of teachers' attitudes toward computers and technology integration in classrooms. In addition, Becker (1999) showed that teaching experience was not a significant factor in predicting teachers' computer anxiety. Also, Dusick and Yildirim,

(2000) showed that years of teaching experience were not significantly correlated with computer use.

In contrast, findings from Asan (2003) and Chiero (1997) showed years of teaching as being a significant factor for predicting teacher's attitudes toward the use of computers. In addition, Mathews and Guarino (2000) showed that years of teaching experience had an effect on computer usage. Migliorino and Maiden (2004) examined teachers' attitudes and years of teaching toward integrating electronic grading software into the school curriculum in two suburban school districts in the Midwestern United States. The sample population consisted of 770 secondary teachers, 333 educators in school district 1 and 437 educators in school district 2. The results revealed that years of teaching were significantly related to the teachers' attitudes toward integrating the electronic grading software into the school districts in both of the districts. Although teaching experience has not been thoroughly examined in the same respect as age and gender, there still has not been a clear conclusion as to its relationship with computer anxiety.

### ***Subject Area Taught and Computer Anxiety***

Subject area taught has received minimal attention in regard to computer anxiety. In a study conducted by Tonsetic (1996), findings revealed that there were moderate correlations between computer anxiety and area of teaching.

Lumpe and Chambers (2001) investigated teachers' attitudes and behaviors about computer use in the classroom. The participants consisted of 117 females and 113 males. This particular study focused on teachers' attitudes and behaviors because teachers play a

vital role in successful technology use. Nevertheless, it was found that there were no significant relationship between teachers' attitudes and behaviors about computer use and subject area taught. In a similar study, Yang, Mohamed, and Beyerbach (1999) examined computer anxiety among 202 vocational technical teachers in Dade County, FL. The findings revealed that teachers' level of education has an influence on computer anxiety. However, there was no significant relationship between computer anxiety and teaching area. In addition, a study by Atkins and Vasu (2000) examined middle school teachers' concerns, knowledge, and use of technology in teaching, and how to integrate technology into the classroom showed teachers' attitudes toward the use of computers in instruction had no significant relationship with subject area taught.

### ***Educational Attainment and Computer Anxiety***

Educational attainment has no effect on teacher's attitudes toward computers (Dusick, & Yildirim, 2000; Mathews & Guarino, 2000). In addition, Atkins and Vasu (2000) examined middle school teachers' concerns, knowledge, and use of technology in teaching, and how to integrate technology into the classroom showed teachers' attitudes toward the use of computers in instruction had no significant relationship with level of education of teachers.

In contrast, Yang, Mohamed, and Beyerbach (1999) investigated computer anxiety among 202 vocational technical teachers in Dade County, FL in regards to computer anxiety and various demographic variables. Findings showed that teachers' level of education influences computer anxiety. Mathews (1998) contributed results that educational level was the best predictor of teachers' attitudes toward the use of

technology for instruction. The participants consisted of 5,862 teachers in 55 rural school districts in southeastern Idaho.

Yaghi and Abu-Saba (1998) found that teaching at different educational levels such as elementary, middle, and secondary had no significant effect on computer anxiety. Northcutt (1999) revealed elementary teachers used computers as a part of their daily activities in the classroom more frequently than middle or high school teachers. The National Center for Education Statistics (2000) reported that 39% of elementary teachers and only 12% of secondary teachers used the computer to assign practice drills to their students. However, the report showed that 41% of secondary teachers and only 25% of elementary teachers required their students to use research from the Internet to complete assignments. The statistics from the National Center for Education also revealed that elementary teachers are less likely to assign their students research from the Internet than secondary teachers; however, elementary teachers have a higher percentage of assigning practice drills to their students than secondary teachers.

### ***Training and Computer Anxiety***

According to Charp (2003), many teachers do not feel equipped to integrate technology into their classroom and because they lack technical skills, they often become frustrated. This frustration leads teachers to feel uncomfortable toward the use of technology. Knezek and Christensen (2002) discovered that teachers' attitudes toward the use of the computer became more positive with constant training. As teachers were exposed to computer training, a reduced amount of anxiety existed.

Furthermore, Becker (1999) stated that there is a correlation between teachers' attitudes and successful integration of technology into the classroom. Teachers with positive attitudes are more apt to integrate technology into their curriculum than teachers with negative attitudes. In order for teachers to change their attitudes toward the use of computers, professional training programs should be provided to help improve teachers' skills. Helping teachers overcome their anxiety is crucial to the success of any program of professional development (Bitner & Bitner, 2002). According to Medcalf-Davenport (1998), teachers' reluctance to the use of computers results from not recognizing the usefulness and necessity of technology to teaching and learning. Mouza (2003) stated that teachers are oblivious of the teaching and learning strategies that technology and the internet are able to provide. Perceived usefulness and ease of use are contributing factors for building confidence. These contributing factors have been related to teachers' attitudes toward technology. Confidence building should be considered a major focus in professional development programs designed for teachers.

A study conducted by Rowand (2000) showed that one or more hours of training increased teachers' attitudes toward the use of computers. However, Parsad, Lewis, and Farris (2002) stated that teachers need time to reflect and collaborate with their peers after training. Collaboration after training with peers has been found to have a positive effect on teachers' attitudes toward integrating technology within the classroom. In addition, Becker and Riel (2000) revealed that the more time teachers spent collaborating with their peers about technology, the more effective technology integration was in the classroom. In other words, collaboration with peers has a positive affect on technology

use in the classroom. Providing teachers with the needed training and collaboration can result in teachers becoming proficient with technology.

According to Feil (1996), technical support for teachers in schools is considerably limited in the area of providing full-time computer coordinators for teachers. Feil (1996) further stated that teachers must educate themselves with regard to computer instruction. According to a report conducted by the U. S. Congress, Office of Technology Assessment (1995), a majority of teachers feel inadequately trained to use technology in the classroom. The National Center for Education Statistics (NCES) reported one third of teachers felt prepared to use technology in their curriculum (Smerdon, Cronen, Lanahan, Anderson, Iannotti, & Angeles, 2000). In a more recent report, only 17% of teachers nationwide is using technology in their curriculum (Market Data Retrieval, 2004).

McCannon and Crews (2000) revealed that computer training has often been inadequate or nonexistent for many educators. Focus has often been on showing teachers how to operate the computer and not how to integrate the technology into the classroom. In a study conducted by McGrail (2005), participants consisted of seven English teachers from four inner city high schools and one suburban high school located in the eastern part of the United States. The teachers' ages ranged from the mid-twenties to the late forties and their experience in teaching English ranged from two to twenty years. Findings revealed that the teachers wanted and needed professional training to shape their use of technology in their classroom practices.

McCannon and Crews (2000) showed that 92% of the respondents indicated that their computer use increased after participating in a professional development class.

Rother (2005) reported from the 2005 Teachers Talk Tech survey that the number of teachers perceiving their computer skills as being advanced had almost tripled from six percent in 2004 to 17.5 percent in 2005. Rother (2005) further stated teachers are contributing their increased comfort level of technology to hands-on experience and professional development.

Swan and Dixon (2006) investigated the influence of technology training on mathematics teachers' attitudes and use of technology in the classroom. The study took place in an urban public middle school in the southeast part of the United States. The participants consisted of eight mathematics teachers. Six of the teachers had less than four years of teaching experience. The results indicated that mathematics teachers' amount and level of technology use in the classroom increased after the professional development training was completed. Results also indicated that if teachers felt that they did not have enough time for training, subsequently there was not a need to make an effort to become technologically proficient. Hence, providing teachers with the needed time to receive training can result in teachers becoming and remaining proficient with technology.

In a similar study, Kumar and Kumar (2003) examined the effectiveness of a training course in improving teachers' attitudes toward computers and their technology skills. There were 31 teachers involved in this study. Of the 31 teachers, 27 were female and four were males with ages ranging from 20 to 63 years. Results revealed that there was a significant improvement in the teachers' attitudes toward computers and their technology skills after completing the training. Furthermore, finding from Yildirim

(2000) showed that the more experience and training teachers have with computers, the more positive attitudes teachers will possess.

McInerney, McInerney, and Sinclair (1994) revealed a reduction in computer anxiety for some individuals after completing a computer training class while others still experienced continuous anxiety. A possible reason may be due to the design of the computer training class. Training must be carefully designed to reduce teachers' computer anxiety. However, training should also provide knowledge for teachers in regards to integrating computers into their curriculum. In addition, Yang, Mohamed, and Beyerbach (1999) made a recommendation in their study regarding reducing computer anxiety by improving training programs that are designed to accommodate teachers' need as well as their interest and provide them with hands on experience.

Furthermore, Mouza (2003) stated that teachers need training that is hands-on as well as related to the teachers' curriculum with follow-up support. Training is a crucial element for teachers to be effective in technology integration and it must be aligned with the teachers' needs. The more time teachers spend in training, the better prepared they are to use computers in the classroom. Hence, evidence showed that adequate training is necessary for teachers to feel comfortable using computers and integrating technology into the classroom. When teachers know how to use the computer effectively in the classroom, the potential for student learning is enhanced tremendously (Mills & Tincher, 2003). Therefore, it is extremely important for teachers to be taught how to use technology.

According to Yildirim and Kiraz (1999), computer training and experience with computers affect teachers' attitudes toward computer integration in the classroom. Findings from Van Braak, Tondeur, & Valcke, (2004) revealed that computer experience is positively related to computer attitudes. In a study conducted by Potosky & Bobko (2001), findings revealed that there was a strong positive relationship between computer attitudes and computer experience. The more experience individuals have with computers, the more probable their attitudes toward computers will be positive (Potosky & Bobko, 2001; Williams, Coles, Wilson, Richardson, & Tuson, 2000). Hence, increased computer experience could reduce computer anxiety in many teachers.

In studies conducted by Parish and Necessary (1996) and Czaja and Sharit (1998), not having computer experience is a major factor in computer anxiety. Positive attitudes toward computers have mostly been linked to experience and computer ownership (McCannon & Tena, 2000). Parish and Necessary (1996) found that individuals who owned computers possessed more favorable attitudes toward computer use. In addition, a study conducted by Walters and Necessary (1996) revealed that computer attitudes are related to computer experience and computer ownership.

### ***Administrative Support and Computer Anxiety***

According to some researchers, administrators must assist teachers through the difficult change process necessary to integrate technology into the classroom (Bitner & Bitner, 2002). Administrators must be prepared to demonstrate the importance of integrating technology by providing teachers with ongoing and onsite support. Teachers

also need prompt support in the technical area as well as in the curriculum area to be effective in using technology in their classrooms.

Norum, Grabinger, and Duffield (1999) examined teachers' thoughts, perceptions, beliefs, experiences, knowledge, and growth about integrating technology into the school curriculum. The participants consisted of 23 teachers with ages ranging from 25 to 50. There were two males and 21 females. One of the main underlying themes from this study involved teachers expressing the importance of administrative support. Administrators play a vital role in expediting changes connected with integrating technology into the classroom (Norum, 1999). According to Norum, Grabinger, and Duffield, the teachers believed administrative support should "provide opportunities to make the classroom change possible, allow time for staff development activities, share the vision for technology in the school and district, and allocate funding to technology" (p. 191). By providing teachers apt administrative support, the discomfort and anxieties associated with technology integration teachers were experiencing can be alleviated.

Hong and Koh (2002) examined a sample of 200 secondary teachers from rural schools in Malaysia in the areas of computer anxiety levels and attitudes of rural secondary school teachers toward computers, the relationship between anxiety and attitudes toward computers, and differences in anxiety levels and attitudes based on demographic variables. Findings revealed that teachers who perceived the school administrators to be supportive of their computer literacy did not have significantly different computer anxiety levels than the teachers who perceived the school administrators to not be supportive of their computer literacy. Results also revealed that

there were no significant differences in the attitudes toward computers in relation to perceived administrative support between these two groups of teachers.

According to Swan and Dixon (2006), teachers and administrators play a key role in the decision making on how and whether technology is used in the classroom. In their study investigating the influence of technology training on mathematics teachers' attitudes and use of technology in the classroom, findings revealed that mathematics teachers' amount and level of technology use in the classroom increased after the professional development training was completed. However, results also showed a need for ongoing support. Recommendations were made for additional support when implementing new strategies and allowing more release time for training, planning, and collaboration. Thus, if administrators provide teachers with the needed time to receive training, then the chances of teachers not integrating technology into their classroom will be decreased.

### **New and Emerging Software Technologies**

New and emerging software technologies that are typically used among teachers for teaching preparation such as Excel Spreadsheets (Microsoft Excel), Advanced Word Processing (Microsoft Word), Graphics Manipulation (Desktop Publishing), PowerPoint Presentation Design (Microsoft PowerPoint), Electronic Gradebook, E-mail, and the Internet. The findings of a survey conducted by the Center for Applied Special Technology ("Survey: Student Technology Use", 1999), revealed that teachers assigned students to use computers for word processing or creating spreadsheets most frequently (61%), followed by internet research (51%), practicing drills (50%), solving problems

and analyzing data (50%), CD-ROM research (48%), multimedia projects (45%), graphical presentations (43%), demonstration and simulation (39%), and correspondence with experts (23%).

Migliorino and Maiden (2004) explored teachers' attitudes toward integrating electronic grading software into the school curriculum in two suburban school districts in the Midwestern United States. The sample population examined consisted of 770 secondary teachers, 333 educators in school district one and 437 educators in school district two. Results revealed that teachers' attitudes toward integrating the electronic grading software into the school districts in both of the districts had a significant effect on successful implementation. In other words, positive attitudes of teachers are needed to successfully implement new and emerging software technologies into the classroom.

In a study conducted by Niederhauser and Stoddart (2001), teachers' attitudes toward the use of educational software were investigated. The presentation and productivity software examined in the study were WordPerfect, MS Word, PowerPoint, Netscape, and Lotus 123. Findings revealed that there were significant differences in teachers' attitudes toward software use at different grade levels. Findings also revealed that there were significant differences in teachers' attitudes toward software use and gender. However, years of teaching experience did not significantly affect the attitudes of teachers toward software use.

Spiegel (2001) analyzed the usage and attitudes of secondary school teachers at four schools. The purpose of the study was to examine local teachers' attitudes towards the use of technology. Participants of this study consisted of 104 teachers, 42 were male

and 60 were female. The ages ranged from 22 to 76 with nearly half of the teachers having 15 or more years of teaching experience. Results proved that the teachers used word processing the most for instructional purposes with the Internet being next. The third software used frequently by teachers was desktop publishing. The findings of this study revealed a negative correlation existed between age and usage. In addition, there was no correlation between age and attitude, but a positive correlation was found between age and usage.

Hackbarth, Grover, and Yi (2003) examined whether if experience with particular software played a vital role in an individual's decision to use the computer. Researchers in this study used a spreadsheet program commonly used by teachers for instructional purposes named Microsoft Excel. There was a sample of 116 participants who used electronic spreadsheets prior to the study. Results indicated that amount of experience with the software was positively related to the individual's perception that it was easy to use. Positive feelings toward the software were found based on an individual having prior experience.

### **Rural Schools**

In a report conducted by the National Center for Education Statistics (NCES), rural was defined as being "a school or district "that is physically located in a place outside of a metropolitan statistical area and has a population of fewer than 2,500 persons" (NCES, 2002). This report further stated that in 2000 there were 89,594 public schools in the U. S. of which 37,548 were located in rural areas or small towns. Schools in rural areas or small towns account for about 42% of all schools in the nation and 30%

of all students (U.S. Department of Education, 2001). According to Johnson and Strange (2005), Mississippi is considered the highest overall priority ranking in the U. S. as the 8th most rural state. Also, a National Center for Education study in 2000 found that 45% of teachers in schools that have for the most part minority students used computers or the Internet for instruction during class, as compared to 56% of their colleagues in schools with few minority students (Reid, 2001).

### **Computer Attitude Scale**

This instrument was developed by Loyd and Gressard in 1984 to measure attitudes and anxiety toward the use of computers. The participants of the study consisted of 155 students ranging from grades eight to twelve. There were 51 males and 104 females involved in the study with ages ranging from 13 to 18. The CAS is a Likert-type instrument that consisted of 30 items which presented positively and negatively worded statements of attitudes and anxiety toward computer usage. There were three main types of subscales used in the instrument which were: (a) Computer Anxiety Subscale - fear or anxiety toward the use of computers (b) Computer Liking Subscale - enjoyment of working with computers or liking of computers and (c) Computer Confidence Subscale - confidence using computers or learning about computers. The 10 questionnaire items under each subscale were selected by a panel of judges from an original pool of 78 items (Loyd & Gressard, 1984). These items were used for each subscale in the study. Respondents were given the ordered response range: 4 = strongly agree, 3 = slightly agree, 2 = slightly disagree, 1 = strongly disagree to answer the positive and negative statements under the three subscales. Possible scores on each

subscale could range from 10 to 30. The coefficient alpha reliabilities were: .86 for Computer Anxiety; .91 for Computer Liking; .91 for Computer Confidence subscales; and .95 for the Total Score of the Computer Anxiety Scale.

Shortly afterwards, Loyd and Loyd (1985) conducted a study to assess the reliability and validity of the Computer Attitude Scale (CAS) by measuring the attitudes and anxiety of classroom teachers. The findings of the study contributed to a fourth subscale identified as Computer Usefulness which focuses on perceived usefulness of computers in present or future work. The coefficient alpha reliabilities for this study were .90 for Computer Anxiety; .89 for Computer Confidence; .89 for Computer Liking; .82 for Computer Usefulness; and .95 for the Total Score of the Computer Attitude Scale.

The Computer Anxiety Subscale consisted of statements such as “Computers usually make me feel nervous and uncomfortable” (Item 14) and “Computers do not scare me at all” (Item 1). On the Computer Liking Subscale, items contain statements such as “I like working with computers” (Item 2), “Once I start working on the computer, I find it hard to stop”(Item 25), and “I don’t understand how some people can spend so much time working with computers and seem to enjoy it” (Item 11). Statements on the Computer Confidence Subscale include, “I’m not the type to do well with computers” (Item 6) and “I’m sure I could do advanced work in computers” (Item 20) (Loyd & Gressard, 1984).

According to Gressard and Loyd (1986), the survey is scored according to the following:

For questions 1, 3, 4, 6, 9, 11, 12, 14, 16, 17, 19, 22, 25, 27, 28, 30, 33, 35, 36, 38

(Strongly Agree=4, Slightly Agree=3, Slightly Disagree=2, Strongly Disagree=1). Also, for questions 2, 5, 7, 8, 10, 13, 15, 18, 20, 21, 23, 24, 26, 29, 31, 32, 34, 37, 39, 40 (Strongly Agree=1, Slightly Agree=2, Slightly Disagree=3, Strongly Disagree=4). The questions are coded so that the higher the score, the more positive the attitude (See Appendix E).

According to Gressard and Loyd (1986), four subscores can also be obtained from the questions. For Anxiety: 1, 5, 9, 13, 17, 21, 25, 29, 33, 37; For Confidence: 2, 6, 10, 14, 18, 22, 26, 30, 34, 38; For Liking: 3, 7, 11, 15, 19, 23, 27, 31, 35, 39; For Usefulness: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40 (See Appendix E). Again, higher scores correspond to more positive attitude, e.g., a higher confidence score means more confidence and a higher anxiety score means less anxiety. The score was calculated by summing the answers for each question, therefore, the total possible score for each subscale range from 10 to 40 and for the total instrument 40 to 160.

### **Summary**

In this chapter, the review of literature is divided into eighteen sections: the challenge for student's success by the 21<sup>st</sup> century, computer use in education, barriers to computer use, factors that facilitate computer use, teachers' attitude toward computer use, anxiety, computer anxiety, age and computer anxiety, gender and computer anxiety, years of teaching and computer anxiety, subject area taught and computer anxiety, educational attainment and computer anxiety, training and computer anxiety, administrative support and computer anxiety, new and emerging software technologies, rural schools, computer attitude scale, and summary.

Previous research indicated that computers can play a vital role in helping students meet higher standards and perform at increased levels by promoting alternative approaches to teaching and learning. However, studies revealed that teachers' attitudes have an impact on technology use in the classroom. For example, positive attitudes promote incorporating technology into the classroom, whereas, negative attitudes results in resistance. Some researchers link resistance to computer anxiety.

Previous studies in the area of age as a factor that could be related to computer anxiety have revealed mixed results. Research in the area of gender and computer anxiety has constantly been examined. However, there are still unresolved issues.

The impact of several demographic variables on computer anxiety such as years of teaching, subject area taught, and educational attainment have received limited attention from researchers. The research findings from these demographic variables have showed conflicting results. Other areas such as administrative support and training, and new and emerging software technologies also have mixed results. Rural schools and computer attitude scale were also addressed in this chapter.

## CHAPTER III

### METHODOLOGY

#### **Introduction**

This study investigated anxiety toward new software technologies among teachers in a rural city school district in Mississippi. For this study, teachers in a rural city school district that consisted of elementary, middle, and high school teachers were examined and data analyzed to determine the level of anxiety teachers experience when using computers. Also, this study examined relationships in the level of anxiety teachers experienced and gender, age, years of teaching, subject area taught, and educational attainment when using new and emerging software technologies. This chapter is divided into the eight sections: (a) research design, (b) population, (c) instrumentation, (d) pilot study, (e) validity of instrument, (f) reliability of the instrument, (g) data collection, and (h) and data analysis.

#### **Research Design**

A survey methodology and both descriptive and correlation statistics were used in this study. The survey methodology is commonly used to administer to a target population about a particular topic or issue. Surveys are used extensively in quantitative research to collect information from participants about their characteristics, experiences, and opinions (Glatthorn, 1998). Surveys are a cost effective, efficient, and concise way

to gather data from a large geographically dispersed population (Anderson & Arsenault, 1998; Gall, Borg, & Gall, 1996).

Fraenkel and Wallen (2003) stated that “correlation research is also sometimes referred to as a form of descriptive research because it describes an existing relationship between variables” (p. 338). In this study, a descriptive survey was used to examine whether teachers perceive that they experience anxiety toward new and emerging software technologies.

### **Population**

The participants in this study consisted of teachers from a rural city school district in Mississippi with a minimum of bachelor’s degree and certified to teach in their respective areas of specialization. This southeast rural school was located in the Central (pseudonym) County School district. The Central County School district consisted of six rural public schools. There were a total of 110 teachers selected from this district with 30 in the elementary, 35 in the middle, and 45 in the high school.

### **Instrumentation**

A survey was determined by the researcher to be the most effective way to collect data for this study. The instrument used in this study was called a Computer Attitude Scale (CAS). The instrument was developed by Loyd and Gressard in 1984 to measure attitudes and anxiety toward the use of computers.

For this study, a slight modification to the CAS was administered to include “new and emerging software technologies for teaching or instructional purposes” in reference

to computer usage. For example, “Computers make me feel uncomfortable” was a statement on the CAS before the revision. After the revision, the statement on the CAS was “Computers make me feel uncomfortable when using new software technologies for teaching. Another example before the revision to the CAS, is the statement “I do not feel threatened when others talk about computers.” After the revision, the statement reads “I do not feel threatened when others talk about using computers with new and emerging software technologies for instructional purposes. The researcher felt that these modifications to the CAS instrument were necessary because it would give teachers a chance to address how they feel when introduced to new and emerging technology.

### **Validity**

According to Loyd and Gressard (1984) and Loyd and Loyd (1985), the CAS is a convenient, reliable, and valid measurement of computer attitudes and anxiety. In addition, CAS has been used by many researchers in the past for its use of content and constructs validity (Dyck & Smither, 1994; Shegog, 1997; Yushau, 2006).

The researcher used a panel of experts to determine the validity of the modified instrument. The panel of experts consisted of 5 experts; two professors from Mississippi State University, one professor from Mississippi Valley State, and two colleagues from Mississippi State University. The panel of experts was given the questionnaire to test for bias and rigorous statements. Feedback from the panel of experts was used to modify the questionnaire. The researcher made changes to the questionnaire and resubmitted to the panel of experts. The panel of experts reviewed the changes and sent the questionnaire back to the researcher with approval.

## **Reliability**

The researcher used the four-subscale instrument developed by Loyd and Loyd (1985) to conduct the study. The four main types of subscales used in this instrument were: (a) Computer Anxiety Subscale - fear or anxiety toward the use of computers (b) Computer Liking Subscale - enjoyment of working with computers or liking of computers (c) Computer Confidence Subscale - confidence using computers or learning about computers and (d) Computer Usefulness Subscale – perceived usefulness of computers in present or future work. Respondents were given the ordered response range: 4 = strongly agree, 3 = slightly agree, 2 = slightly disagree, 1 = strongly disagree to answer the positive and negative statements under the four subscales. Possible scores on each subscale could range from 10 to 40. The items responses were coded in a way that a higher score signify a high degree of liking and a low degree of anxiety. The coefficient of reliability was .95, .89, .90, .89, and .82 for the Total, Computer Anxiety, Computer Liking, Computer Confidence, and Computer Usefulness, respectively.

As a result of the minor modifications, the researcher conducted a pilot study to strengthen the quality and reliability of the instrument. Test retest was used to determine the reliability of the instrument. The researcher administered the modified instrument to 15 teachers who were not participating in the study. After one week had elapsed, the researcher re-administered the same modified instrument to the same 15 teachers. After completion of the test retest, the researcher calculated the coefficient using Pearson ( $r = .70$ ) and found the questionnaire to be reliable.

The Likert scale was used to interpret the results. To convert the scores to Likert scale, the researcher divided each of the subscales, Anxiety, Confidence, Liking, and Usefulness by ten and dividing the total score by forty. Using the Likert scale, the range 3.51 – 4.00 represent High Anxiety, 2.51 – 3.50 represent Moderate Anxiety, 1.51 – 2.50 range represent Slight Anxiety, and 1.00 – 1.50 range represent No Anxiety. Since the original CAS was coded so that the higher the score, the more positive the attitude, the range for high anxiety represent little to no anxiety, whereas the range for low anxiety represent high anxiety. Even though the original CAS instrument was designed to interpret total scores, the results are the same using the Likert scale.

### **Procedures**

Permission to conduct the research was obtained from the Superintendent of Education at the rural public school system in Mississippi and the Institution Review Board at Mississippi State University. The survey was administered to the teachers from all three schools which participated in this study during a mandatory faculty meeting. Before completing the survey, the researcher made an introduction to the teachers. During the introduction, the researcher explained the purpose of the study and informed the teachers that their participation will be completely voluntary. Teachers were also informed that they could withdraw at any time. The researcher explained to the teachers that their responses would be anonymous because their names will not be mentioned or used in the survey. The researcher further explained to the teachers that the numerical responses were used only for statistical analyses and their responses were kept

confidential. Lastly, the researcher explained to the teachers that no risks would result from participating in this research.

Before the consent forms and surveys were distributed, the teachers were instructed that if they choose to participate in the study they were required to sign the consent form and then proceed to complete the survey. The entire population of 110 teachers employed in the three rural public schools located in the Central County district was included in the study. However, only 84 of the 110 teachers were present during the mandatory faculty meeting. All teachers who were present in the mandatory faculty meeting completed the survey and returned it to the researcher. No follow-ups were done because the researcher administered the questionnaire.

### **Data Analysis**

Quantitative data analysis method was used in this study. After all participating teachers had completed a questionnaire package; the researcher proceeded to collect the questionnaires. Once the surveys were collected, the data was incorporated into the Statistical package for the Social Sciences (SPSS) to organize, reduce, and code the data. The researcher began analyzing the raw data by computing the basic descriptive statistics for all items on the questionnaire such as mean scores, averages, percentages, and standard deviation. Descriptive research consists of describing the issue, event, or situation (Gall, Borg, & Gall, 1996). The researcher examined significant relationships by implementing descriptive statistics and Pearson's correlation.

Pearson's correlation is the most common measure of correlation between two continuous variables (Gall, Borg, & Gall, 1996). Pearson's correlation was used in this

study to examine if any significant relationships exist between the level of anxiety Mississippi teachers in a rural city district experience using new and emerging software technologies and age, gender, years of teaching, subject area taught, and educational attainment.

Research questions 1, 2, 3, 4, and 5 were analyzed by the use of descriptive statistics such as means and, standard deviation. Research question 6 was analyzed using Pearson Correlation Coefficient. The data was analyzed by using the Statistical package for the Social Sciences, SPSS and Microsoft Excel. After the analysis was analyzed, conclusions were drawn based on the findings.

### **Summary**

This chapter outlined the methods performed in conducting this research study. There was a discussion of the population, which included development of the Computer Attitude Scale (CAS). A description of the procedures that were used to collect and analyze the data was also discussed. Chapter IV will present the findings obtained from the statistical procedures used to conduct this study.

## CHAPTER IV

### RESULTS

This chapter contains the analysis of the data collected for this study. The primary focus of this study was to investigate anxiety toward new software technologies among teachers in a rural city school district in Mississippi. A survey instrument, the Computer Attitudes Scale (CAS) developed by Gressard & Loyd in 1985 was used. Demographic information was also gathered.

#### **Demographic Data of Participants**

The population of this study was derived of teachers who volunteered during the spring 2006 semester in a rural city school district in Mississippi. There were a total of 110 teachers with 84 participating. Demographic variables were used to determine if a relationship exists with confidence, likeness, usefulness, and anxiety. This helped in establishing possible characteristics that could be used to identify teachers who may suffer from computer anxiety. The demographics are as follows:

#### ***Age***

The age of participants in the study ranged from less than 25 to greater than 51. This information is displayed in Table 1. Of the 84 participants, 20 (23.8%) were male and 64 (76.2%) were female.

Table 1 Distribution of Participants by Age

Age Range	Frequency	Percent
< 25	3	3.6
26-30	10	11.9
31-35	12	14.3
36-40	11	13.1
41-45	12	14.3
46-50	12	14.3
> 51	24	28.6
Total	84	100

***Educational Attainment***

The data in Table 2 displayed the population of the participating teachers in the rural city school district in terms of education level. The demographic data of the population are as follows:

Table 2 Distribution of Participants by Educational Attainment

College Level	Frequency	Percent
1 <sup>st</sup> year	1	1.2
2 <sup>nd</sup> year	4	4.8
3 <sup>rd</sup> year	0	0
4 <sup>th</sup> year	1	1.2

Table 2 cont.

Bachelors	42	50
Masters	35	41.7
Doctorate	1	1.2
Total	84	100

***Major of Study***

The major of study for the participants ranged from elementary school to high school. Of the teachers participating in the study, 20 (23.8%) were elementary, 33 (39.3%) were middle, and 31 (36.9%) were high school. The teaching experience of participants in the study ranged from one year to more than 16 years.

***Teaching Field***

Displayed in Table 3 are the teaching fields taught by participants. The demographic data of the teaching field are as follows:

Table 3 Distribution of Participants by Teaching Field

Subject	Frequency	Percentage
English	7	8.3
Languages	0	0
Social Studies	6	7.1

Table 3 cont.

Science	6	7.1
Mathematics	6	7.1
Technical	3	3.6
Special Education	11	13.1
Self-Contained	19	22.6
Classroom		
Other	26	31
Total	84	100

Of the 84 participants, 27 (32.1%) were elementary teachers, 25 (29.8%) were middle school teachers, and 32 (38.1%) were high school teachers. The data illustrated that 73 (86.9%) participants had access to a computer at home and 11 (13.1%) did not.

### ***Computer Experience***

The computer experience of participants in study ranged from more than a year or less. This information is displayed in Table 4.

Table 4 Distribution of Participants by Computer Experience

Range	Frequency	Percent
1 month or less	2	2.4
2 months to 6 months	12	14.3
7 months to 11 months	2	2.4
12 months to 15 months	4	4.8
16 months to 21 months	2	2.4
22 months or more	62	73.8
Total	84	100

**Descriptive Profile of Participants Scores by  
Computer Attitude and Anxiety Scale**

The information displayed in Table 5 revealed descriptive statistics for the dependent variables: computer anxiety, computer confidence, computer liking, computer usefulness, and total. The data in this study indicated that the mean score for computer anxiety, computer confidence, computer liking, and computer usefulness were 34, 34, 31.5, and 35.5 respectively. Using the Likert scale, the mean score for computer anxiety would be 3.4, computer confidence would be 3.4, computer liking would be 3.1, and computer usefulness would be 3.5.

Table 5 Scoring of Participants by Computer Attitude and Anxiety Scale

	<b>Anxiety</b>	<b>Confidence</b>	<b>Liking</b>	<b>Usefulness</b>	<b>Total</b>
Mean	33	33	32	35	133
Minimum	21	20	13	23	90
Maximum	40	40	40	40	160
Median	34	34	31.5	35.5	132
Standard deviation	5.82	5.61	6.04	4.58	18.40

Table 6 Anxiety

Item No	N	Min	Max	Mean	Std. Dev.
1. Computers do not scare me at all when introduced to new to new software technology for teaching.	84	1.00	4.00	3.27	.883
2. Working with a computer using new and emerging software technologies for teaching will make me very nervous.	84	1.00	4.00	3.15	.976
3. I do not feel threatened when others talk about using computers with new and emerging software technologies for instructional purposes.	84	1.00	4.00	3.18	1.008

Table 6 cont.

4. I feel aggressive and hostile toward using new software for teaching.	84	1.00	4.00	3.50	.857
5. It wouldn't bother me at all to take professional development training classes to learn how to use new software technology for teaching.	84	1.00	4.00	3.49	.925
6. Computers make me feel uncomfortable when using new software technologies for teaching.	84	1.00	4.00	3.33	.961
7. I would feel at ease in a professional development class learning how to use new and emerging software technologies for instructional purposes.	84	1.00	4.00	3.57	.749
8. I get a sinking feeling when I think of trying to use a computer with new and emerging software technologies for teaching.	84	1.00	4.00	3.29	.939
9. I would feel comfortable working with a computer that has new and emerging software technologies for teaching.	84	1.00	4.00	3.26	.946

Table 6 cont.

10. Computers make me feel uneasy and confused when using new and emerging software technologies for teaching.	84	1.00	4.00	3.33	.910
Overall Mean Score					3.34

Table 7 Confidence

Item No	N	Min	Max	Mean	Std. Dev.
1. I'm no good with using computers for new and emerging software technologies for teaching.	84	1.00	4.00	3.06	1.045
2. Generally, I would feel OK about using new and emerging software technologies for teaching.	84	1.00	4.00	3.18	1.008
3. I don't think I would do advanced work in teaching using new and emerging software technologies.	84	1.00	4.00	3.07	.979
4. I am sure I could do work on the computer using new and emerging software technologies for instructional purposes.	84	1.00	4.00	3.40	.838

Table 7 cont.

5. I'm not the type to do well with using new and emerging software technologies for teaching.	84	1.00	4.00	3.37	.847
6. I am sure I could learn new and emerging software technologies for instructional purposes.	84	1.00	4.00	3.56	.812
7. I think using a computer with new and emerging software technologies for teaching would be very hard.	84	1.00	4.00	3.36	.845
8. I am sure that I could be good at using new and emerging software technologies for instructional purposes.	84	1.00	4.00	3.45	.827
9. I do not think I could handle going to a professional professional development training class to learn how to use new and emerging technologies for instructional purposes.	84	1.00	4.00	3.33	.986
10. I have a lot of self-confidence when it comes to using the computer for new and emerging software technologies for teaching.	84	1.00	4.00	3.11	.905
Overall Mean Score				3.29	

Table 8 Liking

Item No	N	Min	Max	Mean	Std. Dev.
1. I would like working with computers using new and emerging software technologies for teaching.	84	1.00	4.00	3.33	.883
2. The challenge of solving problems with computers using new and emerging software technologies for teaching does not appeal to me.	84	1.00	4.00	3.23	.855
3. I think working with computers using new and emerging software technologies for instructional purposes would be enjoyable and stimulating.	84	1.00	4.00	3.48	.702
4. Figuring out computer problems with new and emerging software technologies for instructional purposes does not appeal to me.	84	1.00	4.00	3.05	.968
5. When there is a problem with a computer with new and emerging software technologies for instructional purposes that I can't immediately solve, I would stick with it until I have the answer.	84	1.00	4.00	2.99	1.024

Table 8 cont.

6. I don't understand how some people can spend so much time working with computers with new and emerging software technologies for teaching and enjoy it.	84	1.00	4.00	3.20	.902
7. Once I start to work with the computer with new and emerging software technologies for teaching, I would find it hard to stop.	84	1.00	4.00	3.01	.912
8. I will do as little work with using computers with new and emerging software technologies for teaching as possible.	84	1.00	4.00	3.36	.845
9. I do not enjoy talking with others about using computers with new computers with new and emerging software technologies for teaching.	84	1.00	4.00	3.11	.982
10. If a problem is left unsolved when using a computer with new and with new and emerging software technologies for teaching, I will continue to think about it afterward.	84	1.00	4.00	2.96	.999
Overall Mean Score				3.17	

Table 9 Usefulness

Item No	N	Min	Max	Mean	Std. Dev.
1. I will use computers with new and emerging software technologies software technologies for teaching in many ways in my life.	84	1.00	4.00	3.42	.748
2. Learning to use new and emerging software technologies for teaching is a waste of time.	84	1.00	4.00	3.74	.604
3. Learning about computers with new and emerging software technologies for instructional purposes is worthwhile.	84	1.00	4.00	3.67	.734
4. I'll need a firm mastery of using computers with new and emerging software technologies for my future work in teaching.	84	1.00	4.00	3.21	.945
5. I expect to have little use for computers with new and emerging software technologies for daily teaching.	84	1.00	4.00	3.26	.995
6. I can't think of any way that I will use computers with new and with new and emerging software technologies in my career.	84	1.00	4.00	3.62	.727

Table 9 cont.

7. Knowing how to work with computers using new and emerging software technologies will increase my job possibilities for teaching.	84	1.00	4.00	3.56	.766
8. Anything that a computer can be used for with new and emerging software technologies, I can do just as well some other way.	84	1.00	4.00	3.04	.999
9. It is important to me to do well in professional development development training classes.	84	1.00	4.00	3.70	.597
10. Working with computers with new and emerging software technologies will not be important to me in my life's work.	84	1.00	4.00	3.50	.829
Overall Mean Score					3.47

### Research Findings

The following questions were examined by analyzing the responses provided by teachers who volunteered during the spring 2006 semester in a rural city school district in Mississippi. The results are included in the next section.

### ***Findings Related to Descriptive Data***

Based on the descriptive data collected, the findings indicated that 23.8% of the teachers were male and 76.2% were female. A large proportion of the participants were older than 35 years of age. Forty-three percent of the teachers possessed an advanced degree such as a Master's or Doctoral. Furthermore, a large percentage of the participants had more than five years of teaching experience.

In summary, the participants in this study were mostly female teachers with a moderate amount of participants possessing either a Master's or Ph.D. degree. A large portion of these teachers had one year or more experience with learning about or working with computers. In addition, findings reported that 86.9% teachers indicated that they had access to a computer at home. The findings also revealed that the largest percentage of the participants were well educated and were experienced in using computers.

### **Research Question 1**

Do Mississippi teachers in three rural city schools experience anxiety in using new and emerging software technologies for instructional purpose as measured by the Computer Attitude and Anxiety Scale? This information is displayed in Table 10.

Table 10 Scoring of Participants by the Anxiety Subscale

Descriptive Statistics	Score
Minimum	21
Maximum	40

Table 10 cont.

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Mean	33
Standard deviation	5.82

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The results for this question were found to be a minimum of 21, a maximum of 40, and a mean of 33 with a standard deviation of 5.82 as shown in Table 10. Using the Likert scale, the minimum would be 2.1, the maximum of 4.0, and mean of 3.3.

### ***Findings Related to Research Question 1***

The purpose of this question was to examine the anxiety Mississippi teachers experienced when using new and emerging software technologies. Teachers' anxiety was measured using the Computer Anxiety Scale (CAS) developed by Loyd & Gressard (1986). The four main types of subscales used in this instrument were: (a) Computer Anxiety Subscale (b) Computer Liking Subscale (c) Computer Confidence Subscale and (d) Computer Usefulness Subscale. The total possible score for each subscale range from 10 to 40. According to Loyd, there was no national norm established for the four subscales used in the CAS; therefore, the subscales were broken down into four intervals to interpret the mean scores. Normally, the range 3.51 – 4.00 represent High Anxiety, 2.51 – 3.50 represent Moderate Anxiety, 1.51 – 2.50 range represent Slight Anxiety, and 1.00 – 1.50 range represent No Anxiety. However, the items responses on the instrument were coded in a way that a higher score signify a high degree of liking and a low degree of anxiety. Therefore, in order to interpret the scores the following scales were used by

the researcher: the range 3.51 – 4.00 represent No Anxiety, 2.51 – 3.50 represent Slight Anxiety, 1.51 – 2.50 range represent Moderate Anxiety, and 1.00 – 1.50 range represent High Anxiety.

The mean score for computer anxiety was 33 out of a total possible score of 40. The mean score for computer confidence was 33 out of a total possible score of 40. The mean score for computer liking was 32 out of a total possible score of 40. The mean score for computer usefulness was 35 out of a total possible score of 40. Using the Likert scale, the mean score for computer anxiety was 3.3, mean score for computer confidence was 3.3, mean score for computer liking was 3.2, and the mean score for computer usefulness was 3.5. Based on the results from the mean scores, the researcher draws a conclusion that the Mississippi teachers in the three rural city schools have a moderate degree of confidence, liking, and usefulness when using new and emerging software technology with a low degree of anxiety.

In summary, Mississippi teachers in the three rural city schools have a moderate degree of confidence, liking, and usefulness when using new and emerging software technology with a low degree of anxiety. When a teacher had a substantial amount of confidence, liking, and usefulness for new and emerging software technology, anxiety is reduced. Positive attitude of teachers exert less anxiety when using new and emerging software technology (Migliorino and Maiden, 2004). However, there is no way to totally get rid of anxiety when new and emerging software technology is introduced. This slight anxiety Mississippi teachers in the three rural city schools are experiencing may exist

simply because it is new and emerging software technology. It is common to have slight anxiety when something new is introduced.

### **Research Question 2**

What is the level of Mississippi teachers' anxiety in three rural city schools as they use computers as measured by the Computer Attitude and Anxiety Scale? The mean score for the level of anxiety Mississippi teachers experienced when using computers was 1.56.

#### ***Findings Related to Research Question 2***

The purpose of this question was to examine the level of anxiety Mississippi teachers experienced when using computers. Using the Likert scale, the range 3.51 – 4.00 represent High Anxiety, 2.51 – 3.50 represent Moderate Anxiety, 1.51 – 2.50 range represent Slight Anxiety, and 1.00 – 1.50 range represent No Anxiety.

The mean score for the level of anxiety Mississippi teachers experienced when using computers was 1.56. Based on the data collected, Mississippi teachers in three rural city schools rate their level of anxiety when using computers as having slight anxiety.

In summary, Mississippi teachers in the three rural city schools rate their level of anxiety when using computers as being slight. When teachers use computers frequently, positive attitudes are performed with less anxiety involved (Abbott and Faris, 2000). These results also agree with the findings from Jones (2001) and McGrail (2005).

### Research Question 3

Do Mississippi teachers in three rural city schools feel confident in using new and emerging software technologies for instruction as measured by the Computer Attitude and Anxiety Scale? This information is displayed in Table 11.

Table 11 Scoring of Participants by the Confident Subscale

Descriptive Statistics	Score
Minimum	20
Maximum	40
Mean	33
Standard deviation	5.61

The results for this question were found to be a minimum of 20, a maximum of 40, and a mean of 33 with a standard deviation of 5.61 as shown in Table 11. Using the Likert scale, the minimum would be 2.0, the maximum of 4.0, and mean of 3.3.

#### *Findings Related to Research Question 3*

The purpose of this research question was to determine if Mississippi teachers in three rural city schools feel confident in using new and emerging software technology. The results were based on a four-point Likert scale. Therefore, in order to interpret the scores the following scales were used by the researcher: the range 3.51 – 4.00 represent High Confidence, 2.51 – 3.50 represent Moderate Confidence, 1.51 – 2.50 range represent Slight Confidence, and 1.00 – 1.50 range represent No Confidence.

The results for this question were found to be a minimum of 20, a maximum of 40, and an average of 33 with a standard deviation of 5.61. Using the Likert scale, the minimum would be 2.0, the maximum of 4.0, and an average of 3.3. Based on the results from the mean scores, the researcher draws a conclusion that the Mississippi teachers in the three rural city schools have a moderate degree of confidence when using new and emerging software technology.

#### **Research Question 4**

Do Mississippi teachers in three rural city schools express likeness in using new and emerging software technologies for instruction as measured by the Computer Attitude and Anxiety Scale? This information is displayed in Table 12.

Table 12 Scoring of Participants by the Likeness Subscale

Descriptive Statistics	Score
Minimum	13
Maximum	40
Mean	32
Standard deviation	6.04

The results for this question were found to be a minimum of 13, a maximum of 40, and a mean of 32 with a standard deviation of 6.04 as shown in Table 12. Using the Likert scale, the minimum would be 1.3, the maximum of 4.0, and mean of 3.2.

#### ***Findings Related to Research Question 4***

The purpose of this research question was to determine if Mississippi teachers in three rural city schools express likeness in using new and emerging software technology. The results were based on a four-point Likert scale. Therefore, in order to interpret the scores the following scales were used by the researcher: the range 3.51 – 4.00 represent High Likeness, 2.51 – 3.50 represent Moderate Likeness, 1.51 – 2.50 range represent Slight Likeness, and 1.00 – 1.50 range represent No Likeness.

The results for this question were found to be a minimum of 13, a maximum of 40, and an average of 32 with a standard deviation of 6.04. Using the Likert scale, the minimum would be 1.3, the maximum of 4.0, and an average of 3.2. Based on the results from the mean scores, the researcher draws a conclusion that the Mississippi teachers in the three rural city schools have a moderate degree of liking when using new and emerging software technology.

#### **Research Question 5**

Do Mississippi teachers in three rural city schools perceive new and emerging software technologies as being useful for instruction as measured by the Computer Attitude and Anxiety Scale? This information is displayed in Table 13.

Table 13 Scoring of Participants by the Usefulness Subscale

Descriptive Statistics	Score
Minimum	23
Maximum	40

Table 13. cont.

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Mean	35
Standard deviation	4.58

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The results for this question were found to be a minimum of 23, a maximum of 40, and a mean of 35 with a standard deviation of 4.58 as shown in Table 13. Using the Likert scale, the minimum would be 2.3, the maximum of 4.0, mean of 3.5.

#### ***Findings Related to Research Question 5***

The purpose of this research question was to determine if Mississippi teachers in three rural city schools perceive new and emerging software technology as being useful for instruction.

The results were based on a four-point Likert scale. Therefore, in order to interpret the scores the following scales were used by the researcher: the range 3.51 – 4.00 represent High Usefulness, 2.51 – 3.50 represent Moderate Usefulness, 1.51 – 2.50 range represent Slight Usefulness, and 1.00 – 1.50 range represent No Usefulness.

The results for this question were found to be a minimum of 23, a maximum of 40, and an average of 35 with a standard deviation of 4.58. Using the Likert scale, the minimum would be 2.3, the maximum of 4.0, and an average of 3.5. Based on the results from the mean scores, the researcher draws a conclusion that the Mississippi teachers in the three rural city schools perceived new and emerging software technology as being moderate useful for instruction.

### Research Question 6

Do relationships exist in the level of anxiety experienced by Mississippi teachers in three rural city schools as they use new and emerging software technologies for instructional purposes and gender, age, years of teaching, subject area taught, and educational attainment as measured by the Computer Attitude and Anxiety Scale? Pearson Correlations were used to examine the relationships between the subscales and demographic variables. This information is displayed in Table 14.

Table 14 Statistically Significant Intercorrelations Between Subscales and Demographic Variables

Demographics	Subscale		
	Anxiety	Confidence	Liking
Age	-.267*		
Gender		.245*	.220*
Years of teaching	-.222*		
Educational Attainment			.272*

Note. \*  $p < .05$  (Subject area taught did not have any significant value.)

The purpose of this research question was to determine if any relationships exist in the level of anxiety experienced by Mississippi teachers in three rural city schools as they use new and emerging software technology for instructional purposes and gender, age, years of teaching, subject area taught, educational attainment. The Pearson's

correlation was used to investigate the relationship between the level of anxiety and gender, age, years of teaching, subject area taught, educational attainment. The results for this question using Pearson's correlation were found to be a weak negative correlation between age and anxiety with  $r = -.267$ , a weak positive correlation between gender and confidence with  $r = .245$ , a weak positive correlation between gender and liking with  $r = .220$ . There was also a weak negative correlation between years of teaching and anxiety with  $r = -.222$ .

The weak negative correlation between age and anxiety with  $r = -.267$  is reported as follows: as age increase the anxiety decrease. However, since the Computer Attitude and Anxiety Scale was designed for anxiety to be interpreted in the way of high score represent low anxiety, the proper interpretation is as follows: as age increase so does anxiety. In other words, older teachers experienced more anxiety than younger teachers. These results agree with findings from Ocak (2005) stating that teachers under the age of 38 had a higher confidence level in using the computer than teachers over 38. The teachers under the age of 38 had a lower level of anxiety.

The weak positive correlation between gender and confidence with  $r = .245$  is reported as males have more confidence in using computers than females. The weak positive correlation between gender and liking with  $r = .220$  is reported as males experience more liking to computers than females. These results agree with the findings from Jackson, Ervin, Gardner, and Schmitt (2001) stating that females experience more computer anxiety, have less confidence and liking than males. The weak negative correlation between years of teaching and anxiety with  $r = -.222$  is reported as years of

teaching increase anxiety decrease. However, since the Computer Attitude and Anxiety Scale was designed for anxiety to be interpreted in the way of high score represent low anxiety, the proper interpretation is as follows: as years of teaching increase so does anxiety. In other words, the more teaching experience teachers have the more anxiety. These results agree with the National Center for Education Statistics (2000) stating that teachers with nine or less years of teaching experience are most likely to use the computer more often than teachers with twenty years or more experience.

In summary, the results from Pearson's correlation explained that there was a significant relationship between age and anxiety, gender and confidence, gender and liking, years of teaching and anxiety. There was no significant relationship between gender and anxiety, years of subject area taught and anxiety, or educational attainment and anxiety. There was no significant relationship between age and confidence, years of teaching and confidence, subject area taught and confidence or educational attainment and confidence. There was no significant relationship between age and liking, years of teaching and liking, subject area taught and liking or educational attainment and liking. There was no significant relationship between age and usefulness, gender and usefulness, years of teaching and usefulness, subject area taught and usefulness or educational attainment and usefulness. Based on these results, the researcher draws a conclusion about the Mississippi teachers in the three rural city schools. The older, more experience teachers are not comfortable as the younger teachers when using new and emerging software technologies. However, the males exerted more confidence and liking than the females.

## Summary

The purpose of this chapter was to describe the results of the descriptive and statistical analysis performed on the data obtained from the participants of this study. Descriptive data was used to describe the participants in terms of age, gender, education level, major area of study, subject area taught, experience with computers, teaching experience, teaching level, and access to a computer at home. Also, descriptive statistics were used to describe the total scoring of the computer attitude and anxiety scale as well as the four subscales, which were anxiety, confidence, liking, and usefulness. Pearson's correlation was used to explore if any relationships exist in the level of anxiety experienced by Mississippi teachers in three rural city schools as they use new and emerging software technologies for instructional purposes and gender, age, years of teaching, subject area taught, and educational attainment as measured by the computer attitude and anxiety scale. The results were summarized for the research questions and analyzed by using statistical analyses. A more detailed summary, conclusion, and recommendation are presented in Chapter 5.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this chapter is to discuss the results, to draw conclusions from the data analysis, and to discuss possible recommendations for further research. Since the national mandate made by President Clinton in 1996 commanding that every student among the K-12 school system be technologically literate by the 21<sup>st</sup> century, millions of dollars have been invested into the school system nationwide to make this possible. However, in order to meet this demand, teachers must integrate new and emerging software technology into their curriculum. Consequently, research has shown that the percentage of teachers accomplishing the task were low (U. S. Congress, Office of Technology Assessment, 1995). Researchers have attributed this reluctance from teachers to computer anxiety (Gardner, Discenza, & Dukes, 1993). Experiencing anxiety is known to have a reflection on an individual's capability to carry out a task. If teachers are experiencing computer anxiety, they are going to be reluctant in incorporating technology into their curriculum. Because of teachers' reluctance, the millions of dollars invested by the government for technology integration will be wasted and this will jeopardize the chances of enhancement in student's learning. School administrators, educational leaders, and decision-makers should not continue ignoring the evidence that computer anxiety exist among teachers because it is only going to increase as computer technology continues to expand.

The purpose of this study was to investigate anxiety and the level of anxiety toward new software technologies among teachers in a rural city school district in Mississippi. This study also examined teachers' preparation received by their school prior to using new and emerging software technologies. Findings from the study will contribute to the growing baseline of information and literature that has been related to computer anxiety among teachers as well as serve as a guide to develop and improve teachers' technology skill levels in the classroom.

Previous research (Delcourt & Kinzie, 1993; Jones, 2001) indicated that computers can play a vital role in helping students meet higher standards and perform at increased levels by promoting alternative approaches to teaching and learning. While teachers are being reluctant to convert to new and emerging software technologies, new technologies are constantly being introduced into the market. The issue teachers are faced with regarding integration of technology into the classroom raises the question of whether mandated introduction of new and emerging technology into the school curriculum contributes to teachers' anxiety. Literature was reviewed concerning teachers' reluctance to use new and emerging software technologies for instructional purposes.

The population for this study consisted of Mississippi teachers in three rural city schools with a minimum of bachelor's degree and certified to teach in their respective areas of specialization. These participants taught in one southeast rural school system in the state of Mississippi. This southeast rural school was located in the Central County School district.

A survey instrument developed by Loyd & Gressard (1986), the Computer Attitude Scale (CAS), was used to measure anxiety experienced among Mississippi teachers in three rural city schools. This instrument consists of four subscales: Computer Anxiety, Computer Confidence, Computer Liking, and Computer Usefulness. Each subscale consists of ten items. Possible scores on each subscale could range from 10 to 40. The first part of the survey consisted of 11 questions to gather information regarding teachers' computer experience, access to computer at home, age, gender, teaching field, teaching experience, level of education, and teaching level.

Data were collected during the 2006 fall semester. The survey was administered to teachers employed at three rural city schools in the Central County School District. A total of 110 teachers were employed at the three rural city schools; but only 84 participated in the study.

Descriptive statistics were used to identify Mississippi teachers' anxiety and level of anxiety experienced using computers and new and emerging software technologies. Pearson correlation was used to see if any relationships exist in the level of anxiety Mississippi teachers' in a rural city school district experience and age, gender, year of teaching, and subject area taught. The study's findings were drawn from data that was analyzed as it related to the six research questions.

### **Conclusions**

Mississippi teachers in the three rural city schools experience little to no anxiety when using new and emerging software technologies. It can be concluded that the Mississippi teachers in the three rural city schools reported as having slight anxiety when

using new and emerging software technologies. This slight anxiety could be linked to the way Mississippi teachers in three rural city schools received prior preparation by their school to using new and emerging software technologies. This conclusion is supported by Christensen's (2002) research, which found that when teachers are exposed to computer training or properly prepared, a reduced amount of anxiety existed. Since, the use of computers has become an integral aspect of modern society, this slight anxiety could also be linked to the majority of the teachers having access to a computer at home. This conclusion is supported by Dusick and Yiildirim's (2000) research, which found that having access to computers promotes positive relationship between technology competence and computer use in the classroom. Another consideration for the slight anxiety the Mississippi teachers are experiencing may be due to the fact that the majority of the teachers are females, older, and have more experience. Research proved that older teachers with more experience have less confidence and possess more anxiety than younger teachers with less teaching experience (Dorman, 2001). Research also showed that females demonstrate less interest in computer use than males (Kadijevich, 2000). In conclusion, results displayed that slight anxiety exist among the Mississippi teachers in three rural city schools; however, the researcher draws the conclusion that there can be a number of reasons for this existence.

### **Research Question 1**

Do Mississippi teachers in three rural city schools experience anxiety in using new and emerging software technologies for instructional purpose as measured by the Computer Attitude and Anxiety Scale?

Based on the results from the mean scores, the researcher draws a conclusion that the Mississippi teachers in the three rural city schools have a moderate degree of confidence, liking, and usefulness when using new and emerging software technology with a low degree of anxiety. This conclusion is supported by the findings of Migliorino and Maiden's (2004) research which stated that positive attitude of teachers exert less anxiety when using new and emerging software technology.

### **Research Question 2**

What is the level of Mississippi teachers' anxiety in three rural city schools as they use computers as measured by the Computer Attitude and Anxiety Scale?

Based on the data collected, Mississippi teachers in three rural city schools rate their level of anxiety when using computers as having slight anxiety. This conclusion is supported by Abbott and Faris's (2000) research which stated when teachers use computers frequently, positive attitudes are performed with less anxiety involved. This conclusion also is supported by findings from Jones (2001) and McGrail (2005).

### **Research Question 3**

Do Mississippi teachers in three rural city schools feel confident in using new and emerging software technologies for instruction as measured by the Computer Attitude and Anxiety Scale?

Based on the results from the mean scores, the researcher draws a conclusion that the Mississippi teachers in the three rural city schools have a moderate degree of confidence when using new and emerging software technology.

#### **Research Question 4**

Do Mississippi teachers in three rural city schools express likeness in using new and emerging software technologies for instruction as measured by the Computer Attitude and Anxiety Scale?

Based on the results from the mean scores, the researcher draws a conclusion that the Mississippi teachers in the three rural city schools have a moderate degree of liking when using new and emerging software technology.

#### **Research Question 5**

Do Mississippi teachers in three rural city schools perceive new and emerging software technologies as being useful for instruction as measured by the Computer Attitude and Anxiety Scale?

Based on the results from the mean scores, the researcher draws a conclusion that the Mississippi teachers in the three rural city schools perceive new and emerging software technology as being moderate useful for instruction.

#### **Research Question 6**

Do relationships exist in the level of anxiety experienced by Mississippi teachers in three rural city schools as they use new and emerging software technologies for instructional purposes and gender, age, years of teaching, subject area taught, and educational attainment as measured by the Computer Attitude and Anxiety Scale?

Based on the results, the researcher draws a conclusion about the Mississippi teachers in the three rural city schools. The older, more experience teachers are not comfortable as the younger teachers when using new and emerging software

technologies. This conclusion is supported by findings from Adam (2002) and Dorman (2001) which stated that teachers with less teaching experience are more inclined to use new and emerging software technologies than teachers with more teaching experience. However, the males exert more confidence and liking than the females when using new and emerging software technologies. This conclusion is not supported by findings from Khine's (2001) research which stated males have less anxiety and more confidence toward the use of computers than females. However, females were reported to have more computer liking and computer usefulness than males.

### **Recommendations**

From the findings of this study, the following recommendations are suggested for practice and further research:

#### ***Practice***

1. School districts could search for different funding resources in order to provide teachers with constant access to new and emerging computer technology.
2. Administrators could provide faculty members with specific technological training and extensive workshops before mandating them to integrate the new and emerging computer technology into their school curriculum.
3. The college of education should keep abreast of computer technology integration and continue to adopt classes into their curriculum to help prepare preservice teachers with new and emerging computer technology.

### ***Future Research***

1. This study could be replicated by using a large sample, so that the results can be more generalized to the population.
2. This study could be replicated to address teachers' perception toward their school administrative support when using new and emerging software technology.
3. Research could be conducted to explore why Mississippi teachers in three rural city schools are experiencing little to no anxiety when using new and emerging software technology.
4. Research could be conducted to determine if funds for professional development should be reallocated to another area of concern since Mississippi teachers in three rural city schools are experiencing little to no anxiety when using new and emerging software technology.

### **Summary**

This chapter has provided a summary of the purpose, the procedures, findings, and recommendations for practice and further research. The results from this study revealed that Mississippi teachers in three rural city schools are experiencing slight anxiety when using new and emerging software technology for instructional purposes.

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APPENDIX A

IRB LETTER



October 23, 2006

Matilda Miller  
612 Macedonia Road  
Louisville, MS 39339

RE: IRB Study #06-261: An Investigation of Anxiety Toward New Software Technologies Among K-12 Teachers in Mississippi

Dear Ms. Miller:

The above referenced project was reviewed and approved via administrative review on 10/23/2006 in accordance with 45 CFR 46.101(b)(2). Continuing review is not necessary for this project. However, any modification to the project must be reviewed and approved by the IRB prior to implementation. Any failure to adhere to the approved protocol could result in suspension or termination of your project. The IRB reserves the right, at anytime during the project period, to observe you and the additional researchers on this project.

Please refer to your IRB number (#06-261) when contacting our office regarding this application.

Thank you for your cooperation and good luck to you in conducting this research project. If you have questions or concerns, please contact me at [cwilliams@research.msstate.edu](mailto:cwilliams@research.msstate.edu) or 325-5220.

Sincerely,

A handwritten signature in black ink that reads "Christine Williams".

Christine Williams  
IRB Administrator

cc: Mabel Okojie

**Office of Regulatory Compliance**

P. O. Box 6223 • 8A Morgan Street • Mailstop 9563 • Mississippi State, MS 39762 • (662) 325-3294 • FAX (662) 325-8776

APPENDIX B  
IRB PROCEDURAL MODIFICATION/ADDENDUM  
REQUEST FORM

**Procedural Modification/Addendum Request Form**

*Please note: This form may NOT be used for personnel changes or time extensions. Please complete a Personnel Modification form for personnel changes or a Continuing Review Request form for time extension requests.*

**IRB Docket # 06-261**

**Principal Researcher/Investigator:** Matilda Miller

**Research Title:** An Investigation of Anxiety Toward New Software Technologies Among K-12 Teachers in Mississippi

**1. Summarize / Itemize requested changes and justification for each.**

Research title is the change requested. The original title was **An Investigation of Anxiety Toward New Software Technologies Among K-12 Teachers in Mississippi.** The new title is **An Investigation of Anxiety Toward New Software Technologies Among Teachers in a Mississippi Rural City School District.** Reason for the title change is a recommendation from my dissertation advisory committee.

**2. Do changes require a REVISED CONSENT statement or procedure? If so, attach revised form and procedures. No**

**3. Do changes require revisions to the assessment of risk of harm to the subjects? If so, attach revisions. No**

**4. Do changes require revisions to the methods of ensuring anonymity or confidentiality? If so, explain. No**

**Signature of Researcher/Investigator:** *Matilda Miller* **Date:** *11-06-06*

**Signature of Advisor (if student):** *Melba Croonje* **Date:** *11-06-06*

\*\*\*\*\**(For office use)*\*\*\*\*\*

**Type of Approval:**  *Administrative*  
 *Expedited*  
 *Full Board*

**Date of meeting:**

**Authorized IRB Representative:** *Christine Will*

*11/7/06*

**Date:**

Version February 2005  
*CR 686* ✓

APPENDIX C  
LETTER TO NOXUBEE COUNTY SUPERINTENDENT

October 2, 2006

Dr. Kevin Jones, Superintendent of Education  
Noxubee County School District  
P O Box 540  
Macon, MS 39341

Dear Dr. Jones,

We are requesting permission to conduct a study that involves surveying K-12 teachers in the Noxubee County School District. The title of the study is, *An Investigation of Anxiety Toward New Software Technologies Among K-12 Teachers in Mississippi*.

A national mandate by President Clinton in 1996 ordered that every student in the K-12 school system be technologically literate by the 21<sup>st</sup> century. In order to meet this demand, teachers must integrate new and emerging software technology into their curriculum. If teachers are experiencing anxiety, they are going to be reluctant to incorporating technology into their curriculum. Results from this study can contribute to the growing baseline of information and knowledge of literature that relates to anxiety among teachers as well as serve as a guide to develop and improve teachers' technology skill levels in the classroom. Participation is important and critical to the success of the study.

We encourage participation in this study by completing a survey instrument consisting of 50 questions. The survey will take approximately 10 minutes to complete. We are asking you to please allow the teachers of the Noxubee County School District to complete the survey.

If you should have any additional questions about this investigation, please contact either of us by phone or by e-mail. For additional information regarding human participation in research, please feel free to contact Christine Williams at the Mississippi State University Office of Regulatory Compliance at 662-325-5220 or via email at [cwilliams@research.msstate.edu](mailto:cwilliams@research.msstate.edu).

Thank you for your time. We appreciate your cooperation.

Sincerely,

Matilda Miller  
Doctoral Candidate  
Department of Instructional Systems,  
Leadership & Workforce Development  
Email: [mjm98@msstate.edu](mailto:mjm98@msstate.edu)  
Home: (662) 736-0035

Dr. Mabel CPO Okojie  
Associate Professor  
Department of Instructional Systems,  
Leadership & Workforce Development  
Email: [mokojie@colled.msstate.edu](mailto:mokojie@colled.msstate.edu)  
Work: (662) 325-7598

APPENDIX D  
INFORMED CONSENT LETTER

## INFORMED CONSENT

Matilda Miller  
Dr. Mabel CPO Okojie

My name is Matilda Miller and I am conducting research as a partial fulfillment of my doctoral degree. The purpose of this research is to gather information on K-12 teachers experiencing anxiety toward new software technologies. In addition, this study is to examine the impact anxiety has on teachers using new and emerging software technologies. The factors that will be investigated as possible predictors of computer anxiety include age, gender, educational attainment, years of teaching, subject area taught, administrative support, and training.

Participation in this research study is strictly voluntary and you may refuse to participate or withdraw from the study at any time. If you agree to participate in the study, you can refuse to answer any questions you feel uncomfortable answering. Only the researchers above will have access to the information we collect in this study, and we will treat all of the information we collect as confidential. You will not be identified in the data reported from this study. Your participation is entirely voluntary, and you may discontinue your involvement at any time.

If you should have any questions about this study, please feel free to contact Matilda Miller, researcher, at 662-736-0035 or by email at [mjm98@msstate.edu](mailto:mjm98@msstate.edu). For more information about human participation in research, please feel free to contact Christine Williams at the Mississippi State University Office of Regulatory Compliance at 662-325-5220 or via email at [cwilliams@research.msstate.edu](mailto:cwilliams@research.msstate.edu).

Sincerely,

**Matilda Miller**  
Principal Investigator  
Mississippi State University

**Participant's Signature:** \_\_\_\_\_

APPENDIX E  
SURVEY

**SURVEY OF ATTITUDES AND ANXIETY  
TOWARD USING NEW AND EMERGING  
SOFTWARE TECHNOLOGIES**

**(Please note: By completing this survey, you are consenting to participation.)**

The purpose of this survey is to gather information concerning people's attitudes and anxiety using new and emerging software technologies for instructional purposes. It should take about ten minutes to complete this survey. All responses are kept confidential. Please return the survey to your instructor when you are finished.

Please check the blank which applies to you.

1. Age:     22 or less     23-25     26-30  
              31-35         36-40     41-45  
              46-50         51-55     55+
  
2. College level completed:  1st year     2nd year     3rd year     4th year  
    Bachelors     Masters     Doctorate
  
- Major area of study: \_\_\_\_\_
  
3. Sex:     Male             Female
  
4. Experience with learning about or working with computers:  
 1 month or less     2 months to 6 months     7 months to 11 months  
 12 months to 15 months     16 months to 21 months     22 months and more
  
5. Teaching experience:     1-5 years     6-10     11-15     16+
  
6. Subject area (s) presently teaching:  English     Languages     Social Studies  
    Science     Mathematics     Technical  
    Special Education     Self-contained classroom  
    Other \_\_\_\_\_
  
7. Teaching level:             Elementary             Middle             High
  
8. Please rate how you feel your school prepares you to use new and emerging technology:  
 Excellent             Very good             Fair             Not so good  
 Terrible             No training provided
  
9. Please rate your school administrative support:  
 Excellent             Very good             Fair             Not so good  
 Terrible             No support provided
  
10. Do you have access to a computer at home?  Yes             No
  
11. How do you rate your level of anxiety when using computers?  
 No anxiety             Slight anxiety     Moderate anxiety     High anxiety

COMPUTER ATTITUDE AND ANXIETY SCALE

*Below are a series of statements. There are no correct answers to these statements. They are designed to permit you to indicate the extent to which you agree or disagree with the ideas expressed. Place a circle under the label which is closest to your agreement or disagreement with the statements.*

	<b>Strongly Agree</b>	<b>Slightly Agree</b>	<b>Slightly Disagree</b>	<b>Strongly Disagree</b>
Anxiety	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
1. Computers do not scare me at all when introduced to new software technology for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
2. Working with a computer using new and emerging software technologies for teaching will make me very nervous.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
3. I do not feel threatened when others talk about using computers with new and emerging software technologies for instructional purposes.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
4. I feel aggressive and hostile toward using new software for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
5. It wouldn't bother me at all to take professional development training classes to learn how to use new software technology for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
6. Computers make me feel uncomfortable when using new software technologies for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
7. I would feel at ease in a professional development training class learning how to use new and emerging software technologies for instructional purposes.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
8. I get a sinking feeling when I think of trying to use a computer with new and emerging software technologies for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
9. I would feel comfortable working with a computer that has new and emerging software technologies for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>

10. Computers make me feel uneasy and confused when using new and emerging software technologies for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
Confidence	<b>Strongly Agree</b>	<b>Slightly Agree</b>	<b>Slightly Disagree</b>	<b>Strongly Disagree</b>
1. I'm no good with using computers for new and emerging software technologies for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
2. Generally, I would feel OK about using new and emerging software technologies for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
3. I don't think I would do advanced work in teaching using new and emerging software technologies.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
4. I am sure I could do work on the computer using new and emerging software technologies for instructional purposes.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
5. I'm not the type to do well with using new and emerging software technologies for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
6. I am sure I could learn new and emerging software technologies for instructional purposes.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
7. I think using a computer with new and emerging software technologies for teaching would be very hard.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
8. I am sure that I could be good at using new and emerging software technologies for instructional purposes.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
9. I do not think I could handle going to a professional development training class to learn how to use new and emerging technologies for instructional purposes.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>

10. I have a lot of self-confidence when it comes to using the computer for new and emerging software technologies for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
Liking	<b>Strongly Agree</b> <b>4</b>	<b>Slightly Agree</b> <b>3</b>	<b>Slightly Disagree</b> <b>2</b>	<b>Strongly Disagree</b> <b>1</b>
1. I would like working with computers using new and emerging software technologies for teaching.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
2. The challenge of solving problems with computers using new and emerging software technologies for teaching does not appeal to me.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
3. I think working with computers using new and emerging software technologies for instructional purposes would be enjoyable and stimulating.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
4. Figuring out computer problems with new and emerging software technologies for instructional purposes does not appeal to me.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
5. When there is a problem with a computer with new and emerging software technologies for instructional purposes that I can't immediately solve, I would stick with it until I have the answer.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
6. I don't understand how some people can spend so much time working with computers with new and emerging software technologies for teaching and enjoy it.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
7. Once I start to work with the computer with new and emerging software technologies for teaching, I would find it hard to stop.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>
8. I will do as little work with using computers with new and emerging software technologies for teaching as possible.	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>

9. I do not enjoy talking with others about using computers with new and emerging software technologies for teaching.	4	3	2	1
10. If a problem is left unsolved when using a computer with new and emerging software technologies for teaching, I will continue to think about it afterward.	4	3	2	1
Usefulness	<b>Strongly Agree</b> 4	<b>Slightly Agree</b> 3	<b>Slightly Disagree</b> 2	<b>Strongly Disagree</b> 1
1. I will use computers with new and emerging software technologies for teaching in many ways in my life.	4	3	2	1
2. Learning to use new and emerging software technologies for teaching is a waste of time.	4	3	2	1
3. Learning about computers with new and emerging software technologies for instructional purposes is worthwhile.	4	3	2	1
4. I'll need a firm mastery of using computers with new and emerging software technologies for my future work in teaching.	4	3	2	1
5. I expect to have little use for computers with new and emerging software technologies for daily teaching.	4	3	2	1
6. I can't think of any way that I will use computers with new and emerging software technologies in my career.	4	3	2	1
7. Knowing how to work with computers using new and emerging software technologies will increase my job possibilities for teaching.	4	3	2	1

8. Anything that a computer can be used for with new and emerging software technologies, I can do just as well some other way.	4	3	2	1
9. It is important to me to do well in professional development training classes.	4	3	2	1
10. Working with computers with new and emerging software technologies will not be important to me in my life's work.	4	3	2	1

APPENDIX F

LOYD/GRESSARD COMPUTER ATTITUDE SCALE

**Date:** Wed, 01 Nov 2006 05:56:46 -0500  
**From:** Doug Loyd <del6n@virginia.edu>  
**To:** mjm98@msstate.edu  
**Reply-to:** del6n@virginia.edu  
**Subject:** Re: Loyd/Gressard Computer Attitude Scale

Matilda,

Permission is granted. Best wishes.

-Doug

\_\_\_\_\_  
Doug Loyd, Ph.D. 434-924-0993  
Institutional Assessment & Studies  
University of Virginia

..... Original Message .....

On Wed, 01 Nov 2006 02:37:31 -0600 <mjm98@msstate.edu> wrote:

>Dr. Loyd,

>

>I am requesting permission to modify the survey from its original format. These

>slight modifications were done to target my population. I am emailing the >modified version to you.

>

>I would appreciate a response as soon as possible.

>

>Thank you,

>

>Matilda

>Quoting "Doug Loyd, IAAS" <del6n@virginia.edu>:

>

>> Matilda,

>>

>> Thank you for your inquiry about the Computer Attitude Scale.

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>> As you may know, Brenda Loyd, author of the CAS, was President of the >> National Council on Measurement in Education (NCME) at the time of her >> death in 1995. Dr. Loyd's co-author, Clarice Gressard, has asked me to >> handle all requests for permission to use their survey, and to provide >> the CAS survey and scoring protocol to researchers who wish to use their >> scale.

>>

>> Therefore, in response to your inquiry, I am attaching a copy of the >> Loyd/Gressard survey of attitudes towards computers, in an MSWord >> document (survey.doc). If you have any problem reading it please let me >> know. Unfortunately I have no further information about the use of the >> CAS beyond that provided in this message and the attached document.

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>> The survey is scored according to the following:

>>

>> For questions 1, 3, 4, 6, 9, 11, 12, 14, 16, 17, 19, 22, 25, 27, 28, >> 30, 33, 35, 36, 38 (Strongly Agree=4, Slightly Agree=3, Slightly >> Disagree=2, Strongly Disagree=1).

>>

>> For questions 2, 5, 7, 8, 10, 13, 15, 18, 20, 21, 23, 24, 26, 29, 31, >> 32, 34, 37, 39, 40 (Strongly Agree=1, Slightly Agree=2, Slightly >> Disagree=3, Strongly Disagree=4).

>>

>> The questions are coded so that the higher the score, the more positive

<https://webmail.msstate.edu/imp/message.php?Horde=86ceaab05bacaec909d62cc17e6e3...> 4/16/2009