AN EXAMINATION OF THE RELATIONSHIP BETWEEN TEACHER SELF-EFFICACY OF NON-PUBLIC SCHOOL TEACHERS AND IMPLEMENTING COMPUTERS FOR INSTRUCTION

by

Simpfronia Taylor

(Under the Direction of Myra N. Womble)

ABSTRACT

The purpose of this study was to examine the perceptions of non-public school teachers in the southern U.S. about teacher self-efficacy and implementing computers for instruction. Teacher self-efficacy was assessed using the Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran & Woolfolk-Hoy, 2001). The TSES is based on Bandura's (1977) theory of self-efficacy and cognitive social learning theory. Perceptions about implementing computers for instruction was assessed using the Teachers' Perceptions of Components Related to Implementing Computers for Instruction Survey (TPIC; Shiverdecker, 2002). Non-public school teachers in this sample reported high levels of teacher self-efficacy. There was a statistically significant relationship between teacher self-efficacy and teachers' perceptions about their ability to implement computers for instruction. Grade level taught had a significant effect on teacher self-efficacy of non-public school teachers. Findings in this study can assist educators and teacher training programs in enhancing teacher self-efficacy and addressing the specific needs of teachers to implement computers into the classroom.

INDEX WORDS: Teacher self-efficacy, Teacher efficacy, Non-public schools, Barriers to overcoming computer integration, Self-efficacy, School environment.

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DEDICATION

This study is dedicated to my family. To my late grandmother Semphronia Washington for raising me and providing me with a foundation rooted in God. I am so blessed to not only have your name, but to have your Spirit. To my mother, Peggie W. Thomas, for keeping me focused on completing my degree. To my late father, Edison Taylor, for doing the best he could to provide for my college education. To my Grandmother Mozell, my Uncle Taylor, my brothers, sisters, and my loving cousins, you have all been an inspiration to me in one way or another and I love you very much.

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CHAPTER 1

INTRODUCTION

In the beginning of the twentieth century, various types of technology began to greatly affect the U.S. workforce, giving rise to several new types of occupations (Gabor, Houlder, & Carpio, 2001). In a 2001 U.S. Department of Labor (Gabor, Houlder, & Carpio, 2001) report on employment trends for the U.S. workforce, the top five fastest growing occupations were computer-related positions. Almost a decade later, the U.S. Department of Labor (2010) projected that the increase in computer-related occupations is a trend that will continue across all job areas and subjects for information retrieval, processing, and reporting.

The increase of computer use in our society corresponds to an increase in the number of students who use computers (National Center of Educational Statistics [NCES]; 2009a). To meet the high demand for technology skills it is important to help students develop the relevant abilities and competencies in computer-related fields. The evidence has shown that a key to effective student education is how successfully teachers implement computers for instruction in the classroom so that students will find meaning and real-life application (Brush, Glazewski, & Hew, 2008; Ertmer, 2010). In recent years, schools and colleges have invested heavily in technology and infrastructure in order to prepare their students, and themselves, for this new influx of computers in the workplace (Means, 2010; National Education Association [NEA], 2008). The NCES reports that student use of computers at home increased from 59% in 1993 to 83.5% in 2003 (NCES, 2009a). The percentage of workers 18 years old and over using computers on the job in 1993 was 45.8%, but by 2003 the number increased to 56.3%. As a

result of the increased presence of computers in our society and the increased use by employers, implementing computers for instruction has become a direct and indirect goal of school improvement (Eisenberg & Johnson, 2002; King, 2003; Paraskeva, Bouta, & Papagianni, 2008; Secretary's Commission on Achieving Necessary Skills [SCANS], 1991). Today's educators face the challenge of implementing computers and related technologies into their instruction (King, 2003; Legacy, 2002). However, it appears that the U.S. education system has not adequately adopted ways of training students to meet the demands of the new economy (Kelly, 2004; Kuo, 2008; Means, 2010). Despite the billions of dollars spent to increase computer technology in classrooms, teachers have not been adequately prepared to use these technologies (Archambault et al., 2002; Brush et al., 2008; Ertmer, 2010; Means 2010). Teachers often acknowledge the underutilization of technology in the classroom, citing many reasons including lack of resources or support (NEA, 2008). Hixon and Buckenmeyer (2009) concluded that computers have not transformed the teaching practices of a majority of teachers, but indicated that when teachers have the right circumstances and adequate resources and support, they can successfully implement computers into the classroom.

Researchers usually measure how teachers use computer tools and resources related to computers in the instructional environment (Means, 2010; NEA, 2008; Mims, Polly, & Grant, 2009). For instance, a common measure of a school's technology level is the student-to-computer ratio (Hixon & Buckenmeyer, 2009). The NCES (Gray et al., 2010) measures technology access, including number of computers, attached computer devices and Internet but does not include non-computer technologies such as overhead projectors or VCR's.

Measuring teachers' skills teaching computers is also difficult. Kuo (2008) found that while teachers valued computers and technology and may even have a positive attitude toward

the use of the Internet, they were still unsure whether they possess the knowledge and skills to successfully implement computers and technology into their classrooms. Even at the college level, students seem to lack basic computer skills and knowledge (Wallace & Clariana, 2005). There is support in the literature for the theory that teachers who lack adequate resources or personal belief in their skills (e.g., professional development, resources, time, access, efficacy) will have a more difficult task successfully implementing computers into the curriculum (Albion, 2001; Anderson & Ronnkvist, 1999; Becker, 2000; Brush et al., 2008; Chen, 2008; Ertmer, 2010; NCES, 2001; Pajares, 1997, 2002; Shiverdecker, 2002; Tschannen-Moran, Woolfolk-Hoy, & Hoy, 1998).

Certain school-related environmental factors can either promote computer implementation in general instruction or act as a barrier to computer implementation into general instruction in education (Abdal-Haqq, 1995; Brinkerhoff; 2006; Chen, 2008; Ertmer, 2010). The inability of teachers to implement computers for instruction into the classroom is just one example of a barrier that can inhibit the successful use of computers in education (Ertmer, 2010; Mueller, Wood, Willoughby, Ross, & Specht, 2008). Shiverdecker (2002) compiled a list of the most common barriers to computer implementation that coincides with other research on the topic (Abdal-Haqq, 1995; Albion, 2002; Anderson & Ronnkvist, 1999; Becker, 2000; Brinkerhoff; 2006; Brush et al. 2008; Chen, 2008; Ertmer, 2010; Parsad, Skinner, & Farris, 2001; Pajares, 1997; 2002; Tschannen-Moran et al., 1998). The barriers Shiverdecker cited include time, technology support, training, parent/community support, administrative support, collegial support, access, attitude, and teacher efficacy.

Bandura (1977; 1986; 1997) reported that teacher self-efficacy beliefs are significantly related to choice of task, effort, persistence, and ultimately, level of success achieved Teachers

with a strong sense of efficacy have been found to be less critical of student mistakes (Ashton & Webb, 1986), to work harder with struggling students (Gibson & Dembo, 1984), and to spend more time teaching subject areas in which they have positive self-efficacy (Riggs & Enochs, 1990). Student outcomes for teachers who exhibit positive self-efficacy include higher achievement (Ashton & Webb, 1986), motivation (Midgley, Feldlaufer, & Eccles, 1989), and self-efficacy (Anderson, Greene, & Loewen, 1988).

Teacher self-efficacy, also called teacher efficacy belief, is a judgment a teacher has about his or her capabilities to bring about desired outcomes of student engagement and learning even among those students who may be difficult or unmotivated (Armor et al., 1976; Bandura, 1977. Vekiri (2010) found that perceived teacher expectations were strongly associated with both boys' and girls' computer efficacy. The findings of several studies (Albion, 1996; Downes, 1993; Handler, 1993; Summers, 1990; Vekiri, 2010) support the idea that teachers' beliefs about teaching with computers can influence their students' computer use. Ross et al. (2001) and Marcinkiewicz (1994) reported that teachers' use of computers for teaching was related to their belief in their ability to do so.

Purpose of the Study

The purpose of this study was to examine the perceptions of non-public school teachers in the southern U.S. about teacher self-efficacy and implementing computers for instruction. Although access is an important factor for successful computer use, the school environment, racial make-up, or other factors can affect a teachers' attitude toward computer implementation. Riggs and Enochs (1990) demonstrated that when teachers receive appropriate professional development their self-efficacy (for computers) is increased and they are more likely to implement computers for instruction. Certain school-related environmental factors can either

promote computer implementation into general instruction or act as a barrier to computer implementation into general instruction in education (Abdal-Haqq, 1995; Brinkerhoff; 2006; Chen, 2008; Ertmer, 2010). The barriers can be divided into categories; barriers related to technical and equipment issues and those barriers related to school type and environment (Keengwe, Onchwari & Wachira, 2008). School environmental factors include organizational culture, beliefs about teaching and technology, and openness to change (Keengwe et al., 2008).

Research Questions

To achieve the purpose of this study, the following research questions will be examined:

1. What is the perceived teacher self-efficacy of non-public school teachers in the southern U.S.?
2. What are the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction?
3. Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on age?
4. Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on age
5. Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on grade level taught?
6. Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on grade level taught?

7. Is there a statistically significant relationship between perceived teacher self-efficacy (TSES) of non-public school teachers in the southern U.S. and teachers' perceptions about implementing computers for instruction (TPIC)?

Theoretical Framework

Teacher self-efficacy theory is the theoretical framework that guided this study in combination with the literature on barriers to implementing computers for instruction. Teacher self-efficacy is the belief a teacher has in his or her capabilities to organize and execute a course of action necessary to accomplish a specific teaching task within a particular context (Tschannen-Moran et al., 1998). Ross et al. (2001) reported that teacher self-efficacy is related to student achievement and self-efficacy beliefs. The implication is that attempts to increase teacher self-efficacy might be viewed as a school improvement strategy. In the literature, the term ~~"t~~eacher self-efficacy" may be substituted with the terms ~~"t~~eacher efficacy," ~~"t~~eachers' beliefs," or ~~"t~~eachers' self-efficacy beliefs" (Henson, 2001; J. A. Ross, Hogaboam-Gray, & Hannay, 2001; Woolfolk-Hoy & Spero, 2005).

Research has indicated that one of the major issues to address in our educational system, that can promote effective student education, is how to successfully implement computers into the classroom (Brush, Glazewski, & Hew, 2008; Ertmer, 2010). Barriers to implementing computers for instruction that have been identified in the research literature include: access issues, teacher characteristics, and factors related to environment (Abdal-Haqq, 1995; Albion, 2002; Anderson & Ronnkvist, 1999; Becker, 2000; Brinkerhoff; 2006; Brush et al. 2008; Chen, 2008; Ertmer, 2010; Parsad, Skinner, & Farris, 2001; Pajares, 1997; 2002; Shiverdecker, 2002; Tschannen-Moran et al., 1998). In particular, the personal beliefs and dispositions of teachers are related to successful computer implementation (Vannatta & Fordham, 2004). By examining

teacher self-efficacy beliefs, the teaching environment, teacher backgrounds, and teacher experiences, we may be able to understand how to overcome barriers to computer implementation and facilitate successful computer use by students and teachers in the classroom (Becker, 2000).

A key to effective student education is how successfully teachers implement computers for instruction so that students will find meaning and real-life application (Brush, et al, 2008; Ertmer 2010). Teacher self-efficacy in teaching and learning situations has been identified as a significant factor for general teacher effectiveness (Hosung, Sharpe, Klockow, & Martin, 2002; J. A. Ross et al., 2001; Pajares, 1996; Schunk, 1995; Tschannen-Moran & Woolfolk-Hoy, 2001). Teacher self-efficacy is also significantly related to students learning behavior, and teacher instructional behavior (Gibbs, 2002). In teacher education, the development of highly efficacious teachers has been shown to ensure high levels of student achievement (Ashton & Webb, 1986). Likewise, highly efficacious teachers have efficacy beliefs in the students they teach (Anderson, Greene, & Lowen, 1988; Hosung et al., 2001). In addition, research has found that teachers with high teacher self-efficacy promote increased student motivation (Midgely, Feldlaufer, & Eccles, 1989). Teachers high in self-efficacy tend to experiment more with methods of teaching to better meet their students' needs (Guskey, 1988). Pajares and Schunk, (2001) reported that teacher self-efficacy is related to teachers' instructional practices and to student achievement. Teachers who have a greater belief in their ability to teach are more likely to try various ways of teaching and are more likely to be organized (Allinder, 1994). Self-efficacy belief is related to the choices teachers make in their persistence with struggling students (Gibson & Dembo, 1984). Ashton, Webb, and Doda (1982) found that teachers with a high sense of efficacy are more likely to see to the needs of students and to be supportive and

encouraging. Trentham, L., Silvern, S., & Brogdon, R (1985) found that higher teaching efficacy levels are related to stronger commitments to teaching. Teacher beliefs seem to be at least as important as technology-related teacher characteristics (e.g., computer experience) in determining why teachers implement computers into the classroom (Hermans et al., 2008).

Since highly efficacious teachers transform their ~~–a~~ction theories" into transformational classroom practices, teacher self-efficacy theory is a framework that researchers and practitioners have found useful in addressing educational issues (Tschannen-Moran & Woolfolk-Hoy, 2000). Teacher self-efficacy theory served to guide this study of teacher self-efficacy and implementing computers for instruction.

Significance of the Study

Results of this study will add to the research regarding non-public school teachers and their perceptions about implementing computers for instruction. Administrators and educators at non-public and public schools will gain insight into improving instruction and training for implementing computers for instruction. The results of this study will contribute to existing literature on teacher self-efficacy and will be useful to institutions of higher learning for the purposes of teacher preparation programs as well as school administrators for determining professional development needs of teachers.

Tschannen-Moran and Woolfolk-Hoy, 2002 determined several factors that are significantly related to teacher self-efficacy including: (a) resources and restraints; (b) background variables, such as gender and teaching experience; (c) class variables, such as class size and student achievement; (d) school variables, that is, principal leader style and teacher autonomy; and (e) social-cultural variables (i.e., mass media influence) and teachers' social status.

Barriers to implementing computers for instruction are probably related to resources and restraints that also affect perceptions of teacher self-efficacy (Chen, 2008; Brush et al., 2008). Hermans, Tondeura, Van Braaka and Valckea (2008) conducted a study of 525 primary school teachers and their use of computers to support the teaching or learning process and found that teacher beliefs seem to be at least as important as technology-related teacher characteristics (e.g., computer experience) in determining why teachers adopt computers in the classroom.

Data suggests a relationship between the effectiveness of instructional strategies used in non-public schools (school type or environment) and students having a higher probability of finishing high school, attending college and receiving a degree (Franciosi, 2001; Parsad, Skinner, and Farris, 2001). National data (Alt & Peter, 2002) indicated that the majority of teachers at non-public schools hold perceptions about staff cooperation and school management that are indicative of positive teacher self-efficacy beliefs. While the literature indicates that effective instruction occurs at non-public schools, an examination of how teachers use computers for instruction and factors contributing to effective computer implementation is limited.

An examination of the research seems to indicate that self-efficacy measures may help teachers to overcome factors considered barriers to implementing computers for instruction (Albion, 1999; Ertmer, 2010). The research seems to provide sufficient reason to undertake further investigations into how teacher self-efficacy relates to implementing computers for instruction. In addition, examining particular school environments such as non-public schools may provide information on how teachers form their self-efficacy beliefs.

CHAPTER 2

REVIEW OF LITERATURE

In order to transform instructional practices in technology, it may be beneficial to examine how to promote effective teaching according to teacher self-efficacy research (Hosung et al., 2002). A review of the research on teacher self-efficacy indicates that teachers who have high teacher self-efficacy levels are able to conduct effective teacher practices in the classroom (Tschannen-Moran et al., 1998). In early research by Rotter (1966), teacher self-efficacy was identified as an explanation of the high percentage of goals achieved by teachers and a contributor to improved student performance. Barfield and Burlingame (1974) also revealed that teachers with a high sense of efficacy spend less energy coping with the environment when compared to teachers with low teacher self-efficacy. Allinder (1994) indicated that teachers who had a greater belief in their ability to teach were also more likely to try various ways of teaching, were more likely to be organized, and had more positive beliefs and excitement about teaching when compared to teachers with low teacher self-efficacy. Ross (1994) examined 88 studies of teacher self-efficacy and found six relationships between teacher self-efficacy and teacher behavior. The higher a teacher's efficacy, the more likely he or she is to (a) discover and conduct new teaching techniques, (b) use developmental classroom practices, (c) consider and implement strategies for students with lower achievement, (d) enhance students' efficacy and encourage them as capable learners, (e) set high goals, and (f) exhibit persistence in the face of failure.

This chapter presents a review of literature related to the major components of self-efficacy and the variables of interest to this study. The chapter is divided into five sections: (a) Social Cognitive Theory, (b) Self-efficacy, (c) Teacher self-efficacy, (d) Overview of Non-public Schools (e) Teacher Self-efficacy and Implementing Computers for Instruction (f) Demographic Variables that Affect Teacher Self-efficacy and Implementing Computers for Instruction.

Social Cognitive Theory

Psychologists have espoused many theories regarding learning and motivation. At the turn of the twentieth century, when American psychology began to take its place among the other academic disciplines, there was much interest in the role that self-beliefs play in human conduct. More than a century ago, pioneers in the field of psychology such as William James supported the study of the ―self". However, behaviorists such as John Watson and later B. F. Skinner led an effort to redirect the field to the study of observable stimuli and responses, and the inner life of the individual was labeled as beyond the scope of scientific psychology. About the same time behaviorist theories were most influential, a ―humanistic revolt" in psychology, led by notables such as Abraham Harold Maslow, called for renewed interest in ―self" theories and discussions regarding internal processes (Pajares & Schunk, 2001). During the 1960s and 1970s there was a resurgence of interest in self-beliefs, most notably an effort by many educators and psychologists to promote an emphasis on the importance of a healthy and positive self-esteem. Bandura and Walters (1963) expanded social learning theory with the inclusion of principles of observational learning and vicarious reinforcement. Bandura (1977) continued to examine his own writings and in doing so identified an important addition to his theory: self-beliefs.

The American educational system began to consider theories that advocated the study of ―self-beliefs" which proposed that because a child's self-esteem has a positive relationship with

academic achievement, teacher practices and academic strategies should be aimed at enhancing students' self-esteem (Pajares & Schunk, 2001). Consequently, educators shifted their interest to fields of study related to cognitive processes, information processing, theories and principles of academics, and the study of motivation (Graham & Weiner, 1996). Educators shifted their interest toward cognitive processes and information-processing. The shift has been so successful that after a thorough analysis of the state of knowledge related to theories and principles of academics, Graham and Weiner (1996) observed that ~~"s~~elf" theories began to dominate the research in the field of student motivation. One aspect of this phase of psychology is the study of success, failure, and achievement (Graham & Weiner, 1996).

In a meta-analysis of academic self-efficacy studies, Multon, Brown, and Lent (1991) found that self-efficacy beliefs were found to be related to academic outcomes and accounted for approximately 14% of the variance in student academic performance and approximately 12% of the variance in students' academic performance. Effects were stronger for high school and college students (r = .35) when compared elementary students (r = .21). How the constructs were measured also influenced findings. The strongest effects were obtained when achievement indexes were assessed with basic skills measures (r = .52) or classroom-based indices such as grades (r = .36) when compared to measurement with standardized achievement tests (r = .13). This finding gives support to the idea that efficacy is context-specific in nature.

Self-Efficacy

Bandura (1986) advanced the notion that individuals possess beliefs that enable them to exercise a measure of control over their thoughts, feelings, and actions. What a person thinks, believes, and feels affects how that person behaves. Several researchers have examined the idea that self-efficacy beliefs are positively related to and influence academic achievement.

Bandura (1977) is credited with developing the concept of self-efficacy as a major component of learning theory (Benton-Borghi, 2006; Driscoll, 2000). Bandura (1997) defines self-efficacy as people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances. The foundation of self-efficacy is not concerned with the skills one has but with judgments one makes about those skills (Bandura, 1986). The skills needed to create learning environments that promote an increased level of student cognitive functioning rest with the self-efficacy of teachers (Bandura, 1993).

SOURCE OF SELF EFFICACY	**HOW EXHIBITED**
Physiological States (Emotional Arousal)	Attribution Relaxation, biofeedback symbolic desensitization symbolic exposure
Enactive Mastery Experiences	Participant Modeling Performance Desensitization Performance Exposure Self Instructed Performance
Vicarious Experiences	Live Modeling Symbolic Modeling
Verbal Persuasions	Suggestion Exhortation Self-Instruction Interpretive Treatments

Figure 1. Four Sources Of Efficacy.

Self efficacy is a perception, or judgment of what a person thinks they can do under certain circumstances. These perceptions (whether correctly or incorrectly attributed) are based on information from one of the four sources of efficacy depicted in Figure 1. Adapted from Bandura, A. (1997). Self-efficacy: The exercise of control. New York, NY: Freeman, p. 79.

Enactive Mastery experiences are the most important sources of efficacy information according to Bandura (1977). Experiencing success with a task raises mastery expectations; repeated failure lowers mastery expectations. For example, successfully flying an airplane would be a source of master experience for a new airline pilot. The more mastery experiences, one has, the higher the efficacy that the individual has for the specific task of flying an airplane. Likewise, education teachers who do not have mastery experiences teaching students with disabilities are likely to have low teacher self-efficacy to teach students with disabilities. Success (mastery) on one specific task can influence other areas; the influence is strongest in similar circumstances (Bandura, 1997).

Vicarious experiences through modeling also provides efficacy information. Seeing others perform challenging or risky activities without adverse consequences can generate in observers the feeling that they too will improve if they intensify and persist in their efforts and are willing to take risks (Bandura, 1997). As pre-service teachers observe their teacher educators using technology in effective ways, they are able to cognitively process their observations as efficacy information. Modeling experiences increase efficacy if the observer identifies with the model (Tschannen-Moran et al. 1998). Observing a person successfully performing a task produces greater behavioral change in the observer than witnessing modeling with no clear resolution (Bandura, 1997).

Verbal Persuasions include verbal methods to transmit efficacy information. This source of efficacy information is the least effective for the long term although it might be effective in the short term, and the potency of the persuasion depends on the credibility, trustworthiness, and expertise of the persuader (Bandura, 1997). Although social persuasion alone may have definite

limitations as a means of creating an enduring sense of personal efficacy, it can contribute to successes achieved through corrective performance (Bandura, 1977).

Physiological states, or *emotional arousal*, are also sources of efficacy information. For instance, the individual who has a low efficacy for flying may have a physiological state of anxiety and fear of flying which cannot be overcome. The cognitive processing of this efficacy information makes the same reaction to flying different for everyone because people interpret and assign different degrees of importance to the same set of experiences and physiological sensations (Bandura, 1997; Tschannen-Moran et al. 1998).

Bandura (1977) makes a case for a conceptual distinction between efficacy and outcome expectations. Self-efficacy is a judgment of one's capability, whereas outcome expectancy is a judgment of the likely consequence of the act (Bandura, 1986, 1993). Expectancy refers to the sense of learning or mastery level achieved in the end, while outcome refers to the hope for success in the end (Bandura, 1977, 1995). What individuals believe about their capabilities (expectancy) is very different from the outcomes they expect their actions will have. For example, a belief that one could jump a certain height is an efficacy judgment, while the outcome expectancy is that an audience watching the event may cheer or that one might win a trophy. According to Bandura (1985, 1997), these expected outcomes are related to self-efficacy beliefs because such beliefs help determine the expectations. Thus, individuals who possess strong confidence that they can accomplish a particular action anticipate successful outcomes, whereas persons with low confidence are more likely to anticipate failure. A person can believe that a particular action will produce certain outcomes, yet still not attempt to respond to the ~~–o~~utcome expectancy" because they question if they can execute the act (Bandura, 1986). This means that there are many things people may feel they can accomplish, yet they choose not to attempt a task

because they have no reason or incentive to perform the task. For instance, a person can have confidence that he or she can climb a tree, but not have a desire for the expected outcome of being a good tree climber.

Bandura's (1977) idea of self-efficacy stems from the person's perceived ability to carry out actions toward goals, and he distinguishes self-efficacy from locus of control. For example, a person's beliefs about whether or not actions will produce outcomes are a part of locus of control theory (i.e., "Will I be successful?"). Locus of control differs from a person's self efficacy belief, which is the belief in his or her ability to carry out actions (i.e., "Can I be successful?"). Nevertheless, given appropriate skills and adequate incentives, efficacy expectations are a major determinant of people's choice of activities (Bandura, 1977).

Bandura's (1986) theory utilized a model of causation that is reciprocal, or mutual, in nature (see Appendix E). Personal factors (i.e., behavior, cognition) and environmental influences have an effect on each other. Researchers have posited that this model of causation has been exhibited when the school environment, or educational pedagogy of the school, and is shown to have a statistically significant relationship to behavior or student attitudes (Sahin, & Erkal, 2010; den Brok, Cakiroglu, Taconis & Tekka, 2009; Lester & King, 2009; Proctor & Burnett, 1996). Bandura (1989) believed that this interaction happens over time, that the sources are not of equal strength, and that they do not occur simultaneously.

Dimensions of Self-Efficacy

In defining self-efficacy, it is also important to consider the relevant dimensions of self-efficacy judgments. According to Bandura (1984), self-efficacy judgments differ in three distinct, but interrelated, dimensions: magnitude, strength, and generalizability. The magnitude of self-efficacy refers to what one thinks about the level of difficulty of a task and one's ability to

succeed at it. Individuals with a high magnitude of self-efficacy will see themselves as able to accomplish difficult tasks, while those with a low self-efficacy magnitude will see themselves as only able to execute simple forms of the behavior or task. Self-efficacy strength refers to one's level of conviction about the judgment. Individuals with a low sense of self-efficacy will be frustrated more easily by obstacles to their performance and will respond by lowering their perceptions of their capability to overcome barriers. By contrast, individuals with a strong sense of efficacy will not be frustrated by difficult problems and will retain their sense of self-efficacy and are more likely to overcome whatever barrier was present because of their continued persistence. Generalizability of self-efficacy indicates the extent to which perceptions of self-efficacy are limited to particular situations. Some individuals may believe they are capable of performing some tasks, but only under a particular set of circumstances, while others might believe they can execute the particular task under any circumstances and also perform tasks or behaviors that are slightly different.

Self-Efficacy and Learning Outcomes

The premise that self-efficacy beliefs are positively related to, and influence, academic achievement has been supported by others (Benton-Borghi, 2006; Pajares, 1997). In particular, there is a positive relationship between teacher self-efficacy and student achievement (Allinder, 1995; Ross, 1995; Caprara, Barbaranelli, Steca, & Malone, 2006), student autonomy (Midgley, Feldlaufer, & Eccles, 1989), teacher classroom behavior (Saklofske, Michaylouk, & Randhawa, 1998), relative teacher motivation to teach (Ashton & Webb, 1986), and student and teacher task persistence (Schunk, 1991). Dembo (2001) examined teacher effectiveness and found that self-regulation is a basic component of teacher self-efficacy. Self-regulation of learning refers to the

processes that maintain the cognition, motivation, and behavior needed to achieve set goals (Zimmerman, 2000).

Hacieminoglu, Yilmaz-Tüzün, and Ertepinar (2009) sampled 416 Turkish seventh grade students about a science topic. A correlation analysis was conducted on data gathered from three different instruments completed by the students. Cronbach's alpha was reported for the instrument as follows: learning goals (α=.83), performance goals (α=.73), and self-efficacy scales (α=.75). The data revealed positive relationships among meaningful learning, performance orientation, and self-efficacy for the student population.

Usher and Pajares (1994) examined Bandura's (1997) theory related to the four sources of self-efficacy (physiological states, enactive mastery experiences, vicarious experiences, and verbal persuasions). They surveyed 263 sixth grade middle school students from a public school in the Southeastern U.S., utilizing three instruments. The first was a 24-item instrument called the Sources of Self-Efficacy scale, which is designed to measure evaluations of the four sources believed to inform self-efficacy. The second was a self-report scale called the Academic Self-Efficacy Scale, which measures judgments of one's capability to learn academic subjects and skills. The third self-report measure used was Self-Efficacy for Self-Regulated Learning, which assesses students' judgments of their capability to use various self-regulated learning strategies. Usher and Pajares reported that each of the four sources predicted self-efficacy and perceived mastery experience for the full sample.

Teacher Self-efficacy

The theoretical concept of teacher self-efficacy emerged from two strands of research: Rotter's (1966) social learning theory and Bandura's (1977) social cognitive theory. Rotter's research on internal versus external control of reinforcement offered a modern perspective on the

construct of teacher self-efficacy. Rotter and Mulry (1965) defined internal versus external control as the degree to which persons expect that an outcome of their behavior depends on their own personal characteristics as opposed to believing the outcome is under the control of others or a function of chance, luck, or fate, or simple unpredictability. Those who believe that their actions are not successful in obtaining a desired outcome (external control) will not persist in repeating those actions. By contrast, those who feel they have control over the outcome of a behavior (internal control) will exhibit greater persistence to try to change the outcomes of his/her life, display stronger independence, and resist influence (Rotter & Mulry, 1965). Rotter (1966) developed the 29-item Internal-External Control Scale (I-E Scale) to assess these individual differences.

Another stage of research on teacher self-efficacy was developed in 1975, when the Los Angeles School district hired the Research and Development Agency (RAND) to study the reading achievement of minority students in a federally funded program. RAND sponsored two studies based on Rotter's work which developed into a measure of teacher self-efficacy (Armor et al., 1976; Berman, McLaughlin, Bass, Pauly, & Zillman, 1977). Armor et al. observed that students who achieved high reading levels and high scores on various classroom measurements had teachers who exhibited certain characteristics. Wanting to determine what particular classroom and school factors contributed to student success, Armor et al. asked teachers to indicate their level of agreement on two items extracted from Rotter's Internal-External Control Scale (Rotter, 1966). The first question was, "When it comes right down to it, a teacher really can't do much (because) most of a student's motivation and performance depends on his or her home environment" (Armor et al., 1976, p. 84). The second question was whether the teacher thought that "If I really try hard, I can get through to even the most difficult and unmotivated

students" (Armor et al., 1976, p. 84). Responses to these questions were combined into a single measure of efficacy, and a teacher self-efficacy score was calculated by summing scores on these two items. The model chosen by the researchers included teacher attributes (self-efficacy), classroom setting (disruptions and parent visits), program content (materials and training), and implementation strategies (teacher adaptations of curriculum and teacher collaborations). The adjusted R^2 of .70 indicated that the variables were significant and contributed greatly to the variance. The self-efficacy measure was strongly related to an increase in reading, with a *t* score of 2.54 at the $p < .05$ level.

In the first RAND study (Armor et al., 1976), the effect that federal policies had on local schools was analyzed; specifically what kinds of strategies and conditions tend to promote change in the school and which do not. In the final phase of the study, Berman et al. (1977) examined what happened after federal funding stopped for two local projects under the federal programs division. The report presents an analysis of survey data collected in 20 states. The findings included that particular implementation strategies adopted in the research project had a significant effect on its outcome and continuation. The standardized regression coefficients for the selected dependent variables were as follows: teacher sense of efficacy was positively related to percent of project goals achieved (r =.14), improved student performance (r =.27) and continuation of both project methods (r =.14) and materials (r =.08) after funding ended (p = .05). Specifically, when teachers perceived that the training was useful (e.g., it instructed them about how to use the project methods and materials); the implementation of the project was enhanced and resulted in improved student performance. Furthermore, the working relationships (or collaborations) of teachers were significantly related to percent of project goals achieved (r =.22) and continuation of project methods (r =.13) and materials (r =.15) after funding ended.

The second strand of research that made a major contribution to the concept of teacher self-efficacy stems from Bandura's (1977) work on social cognitive theory. Teacher self-efficacy is a construct derived from the theory of self-efficacy in which the prediction of behavior of an individual is based on two factors: a belief about action and outcome (outcome expectancy) and a personal belief about one's own ability to cope with a task (self-efficacy). For example, an individual rating high on both factors would behave in a confident manner. In the case of teachers, personal efficacy referred to a teacher's beliefs in his or her abilities and how such beliefs can affect the general attitude and direction he or she takes toward the educational process as well as specific instructional activities (Bandura, 1997).

Teacher self-efficacy beliefs are significantly related to teacher achievement, teacher change, student achievement, and the methods and materials teachers choose to complete a task successfully (Akbari & Allvar, 2010; Bandura, 1977; Coladarci, 1992; Dembo & Gibson, 1984; Guskey & Passaro, 1981; Midgley et al., 1989; Pajares, 1992; Ross, Ertmer, & Johnson, 2001; Soodak & Podell, 1993; Teo, 2009; Tschannen-Moran & Woolfolk-Hoy, 2001). Teacher self-efficacy beliefs influence how much effort teachers put forth, how long they will persist in the face of obstacles, their resilience in dealing with failures, and how much stress or depression they experience in coping with demanding situations (Bandura, 1977).

Coladarci (1992) conducted a survey of 170 teachers to establish the degree to which teacher's sense of efficacy predicted the commitment to their teaching career. Coladarci found that personal and general teaching efficacy were both positively and significantly correlated to teaching commitment. Trentham et al. (1985) surveyed 155 teachers and concluded that teacher self-efficacy was positively and significantly correlated to a teacher's willingness to enter the teaching profession if given the opportunity to start over again. Glickman and Tamashiro (1982)

found a negative and significant correlation between teacher self-efficacy and teachers who left the profession and who had lower teaching efficacy than current teachers did in either their first or fifth year of service. Based on these findings, it appears that teachers with high teaching efficacy are more committed to the teaching profession than those with low teaching efficacy.

Research indicates that teacher beliefs are far more influential than knowledge in determining how they will organize and define tasks and problems and are stronger predictors of behavior (Pajares, 1992). The implication of this is that changing environmental factors to increase teacher self-efficacy might be viewed as a school improvement strategy (Ross et al., 2001).

Teacher Self-efficacy Measurement

Several instruments have been developed that have influenced how teacher self-efficacy is measured. Table 1 gives an overview of historically important efficacy measurement scales.

Table 1

Overview Of Teacher Self-efficacy Measurements

Instrument	Researcher	No. of Items	Scale
RAND Efficacy Questionnaire	Armor et al., 1976	2	Agree or Disagree
Internal-External Scale	Rotter, 1966	29	Forced Choice
Webb Efficacy Measure	Ashton et al., 1982	7	Forced Choice
Ashton Vignettes	Ashton et al., 1982	50	Problem Situations

Teacher Efficacy Scale (TES)	Gibson and Dembo, 1984	30	6-point Likert-type- scale
Responsibility for Student Achievement (RSA)	Guskey and Passaro, 1981	30	10 points and 2 alternatives
Science of Teaching Efficacy	Riggs and Enochs, 1990	25	5-point Likert-type- scale
Teachers' Sense of Efficacy Scale long form (TSES)	Tschannen-Moran and Woolfolk-Hoy, 2001	24	9-point Likert-type scale
Teachers' Sense of Efficacy Scale – short form (TSES)	Tschannen-Moran and Woolfolk-Hoy, 2001	12	9-point Likert-type scale

Rotter (1966) developed a 29-item questionnaire to assess individual differences called the Internal-External Control Scale. Rotter describes the test as constructed to be a measure of one's general expectancy, but insists that questions do not directly address an internal or external preference. Factor analysis and item analysis indicated moderately high consistency for this type of scale. Internal consistency scores ranged from α=.69 to α=.76 (N = 50 to 1000) over a period of 10 studies. Test-retest reliability ranged from .49 to .83 (N = 30 to 117) over a period of seven studies. Rotter determined that persons with high internal consistency will (a) be more alert to the environment, (b) take steps to improve their environment, (c) be concerned with their ability (efficacy level), and (d) resist attempts by others to influence them in their Self-Beliefs. Other researchers modified (or at least attempted to modify) the RAND theory. Guskey (1981) developed the Responsibility for Student Achievement scale (RSA), a teacher self-efficacy measure based on the RAND studies which attempted to measure teachers' beliefs about classroom successes and failures.

Ashton et al. (1982) were among the first researchers to apply Bandura's (1977) social cognitive theory as a framework to explore the concept of self-efficacy in teachers or teacher self-efficacy. They believed a connection existed between the original two self-efficacy questionnaire items used in the RAND research and Bandura's self-efficacy and outcome

expectancy dimensions. The first phase of their study involved three years of observations and interviews with teachers and students at two different middle schools serving 6th, 7th, and 8th grades. The teachers completed a questionnaire designed to measure their sense of efficacy and characteristics associated with the efficacy variable. Students were also observed and scored using a student engagement rating form designed by the private, non-profit research and development firm Research for Better Schools. Ashton et al. found that teacher's sense of efficacy was significantly related to student achievement as measured by the Metropolitan Achievement Test scores ($r = .78$, $p < .003$ for math classes and $r = .83$, $p < .02$ for communication classes). Ashton et al. determined that teachers with a high sense of efficacy were more likely to see to the needs of students and to be supportive and encouraging.

The second phase of Ashton et al.'s (1982) teacher self-efficacy study was based on the results of a study of 48 high school basic skills teachers. A comparison of the teachers' scores on the two RAND efficacy questions was conducted. Ashton et al. believed that the two items were separate measures that captured multiple aspects of Bandura's social cognitive theory and should be treated as such. They hypothesized that teachers' sense of efficacy might have been better detected by a more reliable, or longer, instrument (compared to the two RAND items) and as a result created the Webb Efficacy Measure. However, analysis results with the Webb Efficacy Measure were inconclusive and the attempt to develop an internally consistent measure for teaching efficacy was deemed unsuccessful. Ashton et al. then developed a second instrument called the Ashton Vignettes to test the assumption that teacher self-efficacy is context specific. The Ashton Vignettes used a 50-item measure describing various teaching situations that were proposed to elicit more teacher variability. However, it too was unsuccessful at

capturing elements of efficacy and was not widely accepted (Ashton et al., 1982; Nicholson, 2003; Tschannen-Moran et al., 1998).

Gibson and Dembo (1984) agreed with Ashton et al. (1982) that teacher self-efficacy contained two factors and developed the Teaching Efficacy Scale (TES) to measure them. The first factor, personal teaching efficacy (PTE, $\alpha = .75$), was related to the RAND questionnaire's self-efficacy item number 2 and was proposed to measure a teacher's self-efficacy. The second factor, general teaching efficacy (GTE, $\alpha = .79$), corresponded to the RAND questionnaire's self-efficacy item number 1 and was proposed to measure a teacher's belief about outcome expectancy. Conducting further testing with a group of eight teachers, Gibson and Dembo originally designed a 30-item scale, but factor analysis reduced the number of items to 16. Almost 30% of the variance in the model was predicted by the variables PTE (18.2%) and GTE (10.6%). Gibson and Dembo predicted that teachers who believe that student learning can be influenced by effective teaching and who have confidence in their own teaching abilities should persist longer and provide greater academic focus in the classroom, as well as exhibit different types of feedback.

Gibson and Dembo's (1984) study revealed differences in behavior for high and low efficacy teachers that resulted in variations in student achievement. They determined that high efficacy teachers provided less criticism to students, persisted longer even with difficult students, gave more feedback that is informative, and spent less time in small group activities when compared to low efficacy teachers.

Upon further study, researchers have indicated that Gibson and Dembo's (1984) Teacher Efficacy Scale includes some miscalculations (Coladarci & Fink 1995; Guskey & Passaro, 1994; Henson, Kogan, & Vacha-Hasse, 2001; Tschannen-Moran et al., 1998). Guskey and Passaro

commented that the wording for the Gibson and Dembo instrument seemed to affect their scale results, observing that items measuring personal efficacy were written using positive wording, while items measuring teaching efficacy were written using negative wording. When they administered an adapted scale to 342 teachers and analyzed the results, Gibson and Dembo's theory of separate constructs did not hold up.

Tschannen-Moran and Woolfolk-Hoy (2001) also criticized the general teaching efficacy (GTE) variable in the Gibson and Dembo measure. They believed the proposed variable implied beliefs about the ability of teachers in general, not beliefs about outcome expectancy, and tested a modified Teacher Efficacy Scale TES in an attempt to clarify the meaning of the GTE dimension. Based on the testing and clarification of various instruments, Tschannen-Moran and Woolfolk-Hoy (2001) developed the Teacher Sense of Efficacy Scale (TSES), originally referred to as the Ohio State Teacher Efficacy Scale (OSTES).

Tschannen-Moran and Woolfolk-Hoy (2001) conducted three separate studies on the TSES using principal-axis factoring with varimax rotation. Three factors emerged to describe teacher self-efficacy (a) efficacy for instructional strategies, (b) efficacy for classroom management, and (c) efficacy for student engagement. The TSES has two versions; a 24-item long form and a 12-item short form. The instrument is assessed along a 9-point continuum measuring influences with 1 -2 = Nothing, 3-4 = Very Little, 5-6 = Some Influence, 7-8 = Quite a Bit, and 9 = A Great Deal. The TSES is assessed as a valuable instrument with many merits (Nicholson, 2003) and was one of two survey instruments used in this study.

Teacher Self-efficacy and Student Achievement

Positive relationships have been shown between teacher self-efficacy and student achievement. Bandura's (1986) social cognitive theory suggests that personal factors combined

with behavior and environment interact to influence each other through the notion of reciprocal determinism (Appendix E). Several researchers have used the theory of reciprocal determination as the basis for their studies on classroom contextual variables and teacher self-efficacy. Using the RAND items to measure the relationship between teacher self-efficacy and the increase in reading scores, Armor et al., (1976) concluded that the teachers with the highest sense of efficacy produced the students with the greatest gains in reading over a period of one year. Ashton and Webb (1986) also noted a positive and significant relationship between teacher self-efficacy and student achievement in communication and math. Anderson, Greene, and Loewen (1988) found that for third grade students, a teachers' personal efficacy at the beginning of the year was a significant factor in student achievement. Midgley et al. (1989) concluded that teachers' sense of efficacy was related to their students' sense of efficacy. Higher student efficacy is also related to student achievement (Hacieminoglu et al., 2009).

Teacher Self-efficacy and School Environment

In his social cognitive theory, Bandura (1986, 1997) proposes that behavior, personal factors, and the environment interact to influence each other (see Appendix E). Applying this concept to teaching, there is a reciprocal relationship between school environment and teacher self-efficacy beliefs. Several studies have shown that teachers are more likely to be efficacious in districts and schools that promote and support teacher leadership (Lee et al., 1991). Dorman and Fraser (2009) surveyed 4146 students from high schools in Australia using the Technology Rich Outcomes Focused Learning Environment Inventory, which contains 80 items assessing 10 classroom dimensions. The scales measured the extent to which the teacher provides opportunities for students to choose the topics to work on, the extent to which students used computers in various ways, and the extent to which teachers give students responsibility for their

own learning. Reliability coefficients were computed for each scale and resulted in satisfactory internal consistency (indices ranged from α.=82 to α=.95.). Dorman and Fraser reported that teacher support had positive effects on student attitude to subject and student attitude to computer use and contend that the study adds to the evidence to support positive links between teacher characteristics, classroom environment, and student outcomes. The RAND researchers (Armor et al., 1976) included teacher collaboration, a school environment variable, as a part of their research model and found it to contribute to teacher self-efficacy. The research on school climate may provide insight as to why non-public school teachers are contributing to increased motivation and achievement of their students.

A *non-public school* is a type of school environment. Non-public schools do not receive their primary funding from public funds (NCES, 2004). The National Center for Educational Statistics Special Analysis (2002) reported on the environment in non-public schools. The study revealed that non-public school teachers report supportive relationships among leadership and colleagues. In four major areas of school policy linked closely with teaching (establishing curriculum, setting student performance standards, setting discipline policy, and evaluating teachers), private school teachers ranked themselves as having more influence and authority than public school teachers did. For example, 68% of private school teachers reported they had a lot of influence on establishing curriculum, compared with 44% of public school teachers. In addition, non-public school teachers were more likely than public school teachers to say that they had a lot of influence on setting student performance standards (63% vs. 38%) and on student discipline policy (48% vs. 30%).

Non-public school teachers also report positive perceptions regarding teacher effectiveness, and selected student outcomes seem to be positive in non-public schools. NCES

publications (2009b; Dinkes, Kemp, & Baum, 2009) reveal national data which indicate positive results occurring in non-public schools. Fourth and eighth graders in non-public schools have high reading and math scores and complete a rigorous curriculum in core academic subjects in order to graduate.

The high levels of expectancy and achievement reported in non-public schools would seem to indicate that teaching strategies in the non-public setting are infused with the principles of self-efficacy, but is this really the case? While there has been a large body of work concerning efficacy, very little research has been conducted in the non-public setting, which is steadily growing. The latest national data from NCES reports there are 28,220 private schools in the U.S., serving more than 5 million children (Keigher, 2009). The increase in the number of non-public schools will undoubtedly continue and have an effect on the way public schools address curriculum concerns.

Overview of Non-public Schools

Historically, an overwhelming majority of private school students attended Catholic schools. In 1969, Catholic schools accounted for 85% of private school students nationwide; today, however, they enroll about 43% (Keigher, 2009). Thirty-eight percent of non-public school students attend what NCES labels as ~~–o~~ther religious" schools and about 19% attend nonsectarian schools (Keigher, 2009).

School Setting

Historically, a majority of the non-public schools were Catholic schools or religious in nature. In 1969, Catholic schools accounted for 85% of private school students nationwide (Keigher, 2009). Today, however, they enroll about 43% of students. Keigher (2009) reports that one third of non-public schools (35%) are located in urban communities. The same national

data reveals non-public schools are predominantly located in suburban areas (45%). About one-fifth (20%) of private schools that are located in rural areas.

School Size/Class Size

School and class sizes are generally small in private schools. According to the NCES (2002), small/intermediate sized schools and relatively small classes can have advantages, including possibly leading to higher achievement. The latest data indicate that 48% of non-public schools enrolled 100 or fewer students at each school (Keigher, 2009). Approximately 20% of non-public schools enrolled 100-199 students at each school. Approximately 3% of non-public schools enrolled 750 or more students. The data did not show an inverse relationship between school sizes to graduation levels as may be expected (Keigher, 2009); rather, when the student ratio per school rose, non-public school reported lower graduation rates for 12th grade students (Keigher, 2009). Private schools' average class size was about 19 students in elementary classes and 20 students in secondary classrooms (Coopersmith, 2009).

Some research shows that placing students in small groups tends to foster close working relationships between teachers and students, thus enhancing learning, particularly among at-risk students and those in the early grades (Klonsky, 1995; Lubienski, Lubienski & Crane, 2008; Raywid, 1995). In particular, Lubienski et al. examined the academic achievements in non-public schools. They conducted a multilevel analysis of National Assessment of Educational Progress (NAEP) mathematics data on more than 270,000 fourth and eighth graders in over 10,000 schools and determined that smaller classroom size is significant at the 4th grade level.

Non-Public Schools and School Environment

Lubienski et al. (2008) reported that small school size, high teacher morale, high parent involvement, lower instances of conflict are exhibited in non-public school environments. NCES

reports that the average age of non-public school teachers was 44, and their average base salary was $36,300. Teachers in non-public schools believe that they have a sufficient influence on school policies and teaching practices in at schools. When it comes to practices such as selecting teaching techniques, evaluating students, selecting textbooks and materials, choosing content and disciplining students, private school teachers see themselves as having a lot of control (NCES, 2002). In short, the data suggest that private schools trust the professional judgment of teachers and value their counsel.

School Safety

Safety and crime statistics at non public schools may reflect an interaction between environment and academics based on a reciprocal model of causation (Appendix E). Non-public school teachers reported that some student misbehavior (21 %) and student tardiness and class cutting (18 %) interfered with their teaching (Dinkes et al., 2009). A small percentage of non-public school teachers reported being threatened with injury (3%) or physically attacked (2%). The 2009 crime and safety data relate a miniscule percentage of students reported victimization (1%) or theft (1%). It appears from this data that teachers in non-public schools face a low percentage of safety issues or threats.

Teachers with an efficacious outlook set challenging goals and maintain a strong commitment to them. They heighten and sustain their efforts in the face of failure. However, relating teacher self-reports to teacher self-efficacy research, people who doubt their capabilities shy away from difficult tasks which they view as personal threats and have low aspirations and weak commitment to the goals they choose to pursue (Bandura, 1977; Pajares & Schunk, 2001). When faced with difficult tasks, they dwell on their personal deficiencies, the obstacles they will

encounter, and all kinds of adverse outcomes rather than concentrate on how to perform successfully.

Teacher Job Satisfaction

Caprara et al. (2006) surveyed approximately 2000 teachers in 75 Italian junior high schools to assess teacher self-efficacy beliefs and job satisfaction and found that teachers with high teacher self-efficacy beliefs are more likely to promote interpersonal networks that advance and sustain their work and job satisfaction. NCES (2002) data reveal that non-public school teachers are satisfied with their jobs. They were very content about class size and more likely to say they receive support from parents. By substantial margins, they were more likely to agree that most colleagues share the school's mission and that staff cooperative effort is high. Although complaining about management may be an American pastime, the majority of private school teachers had positive things to say about school administrators (60%). Furthermore, a majority of private school teachers strongly agreed that the principal enforced school rules (63 %), expressed expectations for staff (57 %), and communicated school goals clearly (61 %). However, when asked whether the principal often discussed instructional practices, only 15% of non-public school teachers said they strongly agree he or she does. Teachers also seemed to think their work was not appreciated enough. Less than a majority of non-public school teachers (40%) strongly agreed that the staff at their school was recognized for good work.

Academic Outcomes

Federal data reveal that a majority of non-public school 12th grade students graduate with a diploma (Keigher, 2009) and that scores in reading and math are generally higher for 8th grade non-public school students (Braun, et al., 2006; NCES 2009b). The U.S. Department of Education conducts the National Assessment of Educational Progress (NAEP), commonly

referred to as the Nation's Report Card (NCES, 2009b). NAEP is an assessment of what American students know and can do in various subject areas, with math and reading scale ranges from zero to 500. The 2009 NAEP reports that fourth graders in non-public schools scored an average of 245 in math and 236 in reading (NCES, 2009b). Non-public school students in the 8th grade also scored high in reading (236) and math (297).

Bandura (1986) indicated the idea that behavior, cognition, other personal factors, and environmental influences have an effect on each other (see Appendix E). It is a possibility the collective perceptions of non-public school teachers have an effect on the individual efficacy of each teacher. Researchers have examined the effects and influences of collective teacher self-efficacy (Bandura 1993; Goddard, 1998; Goddard, Hoy, & Woolfolk-Hoy, 2000; Knoblauch, 2004; Kurz, 2001). Within an organization, perceived collective efficacy represents the beliefs of group members in terms of systems and performance (Bandura, 1997; Goddard, Hoy, & Woolfolk-Hoy, 2000; Knoblauch 2004). Collective self-efficacy can control a group's goal setting, collective efforts, and persistence when difficulties arise. A highly efficacious team of teachers will, therefore, be more convinced of their ability to cope with adversity. In addition, they will not easily be discouraged by setbacks (Schwarzer, Schmitz, & Daytner, 1999). The collective efforts of non-public school systems seem to promote student achievement, which in turn could have an effect on teacher self-efficacy. For example, non-public high schools have rigorous graduation standards for math, science, social studies, foreign language, and computer science. The coursework is more likely to include advanced courses in science (chemistry, physics, advanced biology), mathematics (trigonometry, pre-calculus, calculus), and foreign language. The number of high school credits earned per year has been shown as significantly related to school drop-out rates (NCES, 2007). This promotion of higher achievement and goals

for their student body could be an example of a system process shared by non-public schools which promotes positive school environments and as such, higher teacher self-efficacy.

A review of the research on teacher self-efficacy indicates that teachers who have high teacher self-efficacy levels conduct effective teacher practices in the classroom (NCES, 2002). In addition, it is important to understand that effective teachers have certain characteristics in common that promote a positive relationship to student attitude and motivation (Allinder, 1994; Barfield & Burlingame 1974; Benton-Borghi, 2006 Berman et al., 1977; Nicholson, 2003). Teachers with high efficacy beliefs are more likely to provide additional support for students who are difficult to teach (J. A. Ross et al., 2001; Soodak & Podell, 1998; Tschannen-Moran & Woolfolk-Hoy, 2001) and to depart from their lesson agenda to address concerns that students cannot deal with (J. A. Ross et al., 2001). The high efficacy teacher is more likely to persist through obstacles, seeing these as temporary impediments rather than as evidence of an inability to accomplish professional goals. For example, they are more likely to keep students on task (Ashton et al., 1983; J. A. Ross et al., 2001).

Teacher Self-Efficacy and Implementing Computers for Instruction

The self-efficacy of the teacher determines the quality of education, the methods, and techniques to be used. Student participation in the learning process, and the comprehension of students both directly affect student success (Albion, 1999; Bandura, 1977; Enochs, Scharmann & Riggs, 1995; Ertmer, 2010; Gibson & Dembo, 1984; Klausmeier & Allen, 1978; Ross, Ertmer, & Johnson, 2001; J. A. Ross et al., 2001; Tschannen-Moran et al., 1998). In light of the prevalent use of educational technologies as tools to support the teaching and learning process, researchers have highlighted the need to assess teachers' knowledge of, and ability to use, technology to meet national standards (Archambault et al., 2002; Brush et al., 2008; Ertmer,

1999; Palak & Walls, 2009; U.S. Department of Labor, 2010). Computer self-efficacy can be defined as perceptions of self-efficacy regarding use and mastery of computers (Paraskeva, Bouta, & Papagianni, 2008). There is substantial evidence that teachers' beliefs, dispositions, and competencies are important predictors of computer use for instructional processes (Albion, 1999; Compeau & Higgins, 1995; Lumpe & Chambers, 2001; Marcinkiewicz, 1994; Means, 2010; Vannatta & Fordham, 2004). Teachers with high efficacy beliefs are more willing to learn about and implement new instructional technologies, increasing the likelihood that students will receive instruction that contributes to increased skill (Czerniak & Schriver-Waldon, 1991; Dutton, 1990; Hani et al., 1996; Hermans et al., 2008; Paraskeva et al., 2008; Riggs & Enochs, 1990; Ross, 1992; Teo, 2009). Paraskeva et al. (2008) investigated the characteristics of 286 secondary education teachers who attended a training program about learning and instruction in order to explore the relationship between general self-efficacy, self-esteem, and computer self-efficacy. Secondary relationships of computer self-efficacy (CSE) with teachers' subject area, prior experience, software use (as an educational tool), and previous computer training were examined. One of the instruments used was the Computer Self-Efficacy Scale (Murphy, Coover, & Owen, 1989). This 32-item Likert-type scale was developed to measure perceptions of one's capabilities regarding specific computer knowledge and skills. Murphy et al. (1989) reported that the higher the teacher's general self-efficacy, the higher his or her CSE. They also found that prior computer use was the greatest factor in determining a positive attitude toward computers. Teachers who have more experience teaching technology are more likely to integrate technology into their classroom (Paraskeva et al. 2008). Albion (2001) conducted a study with teacher candidates and discovered that when teacher candidates see sufficient and appropriate examples of computer use in their practice, they are more likely to develop computer self-

efficacy. Yang, Mohamed, and Beyerbach (1999) indicated that computer anxiety can be decreased with well planned and developed training.

Teacher Self-efficacy and Computer Self-efficacy

The definition of CSE used in this study is from Compeau and Higgins (1995), who defined it as one's judgment of one's capability to use a computer. CSE is not concerned with what one has done in the past, but rather with judgments of what could be done in the future. Moreover, it does not refer to a simple component of sub-skills, such as formatting diskettes or entering formulas in a spreadsheet, but incorporates judgments of the ability to apply those skills to broader tasks (e.g., preparing written reports or analyzing financial data).

Some researchers have explored the role of self-efficacy in computing behavior (Burkhardt & Brass, 1990; Gist et al., 1989; Hill et al., 1987; Webster & Martocchio, 1992, 1993). These studies provided initial evidence that self-efficacy has an important influence on individual reactions to computing technology (Compeau & Higgins, 1995). Other researchers (Gist et al., 1989; Webster & Martocchio, 1992, 1993) have found evidence of a relationship between self-efficacy with respect to using computers and a variety of computer-related behaviors such as registration in computer courses at universities (Hill et al., 1987), adoption of high technology products (Hill et al., 1986), and computer innovations (Burkhardt & Brass, 1990).

In terms of the outcome expectancy component of efficacy, CSE represents an individual's perceptions of his or her ability to use computers in the accomplishment of a task such as using a software package for data analysis, writing a mail merge letter, or using a word processing program (Compeau & Higgins, 1995). Substantial evidence suggests that teachers' belief in their capacity to work effectively with technology is a significant factor in determining

patterns of classroom computer use (Abdal-Haqq, 1995; Albion, 1999; Brinkerhoff; 2006; Burkhardt & Brass, 1990; Chen, 2008; Compeau & Higgins, 1995; Ertmer, 2010; Hermans et al., 2008; Hill et al., 1986; Marcinkiewicz, 1994; Paraskeva et al., 2008; Piper, 2003). Albion (2000) reports that student teachers who indicate a strong belief in their personal capacity to work with computers are more likely to report feelings of self-efficacy for teaching with computers. Furthermore, self-efficacy beliefs about using technology for teaching are related to teacher practice or ~~"m~~mastery experiences" (Albion, 1999; Marcinkiewicz, 1994; Hermans et al., 2008). Paraskeva et al. (2008) indicate that computer self-efficacy is related to characteristics such as gender, age, and subject areas. Marcinkiewicz (1994) reports that computer self-efficacy is affected by the expectations and beliefs regarding computer use that a person perceives from principals, colleagues, and the profession.

Perceived self-efficacy with respect to computers has been found to be an important factor in decisions about using them (Albion, 1996; Thatcher, 2002) and individuals who do not regard themselves as competent computer users are less likely to use them (Paraskeva et al., 2008). Albion reports that despite possessing positive attitudes toward computer use, pre-service teachers lacked confidence in their capacity to teach successfully with computers. Consequently, teachers who lack confidence regarding their use of certain computer functions might be unwilling to attempt or demonstrate those functions to students (Ross et al., 2001). Examining teacher self-efficacy may provide useful information for the educational initiatives needed to assist teachers in the general instruction of computer-related tasks (Shapka & Ferrari, 2003; Vannatta & Fordham, 2004) and also may help teachers in overcoming any barriers to computer instruction (Ertmer, 2010; E.M. Ross et al., 2001; Vannatta & Fordham, 2004).

Barriers to Implementing Computers for Instruction

Several authors have indicated that certain teacher and classroom characteristics may act as either barriers or facilitators of technology use (Abdal-Haqq, 1995; Albion, 2002; Anderson & Ronnkvist, 1999; Becker, 2000; Brinkerhoff, 2006; Brush et al. 2008; Chen, 2008; Ertmer, 2010; Parsad, Skinner, & Farris, 2001; Pajares, 1997, 2002; Shiverdecker, 2002; Tschannen-Moran et al., 1998). Specifically, teacher self-efficacy has a significant influence on novice teachers' classroom use of technology (Abdal-Haqq, 1995; Brinkerhoff, 2006; Chen, 2008; Ertmer, 2010; Piper, 2003). Furthermore, this sense of efficacy should be developing in teacher training programs. Russell et al, (2003) recommend that the colleges of teacher education need to focus less on teaching technology and more on teaching with technology. Wetzel and Williams (2004) found student teachers successfully integrated technology when their teacher educators effectively modeled its use.

Kleiner, Thomas, and Lewis (2007) surveyed about 700 of the nation's Title IV degree-granting 4-year institutions to provide information for the NCES on the types of educational technology training received by pre-service teachers. They found that although the definition varied by institution, most institutions (79%) reported that educational technology was taught, at least to some extent, during the field experiences of their teacher candidates prior to initial licensure. The institutions were also surveyed to determine the extent to which various barriers hindered teacher candidates' ability to practice educational technology-related skills and knowledge during their field experiences. A variety of barriers that were limiting the effectiveness of teacher practice was reported, namely:

- competing priorities in the classroom (93% of institutions surveyed)
- availability of technology infrastructure (92%)

- lack of training or skill with technology (44%)
- lack of time (44%)
- lack of willingness to learn (42%)

Hermans et al. (2008) conducted a study of 525 primary school teachers and their use of computers to support the teaching or learning process. They investigated demographic variables in relationship to years of computer experience, general computer attitudes, supportive computer use in hours, and teacher's constructivist (student-centered), and traditional (teacher-centered) beliefs about the classroom use of computers using the Constructivist Beliefs Scale. The findings indicated that teacher beliefs seem to be at least as important as technology-related teacher characteristics (e.g., computer experience) in determining why teachers adopt computers in the classroom.

Vannatta and Fordham (2004) discovered that teachers who had above average self-efficacy scores leaned toward a constructivist (student-centered) environment. These teachers were more open to change and produced a higher level of classroom technology use. The authors recommend that in order to motivate teachers to increase technology use, teacher training programs need to offer more technology training, demonstrations of effective technology lessons, opportunities for collaboration, and discussion and leadership from administrators.

NEA (2008) surveyed 1,934 educators to examine the state of resources and support for educational technology in public schools. The survey results mirror the NCES findings (Gray et al., 2010) showing that most educators used technology regularly for administrative tasks, but fewer used technology for instruction-related tasks. Elementary schools were more likely to have more computers in the classrooms when compared to secondary schools, which were more likely to have computers in school technology labs. Almost all of the teachers (95%) had access

to the Internet in their classrooms, but half believed that inappropriate use of the Internet by students resulted in a decline in the quality of student work. These findings are similar to the findings of the NCES (Gray et al., 2010) which showed that teachers prefer to participate in low-level computer tasks and are not integrating computers in the classroom to promote student success. These findings reflect Bandura's (1984) claim that individuals with a high magnitude of self-efficacy will see themselves as able to accomplish difficult tasks, while those with a low self-efficacy magnitude will see themselves as only able to execute simple forms of the behavior or task.

Self-efficacy is a key judgment factor for the choices we make, the goals we set, and our persistence to complete those goals and tasks (Weber, Weber, Sleeper, & Schneider, 2004). Because self-efficacy beliefs affect one's sense of responsibility (Erdem & Demirel, 2007), the effect they might have on the goals and tasks of classroom teachers is a major component of research in education. Tschannen-Moran and Woolfolk-Hoy (2001) proposed that teachers' efficacy belief is a judgment of their ability to influence desired outcomes and affect student performance, behavior, and motivation in the classroom. In light of this, there is a strong possibility that teachers' levels of efficacy may have a significant effect on their tendency to overcome barriers to teaching computer-related topics (Shaughnessy, 2004). Tchannen-Moran et al. (1998) stated that the teacher's beliefs in his or her capacity to organize and execute courses of action are related to the successful completion of a teaching task in a specific context such as teaching technology-related topics.

Shiverdecker (2002) investigated Ohio science teachers' perceptions of components that are related to using computers for instruction and what they perceive as barriers to using computers for instruction. The components Shiverdecker determined from the literature that

inhibit (or are barriers to) computer use is administrative support, technical support, collegial support, parent/community support, training, time, teacher self-efficacy, access, and attitude toward computers for instruction. Shiverdecker designed an 81-item peer-evaluated instrument called the Teachers' Perceptions of Components Related to Implementing Computers for Instruction Survey (TPIC). Shiverdecker reported a Cronbach's alpha of .94 for the entire instrument, which was completed by 124 teachers. Alpha levels for each of the components ranged from α=.46 to α=.85. The alpha levels reported for the TPIC indicate the survey is appropriate for use. A secondary goal of Shiverdecker's study was to examine *stage of use* theory, but this component of the Shiverdecker instrument was omitted since the current study did not address this variable. In addition the Teacher Sense of Efficacy Scale (TSES) will be included into the study and the current subscale on efficacy will be omitted. The literature indicates that the TSES is a reliable instrument to collect data on teacher self-efficacy (Henson, 2001; Nicholson, 2003). The following is a discussion of the eight barriers, from Shiverdecker's instrument, that are relevant to the current study.

Administrative Support Barriers

Administrative support is defined as providing resources, training, encouragement, and recognition for accomplishments (Shiverdecker, 2002). Shiverdecker found that teachers who had higher efficacy levels also reported greater administrative and collegial support and greater access. There is a relationship between teacher self-efficacy and school characteristics such as teachers' perceived support, especially administrative support received primarily from principals (Celep, 2000; Legacy, 2002; Linnell, 1994). Principals and their leadership have been described as one of the most important factors affecting the use of technology in classrooms (Byrom & Bingham, 2001). Principals are in a position to help teachers realize the difference they are

making with students and can increase their self-efficacy by verbal cues (Edwards et al., 2002). Unfortunately, teachers often do not receive the administrative support and guidance they need. A NCES (2002) report found that teachers in private schools did not rate principals' leadership on instruction very high. In fact teachers in non-public school settings reported that discussions with principals regarding instructional matters did not occur. When school principals do not provide leadership to teachers, the absence may prove to be a barrier to a teacher's effective use of technology (NCES, 2000b).

There seems to be a distinction between what contributes to personal teaching efficacy versus general teaching efficacy. For example, Edwards (1996) found that personal teaching efficacy was most closely related to motivation and teacher professionalism, while teaching efficacy was related to professional treatment by administrators, perceived influence, and values (Abbitt & Klett, 2007). These minute distinctions on administrative support may be cleared up by Tschannen-Moran and Woolfolk-Hoy (2007), who explored several potential sources of teachers' self-efficacy beliefs to see if differences could be found between novice and experienced teachers. The participants were 255 teachers who were graduate students at three state universities as well as teacher volunteers from two elementary schools, one middle school, and one high school. In the case of experienced teachers, satisfaction with teaching performance was related to all of the interpersonal support variables (with *r*'s ranging from .25 to .38). However, when it came to general support variables, neither experienced nor new teachers seemed to anchor their self-efficacy beliefs on the support of their administrators. It appears from the research results that administrative support plays a part, even if indirectly, in how teachers view themselves or their performance but may not play a part in how teachers determine efficacy on self-report measures.

Technical Support Barriers

Shiverdecker (2000) defines technical support as support and assistance with hardware, technical concerns, and instructional issues. For example, schools can employ a full-time computer coordinator to assist teachers with using computer software and hardware or train teachers to adapt their teaching practice to include computer or Internet use (NCES, 2000b). According to NEA (2008) 71% of teachers believed that technical assistance for setting up and using technology in their school was adequate, but only 67% believed that technical assistance for troubleshooting or fixing problems with the school technology was adequate. These numbers relate that while initial assistance with technology was available to the population of public school teachers, continuing or supportive assistance with technology was not available.

Collegial Support Barriers

Teachers are more likely to feel confident in dealing with the issues that occur at work when they perceive collegial interactions are occurring in their environment (Brownell & Pajares, 1996). Encouragement from peers is a major factor in alleviating computer anxiety and promoting effective use of classroom technologies (Bradley & Russell, 1997). Woodrow (1989) and Greenberg et al. (1998) found that teachers who have mastered technology help with implementation by becoming leaders in their schools. Greenberg et al. further found that leaders offer the support and encouragement novice teachers need when accomplished teachers become mentors. It is likely that the colleagues with whom teachers share resources, talk about using computers, and ask questions of, are filling the role of mentor. This type of informal leadership provides the assistance novice teachers need in a very non-threatening way.

Chong, Klassen, Huan, Wong, and Kates (2010) used the TSES to determine teacher self-efficacy scores of 222 middle school teachers in Singapore who were assigned students based on

the students' prior academic achievement (designated as high-track and low-track for this study). They reported that teachers' beliefs about a task are influenced in part by the attitudes of other teachers as well as specific resources and constraints (or barriers) to facilitate their work. Teachers in high-track schools were more efficacious compared to teachers in low-track schools. The authors suggested that student academic level may have influenced teacher self-efficacy. Further analysis by the team revealed that teachers who feel efficacious about their own and collective capacity can produce positive outcomes.

Parent and Community Support Barriers

Bandura (1986) in his reciprocal model of causation (see Appendix E) indicated that environmental variables can affect efficacy and vice versa. In the case of teacher self-efficacy, one such environmental variable is parent and community support (Lumpe & Chambers, 2001). In fact that lack of parent support can act as a barrier to teacher self-efficacy (Shiverdecker, 2002). Researchers have found that communication barriers exist between teachers of students with disabilities and their parents (Bennett, Deluca, & Burns, 1997; Brandes & Nasherm, 1996). NCES data (Gray et al., 2010) reported that just over half (59% sometimes or often) of teachers used e-mail or Listserv technology to send out group updates in order to communicate with parents; but the majority (79% sometimes or often) used e-mail to address individual concerns with parents. Gray et al. (2010) indicate that teachers use more resources to address individual student occurrences and fewer resources to create a supportive group environment among parents; and as such this lack of parent support which can affect teacher self-efficacy. Van Brummelen (1988) indicated that one of the focal points in his study was the significant factors contributing to change and the processes of curriculum implementation in Christian school settings. Van Brummelen found that in order for change to occur, schools needed a supportive

community that shared a common vision and purpose. However, Wertheim and Leyser (2002) indicated that although pre-service teachers expressed a strong willingness to communicate and interact with students and parents to support academic progress and appropriate classroom conduct, they did not perceive such interactions as effective. It could be possible that teachers who are not communicating as much with parents in order to create supportive environments lack the confidence to do so. Caprara et al. (2006) reported that along with student academic achievement, parent perception is one of the variables that contribute to teachers' job satisfaction. Caprara et al. (2006) found that teachers with high teacher self-efficacy beliefs are more likely to promote interpersonal networks that advance and sustain their work and job satisfaction. The research seems to indicate that there is a reciprocal relationship between job satisfaction, teacher self-efficacy, and parent support.

Training Barriers

In the area of technology, training has typically focused on the operation of the computer rather than on integration of computer technology (U.S. Congress Office of Technology Assessment, 1995). The introduction of computers into the classroom has brought with it the need for additional training. In their RAND research, Berman et al. (1977) reported that particular implementation strategies adopted in the research project had a significant effect on its outcome and continuation. They conceived teacher self-efficacy as a belief that the teacher can help even the most difficult or unmotivated students and found that teacher self-efficacy could be raised with projects (such as training) or school activities. Specifically, when teachers perceived that the training was useful (e.g., it instructed them about how to use the project methods and materials) the implementation of the project was enhanced and resulted in improved student performance.

Current national data indicate that most teachers spend 1 to 8 hours per year in professional development (Gray et al., 2010). The majority of teachers agreed that the training *met their goals or needs* and was *available at convenient times*. The NEA (2008) report also reveals important findings regarding teacher training. While the districts required professional development in technology for the majority of educators, most of the educators believed training for non-instructional tasks was the most effective. There was a difference of opinion about training effectiveness as reported by grade level. Educators with the most job experience were more likely to participate in technology training and more likely to believe that their training was adequate. New teachers were more satisfied with their knowledge of technology and its impact on their own jobs. Urban school educators were the least likely to receive adequate training to use technology, particularly in using administrative and instructional software and in designing individual lessons for students. Educators in middle schools were the most satisfied with the technology training they received.

Furthermore, although training can increase teacher self-efficacy with computers, the type of training that would be most effective is not commonly enacted (NCES, 2000b) and the lack of effective training can be considered a barrier to implementing computers for instruction.

Time Barriers

There are many time barriers related to implementing computers for instruction, including time needed to train and practice with the technology and explore its applications; lesson planning time; instructional time with students; and the time required to collaborate with other teachers or to observe others using technology (Hixon & Buckenmeyer, 2009; Keengwe et al., 2008; Shiverdecker, 2000). NCES (2000b) defined lack of time as the lack of release time for teachers to learn, practice, or plan ways to use computers or the Internet for instruction and

reported that this lack of time is one of the greatest barriers to the use of technology in instruction. Teachers need adequate instructional time with students so that time for content instruction is not used for task related technology instruction (Shiverdecker, 2002).

Access Barriers

Access is another multidimensional variable which is considered a barrier to implementing computers for instruction (Shiverdecker, 2000). It includes access to computers, where computers are placed, student/computer ratios, the age and capability of the computers, quality and appropriateness of the software, scheduling issues, and access for teacher's personal computer use (Shiverdecker, 2000).

Gray et al. (2010) found that 100% of schools participating in the survey had one or more instructional computers with Internet access. Teachers further reported that they or their students used computers in the classroom approximately 40% of the instructional time. These findings would seem to indicate that access to computers increased over the years and that more teachers are using the Internet for instructional or administrative tasks, but Gray et al. also reveal that the use of computers in the classroom by students is less than 50%. This statistic is despite the fact that 87% of teachers reported that they received professional development training that applied to technology available in their schools. What these results indicate is that having access to more technology resources in schools does not mean that implementation of computers for instruction is occurring; especially if teachers have not received training to use the technology effectively (Dorman & Fraser, 2009).

The NEA (2008) report discusses another component of access to computers: there are differences between computers in the classroom depending on school location (urban, suburban, and rural/town). Suburban educators were more likely (51%) to have additional computers

available in their classroom (e.g., laptops). Urban teachers were more likely to say that their classroom was the primary situation for computer access (50%) and to have smaller computer labs for their students to use. Moreover, urban educators were more likely than suburban teachers to receive a laptop (33%) provided by the school for their personal use. Educators in smaller areas did not receive as much assistance with advice to purchase their own computer. When it comes to the condition of computers, urban educators (68.5%) were less likely than suburban educators (76.0%) to have adequate working computers. Additionally, urban educators (64.8%) were less likely than suburban educators (72.0%) to have adequate technical assistance. The NEA report indicates that urban schools (43.3%) were less likely than suburban schools (51.2%) to receive additional computers, such as laptops for students. However, urban teachers were more likely (50.0%) than suburban teachers (44.0) to have computers in the classroom. The NEA report (2008) revealed that urban (58.5%) teachers and rural teachers (58.6%) reported more optimistic views of technology (technology as being essential to education) when compared to suburban teachers (51.9%).

Attitudes Toward Implementing Computers For Instruction

Self-concept and self-efficacy stem from the evaluation we make of our character or capabilities (Bandura, 1977). Attitudes about learning outcomes also stem from this internal state. Most definitions emphasize that an ~~"a~~ttitude" contains three essential ingredients: (a) a cognitive component, or ideas and perceptions a person has; (b) an affective component which consists of feelings or emotional responses; and (c) a behavioral component, or a person's tendency to act in a particular way (Burns, 1982).

Attitudes regarding learning outcomes arise because we usually try to explain success or failure based on self-evaluation, evaluation of the environment/situation, and evaluation of

ourselves when compared to others (Woolfolk, 1990). Attitudes are formed from such activities as direct interaction, social interaction, verbal persuasion, emotional arousal and vicarious experience, mass media, and chance conditioning (Bandura, 1977, 1995). Our attitudes influence how we respond with respect to our knowledge and skills (Bandura 1977, 1995; Coon, 1994; Purskey, 1970).

Efficacy is a domain-related judgment. In the domain of computer technology, there are certain precursors, evaluations, or attitudes of capability, that lead to efficacy expectations. Therefore, the personal philosophies and beliefs (attitudes) of teachers are a major influence on the successful integration of technology (Albion, 2002). Becker (2000) reported that philosophical bias about the basic nature of student learning (and what type of instruction is best) limits successful implementation of computers for instruction.

Computer attitudes determine how a teacher will approach a novel task on the computer and the efficiency with which he/she will engage in a difficult new task (Pierce & Ball, 2009; Shapka & Ferrari, 2003). Abbitt and Klett (2007) investigated the influence of self-efficacy beliefs toward technology integration among pre-service teachers. Participants in the study were 108 undergraduate students enrolled in teacher preparation programs. Abbitt and Klett used data collected from two existing survey instruments; the first being the Attitudes Toward Computer Technology (Kinzie et al., 1994; Milbrath & Kinzie, 2000) designed to assess perceived comfort and anxiety and perceived usefulness of computer technologies, and the Computer Technology Integration Survey (CTIS; Wang, Ertmer and Newby, 2004) designed to measure participants' confidence and self-efficacy in using computer technology in teaching. The CTIS was evaluated by the original authors for internal consistency resulting in $\alpha = .94$ and .96 for the pre-survey and post-survey respectively.

Abbitt and Klett (2007) indicated that significant changes in self-efficacy ratings occurred in all groups. In terms of preparing pre-service teachers to effectively integrate technology in their future classrooms, Abbitt and Klett also reported that the impact the courses had on self-efficacy beliefs was not equal in that the changes in attitudes toward computer technology differed among the groups. They received an unexpected result in that ratings of comfort with computer technology were a significantly related to self-efficacy beliefs while perceived usefulness was not. They posited that the findings that indicate no significant changes in perceived usefulness of computer technology in any of the groups might be an indication that these participants had already believed technology to be useful in the classroom and there was little movement in that opinion over the course of one semester. Of particular note in Abbitt and Klett's (2007) study were the results of the comparisons among the groups on self-efficacy beliefs toward technology integration, which support the belief that training and development need to be useful and specific. The authors indicate that a course design that encompassed issues relating to the integration of technology into teaching was likely to have a larger positive impact on self-efficacy beliefs than a course focused primarily on developing proficiency skills with specific computer technology. Abbitt and Klett also indicated that the amount of instructional time did not appear to be a major barrier influencing self-efficacy beliefs.

Demographic Variables that Affect Teacher Self-efficacy and Computer Implementation

Findings have been mixed regarding the selected demographic variables that were used for this study. The survey in this study collected common demographic information in categories which were extensively commented on in the literature as having a relationship to teacher self-efficacy or computer integration as discussed in the following sections.

Educational Level

Celep (2000) conducted a study of 310 teachers from 22 elementary schools in the country of Turkey and found that teachers with higher educational levels expect more from their students. In addition, the higher the teacher's educational level, the more he or she believed that students did not struggle to learn. However, Edwards (1996) reported there were no significant differences for educational level in teacher self-efficacy.

Age

The average age of teachers in non-public school is 44 years of age in the U.S. (Coopersmith, 2009). The largest percentage of non-public school teachers are between the ages of 30-49 (46%). Pierce and Ball (2009) used the theory of planned behavior as the framework for an investigation of mathematics teachers' perceptions of possible barriers and enablers related to their incorporation of technology into the classroom, specifically scientific calculators, Computer Algebra Systems (CAS), lists, and spreadsheets. Theory of planned behavior relates to a view of favor or disfavor towards an action and how that view can lead to barriers or enablers of change. According to Pierce and Ball, TPB explains how teachers' positive or negative attitudes toward teaching with technology are directly related to their beliefs about teaching and impact on students' learning. Data were collected from 92 mathematics teachers in a wide range of schools by means of an emailed survey with two sections. Section 1 asked about mathematics teachers' attitudes and perceptions. Section 2 of the survey asked questions in relation to the class in which math teachers had made the greatest use of technology in the past year. A majority of participants held positive attitudes and perceptions in relation to the use of technology for teaching mathematics. Age was reported to influence the perceived norm for using or not using the technology.

Gender and Computer Anxiety

Computer anxiety is often studied in connection with computer attitudes. The major areas of computer anxiety related to a person's feelings of being stuck are not knowing what to do next, not understanding the computer language, and not understanding computer instructions or messages (Bradley & Russell, 1997). In addition, low mechanical aptitude, a dislike of technology, uneasiness, or fear of current or future computer use, and a distrust of change in general are all characteristics of computer anxiety (Buche, Davis & Vician, 2007; Saadé & Kira, 2009; Weil, Rosen, & Wugalter, 1990). Some researchers, such as Lewis (1999), have indicated that computers are associated more with males than females. Edwards (1996) reported significant gender differences in teaching efficacy regarding technology with males reporting lower teaching efficacy. Busch (1995) indicated that when controlling for other variables, female and male students have equal self-efficacy expectations in performing simple tasks. Recent research has indicated that gender is not as much a factor in computer anxiety as once thought. Smith (2001) indicated that there were no significant differences between males and females in feelings of efficacy. Shapka and Ferrari (2003) added to the growing literature which indicates that when skill levels are similar, gender is not a main effect for instruction of computer-related topics. Tschannen-Moran and Woolfolk-Hoy (2007) also found that gender were not related to the self-efficacy beliefs of either novice or career teachers when teaching with technology.

Gender and Computer Attitudes

Important variables related to computer attitudes are previous computer experience and encouragement (Busch, 1995, 1996; Tschannen-Moran & Woolfolk-Hoy, 2001). There is also a correlation between increased computer use and reduced computer anxiety, enhanced computer

confidence, greater computer knowledge, and increased liking for computers (Bradley & Russell 1997; Busch, 1995). Yang et al. (1999) indicate that the training environment should be non-threatening and that administrators should use family members, trainers, peers, or colleagues to help dispel stereotypes. It appears that more experience with computers and watching others use computers decreases anxiety. Bandura (1977) indicated that there are four sources of self-efficacy (enactive mastery experiences, vicarious experiences, verbal persuasions, and physiological states [emotional arousal]). These studies provide more evidence that mastery experiences (doing the task) and vicarious experiences (watching someone do the task) increase self-efficacy (beliefs about capability) for a behavior.

Years of Experience

Cowley and Meehan (2001) indicated that there was virtually no correlation between years of experience and either efficacy or professional learning community constructs. The NCES (2000b) reported that teachers new to teaching were more likely to use computers or the Internet compared to experienced teachers. Eighty-seven percent of experienced teachers (those having 10 or more years of experience) compared to 63% of inexperienced teachers (those having three or fewer years of experience) reported having participated in professional development activities related to basic computer use and software applications. Teachers with only three or fewer years of teaching were more likely to use their home computers (65%) largely compared to teachers with 20 or more years of teaching experience (57%). Inexperienced teachers were more likely than experienced teachers to report that their graduate work prepared them to use computers and the Internet. Tschannen-Moran and Woolfolk-Hoy (2007) indicated that self-efficacy beliefs tend to be stable once set and do not necessarily tend to increase as years of experience increase. Tschannen-Moran and Woolfolk-Hoy (2007) report

that gender, race, teaching experience, age, teaching setting (urban, suburban, rural), and school level (preschool through high school) were significantly related to teacher self-efficacy for new teachers, but only school level was related (r =.21) to teacher self-efficacy for experienced teachers.

Grade Level Taught

Cowley and Meehan (2001) indicated that elementary teachers had a higher level of internal efficacy and a higher sense of a professional learning community in their schools than did high school teachers, while high school teachers had a higher level of perceived external efficacy regarding learning than the elementary teachers.

Shapka and Ferrari (2003) found no effect on efficacy based on the training and knowledge level of elementary teachers or secondary teachers. Individuals training to teach at the secondary level had higher self-efficacy and were more likely to self-report that they would not give up or avoid a challenging task. Both male and female new secondary teachers had higher levels of computer self-efficacy than their elementary and junior high school counterparts did.

Wertheim and Leyser (2002) also reported differences between early childhood, junior high, and elementary education majors. Pre-service elementary childhood education majors had higher scores on personal teacher self-efficacy (outcome expectancy) as compared to their elementary and junior high pre-service teacher counterparts.

Tschannen-Moran and Woolfolk-Hoy (2007) reported that school level (preschool through high school) was significantly related to teacher self-efficacy for new teachers, but not for experienced teachers. Conversely, when new teachers are compared to experienced teachers, the efficacy level can vary depending on grade level taught.

Computers in the Home

Experience using a computer or the Internet may improve comfort level with technology regardless of whether the experience is gained in the home or at school (NCES, 2000b). Teachers who have above-average technical skill and who use computers for their own professional needs also tend to use computers in broader and more sophisticated ways with students (Becker, 2000). Shiverdecker (2002) reported that science teachers had a positive sense of efficacy with regard to using computers for instruction. Teachers who had more experience with computers had a greater sense of efficacy.

National data from NCES (Gray et al., 2010) indicate that 69% of teachers used computers in the classroom for instructional purposes *sometimes* or *often*. Ninety-seven percent of teachers reported having remote access to school e-mail, and 81% had remote access to student data. The same report indicated that computer use was not affected by location. The percentage of teachers reporting how frequently they or their students use computers during instructional time in the classroom and in other locations sometimes or often was 70% in city locations, 70% in suburban locations, 71% in town locations, and 69% in rural locations. Separate data for non-public schools were not cited in this NCES publication, and the most recent data on non-public school teachers and technology use are almost ten years old and thus not useful for a comparison.

CHAPTER 3

METHODS

This chapter presents the methods used in this study. Details concerning the research design, participants, instrumentation, procedures, and design analysis are provided. The chapter begins with a review of the purpose of the study and research questions.

Purpose of the Study

The purpose of this study was to examine the perceptions of non-public school teachers in the southern U.S. about teacher self-efficacy and implementing computers for instruction. Tschannen-Moran and Woolfolk-Hoy (2002) concluded that certain factors are significantly related to teacher self-efficacy including: (a) resources and restraints; (b) background variables, such as gender and teaching experience; (c) class variables, such as class size and student achievement; (d) school variables (e.g., principal leader style and teacher autonomy); and (e) social-cultural variables (e.g., mass media influence) and teachers' social status.

The literature identifies certain factors related to perceptions of teacher self-efficacy that are also related to implementing computers for instruction (Chen, 2008; Brush et al., 2008). Hermans et al. (2008) conducted a study of 525 primary school teachers and their use of computers to support the teaching or learning process and found that teacher beliefs seem to be at least as important as technology-related teacher characteristics (e.g., computer experience) in determining why teachers implement computers into the classroom. Riggs and Enochs (1990) demonstrated that when teachers self-efficacy beliefs, in their ability to use computers, is

increased through appropriate professional development, they are more likely to implement computers into their teaching strategies.

Although access to computers is an important contributor to teacher computer use (Goktas, Yildirim, & Yildirim, 2009; Keengwe et al., 2008; Mueller et al., 2007), the school environment, racial make-up, or other contributors can affect a teachers' attitude toward implementing computers for instruction (Goktas, Yildirim, & Yildirim, 2009; Mueller et al., 2007; Vannatta & Fordham, 2004; Shapka & Ferrari, 2003). Keengwe et al., (2008) makes the case to identify factors as those related to technical and equipment issues or those factors related to school type and environment. School environmental factors include organizational culture, beliefs about teaching and technology, and openness to change (Keengwe et al., 2008). Research reports that school-related environmental factors can have a significant influence on weather teachers implement computers into general instruction (Abdal-Haqq, 1995; Brinkerhoff; 2006; Chen, 2008; Ertmer, 2010; Mueller et al., 2007; Vannatta & Fordham, 2004; Shapka & Ferrari, 2003).

An examination of the research seems to indicate that self-efficacy measures may help us to understand how teachers can successfully implement computers into instruction (Ertmer, 2010). Teachers with high levels of self-efficacy may be more likely to implement computers into instruction despite perceiving technology issues or barriers (Albion, 1999; Mueller et al., 2008). The research certainly provides sufficient reason to undertake further investigations into teacher self-efficacy beliefs and the relationship to technology implementation. In addition, examining particular school environments or types may provide information about how teacher self-efficacy beliefs are formed.

One environment that is worthy of further investigation is the non-public school environment. Data suggest a relationship between the effectiveness of instructional strategies used in non-public schools (school type or environment) and a higher probability of finishing high school, attending college, and receiving a degree (Franciosi, 2001; Parsad, Skinner, & Farris, 2001). National data (Alt & Peter, 2002) reports that the majority of teachers at non-public schools hold perceptions associated with positive teacher self-efficacy beliefs. While the literature reveals that effective instruction occurs at non-public schools, examination of how teachers use computers for instruction and factors contributing to effective computer technology implementation is limited. The influence environment has on teacher self-efficacy and technology implementation promoted this researcher to study how non-public school teachers implement computers for instruction.

Research Questions

To achieve the purpose of this study, the following research questions will be examined:

1. What is the perceived teacher self-efficacy of non-public school teachers in the southern U.S.?
2. What are the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction?
3. Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on age?
4. Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on age
5. Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on grade level taught?

6. Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on grade level taught?
7. Is there a statistically significant relationship between perceived teacher self-efficacy (TSES) of non-public school teachers in the southern U.S. and teachers' perceptions about implementing computers for instruction (TPIC)?

Research Design

The design chosen for this study was survey research. Survey research is a type of non-experimental quantitative research design that is popular in the social sciences due to its flexibility (Muijs, 2004). The purpose of a survey is to collect research data from participants about their characteristics, experiences, knowledge, or opinions using questionnaires (Creswell, 2009). There are various ways to collect research data for a study. Probability sampling is the preferred method used when data collected in survey research is analyzed and certain generalized findings can be applied to the population of interest (Creswell, 2009). Random sampling is an example of probability sampling methods (Bernard, 2000). Non-probability sampling does not allow the researcher to generalize from the sample to the population, but you may be able to generalize about cultural data (Bernard, 2000). Convenience sampling, as was used in this study, is an example of non-probability sampling methods (Bernard, 2000).

Questionnaires are an inexpensive way to collect data from a potentially large number of participants. Often they are the only feasible way to reach a large enough sample size in order to allow statistical analysis of the results. Bernard (2000) indicates questionnaires can help to reduce interviewer bias, increase the chances that participants will complete socially awkward questions, and provide a forum to ask complex questions. Best and Kahn (1986) maintained that

the questionnaire has unique advantages and that it may serve as an appropriate and useful data-gathering device when properly constructed and administered. One of the disadvantages of questionnaires includes the loss of control regarding question interpretation (Bernard, 2000). Which means while researchers can take great care to structure questions for desired inferences, participants can still make certain cultural interpretations that differ from what the researcher intended. Non-response bias (error) is another disadvantage of questionnaires and occurs when the people who respond to the survey have different characteristics from those who did not respond to the survey and those characteristics are vital to the research study (Bernard, 2000; Dillman, 2007). Additional disadvantages to using questionnaires include low response rates; uncertainty about who actually filled out the survey; and concerns about the literacy of the population sampled and weather they are able to complete the survey (Bernard, 2000).

Researchers collect information in survey research by standardized means, or procedures, so that every individual answers the same question using the same mode of investigation (Scheuren, 2004). Surveys allow researchers to describe, compare, or explain individuals' or groups' knowledge, feelings, values, preferences, and behavior (Fink, 2006). To this end, surveys are used to collect information for administrative, commercial, and scientific purposes (Scheuren, 2004). A convenience sample completed the surveys for this study. Huck and Cormier (1996) define a convenience sample as the participants who are available to participate in the study; but when using a convenience sample the results may or may not represent the general population. Nonetheless, convenience sampling provided ease of sample selection and data collection for this study and allowed the researcher to describe this group of non-public school teachers in an exploratory way.

Participants

The convenience sample for this study was all teachers employed by a member school of the American Association of Christian Schools (AACS) and who attended an AACS southern regional conference held in September 2006 at Myrtle Beach, South Carolina

The American Association of Christian Schools is divided into regions. At the time of data collection, the southern regional conference was under the direction of the Georgia Association of Christian Schools (GACS) whose offices are located in Athens, Georgia. With permission of the Director of the GACS, the survey was mailed to the 76 schools listed as member schools under the state of Georgia as a part of the Georgia Association of Christian Schools. Therefore, the teachers employed by the 76 AACS member schools were the initial convenience sample for this study. However, the survey response level was very low, and as such, the IRB was petitioned for permission to collect data at the AACS regional conference. A copy of the IRB is provided in Appendix C.

Of the 316 non-public member schools represented at the regional conference, 197 surveys were returned resulting in an initial response rate of 62.3%. Forty-four of the surveys were discarded due to incomplete data. The remaining 153 surveys used in this study resulted in a 77.7 % usable response rate.

The instrument did not collect data that would identify which U.S. states are represented in the sample, nor did it collect information that would identify individual schools; consequently, comparisons based on these demographics were not possible. The demographic survey collected information about the participants' gender, ethnicity, age, education, grade level taught, years of teaching experience, subject taught, and location. Participants also responded to the open-ended question, *Give examples of how students use computers in your class or in the computer lab as*

part of your class. Table 2 gives an overview of the demographic make-up of the convenience sample

The demographic make-up of the convenience sample indicated more females (72.5%) than males (27.5%). The sample included more Caucasian participants (88.2%) and participants who identified themselves as multi-racial (5.9%) As discussed in Chapter 2, *gender* and *ethnicity* (race) were not items of interest for this study. Tschannen-Moran and Woolfolk-Hoy (2007) found that *gender* and *ethnicity* were not related to the self-efficacy beliefs of either novice or career teachers when teaching with technology. Teachers completed the open ended question, *My age is___?* Participants' responses ranged from 22 to 68 years of age and the mean age was just over 41 (M=41.88, SD=11.15). For the purpose of analysis, the *age* data was collapsed into four subsets (≤29 years of age; 30-49 years of age; 50-54 years of age; 55-75 years of age). The age subsets are based on the categories used in the NCES 2008 Schools and Staffing Survey (Morton, Hurwitz, Strizek, Peltola, & Orlofsky, 2008). Teacher *age* has been reported to influence the perceived norm for using or not using technology (Pierce & Ball, 2009) and was one of the variables used in this research study. The *grade level taught* and *education* categories were collapsed into standard subsets used by NCES (Morton et al., 2008). Tschannen-Moran and Woolfolk-Hoy (2007) indicated that grade levels (preschool through high school) were significantly related to teacher self-efficacy for experienced teachers. The majority of the teachers in the sample taught in high school (48.4%). *Grade level taught* (elementary, middle school and high school) is a variable used in this research study. The majority of the participants in the study had at least a Bachelor's degree (52.9%). Teachers in this sample had a minimum of zero and a maximum of 38 years of teaching experience (M=13.2, SD=9.48). Only three teachers (2%) indicated no teaching experience. For the purpose of analysis, *years of*

teaching experience was collapsed into four subsets that were chosen based on national data from NCES (Coopersmith, 2009). *Subject taught* was an open-ended question that was collapsed into standard subsets used by NCES (Morton et al., 2008). Most participants indicated they taught English (Literature or Grammar; 32.7%) and lived in urban areas (14.4%).

Table 2

Teacher Characteristics (N = 153)

Variable	**N**	**Percent**
Gender		
Female	111	72.5
Male	42	27.5
Ethnicity		
African American	1	0.7
Caucasian	135	88.2
Hispanic	1	0.7
Multiracial	9	5.9
Native American	1	0.7
Missing	6	3.8
Age		
≤29	33	21.6
30-49	74	48.4
50-54	29	19.0
55-75	17	11.1
Education Level		
Associate Degree/Undergraduate	12	7.8
Bachelor's Degree/Plus Certification	81	52.9
Doctorate	3	2.0
Graduate Work/Masters' Degree	45	29.4
Specialist Degree	2	1.3
Other	3	2.0
Missing	7	4.6
Grade Level Taught		
Elementary	53	34.6
Middle School	26	17.0
High School	74	48.4
Years of Teaching Experience		
0-3	26	17.0
4-9	40	26.1
10-19	43	28.1
20-50	43	28.1
Missing	1	0.7

Subject Taught		
Art/Music/Drama	24	15.7
Bible/Christian Curriculum	4	2.6
Business	2	1.3
Computers/Programming	2	1.3
English/Eng. Lit./Grammar	50	32.7
Languages/Social Studies	9	5.9
Math	6	3.9
Multiple Subjects/Other	7	4.6
Physical Education	8	5.2
Science	20	13.1
Location		
Rural	31	20.3
Suburban	89	58.2
Urban	22	14.4
Other	2	1.3
Missing	9	5.9
Missing	21	13.7

Instrumentation

The instrument developed for this study is entitled, *TeacherSelf-efficacy and Implementing Computers for Implementing Computers for Instruction: An Inquiry into Non-public Schools*. A sample of the instrument is provided in Appendix B. Cronbach's alpha was used to determine the internal consistency reliability estimate since it can be used with responses that are coded on a Likert-type scale (Huck, 2004). The closer the Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale.

The first part of the instrument collects demographic information providing a profile of the convenience sample. Teachers provided responses to items on gender, ethnicity, age, education level, grade-level taught, years of teaching experience, education, subject taught, and location.

The second part of the instrument is the 12-item short version of the *Teacher Sense of Efficacy Scale* (TSES) developed by Tschannen-Moran and Woolfolk-Hoy, (2001). The TSES

assesses' teacher perceptions of general teacher self-efficacy. The TSES contains three subscales for teacher self-efficacy: student engagement, instructional strategies, and classroom management. Tschannen-Moran and Woolfolk-Hoy evaluated the Teacher's Sense of Efficacy scale using Cronbach's alpha and yielded $\alpha = .94$ global reliability estimate. Cronbach's alpha for student engagement yielded $\alpha = .87$, Cronbach's alpha for instructional strategies yielded $\alpha = .91$ reliability estimate, and Cronbach's alpha for classroom management yielded $\alpha = .90$ reliability estimate. These findings suggested that instrument items were internally consistent.

The third part of the instrument is the *34*-item *Teacher's Perceptions of Components Related to Implementing Computers for Instruction* (TPIC) scale. The scale was modified from the 81-item instrument developed by Shiverdecker (2002). The purpose of the original Shiverdecker scale is to determine what perceptions teachers hold related to implementing computers for instruction. The modification included omitting the *efficacy* component of Shiverdecker's TPIC scale and substituting the Teacher Sense of Efficacy Scale (Tschannen-Moran and Woolfolk-Hoy, 2001). Chapter 2 provides detailed discussion about the omission and substitution of items and subscales. Shiverdecker (2002) identifies several components, beyond access to computer application software, that act as barriers and hinder teachers from implementing computers for instruction. Chapter 2 discusses her findings for the components: Administrative Support, Technical Support, Collegial Support, Parent/community support, Training, Time, Access, and Attitude. Shiverdecker used the TPIC instrument to survey 260 junior high and high school teachers with almost equal numbers of males and females and reported a Cronbach's alpha, $\alpha = .94$ global reliability estimate for the instrument. Cronbach's alpha for each of the instrument's subscales ranged from $\alpha = .46$ to $\alpha = .85$.

The *Teacher Self-efficacy and Implementing Computes for Instruction: An Inquiry into Non-public Schools* questionnaire is the final instrument as described to participants in this study. The Cronbach's alpha for the TSES scale in this research study (α=.92) is comparable to results found in the literature Tschannen-Moran and Woolfolk-Hoy, (2001). The Cronbach's alpha for the subscales, for this research study, are α=.82 for student engagement, α=.83 for instructional strategies, and α=.91 for classroom management. The Cronbach's alpha for the TPIC scale in this research study is α=.83. Permission was obtained to use these instruments from each of the original authors.

The instrument contained an open-ended question which allowed survey participants to add comments regarding how students used computers in their classrooms: "Please give examples of how students use computers in your class or in the computer lab as a part of your class". Table 3 reports teacher response to the open-ended question. Of the 153 participants, 145 provided a response to the question. The comments had some recurrent themes that were collapsed into 11 subsets. Subsets were determined by the researcher's teaching experience and by the categories in a NCES report (Morton, et al, 2008).

The majority of teachers assign students to use computers for research (24.8%). Slightly over 12 percent (12.5%) indicated that no computers were used in their school and 5.9% reported that computers were not available in the school. Teachers also indicated that they assigned the computer to students for enrichment or subject-related tutoring (12.4%).

Table 3

Participant Responses to Open-ended Question (N = 153)

Student Use of Computers	N	Percentage
Research/homework	38	24.8
No computer used	19	12.5
Enrichment/subject related/tutoring	19	12.4
Internet related activities/website	14	9.2
Games/educational games/reward	13	8.5
Students go to computer lab	13	8.5
No computers in school/n/a	9	5.9
Keyboarding/typing/computer class	8	5.2
MS Office products	6	3.9
Other	4	2.6
Multiple uses/multiple grade levels	2	1.3
Missing data	8	5.2

Note. Question 6 open-ended question: *Please give examples of how students use computers in your class or in the computer lab as a part of your class.*

Procedures

The executive director of the Georgia Association of Christian Schools (GACS) was contacted to determine if the listing of non-public schools presented on the organization's web site was the most current. The executive director was also asked to support this research through either a letter to member schools or an endorsement in the GACS newsletter. Subsequent to receiving approval to survey participants at the conference, IRB approval to conduct the research was obtained and a copy is provided in Appendix C. The Southeastern Region Teacher's Convention for the American Association of Christian Schools (AACS) was held in Myrtle Beach, South Carolina. There were 316 non-public member schools represented at this regional conference. Participants received the *Teacher Self-efficacy and Implementing Computers for Instruction: An Inquiry into non-public Schools* survey on the first day of the regular conference session. Administration protocol included a cover letter at the beginning of the instrument

informing teachers of the purpose and goals of the study and instructions for completing and returning the survey. Survey instruments were distributed and teachers were allowed approximately 20 minutes for completion. The surveys were either collected by the researcher or deposited in one of two drop boxes located at the exit door of the session meeting room and near the registration tables. After surveys were collected, they were entered into SPSS 17.0.

Data Analysis

The purpose of this study was to examine the perceptions of non-public school teachers in the southern U.S. about teacher self-efficacy and implementing computers for instruction. Descriptive statistics (frequencies, percentages, mean, and standard deviation) yielded answers to research questions one and two. One-way analysis of variance (ANOVA) answered research questions three though six. Pearson product moment correlation answered research question seven.

Demographic data collected included teachers' gender, ethnicity, age, years of teaching experience, education, location, grade level taught and subject taught. The TSES variable measured perceptions of teacher self-efficacy and the TPIC measured perceptions of implementing computers for instruction. Statistics selected to describe the sample for this study were frequencies, percentages, means, and standard deviations (Rosenthal, 2001). These statistics, as were appropriate, were used to describe the demographic variables (questions 1-11 on the instrument) for gender, ethnicity, age, education level, grade level taught, years of teaching experience, subject taught and location.

The 12-item short form of the Teachers' Sense of Efficacy Scale (TSES; Tschannen-Moran and Woolfolk-Hoy, 2001) is part two of the instrument. The TSES short form uses a 9-point Likert-type scale to measure levels of influence with these ranges: *None* (1 point), *Very*

Little, (2-3 points), *Some* (4-5 points), *Quite a Bit* (6-7 points), and *A Great Deal* (8-9 points). The maximum global TSES score is 9 points. The TSES has three subscales or factors: Efficacy in Student Engagement (SE), Efficacy in Instructional Strategies (IS), and Efficacy in Classroom Management (CM) (Tschannen-Moran & Woolfolk-Hoy, 2001). Table 4 presents the TSES subscales and items (as numbered on the questionnaire) for each of the TSES subscales in this study.

Table 4

TSES Subscales and Items

Student Engagement:
Item 13 How much can you do to motivate students who show a low interest in school?
Item 14 How much can you do to get students to believe they can do well in school work?
Item 15 How much can you do to help your students to value learning?
Item 22 How much can you do to assist families in helping their children do well in school?
Instructional Strategies:
Item 16 To what extent can you craft good questions for your students?
Item 20 How much can you use a variety of assessment strategies?
Item 21 To what extent can you provide an alternate explanation, for example when students are confused?
Item 23 How well can you implement alternative strategies in your classroom?
Classroom Management:
Item 12 How much can you do to control disruptive behavior in the classroom?
Item 17 How much can you do to get children to follow classroom rules?
Item 18 How much can you do to calm a student who is disruptive or noisy?
Item 19 How well can you establish a classroom management system with each group of students?

A *frequency* measures the number of times that an observed variable occurs. The observed data is described by the frequency distribution (or single value; Witte, 1985). A more useful description is the *relative frequency* distribution which indicates the part, or fraction, of the total frequency occurring for each variable (Fraenkel & Wallen, 2003). A frequency table presents the frequencies and percentages of the responses for each category of variables for this study (Gall et al., 1996). Data from a frequency table can be summarized even further by measuring how the data are centered (central tendency). The three measures of central tendency

are the mode, median, and mean. Of these three, the mean is considered the best measure of central tendency (Gall et al., 1996). The arithmetic mean is calculated by summing all case values, then dividing by the number of cases (Gall et al., 1996). The unweighted mean is preferred in some situations; such as if the sample has a disproportionate number of identified observations, for example, if there are more observations for females than males (Wuensch, (2010). The purpose is to accurately generalize the findings from the sample to predictions about the general population.

The score for teacher self-efficacy begins by calculating the unweighted means of the TSES subscale items (Tschannen-Moran & Woolfolk-Hoy, 2001). The average mean score (using student engagement, instructional strategies and classroom management scores) is then calculated to determine the participants' global sense of efficacy (total TSES score).

The standard deviation is a single number that represents the average amount an observed score deviates from the mean (Fraenkel & Wallen, 2003; Gall et al., 1996; Witte, 1985). A primary measure of variability, the standard deviation is considered a powerful, stable, and useful statistic (Gall et al., 1996; Nardi, 2003; Rosenthal, 2001) because it gives an idea of how similar or dissimilar a population is (Bernard, 2000). The standard deviation on its own communicates little information about the behavior of a set of scores but provides a good description of how the sample scored on a measure when paired with the mean (Gall et al., 1996).

The subscales for describing teacher's perceptions of implementing computers for instruction is based on Shiverdecker's (2002) research and included: administrative support, technical support, collegial support, parent/community support, training, time, teacher efficacy, access, and attitude toward computers for instruction. Data analysis was conducted using the

Statistical Package for Social Sciences (SPSS) version 17. Participants were allowed to enter any text for the questions regarding age, ethnicity, years of teaching experience, and how students use computers in the classroom. Results were then collapsed into new subsets in order to perform statistical procedures. The categories for the continuous variables *age* and y*ears of teaching experience* were coded into the categories (subsets) as shown in Table 2. The categorical variables *ethnicity*, *education level*, *grade level taught*, *subjects taught* and *location* were coded as shown in Table 2.

Analysis of variance (ANOVA) was used to answer questions three through six which ask if statistically significant differences exist between teacher self-efficacy by age group; teacher self-efficacy by grade level taught; perceptions about implementing computers for instruction by age group; and perceptions about implementing computers for instruction by grade level taught. ANOVA is the appropriate statistic to use when testing for differences between mean scores of two or more groups and when the sample is tested only once (Salkind, 2000). ANOVA is employed to determine if a dependent variable's means differ significantly among groups (Salkind, 2000). ANOVA can reveal the possibility of variability between sample means being solely due to sampling error or true differences between population means and sampling error (Witte, 1985). ANOVA tests the null hypothesis that the mean of all the groups being compared are equal (Bernard, 2000). The *p*-value reveals significance or no significance of effects. For this study, a significance (alpha) level of .05 has been selected, which means the probability of rejection of the null hypothesis occurs no more than five percent of the time when it is unjustified (Type I error; Gall et al., 1996; Witte, 1985). If the *p*-value is below the critical value (usually .05), the null hypothesis is rejected, and significant relationships are determined. On the other hand, if the *p*-value is larger than the critical value, the null hypothesis is accepted

and no significant relationship is determined (Gall et al., 1996; Witte, 1985). If the effects are found to be significant using the ANOVA statistic, then the mean difference is more than would be expected by chance alone. In terms of this research, the result of the ANOVA statistic would result in demographic variables being statistically significant and related to teacher self-efficacy and/or statistically significant or related to perceptions of implementing computers for instruction. Once we reject the null hypothesis, the question still remains which of the means (among our groups tested) differ and by how much. The answer to this question is resolved by conducting a *post hoc* (or after the event) test.

The one-way ANOVA method was chosen for this study because it is appropriate when there is one independent variable and one dependent variable (Sirkin, 2006). In a one-way ANOVA, each respondent must have scores on two variables: a factor and a dependent variable. The factor divides participants into two or more groups (e.g., age), and the dependent variable divides individuals on some quantitative measure (teacher self-efficacy). The ANOVA *F* statistic evaluates whether the group means on the dependent variable differ significantly from each other (Salkind, 2007). The *F* value computed from the ANOVA *F* statistic is the ratio of between-groups variance to within-groups variance (Gall et al., 1996). If the *F* ratio is high enough (statistically significant), it means that the independent variable or factor had an effect on the dependent variable (Witte, 1985). When only two groups are compared, the *F* ratio is enough to inform the researcher whether significant differences exist. However, when there are more than two groups being evaluated and significance is noted, the *F* test alone will not tell us which means are different (Fraenkel & Wallen, 2003). Further analysis must be conducted. Follow-up tests are conducted to compare pairs of means. This comparison of multiple means to determine where differences exist is known as post hoc analysis (Fraenkel & Wallen, 2003, Gall

et al., 1996). The multiple comparison process adjusts the Type I error risk so that it affects the whole series of comparisons instead of each individual one. If, as in the case of this study, the ANOVA yields an *F* value that is not significant, post hoc analyses are not conducted (Gall et al., 1996).

In cases where the *p*-value is below the critical value and a significant relationship is determined, it is an assumption of ANOVA that the sample means and variances of the populations from which different samples are drawn are equal (Witte, 1995). Homogeneity of variance can be tested using the Levene statistic. If it is determined that differences exist among the means, particular post hoc comparisons help to determine which means differ (Witte, 1995). In cases where the ANOVA F ratio indicated statistical significance, a post hoc test was conducted for this study.

A Pearson product-moment correlation was conducted to determine if a statistically significant relationship existed between the teachers' self-efficacy and their perceptions about implementing computers for instruction. Correlation statistics allow the comparison of two or more quantitative variables (Fraenkel & Wallen, 2003). A statistic known as a correlation coefficient is calculated to determine the magnitude and direction of the relationship between two variables (Gall et al., 1996; Fraenkel & Wallen, 2003). The value of the correlation coefficient determines the magnitude or degree of the relationship and may range from +1.00 to -1.00 (Salkind, 2007; Witte, 1995). The sign of the coefficient (positive or negative) determines the direction of the relationship (Witte, 1995).

The correlation coefficient selected for this study is the *Pearson product-moment correlation coefficient,* or Pearson's *r* (Salkind, 2007). This coefficient is the most frequently used and most stable correlation statistic used in the social sciences (Fraenkel & Wallen, 2003;

Gall et al., 1996). Pearson's *r* measures the magnitude of the linear relationship between two interval/ratio level variables (Witte, 1995). To determine if a relationship that is discovered is statistically significant (did not occur by chance). Pearson's *r* uses a probability criterion of .05. If the probability discovered is equal to or less than .05, the relationship between the variables is determined to be statistically significant (Witte, 1996). It is important to note that identification of a relationship between variables does not imply causation (Gall et al., 1996, Fraenkel & Wallen, 2003).

The data analysis for the research questions in this study is summarized in Table 5. The table includes the statistical analyses used for each research objective. The independent and dependent variable for each research objective is also included.

Table 5

Data Analysis for Research Questions

Research Questions	Independent Variables	Dependant Variables	Analysis
1. What is the perceived teacher self-efficacy of non-public school teachers in the southern U.S.?		Teacher Sense of Efficacy <u>Subscales</u> • Student Engagement • Instruction-al Strategies • Classroom Management	Descriptive Statistics (frequencies, percentages, means, standard deviation) Descriptive Statistics (frequencies, percentages, means, standard deviation)
2. What are the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction?		Implementing Computers for Instruction <u>Subscales</u> • Administra-tive Support • Technical Support • Collegial Support • Parent and Community Support • Training • Time • Access • Attitude	Descriptive Statistics (frequencies, percentages, means, standard deviation)
3. Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on age?	Age (Categorical) • ≤29 • 30-49 • 50-54	Teacher Sense of Efficacy	Analysis of Variance (ANOVA)

	• 55-75		
4. Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on age	Age (Categorical) • ≤29 • 30-49 • 50-54 • 55-75	Implementing Computers for Instruction	Analysis of Variance (ANOVA)
5. Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on grade level taught?	Grade Level Taught (Categorical) • Elementary • Middle School • High School	Teacher Sense of Efficacy	Analysis of Variance (ANOVA)
6. Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on grade level taught?	Grade Level Taught (Categorical) • Elementary • Middle School • High School	Implementing Computers for Instruction	Analysis of Variance (ANOVA)
7. Is there a statistically significant relationship between perceived teacher self-efficacy (TSES) of non-public school teachers in the southern U.S. and teachers' perceptions about implementing computers for instruction (TPIC)?	Implementing Computers for Instruction*	Teacher Sense of Efficacy*	Pearson product-moment correlation coefficient,

*There is no distinction of independent and dependent variables due to the use of correlation.

CHAPTER 4

RESULTS

This chapter describes the findings obtained from the survey instruments, *Teacher Sense of Efficacy Scale* (TSES) and *Teacher's Perceptions of Components Related to Implementing Computers for Instruction* (TPIC) scale, completed by the participants. The purpose of this study was to examine the perceptions of non-public school teachers in the southern U.S. about teacher self-efficacy and implementing computers for instruction. Findings are organized by research question; therefore, this chapter begins with a restatement of the research questions, followed by presentation of the findings for each research question posed.

Research Questions

To achieve the purpose of this study, the following research questions were examined:

1. What is the perceived teacher self-efficacy of non-public school teachers in the southern U.S.?
2. What are the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction?
3. Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on age?
4. Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on age?
5. Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on grade level taught?

6. Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on grade level taught?
7. Is there a statistically significant relationship between perceived teacher self-efficacy (TSES) of non-public school teachers in the southern U.S. and teachers' perceptions about implementing computers for instruction (TPIC)?

Findings for Research Questions

Research Question 1

What is the perceived teacher self-efficacy of non-public school teachers in the southern U.S.?

The *Teachers' Sense of Efficacy Scale* (TSES; Tschannen-Moran & Woolfolk Hoy, 2001) was the survey instrument used to determine the level of teacher self-efficacy among non-public school teachers in the southern U.S. (see Chapter 3 for a description of the TSES). The results for research question 1 are reported in Table 6. To determine the score for the TSES, the mean of the subscales and the mean for the total TSES were computed (Tschannen-Moran & Woolfolk Hoy, 2001). The mean (global) TSES score was 7.22 out of a possible score of 9.0. Tschannen-Moran and Woolfolk Hoy, the creators of the TSES, have established that scores in the 6 to 7 point range indicate "quite a bit" of efficacy.

Table 6
TSES Mean Score (with subscales, N = 153)

Teacher's Sense of Efficacy Scale (TSES)	M	SD	No of Items
Efficacy for Student Engagement	6.89	1.28	4
Efficacy for Instructional Strategies	7.01	1.15	4
Efficacy for Classroom Management	7.75	1.13	4
Total TSES	7.22	1.01	12

Research Question 2

What are the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction?

Teachers' Perceptions of Components Related to Implementing Computers for Instruction (TPIC; Shiverdecker, 2002) was chosen as the measurement to determine what perceptions teachers held about implementing computers for instruction (see Chapter 3 for a description of the TPIC). Shiverdecker indicates that a single score is used to determine if the participants have positive, neutral, or negative perceptions about a component. Means (or scores) below three indicate a negative perception, means (or scores) above three indicate a positive perception, and means (or scores) at or near three indicate a neutral perception. Shiverdecker indicated that a positive attitude toward the use of computers is an important factor in the implementation of computers as instructional tools. Results for research question 2 are presented in Table 7. The scores for the participants in the sample were positive for Parent and Community Support ($M = 3.76$), Access to computers ($M = 3.72$) and Attitude toward computers ($M = 3.47$).

Table 7

TPIC means and scores (with subscales, N = 153)

Scale Components	M	SD	N
Parent and Community Support	3.76	0.61	153
Access	3.72	0.86	153
Attitude	3.47	0.55	153
Administrative Support	3.42	0.95	153
Collegial Support	3.36	0.90	153
Time	3.15	0.46	153
Training	3.01	0.75	153
Technical Support	2.78	0.87	153
Total TPIC	3.33	0.48	153

Note. TPIC scale component means are listed in descending order.

Research Question 3

Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on age?

A one-way analysis of variance (ANOVA) was conducted to determine if there was a statistically significant difference for teacher self-efficacy mean scores based on teachers' age group. The variable, teachers' age group, included four categories: age's ≤ 29, 30-49, 50-54, and 55-75. Table 8 reports the mean scores for each category.

Table 8

Descriptive Statistics for TSES mean score by Teachers' Age Group (N = 153)

Age Group	M	SD	N
1.00 (Ages ≤29)	6.90	0.97	33
2.00 (Ages 30-49)	7.23	1.12	74
3.00 (Ages 50-54)	7.41	0.81	29
4.00 (Ages 55-75)	7.44	0.86	17

Based on the ANOVA findings in Table 9 there was no statistically significant difference for TSES mean scores based on age teachers' group *(F*(3, 149) = 1.73, *p* = .16) for participants in this study.

Table 9

One-way ANOVA: TSES and Teachers' Age Group (N = 153)

	SS	df	MS	*F*	Sig.
Between Groups	5.25	3	1.75	1.73	.16
Within Groups	150.91	149	1.01		
Total	156.16	152			

Research Question 4

Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on age?

A one-way analysis of variance was conducted to determine if there was a statistically significant difference for teachers' perceptions about implementing computers for instruction (i.e., mean score on the TPIC) based on teachers' age group. The variable teachers' age group included four categories: ≤ 29, 30-49, 50-54, and 55-75. Table 10 reports the descriptive statistics for TPIC by teachers' age group.

Table 10

Descriptive statistics for TPIC mean score by Teachers' Age Group (N = 153)

Age Group	M	SD	N
1.00 (Ages ≤29)	3.43	0.48	33
2.00 (Ages 30-49)	3.30	0.46	74
3.00 (Ages 50-54)	3.37	0.51	29
4.00 (Ages 55-75)	3.22	0.55	17

Based on the ANOVA findings in Table 11 there was no statistically significant difference between TPIC group means based on teachers' age group($F(3, 149) = .0.94$, $p = .42$).

Table 11

One-way ANOVA: TPIC by Teachers' Age Group (N = 153)

	SS	df	MS	F	Sig.
Between Groups	0.66	3	0.22	0.94	.42
Within Groups	34.65	149	0.23		
Total	35.30	152			

Research Question 5

Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on grade level taught?

A one-way analysis of variance was conducted to determine if there was a statistically significant difference for teacher self-efficacy mean score based on grade level taught. Table 12

reports the descriptive statistics for the TSES by grade level taught. The variable grade level taught included three categories: elementary school, middle school, and high school.

Table 12

Descriptives statistics for TSES mean score by Grade Level Taught (N = 153)

Grade level taught	M	SD	N
Elementary School	7.61	0.95	53
Middle School	7.05	0.88	26
High School	6.99	1.03	74

Based on the ANOVA findings in table 13, the main effect yielded an F ratio of $F(2, 150) = 6.77$, $p < .01$, indicating that there was a statistically significant difference for teacher self-efficacy based on grade level taught (elementary, middle and high school) for the participants in this study.

Table 13

One-way ANOVA: TSES by Grade Level Taught (N =153)

	SS	df	MS	*F*	Sig.
Between Groups	12.92	2	6.46	6.77	>.01
Within Groups	143.24	150	0.96		
Total	156.16	152			

Since significant effects were found, the group means were examined in order to determine where differences occurred. Games-Howell post hoc tests were conducted to compare the mean difference by grade level between each condition (elementary, middle and high school teachers). The results indicated that the TSES mean score for the elementary school teachers (M = 7.61, SD = 0.95) differs significantly from middle school teachers (M = 7.05, SD = 0.88) and high school teachers (M = 6.99, SD = 1.03). There was not a statistically significant difference

between the TSES of middle school teachers (M = 7.05, SD = 0.88) and high school teachers (M = 6.99, SD = 1.03). Table 14 presents the results of the post hoc comparisons.

Table 14

Games-Howell post hoc comparisons: TSES mean score by Grade Level Taught (N= 153)

Grade level taught	Grade level taught (Comparison)	Mean Difference	Sig.
Elementary School	Middle School	0.57*	.03
Elementary School	High School	0.62*	.01
Middle School	High School	0.06	.96

Note. *p <.05.

Research Question 6

Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on grade level taught?

A one-way analysis of variance was conducted to determine if there was a statistically significant difference between teacher's perceptions about implementing computers for instruction based on the grade level they taught. The variable grade level taught included three categories: elementary school, middle school, and high school. Table 15 presents the descriptive statistics for the TPIC group means by grade level taught.

Table 15

Descriptive statistics for TPIC means score by Grade Level Taught)N= 153)

	Mean	SD	N
Elementary School	3.25	0.45	53
Middle School	3.35	0.46	26
High School	3.39	0.51	74

Based on the ANOVA results in Table 16, $F(2, 150) = 1.36$, $p = .0.26$, there was no statistically significant difference between TPIC group means based on grade level taught for participants in this study.

Table 16

One-way ANOVA: TPIC by Grade Level Taught (N = 153)

	SS	df	MS	F	Sig.
Between Groups	0.63	2	0.31	1.36	.26
Within Groups	34.68	150	0.23		
Total	35.30	152			

Research Question 7

Is there a statistically significant relationship between perceived teacher self-efficacy (TSES) of non-public school teachers in the southern U.S. and teachers' perceptions about implementing computers for instruction (TPIC)?

Data was collected from 153 non-public school teachers regarding their perceptions for implementing computers for instruction (M=3.33, SD= 0.48) and their self-reported level of teacher self-efficacy (M=7.23, SD=1.01). A Pearson's r data analysis revealed a small but positive correlation at the .05 level (r = 0.17). Teachers who reported a higher score for teacher self-efficacy also reported more positive perceptions (score) toward implementing computers for instruction.

Summary

The results of this study revealed that teachers in this sample reported "quite a bit" of teacher self-efficacy (TSES). However, there was no statistically significant difference in the TSES scores based on teacher's age group. Results of this study also indicate that teachers generally had a positive perception about implementing computers for instruction (TPIC).

However, there was no statistically significant difference of teachers' perceptions for implementing computers for instruction (TPIC) based on a teachers' age group. In addition, there was no statistically significant difference for teachers' perceptions about implementing computers for instruction (TPIC) based on the grade level they taught.

There was a statistically significant difference for a teacher's efficacy score (TSES) based on the grade level that they taught. Teacher self-efficacy scores (TSES) for elementary school participants differed significantly from middle school participants in this study. In addition, the teacher self-efficacy scores (TSES) between the elementary school participants differed significantly from the high school participants. There was also a small, yet statistically significant and positive relationship between the variables *Teachers Sense of Efficacy* (TSES) and *Teachers Perceptions of Components Related to Implementing Computers for Instruction* (TPIC) for non-public school teachers in this study.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter begins with a restatement of the purpose and research questions for this study followed by a summary of the findings. A discussion of the major findings is presented, followed by conclusions drawn from the findings. The chapter ends with recommendations for practice and further research that address teacher self-efficacy and implementing computers for instruction.

Purpose of the Study

The purpose of this study was to examine the perceptions of non-public school teachers in the southern U.S. about teacher self-efficacy and implementing computers for instruction.

Although access is an indicator of computer use, the school environment, racial make-up, or other factors can affect a teachers' attitude toward implementing computers for instruction. Riggs and Enochs (1990) demonstrated that when teachers receive appropriate professional development, their self-efficacy (for computers) is increased and they are more likely to implement computers for instruction. Certain school-related environmental factors can either promote computer implementation into general instruction or act as a barrier to implementing computers into general instruction in education (Abdal-Haqq, 1995; Brinkerhoff, 2006; Chen, 2008; Ertmer, 2010). The barriers can be divided into categories; barriers related to technical and equipment issues and those barriers related to school type and environment (Keengwe, Onchwari & Wachira, 2008). School environmental factors include organizational culture, beliefs about teaching and technology, and openness to change (Keengwe et al., 2008).

Research Questions

To achieve the purpose of this study, the following research questions were examined:

1. What is the perceived teacher self-efficacy of non-public school teachers in the southern U.S.?
2. What are the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction?
3. Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on age?
4. Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on age
5. Is there a statistically significant difference in the perceived teacher self-efficacy of non-public school teachers in the southern U.S., based on grade level taught?
6. Is there a statistically significant difference in the perceptions of non-public school teachers in the southern U.S. about implementing computers for instruction, based on grade level taught?
7. Is there a statistically significant relationship between perceived teacher self-efficacy (TSES) of non-public school teachers in the southern U.S. and teachers' perceptions about implementing computers for instruction (TPIC)?

Summary of the Findings

Teachers who work at non-public schools listed on the roster of the American Association of Christian Schools (AACS) and who attended the Southeastern Regional Conference held in September 2006 in Myrtle Beach, South Carolina were the convenience sample for this study. The questionnaire, *Teacher self-efficacy and Implementing Computers for*

Instruction: An Inquiry into Non-Public Schools, was used to collect data on 153 participants. The convenience sample had more females (72.5%) than males (27.5%) and also included an overwhelming number of Caucasian participants (88.2%). There were thirty-three participants (21.6%) age 29 or younger. The largest number of participants were ages 30-49 (48.4%) and the mean age was just over 41 (M=41.88, SD=11.15). The largest number of the teachers in the sample taught in high school (48.4%). The majority of the participants in the study had at least a Bachelor's degree (52.9%). Only three teachers in the sample reported no teaching experience (0.02%) and the mean years of teaching experience (M=13.2, SD=9.48) was slightly over 13 years. Half of the participants indicated that they taught English Literature or Grammar (32.7%) and over half (58.2%) lived in suburban areas.

The results of the study indicate that teachers in non-public schools in the southern U.S. have high self-efficacy levels. Teachers scored an average of 7.22 on a 9-point Likert-type scale for teacher self-efficacy. The study also revealed that non-public school teachers in the southern U.S. have neutral (sores around 3) perceptions regarding implementing computers for instruction as reported on the TPIC (total score 3.33 out of a possible 5.0). Teachers scored 3.76, 3.72, and 3.47 on the parent/community support, access, and attitude toward computers subscales indicating perceptions about implementing computers for instruction in these areas was positive (scores 3.5 or above). Teachers scored 3.42, 3.36, 3.15, and 3.01 on the administrative support, collegial support, time, and training components indicating that their perceptions were neutral about implementing computers for instruction in these areas. Teachers scored 2.78 on the technical support component indicating that their perceptions were negative (scores below 3) about implementing computers for instruction in this area.

An ANOVA statistic found no significant difference in perceptions of teacher self-efficacy (TSES) based on a teacher's age group. An ANOVA statistic also found no significant difference in perceptions of implementing computers for instruction (TPIC) based on a teachers' age group. There was a significant difference in teacher self-efficacy based on grade level taught. The results of the study indicate that the TSES (teacher self-efficacy) group mean for elementary teachers was significantly different from the teacher self-efficacy group mean of middle school teachers. In addition, the TSES (teacher self-efficacy) group mean for elementary teachers was significantly different from that of high school teachers. There was no statistically significant difference between the TSES score (teacher self-efficacy) for middle school participants group mean compared to the high school participants' group mean.

A correlation will report the strength of the relationship between teacher self-efficacy (TSES) and perceptions about implementing computers for instruction (TSES). Ultimately, if a relationship exists, a strategy to overcome barriers to implementing computers for instruction by increasing teacher self-efficacy training would benefit professional development programs. The correlation coefficient indicated a statistically significant relationship between the TSES and the TSES (r= .17, N=153). This result is reflective of past literature (Pajares, 2001; Albion, 2002) which indicates teacher self-efficacy theory is useful when training teachers to implement computers for instruction.

Participants' responses to the open-ended question, *please give examples of how students use computers in your class or in the computer lab as a part of your class*, provided a range of answers. The teachers mainly assigned students to use computers for research (24.8%). Unfortunately, some teachers in this study reported not having computers available for use in their class (9; 5.9%) or simply did not use computers in their instruction (12.5%).

Discussion

Results of this study indicated that the level of teacher self-efficacy for non-public school teachers in the southern U.S. who implement computers into their instruction can be interpreted as relatively high. The mean (global) TSES score for these teachers was 7.23 out of a possible score of 9.0. Tschannen-Moran and Woolfolk-Hoy (2001) have established that scores in the 6.0 to 7.0 point range indicate "quite a bit" of efficacy, or as I interpret it, relatively high teacher self-efficacy. Looking at the definition of teacher self-efficacy from Tschannen-Moran et al. (1998) adopted for this study, this finding suggests that these teachers believe in their ability to organize and execute courses of action required to successfully accomplish a specific teaching task in a particular context. A relatively high level of teacher self-efficacy means that these teachers likely believe they can accomplish many tasks that are required of them, including implementing computers into their instruction. This type of information is useful in planning and executing professional development opportunities for teachers who work in non-public school settings. Administrators, trainers, and professional developers working in the non-public school sector may want to consider using the TSES scale to assess teacher self-efficacy as it relates to implementing computers for instruction. Results of this study also indicate that these teachers generally had a positive perception about their ability to overcome barriers to implementing computers for instruction. In this study, participants had positive perceptions for their ability to access computers, had parent/community support for their use of computers in the classroom, and generally had a positive attitude about implementing computers into their instruction. The lowest scores (negative to neutral) were in the areas of training and technical support, respectively.

Responses to the individual items for the component, *access,* indicate that this group of non-public school teachers has access to computers for instructional use. Many participants (41.2%) agreed that they had access to additional technologies such as digital cameras, scanners, printers, and laser disk players (Item 44). Some of the participants (19.0 %) did not have such access or were neutral to this question (13.7 %). A large percentage of the participants (44.4%) agreed that they could access the Internet from their classroom (Item 45). A small percentage of participants (11.1%) did not have Internet access. These results indicate the areas on which administrators should likely focus when making future technology purchases. Findings revealed areas of technology needs for teachers in this sample. Some participants apparently did not have access to a basic printer or the Internet. Lack of access to this technology can be perceived as a barrier to implementing computers for instruction (Abdal-Haqq, 1995; Brinkerhoff; 2006; Chen, 2008; Ertmer, 2010).

Participants overwhelmingly disagreed (61.4%) with the idea that parents in their community are opposed to the use of computers for instruction (Item 34). Some participants (25.5 %) were neutral to the statement, but no participants (0%) agreed with the statement. This result is indicative of a community that is supportive of teachers implementing computers for instruction. Just over half of the participants (56.2%) agreed that the community was not dismayed by the amount of money the school spent on computers (Item 35). Administrators and community leaders should consider appealing to the businesses in the community to assist with solving technology concerns by serving on technology planning committees and volunteering in the schools. A supportive community may also provide training assistance in the form of technology experts and professionals with whom teachers may consult. One of the sources of efficacy discussed in the literature was vicarious experience (Bandura, 1997). As teachers

observe community and business leaders model computer implementation connected to real-life applications, they will be able to increase their own efficacy for such use (Bandura, 1997; Tschannen-Moran et al., 1998).

Participants in this study were neutral (3.01) for the item addressing formal training (Item 36). The majority of participants (58.8%) held a perception that they had received formal training related to using computers for instruction, but over a third of the participants (36.6%) perceived they did not receive formal training and 4.6% were neutral to the question. It is not surprising; therefore, that participants did not believe they received formal training that related to using computers for instruction. Administrators and trainers can view these findings as a recommendation for increased assessment of training as well as evaluation of teacher perceptions. More than one-third of the participants (37.9%) agreed that training had influenced the degree to which they use computers for instruction (Item 38). Almost one-third of the participants (27.5 %) indicated that training had not influenced the degree to which they used computers for instruction. One-third of the participants (34.6 %) were neutral regarding this item. The participants split on their need for training that addressed classroom management issues related to using computers as instructional tools (Item 39). Slightly over one-third of the participants (38.6%) thought that they did need training that addressed the issue of classroom management. Slightly less than one-third (28.1%) thought that they did need such training, and again, slightly over one-third third (33.3%) were neutral regarding this item. It appears from the results of the study that non-public school teachers in the southern U.S. have not benefited substantially from formal training in the area of implementing computers for instruction. Administrators should consider formalizing training plans and clearly communicate these plans to their staff. An NEA report (2008) revealed that teachers are more satisfied when they receive

training that increases knowledge of technology and its impact on their own jobs. Findings of this study suggest that these participants may have similar beliefs.

Findings indicated that there was no statistically significant difference between teacher self-efficacy based on age. There was also no statistically significant difference between perceptions about implementing computers for instruction (TPIC) based on age. These results suggest that the age group of these teachers did not affect their perceived teacher self-efficacy and their perceptions about implementing computers for instruction were also not affected by their age. In recent research Tschannen-Moran and Woolfolk-Hoy (2007) have suggested that demographic variables such as age, race, and gender are generally not related to the self-efficacy beliefs of teachers and likewise, age clearly was not an influencing factor for participants in this study. It appears that for non-public school teachers in the southern U.S. age is not significantly related to their perceived level of self-efficacy. The high efficacy scores for these non-public school teachers may decrease negative perceptions historically associated with age and technology. Goddard, Hoy, and Woolfolk-Hoy (2000) reported that teachers with high self-efficacy can overcome negative external influences, and temporary setbacks or failures do not affect them. Furthermore, the participants in this study generally had positive attitudes about computers. The majority of the participants (82.3%) agreed that computers can be effectively implemented as instructional tools (Item 48). The majority of participants (92.2%) agreed that when used effectively, the Internet and other electronic media are good resources for information (Item 49). Also, over half of the participants (66.0 %) did not feel anxious when they were using the computers for instruction. Obviously, the participants in this study had positive perceptions and it appears that their age did not prevent them from having positive computer experiences, which may play a part in their generally high self-efficacy. Bandura's (1986) model of causation

(see Appendix E) gives insight that environment and personal beliefs have a mutual effect on one another, and in this case, the effect is positive.

The differences between the teachers' perceptions about implementing computers for instruction (TPIC) and the grade level they taught were examined, and no statistically significant difference was found. Keengwe et al. (2008) reported that the major barriers identified by teachers in the use and implementation of computers in the classroom include lack of computers, lack of time, technical problems, attitude, poor administrative support, and poor training (Keengwe et al., 2008). However, the results of this study indicate that teachers' perceptions of these barriers did not differ based on the grade level taught. For the participants in this sample it appears that grade level taught does not affect their perceptions about implementing computers for instruction (i.e. in areas such as access, administrative support or training).

There was a statistically significant difference between teacher's sense of efficacy (TSES) based on the grade level taught. The elementary school teacher participants' group mean differed significantly from the group means of the middle school and high school teacher participants. Likewise, the teacher self-efficacy group mean for the elementary school teacher participants was the highest. There was no statistically significant difference between the teacher self-efficacy for the high school and middle school teacher participants. These findings are supported by Cowley and Meehan (2001) who indicated that elementary teachers had a higher level of internal efficacy than did high school teachers. These findings are very encouraging for elementary school stakeholders due to the relationship between teacher self-efficacy and positive teacher behavior. More specifically, Ross (1994) examined teacher self-efficacy and found six relationships between teacher self-efficacy and teacher behavior. The higher a teacher's efficacy, the more likely he or she is to (a) discover and conduct new teaching techniques, (b)

use developmental classroom practices, (c) consider and implement strategies for students with lower achievement, (d) enhance students' efficacy and encourage them as capable learners, (e) set high goals, and (f) exhibit persistence in the face of failure. It also seems that elementary teachers have higher teacher self-efficacy than their middle school and high school counterparts for non-public school teachers in the sample. Examining the six areas Ross (1994) mentions we see the connection between discovering new teaching techniques and developmental practices and teacher self efficacy. The need to develop new techniques is inherent in the pedagogy of elementary teachers who are expected to use more developmental strategies for younger age ranges. It appears that if teacher efficacy is increased for elementary teachers it will also increase their classroom effectiveness. While teachers at all grade levels deal with underachieving students, it is especially noteworthy that high school teachers expect their students to be self-directed learners. It is likely that the reason for the score differences, in this study, is that the classroom environment and the teacher expectations at the elementary and high school level differ significantly.

Administrators and trainers can use the findings of this study to formulate professional development plans that specifically address the classroom environment for teachers at the middle and high school grade levels and to develop ways to improve classroom instruction and teaching behaviors at these grade levels. For example, professional development exhibiting (modeling) methods of implementing computers for instruction that help teachers promote self-direction for students. Modeling is an example of the type of vicarious experience (watching someone do the task) that can promote positive efficacy judgments (see Figure 1). Results of this study counter some of the research on the variables teacher self-efficacy and grade level taught. Tschannen-Moran and Woolfolk-Hoy (2007) reported that school level, preschool through high school, was

significantly related to teacher self-efficacy for new teachers, but not for experienced teachers. However, the majority of the participants in this study were experienced teachers; yet a statistically significant difference was found with regard to teachers at the elementary level, thus new information is added to the literature.

A Pearson's *r* correlation revealed a relationship between teacher self-efficacy (TSES) and implementing computers for instruction (TPIC). The variables teachers' perceived sense of efficacy (TSES) and teachers' perception about implementing computers for instruction (TPIC) had a statistically significant and positive relationship at the .05 level ($r = .168$, $N = 153$). However, because the relationship is a weak one, overstatement of the relationship is not advisable, but the results from this sample are consistent with other research (Albion, 1999; Ertmer, 2010; Van Braaka & Valckea, 2008). The results from this study indicate that there is a relationship between non-public school teachers' self-efficacy and their perceptions about implementing computers for instruction. Few have researched this topic and provided evidence of the relationship, so these results shed light on environmental factors (organizational culture, beliefs about teaching and technology, and openness to change; Keengwe et al., 2008) and the part they play in forming positive perceptions and beliefs; specifically in the area of teacher self-efficacy. This research study confirms what Keengwe et al., other researchers (Albion, 1999; Compeau & Higgins, 1995; Lumpe & Chambers, 2001; Marcinkiewicz, 1994; Means, 2010; Vannatta & Fordham, 2004) have reported and will help educators better understand the links between teachers' perceived self-efficacy and implementing computers for instruction. The more we understand, the more likely we are to develop effective professional development opportunities that will help teachers overcome barriers to implementing computers in their instruction.

This study included an open-ended question which allowed survey participants to add comments regarding how students used computers in their classrooms. Participants' responded to the question, *please give examples of how students use computers in your class or in the computer lab as a part of your class*. Slightly over one fourth of these teachers (24.8%) reported that they assign students to use computers for research. However, some teachers (12.5%) indicated that computers were not used for their class and even fewer teachers (5.9%) reported that computers were not available in their school (5.9%). The majority of teachers in this study (76.5%) implemented computers for instruction by assigning computers for student use or assigning students to the lab (see Table 3). Participants' scores on the global TPIC (3.46) indicated that they had a positive attitude toward implementing computers for instruction. Teachers had concerns about letting students work on the Internet (Item 52) with slightly over one third of the teachers (35.2%) worried about student use of the Internet; but the majority (52.9%) did not worry about students' Internet use. The majority of teachers felt that when their students were working on computers (Item 54) they were still receiving valuable teaching and instruction (56.2%). A little more than one third of the teachers were neutral (35.9%) and only a few of the teachers did not feel students were learning on computers (8.0%).

The results of this study indicate that schools still exist where teachers do not have the capability to share Internet resources with the class. Teachers may have a computer, often just one, but they may not have a projector or the connections necessary for classroom computer use-thus are limited in their ability to implement computers for instruction. Private school associations (and public school districts) should make a concerted effort to adopt policies that assure member schools provide basic desktop, projector and Internet classroom sharing capabilities for all teachers in all classes (Goktas et al. 2009).

Teacher candidates are more likely to develop computer self-efficacy when they see sufficient and appropriate examples of computer use in their practice schools (Albion, 2001). In addition, teachers need adequate training to fully integrate computers into the classroom. Teachers in this study scored neutral on technical training and; therefore, may not have received training that addresses their individual needs.

The results of this study also indicate that teachers scored neutral to slightly positive (3.42) on the administrative support component (Items 24-26). Teachers need a supportive environment in order to promote integration of computers into the classroom (Hixon & Buckenmeyer, 2009). In the 2002 NCES report, teachers in private schools did not show much of an advantage in their principal's leadership on instruction; teachers in both public and non-public settings reported that discussions with principals regarding instructional matters did not occur. When school principals do not provide leadership to teachers, the absence may prove to be a barrier to a teacher's effective use of technology (NCES, 2000b). Teachers also need support in the form of a technology specialist or coach that will assist them when technical problems occur. The NEA (2008) reports that in the public schools surveyed, teacher access to instructional software and technical support was not adequate. Results for the non-public school teachers in this study indicate that they may have similar perceptions about access to instructional software and technical support.

Conclusions

The following conclusions were drawn based on the findings of this study:

The participants who were non-public school teachers from the southern region had "quite a bit" of teacher self-efficacy as self-reported on the TSES. Because teachers in this study have more positive perceptions of their ability, it will likely result in significantly increased

positive teacher behaviors in the classroom. A teacher's age group was not found to be related to their perceptions of teacher self-efficacy (TSES). So it appears that a teacher's age group was not the reason teachers would, or would not, have confidence in their abilities.

Teachers' sense of efficacy (TSES) is significantly related to the grade level they teach. The teachers in this study scored the lowest on the TSES student engagement subscale. Student engagement reflects a person's confidence that he or she can help students become and remain involved, invested, or motivated for learning (Tschannen-Moran & Woolfolk-Hoy, 2001). The majority of teachers in this study were high school teachers, and more than likely their classroom environment is not focused on increasing student engagement; but rather increasing self-directed learners (Doyle & Smith, 1997).

Teachers generally had a positive perception about their ability to implement computers for instruction (TPIC). Furthermore, teachers' perceptions about implementing computers for instruction (TPIC) were not related to grade level taught. Since technology has become pervasive in our society, the teachers in this study likely believe implementing computers for instruction is necessary at all grade levels.

In general, teachers felt that they could implement computers if they had appropriate support and training. Teachers answered neutral to Items 29 (41.6%) and 30 (39.2%) which could indicate that they do not have any technical support at their non-public schools. Teachers' perceptions about implementing computers for instruction (TPIC) were not related to their age. For the most part, age did not increase anxiety or promote a negative attitude toward computers. Additionally, the results did not indicate age as the main reason teachers perceived technical support needs.

Teachers' sense of efficacy (TSES) is positively related to perceptions about implementing computers for instruction (TPIC). Although the relationship is a weak one, results would indicate that as teacher self-efficacy increases, teachers are more likely to implement computers into instruction in the general classroom. If teachers do not believe that they can use computers for instruction, then they probably will not make efforts to do so. Results of this study indicate that teachers hold a positive belief about computer implementation and are likely to integrate computer use into their classes. Data that confirms these results in presented in Table 3. The majority of teachers (76.5%) in the study implemented computers into the classroom using various computer related assignments or sending students to the computer lab. A small percentage (12.4%) of teachers reported that computers were not used for their classes and 11.1% reported that computers were not available in the school or did not provide an answer to the question.

Recommendations for Further Research

These recommendations for additional research are presented based upon the findings and conclusions of this study.

Because teachers scored high on the teachers' sense of efficacy scale (TSES), it is suggested that additional studies be conducted in non-public school environments with a sample representing an additional membership group (district or state) to determine if findings are consistent.

Elementary school teachers had a higher group mean score on the TSES when compared to middle or high school teachers. Those who believe that their actions are not successful in obtaining a desired outcome (external control) will not persist in repeating those actions. By contrast, those who feel they have control over the outcome of a behavior (internal control) will

exhibit greater persistence to try to change the outcomes of his/her life, display stronger independence, and resist influence (Rotter and Mulry, 1965). Research has indicated that elementary teachers have a higher level of internal efficacy and a higher sense of a professional learning community in their schools than high school teachers, while high school teachers have a higher level of perceived external efficacy regarding learning than elementary teachers (Cowley & Meehan, 2001). Tschannen-Moran and Woolfolk-Hoy (2007) reported that school level (preschool through high school) was significantly related to teacher self-efficacy for new teachers, but not for experienced teachers. Internal and external controls identify the extent to which teachers' believed that affecting change in student learning is within their control (internal), or beyond their control (external). Several researchers have conducted studies on the relationship between internal and external control and self-efficacy (Rotter, 1966; Rotter & Mulry, 1965; Guskey & Passaro, 1994). In light of this finding, more research into the relationship of internal and external control and non-public teachers should be conducted. There was a statistically significant difference between teacher self-efficacy scores (TSES) based on grade level taught. Furthermore, teachers in this sample scored the lowest on the TSES student engagement subscale. Researchers should explore how grade level taught for non-public school teachers affects their perceptions of student engagement in connection with internal and external controls.

The relationship between TSES and TPIC was weak. In addition, grade level taught was the only variable in this study that was revealed to be statistically significantly and related to the main effect (TSES). Further analysis to determine other variables that may influence teachers' implementation of computers in instruction and teacher self-efficacy for non-public teachers is

recommended. It is also suggested that further research examine additional factors that may contribute to teacher self-efficacy, beyond grade level, and consider other study designs.

Results of this study indicated that teacher self-efficacy and implementing computers for instruction are related. Additional studies should be conducted to examine a variety of teacher characteristics and school environments to determine if they affect implementing computers for instruction.

Teachers in this study scored neutral (around 3) on technical training and may not have received training that addresses their individual needs. Further examination of the professional development of non-public school teachers and the relationship those learning experiences have on teacher self-efficacy is recommended.

Recommendations for Practice

Teacher education colleges should be proactive in examining sources of teacher self-efficacy information and designing training units to include the subject as part of the coursework. Professional development trainers should examine attitudes teachers have toward computers and present them with positive training experiences that address specific needs. Training programs should move from general software training to subject matter-specific training that provides examples about how to implement computers in instruction. Examples such as utilizing problem-based learning and/or cloud computing with online tools such as Google applications for education are two suggestions for where training may be needed.

Educators have used creative methods for implementing technology into the classroom (e.g., using computers as a reward, WebQuests, Word-based games) . Now is the time for schools and non-public funding agencies to focus on specific gaps in technology access.

Providing teachers with a basic computer set-up in the classroom would increase implementation of computers for instruction and allow teachers greater opportunity to practice their skill.

Teachers in this study scored negative (2.78) on the technical support subscale; indicating they lacked technical assist with computer implementation. As a start, non-public school associations and independent school districts should invest in technical coordinators at each grade level in each association. Technology issues, interests, and teacher instructional design differ among the grade levels and it is important for administrators to recognize this fact. A starting point is to prepare faculty and staff within the school so that they are able to troubleshoot minor technology problems. Schools and non-public independent school districts or non-public school associations can also establish a collaborative model in which teachers receive some release time to share new ideas with other teachers regarding how to implement computers in their instruction.

Universities should consider including study about the non-public school arena to the teacher education curriculum and researchers should increase studies about the non-public school option. Non-public schools have exhibited several academic successes over the years , for example high reading and math scores, a rigorous curriculum, and effective high school graduation rates (Dinkes, Kemp, & Baum, 2009). It is time that all education stakeholders foster cooperative relationships aimed at educating our students in the best way possible.

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APPENDIX A

COVER LETTER

Name of Principal/Teacher
Name of School
City/State

Date

Dear _____,

I am currently a doctoral student majoring in Occupational Studies at The University of Georgia in Athens, Georgia. In fulfillment of program requirements for the Doctor of Education degree, I am seeking your participation in a study entitled Teacher Self-efficacy and Implementing Compters for Instruction: An Inquiry into Non-Public Schools. This study will seek to contribute to the research regarding effective instruction of computer-related topics. More specifically, the The purpose of this study was to examine the perceptions of non-public school teachers in the southern U.S. about teacher self-efficacy and implementing computers for instruction.

The main factor is *teacher self-efficacy* and the secondary factor is *implementing computers for instruction,* which incorporates the variables Administrative Support, Technical Support, Collegial Support, Parent/Community Support, Training, Time, Efficacy, Access, Satisfaction with Use, and Attitude. The demographic information requested will focus on age, gender, degree level, race, academic background, years of teaching experience, occupational training, teaching background, teaching experience, school setting, computers and students in your class, and grade level taught. This area of interest is of particular importance because of the increase of technology in our society and debate regarding choice in education. Therefore, your participation in this study will be most valuable in helping our state education system learn from your perspective. As a teacher, I understand that your time is valuable; completion of the three-part survey instrument should take no longer than 45 minutes.

Please be assured that the information you will be asked to provide will be treated in a confidential manner. In order to assure anonymity, your name will not be printed in the document. I thank you in advance for your participation and willingness to cooperate in this study. Results will be beneficial in helping local school officials, politicians, college deans of education, and community representatives investigate ways that might be helpful in improving the education system in our nation.

If you have any questions, please feel free to contact me at (706) 542-1682 (Department Telephone), or (706)543-7315 (home). You may also e-mail me at sttaylor@uga.edu. I have enclosed my business card for your convenience.

Sincerely yours,
Simpfronia Taylor

APPENDIX B

TEACHER QUESTIONNAIRE

TEACHER SELF-EFFICACY AND IMPLEMENTING COMPUTERS FOR INSTRUCTION

Part 1: The following demographic data is for informational and descriptive purposes only.

1. My age is _____(Please fill in):

2. My Gender is (Please check one): □Female □ Male

3. My racial background is: (Please write 1-3 words to describe your racial identity).
_____

4. My highest degree (Please check one): □ Associates Degree □ Bachelor's
□ Master's □ Specialist □ Ph.D./Ed.D □ Other_____

5. Including this year, I have _____year(s) of full time teaching experience: (Please fill in).

6. Please give examples of how students use computers in your class or in the computer lab as a part of your class:
_____
_____
_____
_____
_____
_____
_____
_____
_____

7. Including this year, I have _____ years of experience teaching computers or computer related topics (Please fill in)

8. I have used a computer at home for _____years (Please fill in):

9. Grade Level(s) you currently teach:
□ Elementary K-5 □ Middle (6-8) □ Jr. High (7-9) □ High School (10-12)

10. Subjects you currently teach (Please check all that apply):

□ Art/Music/Drama □ English/Grammar □ Physical Education □ Science
□□ Business □ Computer(s)/ Programming □ Languages/Social Studies □□ Math
Other(s) _____

11. The school setting you teach in is described as: □ Urban □ Suburban □ Rural

Part 2: **Teacher Beliefs**[1]	**How much can you do?**								
Directions: The following questions are designed to help gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate your opinion about each of the statements below regarding teaching computers or integrating computers into the classroom. Your answers are confidential.	Nothing		Very little		Some		Quite A Bit		A Great Deal
12. How much can you do to control disruptive behavior in the classroom?	1	2	3	4	5	6	7	8	9
13. How much can you do to motivate students who show low interest in school work?	1	2	3	4	5	6	7	8	9
14. How much can you do to get students to believe they can do well in school work?	1	2	3	4	5	6	7	8	9
15. How much can you do to help your students value learning?	1	2	3	4	5	6	7	8	9
16. To what extent can you craft good questions for your students?	1	2	3	4	5	6	7	8	9
17. How much can you do to get children to follow classroom rules?	1	2	3	4	5	6	7	8	9
18. How much can you do to calm a student who is disruptive or noisy?	1	2	3	4	5	6	7	8	9
19. How well can you establish a classroom management system with each group of students?	1	2	3	4	5	6	7	8	9
20. How much can you use a variety of assessment strategies?	1	2	3	4	5	6	7	8	9

21. To what extent can you provide an alternative explanation or example when students are confused?	1	2	3	4	5	6	7	8	9
22. How much can you assist families in helping their children do well in school?	1	2	3	4	5	6	7	8	9
23. How well can you implement alternative strategies in your classroom?	1	2	3	4	5	6	7	8	9

Part 3: Teacher's Perceptions of Components Related to Implementing Computers for Instruction.[2]

How much do you agree with each statement in the following categories? Circle your response.

SA = Strongly Agree A = Agree N = No Opinion D = Disagree SD = Strongly Disagree

Administrative					
24. My school administration is unaware of my use of computers.	SA	A	N	D	SD
25. My school administration expects me to use computers as a teaching tool.	SA	A	N	D	SD
26. My school administration has not clearly communicated their expectations regarding how teachers should use computers in the classroom.	SA	A	N	D	SD
Technical					
27. The technical coordinator is available during class time if I need assistance while I am using computers with a group of students.	SA	A	N	D	SD
28. The technical coordinator has helped me plan lessons that effectively incorporate computers for instruction.	SA	A	N	D	SD
29. The technical coordinator does not consult with me before purchasing software or hardware for my classroom or department.	SA	A	N	D	SD
30. My technical coordinator encourages me to use computers in my classroom.	SA	A	N	D	SD
Collegial support					
31. The teachers in my building are willing to share resources that will help me use computers for instruction.	SA=Strongly Agree, A=Agree, N=No Opinion D=Disagree SD=Strongly Disagree				
32. As a staff, we work collaboratively on a regular basis to meet our goals for school-wide technology implementation	SA	A	N	D	SD
Parent Support					
33. Parents expect teachers in our district to use computers for instruction.	SA	A	N	D	SD

34. The parents in my community are opposed to the use of computers for instruction.	SA	A	N	D	SD
35. The community has expressed dismay over the amount of money spent on computers.	SA	A	N	D	SD
SA = Strongly Agree, A = Agree, N = No Opinion, D = Disagree, SD = Strongly Disagree					
Training					
36. I have not received any formal training (i.e., staff development, University courses) related to using computers for instruction.	SA	A	N	D	SD
37. Release time has been arranged so that I can receive training.	SA	A	N	D	SD
38. Training has not impacted the degree to which I use computers for instruction.	SA	A	N	D	SD
39. I do not need training that addresses the classroom management issues related to using computers as instructional tools.	SA	A	N	D	SD
Time					
40. Using computers for instruction takes time away from more effective instructional practices.	SA	A	N	D	SD
41. I have adequate instructional time with my students to allow me to incorporate computers regularly.	SA	A	N	D	SD
42. Time spent planning to use computers in a lesson could be better spent doing other things.	SA	A	N	D	SD
43. Using computers for instruction is worth the time investment required for planning.	SA	A	N	D	SD
44. I have access to additional technologies such as digital cameras, scanners, printers, and laser disk players.	SA	A	N	D	SD
Access					
45. I can access the Internet from my classroom.	SA	A	N	D	SD
46. I do not have access to the Internet from my classroom, but I can access it elsewhere in the school.	SA	A	N	D	SD
47. I have a computer in my classroom or one is readily available for my instructional use.	SA	A	N	D	SD
Attitude					
48. Computers can be effectively implemented as instructional tools.	SA	A	N	D	SD
49. When used effectively, the Internet and other electronic media (i.e., electronic encyclopedias, interactive CD-ROMs) are good resources for information.	SA	A	N	D	SD
SA=Strongly Agree, A=Agree, N=No Opinion D=Disagree SD=Strongly Disagree					
50. I feel anxious when I use computers for instructional purposes.	SA	A	N	D	SD
51. I worry about letting my students use the Internet in my classroom.	SA	A	N	D	SD

52. I feel at ease when my students are working cooperatively at the computers.	SA	A	N	D	SD
53. I don't feel like I'm really teaching anything when my students are using computers.	SA	A	N	D	SD
54. I use computers to engage students in content specific activities.	SA	A	N	D	SD
55. I use computers for collaborative group work.	SA	A	N	D	SD
56. I allow my students to use the Internet to access content related resources.	SA	A	N	D	SD
57. I allow my students to use electronic media (i.e., electronic encyclopedias, interactive CDROMs) as research tools.	SA	A	N	D	SD

[1] The Teacher Sense of Efficacy Scale. Permission granted by authors. For details on this instrument please see Tschannen-Moran, M., & Wolfolk Hoy, A., (2001). Teacher self-efficacy: Capturing the elusive construct. *Teacher and Teacher Education* 17, 783-805.

[2] Survey of Teacher's Perceptions of Components Related to Implementing Computers for Instruction permission granted by authors. For details on this instrument please see Shiverdecker, T. (2002). Ohio Science Teachers' perceptions of factors related to implementing computers for instructional use (Doctoral dissertation, The University of Cincinnati., 1990).

This is the end of the study. Thank you very much for your effort and input.

Please return the survey to Simpfronia Taylor by placing it in the collection box at the Georgia Association of Christian Schools desk or placing it into the drop box at the back of the auditorium labeled "Taylor Survey".

After Friday, you may also return this survey to the address on the front of the booklet

APPENDIX C

IRB APPROVAL TO CONDUCT RESEARCH

Kirsten Walters [kwalters@uga.edu] Actions

Monday, December 19, 2005 4:25 PM
To: Simpfronia Taylor
PROJECT NUMBER: 2006-10110-0
TITLE OF STUDY: Teacher Self-efficacy and Impementing Computers for Instruction: An Inquiry Into Private Schools
PRINCIPAL INVESTIGATOR: Ms. Simpfronia Taylor

Ms. Taylor,

Please be informed that the University of Georgia Institutional Review Board (IRB) has reviewed and approved your above-titled proposal through the exempt (administrative) review procedure authorized by 45 CFR 46.101(b).

You may now begin your study. Your approval packet will be sent via campus mail.

Please remember that no change in this research proposal can be initiated without prior review by the IRB. Any unanticipated problems must be reported to the IRB immediately. The principal investigator is also responsible for maintaining all applicable protocol records (regardless of media type) for at least three (3) years after completion of the study (i.e., copy of approved protocol, raw data, amendments, correspondence, and other pertinent documents). You are requested to notify the Human Subjects Office if your study is completed or terminated.

Good luck with your study, and please feel free to contact us if you have any questions. Please use the IRB number and title in all communications regarding this study.

Kind regards,

Kirsten

Kirsten Walters
IRB Coordinator
University of Georgia
Institutional Review Board
Human Subjects Office
606a Boyd GSRC
Athens, GA 30602-7411
p: 706-542-3199
f: 706-542-3360
e: kwalters@uga.edu
UGA IRB homepage: www.ovpr.uga.edu/hso/

APPENDIX D

INFORMED CONSENT FORM

University of Georgia
Department of Occupational Studies
Simpfronia Taylor, Doctoral Candidate
706-543-7315

Before agreeing to participate in this study, it is important that the following explanation of the proposed procedures be read and understood. This form describes the purpose, procedures, risks, and benefits of the study. It also describes the right to withdraw from the study at any time. It is important to understand that no guarantee or assurance can be made as to the results.

Purpose
The purpose of this study was to examine the perceptions of non-public school teachers in the southern U.S. about teacher self-efficacy and implementing computers for instruction.

Duration
The survey will take approximately 45 minutes.

Procedure
You are being asked to complete the Teacher self-efficacy and Teaching Computer-Related Topics Survey as it pertains to the school setting and teaching computer topics. If you choose to complete the survey, you will then return it to the researcher by mail.

Costs
Participation in this study does not involve any expense for the participants.

Security and Deposition of Data
The only person who will examine the surveys is the researcher. After analysis of the data is complete the surveys will be destroyed.

Right to Withdraw
You may withdraw from the study at any time. To withdraw simply discard the paper survey. There will be no negative consequences for withdrawing from the study.

Potential Risks
Since this is a survey study there are no foreseeable risks.

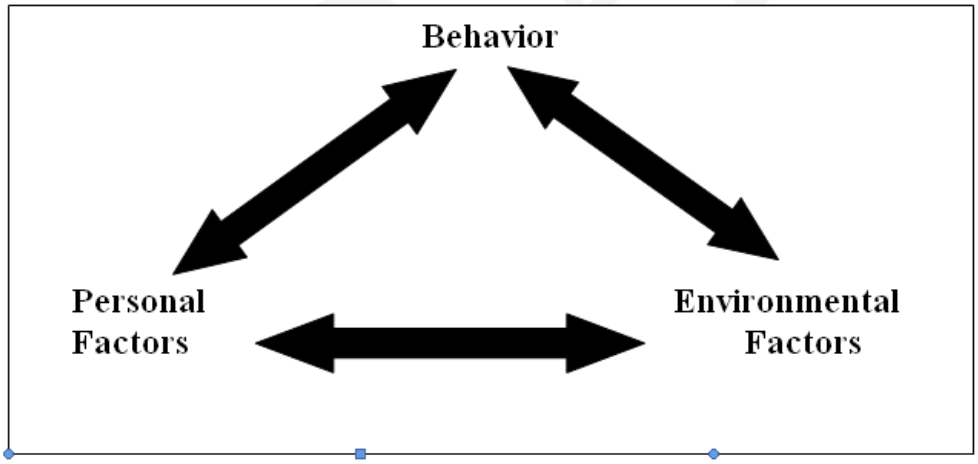
Confidentiality
You are not required to sign the survey or in any way include identifying information. All reports produced as a result of this research will use pseudonyms.

If I have additional questions about this research, I will contact Simpfronia Taylor706-543-7315 or Dr. Myra Womble at 706-542-4091 or the University of Georgia Human Subjects Chair at (Include contact number).
Completing the questionnaire indicates consent to participate in the study.

APPENDIX E

RECIPROCAL MODEL OF CAUSATION

Representation of Bandura's (1989) *reciprocal model of causation*.



Bandura's (1986) utilized a model of causation (called triadic reciprocal causation) that is mutual in nature. Personal factors (i.e., behavior, cognition) and environmental influences have an effect on each other. Bandura (1989) called the three factors *determinants*. Bandura believed that this interaction happens over time, that the sources are not of equal strength, and that they do not occur simultaneously. It is believed that student behavior is affected by these interactions under different school environments, or educational settings. Adapted from Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice-Hall, p. 454.