INFLUENCE OF DESCRIPTIVE AND CONTEXTUAL CHARACTERISTICS ON TEACHING EFFICACY OF SECONDARY TEACHERS

by

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(Under the Direction of Jay W. Rojewski)

ABSTRACT

The purpose of this survey study was to examine the influence of descriptive and contextual characteristics on the perceived teaching efficacy of secondary teachers within public schools in the State of Georgia, with special emphasis on career and technical education teachers. Contextual characteristics included gender, race/ethnicity, subject area taught, years of teaching experience, and certificate level. Teacher efficacy was defined as the belief a teacher has about his or her abilities to influence or bring about the desired outcomes of student engagement and learning (Bandura, 1977). Three distinct aspects of the teacher efficacy construct were measured, including instructional strategies, classroom management, and student engagement. These three factors were examined using the Teachers' Sense of Efficacy scale – long form (TSES; Tschannen-Moran & Hoy, 2001).

The population for this study contained all secondary academic and CTE teachers in the Griffin Regional Educational Service Agency (RESA) region of the state of Georgia. A proportional sample of teachers randomly selected from the population included 1,095 academic and 200 CTE teachers. The sample consisted of 403 secondary teachers.

Statistical analysis included the use of descriptive statistics and several series of one-way and two-way analysis of variance (ANOVA) procedures, using an alpha level of .05. Statistical Package for the Social Sciences (SPSS) version 19 software was used to conduct each statistical procedure.

No statistically significant interactive or main effects were detected between academic and CTE teachers on any of the three teacher efficacy subscale areas (instructional practices, classroom management, and student engagement) when grouped by gender, years of teaching experience, or certificate level. However, the findings of this study contribute to limited research on the teacher efficacy of career and technical educators.

INDEX WORDS: Teacher Efficacy, Self-Efficacy, Instructional Practices, Classroom Management, Student Engagement, Career and Technical Education

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DEDICATION

To the memories of:

William Ernest Kelley
October 18, 1946 – June 12, 2008

John Davis Jordan
January 31, 1944 – August 17, 2009

Elizabeth Williams Martin
February 14, 1924 – March 25, 2010

Their time ended too soon. I will remember the many lessons learned from each of them and thank them for their love and support. One day we will meet again and share eternity together.

To my husband Mart, you have been a source of strength for the last twenty six years and have supported me in everything, no matter how big or small. Throughout this work, you have made many sacrifices and taken care of our family so that I could write. Without your love, support, and encouragement, this would not have been possible. I love you and thank you for giving much so that this dream could be accomplished.

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And do not be conformed to this world, but be transformed by the renewing of your mind… (Romans 12:2, NKJV)

I thank God for allowing me to take this journey. With Him all things are possible, without Him nothing is possible. He has brought me through many trials, all which have made me stronger. Along the way, I have learned to keep pressing forward and believe that He is with me. I have also learned that He works in our lives to transform us into His image. While I know that He is still at work in my life, I thank Him for the transformation that has taken place thus far.

Only recently have I come to appreciate the desires He has placed in my heart. The greatest desire, which has driven me to accomplish this dream, is to devote my life to learning. Through this process, I have observed how my mind has been challenged and transformed. He has also awakened me to many new things and I am so eager to learn even more.

I thank Him also for placing Dr. Jay Rojewski, Dr. Elaine Adams, Dr. Sally Zepeda, and Dr. John Schell in my life. Dr. Rojewski has challenged my mind and refused to allow me to remain in my comfort zone. Along the way, he has posed questions for me to consider. Each set of questions has required me to climb even higher. Now that I have reached the summit, I have learned it is important to enjoy the journey, or as Dr. Rojewski would say ~~–e~~njoy the ride." Strangely though, the view from the summit only reveals more mountains to climb.

During my masters program, Dr. Elaine Adams placed a transforming truth in my mind – ~~–i~~ntelligence is not always having the answer to every question, but rather intelligence is knowing where to find the answer." For years I believed that I would never possess enough intelligence to pursue my dream of becoming a scholar. After hearing Dr. Adams speak these words, it was as if someone had unlocked the gate to a beautiful garden. Throughout this journey, she too has challenged me to explore this garden of knowledge and demands that my mind grow beyond its present state.

When we are questioning our abilities, someone comes along and encourages us to believe in ourselves. Dr. Sally Zepeda has been a blessing to me and encouraged me to believe. At the beginning of this journey, I had thought of pursuing leadership certification. Dr. Zepeda spent time talking to me about the work required. I began to doubt my abilities; however she would not accept the doubt. She continued to encourage me and believed that I had the ability, and would most definitely possess the knowledge after completing required coursework. During those times when we doubt ourselves, God will send someone along to help us to believe.

Dr. John Schell laid the foundation for this journey. Through our many discussions, he challenged me to think and question many things. He spent countless hours meeting with me until I had discovered the focus for my research. I am thankful that he would not simply accept any research topic that was presented during our discussions. He knew that my research would need to come from the heart. Although his retirement came earlier than expected, I knew that he would guide me safely to another professor that would continue the work he had begun.

There have been many other professors and staff at the University of Georgia who have contributed so much to my life during this journey, but these four will forever remain etched in my mind. This journey has been truly amazing and one that I do not take for granted. Thank

you again Dr. Rojewski, Dr. Adams, Dr. Zepeda, and Dr. Schell. I have the utmost respect for each of you and will seek to encourage and believe in others the way you have in me.

My belief in myself is stronger now than when I began this journey. However, there is much to learn about how beliefs shape lives and how unbelief can be overcome. ~~–~~Men often become what they believe themselves to be. If I believe I cannot do something, it makes me incapable of doing it. But when I believe I can, then I acquire the ability to do it even if I didn't have it in the beginning." (*Mahatma Gandhi*)

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CHAPTER 1

INTRODUCTION

Over the past three decades, research has examined teacher effectiveness (Armor et al., 1976; Ashton & Webb, 1986; Brandt, Hayden, & Brophy, 1975; Ross, 1992; Sanders & Rivers, 1996), showing that effective teachers share a common set of practices. Behaviors characteristic of effective teachers include maintaining high academic standards, setting clear expectations, focusing on academic instruction, and maintaining student on-task behavior (Ashton, Webb, & Doda, 1983; Ding & Sherman, 2006). Gibson and Dembo (1984) found that effective teachers believe student achievement can be influenced by a greater academic focus in the classroom, extensive content coverage, monitoring of student performance, and use of large group instruction. Effective teachers also have very positive beliefs about their teaching abilities (Brandt, et al.; Guskey, 1988).

Teachers who possess a positive belief in their ability to teach and increase student achievement have higher self-efficacy (Allinder, 1994; Bandura, 1977; Dembo & Gibson, 1985; Tschannen-Moran & Hoy, 2001). Self-efficacy is the belief ~~in~~ one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 3). These beliefs influence the courses of action people will pursue, how much effort will be expended in pursuing goals, how long they will persevere when faced with obstacles, their resilience to adversity, the amount of self-hindering thought patterns, and the level of accomplishments achieved. If people believe they do not have the power to produce desired results, they will take no action to achieve goals.

Within the context of teaching, a teacher's sense of self-efficacy serves as a mechanism that influences behaviors exhibited in the classroom (Bandura, 1997; Goodard, Hoy, & Hoy, 2004). Such efficacy is referred to as a teachers' sense of efficacy, or teacher efficacy. The concept of teacher efficacy addresses the importance of a teacher's belief in his or her own ability to bring about student learning (Armor et al., 1976). Based on Bandura's (1997) self-efficacy theory, teacher efficacy is defined as the belief a teacher has about his or her abilities to influence or bring about the desired outcomes of student engagement and learning.

The importance of teachers' sense of efficacy was first recognized by RAND researchers in a study of teacher characteristics and student learning (Armor et al., 1976). Guskey (1981) subsequently observed a relationship between teacher efficacy and student success leading others to develop instruments to measure the construct of teacher efficacy (Ashton, Buhr, & Crocker, 1984; Ashton et al., 1983; Gibson & Dembo, 1984; Hoy & Woolfolk, 1993; Moore & Esselmann, 1992; Soodak & Podell, 1996; Tschannen-Moran & Hoy, 2001; Tschannen-Moran, Hoy, & Hoy, 1998). Characteristics that influence teacher efficacy include gender, race/ethnicity, subject area taught, years of teaching experience, and degree level.

Teacher efficacy differs for male and female teachers. Females report higher efficacy than males (Raudenbush, Rowan, & Cheong, 1992). Female teachers also assume a greater level of responsibility for student achievement than male teachers (Guskey, 1981). Recent studies confirm previous findings revealing that female teachers report higher teacher efficacy than male teachers (Cheung, 2008; Shahid & Thompson, 2001).

Race/ethnicity is another factor that has been positively correlated with teacher efficacy. Beady and Hansell (1981) studied the influence of teachers' race/ethnicity on expectations for student achievement, and found that teacher beliefs and expectations of students were positively

related to teachers' race. They found that black teachers are more likely to have positive perceptions and high expectations of black students than white teachers.

When observed as a factor of teacher efficacy, subject area taught has also shown to have an effect (Ashton & Webb, 1986). Raudenbush et al. (1992) examined contextual effects on the self-perceived efficacy of high school teachers and found a contextually-situated component. For example, higher teacher efficacy was related to the type and level of class taught. Teachers of honors classes reported greater efficacy than those in general academic or career and technical classes.

Teacher efficacy increases with teaching experience (Dembo & Gibson, 1985; Hoy & Woolfolk, 1993). Shahid and Thompson (2001) and Cheung (2008) found that years of teaching experience had a significant relationship to teacher efficacy. Both studies found that as years of teaching experience increased, efficacy beliefs increased. Cheung noted that the more experience a teacher has, the more confidence they demonstrate in addressing situations with students.

Teacher efficacy is also linked to certification level or degree. Hoover-Dempsey, Bassler, and Brissie (1987) found that teachers with advanced degrees had higher efficacy. Teachers with advanced degrees were more aware of theoretical links between school and home. When conducting parent conferences, teachers with higher efficacy were more confident in their abilities to communicate instructional goals to parents. Ross, Cousins, and Gadalla (1996) noted that teachers with a graduate degree have higher teacher efficacy due to advanced training and acquisition of teaching skills. They suggested that graduate programs may make teachers more aware of factors that influence teacher effectiveness.

Although research provides a link between teacher efficacy, student achievement, and contextual characteristics, previous studies have focused primarily on elementary or secondary school teachers of core academic classes and neglected the examination of teacher efficacy for secondary career and technical educators (Armor et al., 1976; Ashton & Webb, 1986; Ashton et al., 1983; Gibson & Dembo, 1984; Guskey, 1988; Hoover-Dempsey et al., 1987; Hoy & Woolfolk, 1993; Rose & Medway, 1981). However, since teacher efficacy is situation specific (Enochs, Posnanski, & Hagedorn, 1999; Gibson & Dembo, 1984; Riggs & Enochs, 1990; Rubeck & Enochs, 1991), these general studies cannot be readily extrapolated to all teachers. Ross et al. (1996) found that teachers do not demonstrate equal efficacy beliefs in all teaching situations. Raudenbush et al. (1992) reported that 44% of the total variance in teacher efficacy was related to subject taught and academic track level of students. They also noted that academic teachers reported higher self-efficacy than career and technical teachers.

This lack of research on teacher efficacy of secondary career and technical educators poses a barrier to instructional reform efforts that seek to improve teacher effectiveness and student achievement. Current legislation mandates that career and technical educators increase student achievement in not only career-related competencies, but academic achievement tests as well (Castellano, Stringfield, & Stone, 2003). However, due to the limited understanding of teacher efficacy among career and technical teachers, such efforts are restricted. "In these days of hard-nosed accountability, teachers' sense of efficacy is an idea that neither researchers nor practitioners can afford to ignore" (Tschannen-Moran & Hoy, 2001, p. 803). Therefore, further research is needed to examine the teaching efficacy of secondary career and technical education teachers.

Purpose of Study

The purpose of this survey study was to examine the influence of descriptive and contextual characteristics on the perceived teaching efficacy of secondary teachers within public schools in the State of Georgia, with special emphasis on career and technical education teachers. Contextual characteristics included gender, race/ethnicity, subject area taught, years of teaching experience, and certificate level. Teacher efficacy was defined as the belief a teacher has about his or her abilities to influence or bring about the desired outcomes of student engagement and learning (Bandura, 1977). Three distinct aspects of the teacher efficacy construct were measured, including instructional strategies, classroom management, and student engagement.

Research Questions

1. What are the characteristics of secondary teachers in relation to gender, ethnicity, subject area taught, years of teaching experience, and degree level?
2. Does teacher efficacy differ in the subscale areas of instructional practices, classroom management, and student engagement for CTE and academic teachers?
3. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by gender?
4. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by ethnicity?
5. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by years of teaching experience?

6. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by degree level?

Theoretical Framework

There are three theoretical foundations typically used to support research on teacher efficacy. The first is Rotter's (1966) theory of social learning, which is based on a belief teachers have about their ability to control the reinforcement of their actions and whether such actions are dependent on internal or external factors. Second is Bandura's (1986) social cognitive theory, which defines human behavior as the interaction between personal factors, behavior, and the environment. Third is Bandura's (1997) self-efficacy theory, which is a component of social cognitive theory. Unlike social cognitive theory, which is based on outcome expectancies, self-efficacy theory focuses on individuals' expectations. An efficacy expectation is the belief an individual has about his or her abilities to perform a required action in order to accomplish a task, whereas outcome expectancies are based on judgments of the consequences such actions will produce (Bandura, 1997).

The theory selected for this study is Bandura's (1997) self-efficacy theory, which refers to the belief an individual has in his or her abilities to organize and execute a course of action in order to achieve a task. If a person does not believe he or she has the ability to produce results, he or she usually will not attempt to take action or make things happen.

Self-efficacy beliefs interact with the skills a person possesses. As long as individuals continue to believe in —their ability to perform a given activity, they act habitually on that belief without having to keep reminding themselves of it. Should they cease to believe in their ability, they would behave differently" (Bandura, 1997, p. 34). For example, a teacher may cease to

believe in her ability to affect student learning, thus actions or behaviors will not be performed that would promote learning.

The measurement scale selected for this study was the *Teachers' Sense of Efficacy scale* long form (TSES), developed by Tschannen-Moran and Hoy (2001; see Appendix B). This instrument supports the research of Bandura's (1997) self-efficacy theory and includes subscale factors of previously developed efficacy scales (including Ashton, Olejnik, Crocker, & McAuliffe, 1982; Gibson & Dembo, 1984; Guskey, 1981; Rose & Medway, 1981). Subscale factors include instructional strategies, classroom management, and student engagement.

Instructional strategies include the variety of assessments used within a classroom, the ability to offer alternative explanations to students who do not understand a concept, and how lessons are adjusted to accommodate the learning abilities of students. Classroom management focuses on a teachers' ability to control disruptive behavior and the extent to which expectations of appropriate behavior are clearly communicated to students. Student engagement focuses on a teachers' ability to get students to value learning and to motivate students who demonstrate a low interest in schoolwork (Tschannen-Moran & Hoy, 2001).

Previously developed scales include factors of general teaching efficacy (GTE) and personal teaching efficacy (PTE). General teaching efficacy is closely associated with the outcome expectancy component of Bandura's (1977) social cognitive theory. The personal teaching efficacy factor focuses on a teacher's own feelings of competence as a teacher. The TSES includes both factors and allows teachers to assess their perceived abilities on a wide range of activities and tasks. Yet, the instrument remains generalizable to teachers across subject areas, grade levels, and experience levels (Tschannen-Moran & Hoy, 2001).

Importance of Study

While the U.S. Department of Education's landmark report, *A Nation at Risk: The Imperative for Educational Reform* (1983), called for a greater focus on accountability and teacher effectiveness, little has been done to address teacher effectiveness. This is unfortunate since "effective teachers are one of the most crucial components in education improvement" (p. 14). Effective teachers are those who possess high levels of efficacy (Armor et al., 1976). In fact, an important link has been established between teacher efficacy and student achievement (Ashton et al., 1983; Bandura, 1993; Dembo & Gibson, 1985; Gibson & Dembo, 1984; Goddard, Hoy, and Hoy, 2000; Moore & Esselman, 1992; Ross, 1992, 1994; Tschannen-Moran et al., 1998).

Although research has established the importance of teacher efficacy and its impact on student achievement, it has focused only on teachers of academic classes. By providing an understanding of this construct for career and technical educators, this study contributes to a research base that has the potential to make a positive difference in education. For example, if teacher efficacy beliefs were taken seriously, it could provoke changes in teacher preparation and mentoring programs (Tschannen-Moran & Hoy, 2001). Such changes, if focused on increased mastery experiences of teachers, would result in increases in teacher efficacy (Bandura, 1997). As evidenced in research, increases in teacher efficacy lead to increases in student achievement (Armor et al., 1976; Ashton & Webb, 1986; Ross, 1992, 1994). Thus far, limited research has shown that career and technical teachers have lower efficacy than academic teachers.

CHAPTER 2

REVIEW OF LITERATURE

This chapter presents a review of literature related to teacher efficacy. First, a review of social cognitive theory and self-efficacy theory are presented. These two concepts serve as a basis for teacher efficacy. Next, a review of research on teacher efficacy, the influence of contextual characteristics on teacher efficacy beliefs, and the influence of teacher efficacy on teacher characteristics, practices, and student achievement is provided. Research on the historical development of teacher efficacy measures is then reviewed. The chapter concludes with a discussion of the strengths and limitations of existing research.

Social Cognitive Theory

Social cognitive theory is focused on human agency, or the ways that people exercise control over situations they encounter and serves as the origin of self-efficacy theory (Bandura, 1977). Human agency operates within a process called triadic reciprocal causation. Reciprocal causation is a three-part structure that proposes human behavior is the result of environmental influences, behavior, and personal factors (cognitive, affective, and biological). This three-part structure determines what people believe about themselves, thus affecting their choices and actions.

Human Agency

Social cognitive theory assumes that people can exert influence and control over what they do. The ability to intentionally pursue a course of action is referred to as agency. Within the framework of social cognitive theory, human agency refers to the ability a person possesses

to intentionally exert control over their thoughts, feelings, motivation, and actions (Bandura, 1977). The theory assumes that people are actively involved in the shaping of their lives; they are creative and proactive, not just reactive.

Beliefs are the key factor of human agency. These beliefs serve as a reference for perceiving, regulating, and evaluating behavior (Pajares, 1996). The interaction between human agency and environmental forces are the result of the beliefs a person possesses. Through the self-regulatory processes of human agency, people have the ability to influence thought processes, action and, thus, alter their environments (Bandura, 1997).

Triadic Reciprocal Causation

According to social cognitive theory, human agency operates within a structure called triadic reciprocal causation (Bandura, 1997). This three-part structure provides a multi-directional approach to understanding human agency. Triadic reciprocal causation suggests that human agency, or intentional course of action, is the interactive result of environmental influences, behavior, and personal factors such as cognitive, affective, and biological events (Bandura, 1986). From this perspective, people become both products and producers of their environment; they are responsible for producing and shaping their environmental contexts (Bandura, 1997).

Each element within this structure is interdependent, and can be acted on or affected by the others (Bandura, 1986). This three-part structure determines what people believe about themselves, the choices they make, and their actions. For example, when attempting a new instructional strategy, a teacher's behavior interacts with the environment (e.g., students) and the teachers' own internal personal factors (e.g., thoughts about improving the strategy) (Goddard et al., 2000). Future behavior exhibited by the teacher is then based on beliefs about the response

received from the environment (e.g., students) and the teacher's own internal reactions to the new behavior. Environmental responses and the teacher's personal reactions to the behavior and environment determine whether or not the teacher will use the instructional strategy again (Bandura, 1997).

Self-Efficacy Theory

Within social cognitive theory, self-efficacy theory provides guidelines on how people are enabled to exercise influence over the courses of actions they will pursue (Bandura, 1997). According to self-efficacy theory, beliefs inform behaviors people exhibit, which then determine the course of action taken. Personal function in any given situation is, therefore, dependent upon self-efficacy beliefs (Goddard et al., 2000; Pajares, 1996).

Self-efficacy beliefs are not concerned with the number of skills or amount of knowledge a person may possess, but rather the belief that one can do what they need to with the skills and knowledge they possess (Bandura, 1997). Self-efficacy beliefs are contextual, which means they are task and situation specific (Pajares, 1996). For example, a teacher's belief that he or she can help students learn will depend on the teacher's perceived competence of the subject taught, as well as his or her belief about the students within the class. People who do not believe in their abilities will be reluctant to attempt difficult tasks. Conversely, people who have strong beliefs in their abilities approach difficult tasks as challenges to be mastered rather than avoided.

Outcome Expectancy

Outcome expectancy is related to the concept of self-efficacy (Bandura, 1997). However, Bandura (2006) stated that the distinction should be made between the construct of self-efficacy and outcome expectancies. Outcome expectancies are judgments about the consequences that flow from actions, whereas self-efficacy is a judgment of one's ability to perform an action. For

example, a person can believe that a particular course of action will produce a certain outcome, but if they doubt their abilities to perform the action such information will not influence their behavior (Bandura, 1977).

There are three forms of outcome expectations; physical, social, and self-evaluative. Each form contains positive aspects that serve as incentives and negative aspects that serve as disincentives. Anticipated outcomes depend on judgments of how well one will be able to perform in given situations (Bandura, 2006).

Sources of Self-Efficacy

There are four primary sources of efficacy beliefs: mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states (Bandura, 1997). Mastery experiences are the most influential source of efficacy and provide the most authentic evidence of whether one has what it takes to succeed. For example, a teacher may create a lesson based on subject matter that responds to the interests of students. As a result, student motivation and learning are increased. This experience serves as a mastery experience for the teacher and increases self-efficacy. Successes build efficacy beliefs, while failures threaten them.

Vicarious experiences also influence efficacy beliefs through modeled attainments (Bandura, 1997). Seeing people similar to one's self perform actions successfully raises efficacy beliefs that they themselves possess the capabilities needed to perform those same actions. For example, a teacher's sense of efficacy is strengthened when an instructional strategy is modeled successfully by a person with similar characteristics (Goddard et al., 2004).

Social persuasion also contributes to efficacy beliefs. If people are persuaded they have what it takes to succeed, they will exert more effort and perseverance to accomplish a task or goal. When others express faith in a person's capabilities, or persuade a person they have what it

takes, a sense of efficacy is strengthened. However, to raise unrealistic beliefs about a person's capabilities invites failure that undermines beliefs and discredits persuaders (Bandura, 1997).

People also rely on physiological and emotional states to provide information about their capabilities. Stressful situations can hinder performance by increasing physical distress (e.g., tensing, trembling, experiencing a pounding heart), which can then lead to disbelief in one's capabilities. As with physiological states, emotional states can also provide additional information for judging efficacy. People are able to learn things faster when their mood fits what they are learning. A negative mood will activate thoughts of past failures, while a positive mood will activate thoughts of past successes (Bandura, 1997). Therefore, efficacy is enhanced by thoughts of past accomplishments and diminished by thoughts of past failures.

Self-Efficacy Compared with Locus of Control and Self-Esteem

Self-efficacy is sometimes confused with locus of control and self-esteem. However, according to Bandura (2006) self-efficacy is a distinctly different construct and should be distinguished from locus of control and self-esteem. Locus of control is not concerned with perceived capability, but whether outcomes are determined by a person's actions (internal) or forces outside (external) of the person's control (Bandura, 1977, 1997). A person may believe an outcome is internally controllable, or caused by actions of the individual, but lack the confidence to accomplish the desired action (Goddard et al., 2000).

Self-esteem and self-efficacy are often used interchangeably (Bandura, 1997). Self-efficacy is concerned with judgments of personal abilities, whereas self-esteem is concerned with judgments of self-worth (Bandura, 2006). Individuals may judge themselves to be inefficacious in a certain activity and yet suffer no loss of self-worth. Bandura (1997) stated that people need

much more than self-esteem to do well in pursuits; they need confidence in their abilities to sustain the effort required to succeed.

Teacher Efficacy

Teacher efficacy refers to the belief a teacher has about his or her abilities to influence or bring about the desired outcomes of student engagement and learning (Ashton & Webb, 1986; Bandura, 1997; Gibson & Dembo, 1984, Tschannen-Moran & Hoy, 2001). Teachers with a high sense of efficacy believe that difficult students are teachable, should extra efforts and appropriate techniques be used (Bandura, 1997). In contrast, teachers with a low sense of general teaching efficacy believe that students cannot or will not learn; they believe there is nothing any teacher can do to change this fact.

Additionally, teachers with a high sense of efficacy believe in their abilities to teach students and devote more time to instructional activities (Bandura, 1997). However, teachers with a low sense of personal teaching efficacy may allow students to ignore classroom rules. If they doubt their teaching abilities, they may refrain from encouraging students to achieve standards of performance.

As teachers reflect on their teaching experiences, efficacy beliefs are formed. Teachers attribute their efficacy beliefs to factors outside of themselves or personal factors they bring to the task (Tschannen-Moran et al., 1998). Teacher efficacy beliefs are based on the interpretation of information received from mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states (Bandura, 1997). These four sources contribute to the teachers' analysis of the teaching task and self-perceptions of teaching abilities.

Mastery experiences are the most influential source of efficacy information for teachers (Tschannen-Moran et al., 1998). Perceptions of successful performance on teaching tasks raise

teacher efficacy beliefs, which contribute to future expectations of successful performance. Conversely, teachers who perceive their efforts have failed form beliefs that future attempts will also fail.

Teacher efficacy beliefs are also influenced through vicarious experiences. Observing other successful teachers can lead to increased efficacy beliefs (Bandura, 1997). Comparisons to other successful teachers can lead teachers to believe they also have the same abilities and will be successful (Hoy & Spero, 2005). Then again, observing others' failures will result in decreased efficacy beliefs.

Social persuasion also contributes to teacher efficacy beliefs. For example, specific feedback from supervisors about teacher's skills can lead to increased teacher efficacy beliefs (Tschannen-Moran et al., 1998). However social persuasion may lower efficacy beliefs if the feedback is overly harsh rather than constructive.

Physiological and emotional states add to teacher efficacy beliefs. Positive emotions serve as signals of self assurance of success (Bandura, 1997). The level of emotional arousal teachers experience in various teaching situations can lead to beliefs of teaching competence and anticipation of future success (Charalambous, Philippou, & Kyriakides, 2007; Tschannen-Moran et al., 1998).

Historical Evolution of Teacher Efficacy

In 1976, RAND researchers, as part of a survey on teacher characteristics and student learning, posed two statements which gave birth to the study of teacher efficacy (Ashton & Webb, 1986; Hoy & Wolkfolk, 1993). The RAND study asked teachers to indicate their level of agreement with the following two statements:

RAND item 1: When it comes right down to it, a teacher really can't do much – most of a student's motivation and performance depends on his or her home environment.

RAND item 2: If I try really hard, I can get through to even the most difficult or unmotivated students.

Along with the study of teacher efficacy came the task of defining the construct. From its inception, researchers have referenced three theoretical foundations when seeking to define this construct: Rotter's (1966) locus of control, grounded in social learning theory; Bandura's (1977) social cognitive theory; and Bandura's (1997) self-efficacy theory. While each of these theories has remained constant, the definition of teacher efficacy has been defined in varying ways.

Woolfolk and Hoy (1990) found that the earliest citation provided by the Educational Resources Information Center (ERIC) was a study by Barfield and Burlingame (1974). "These researchers defined efficacy as a personality trait that enables one to deal effectively with the world" (Woolfolk & Hoy, p. 82). This definition was based on the field of political science.

Unlike Barfield and Burlingame (1974), the definition provided by Armor et al. (1976) was grounded in psychology. They defined teacher efficacy as a teacher's belief to bring about student learning, even among "children with shaky motivation or home background" (p. 38), and measured sense of efficacy by the sum product of two questions: (a) "When it comes right down to it, a teacher really can't do much – most of a student's motivation and performance depends on his or her home environment" and (b) "If I try really hard, I can get through to even the most difficult or unmotivated students" (p. 73). Rotter's (1966) social learning theory served as the framework for these items.

Guskey (1981), when developing the responsibility for student achievement scale, also used Rotter's social learning theory and expanded the explanation of teacher efficacy by

including Weiner's (1979) attribution theory. Guskey defined teacher efficacy as the belief a teacher has about his or her ability to affect student performance, even those who may be difficult or unmotivated.

Also during this time, Rose and Medway (1981) developed their definition of teacher efficacy based on Rotter's (1966) theory of social learning and Heider's (1958) attribution theory. They conceptualized teacher efficacy as teachers' beliefs that factors within their control have a greater influence on student achievement than factors beyond their control.

While these first definitions were grounded in Rotter's theory of social learning, a second group emerged that was based on Bandura's (1977) social cognitive and self-efficacy (1997) theories. According to Bandura (1997), efficacy is the ~~"b~~belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). Within the context of teaching, teacher efficacy beliefs affect instructional activities and classroom management strategies.

With Bandura's (1977) theory as a guide, Ashton et al. (1983) sought to further clarify the construct by developing and investigating a framework for understanding the many facets of teacher efficacy. They defined teacher efficacy as ~~"t~~he extent to which teachers believe they can have a positive effect on student learning and student achievement" (p. 5). Their investigation included factors that facilitate or prohibit the development of teacher efficacy, the observation of teacher behaviors that determine efficacy beliefs, the observation of effects of teachers' sense of efficacy on students, other teachers, and other aspects of the school environment. They also examined methods that would influence the development of teacher efficacy.

Gibson and Dembo (1984) defined teacher efficacy as a belief that teachers have about their ability to help students even those who are difficult or unmotivated. They also identified a

two factor structure for teacher efficacy. The first factor was labeled personal teaching efficacy (PTE) and the second was labeled general teaching efficacy (GTE). The PTE factor was said to reflect the self-efficacy aspect described by Bandura (1977), while the GTE factor described outcome expectancy.

> If we apply Bandura's theory to the construct of teacher efficacy, outcome expectancy would essentially reflect the degree to which teachers believe the environment could be controlled, that is the extent to which students can be taught given such factors as family background, IQ, and school conditions. Self-efficacy beliefs would indicate teachers' evaluation of their abilities to bring about positive student change. (Gibson & Dembo, 1984, p. 570)

Soon after Gibson and Dembo (1984) provided their explanation of teacher efficacy, Ashton and Webb (1986) presented another very similar definition. They defined teacher efficacy as a situation specific expectation in which teachers believe they can help students learn. They also recognized that teacher efficacy consists of two dimensions, sense of teaching efficacy and personal teaching efficacy. For their study, sense of teaching efficacy referred to the teachers' expectation that teaching can influence student learning. Personal teaching efficacy referred to the teachers' assessment of their own teaching abilities. Additional studies confirmed the existence of this two factor structure (Guskey & Passaro, 1994; Hoy & Woolfolk, 1993; Woolfolk & Hoy, 1990).

Hoy and Woolfolk (1993), in their study of the relationship between the two factors of teaching efficacy (general and personal teaching efficacy) and aspects of a healthy school climate, also adopted Ashton and Webb's (1986) definition of teacher efficacy. For their study,

teacher efficacy was defined as the belief a teacher has in his or her ability to have a positive effect on student learning.

More recently, Tschannen-Moran and Hoy (2001) defined teacher efficacy as the belief a teacher has about his or her abilities to influence or bring about the desired outcomes of student engagement and learning. This explanation was very similar to those provided by previous researchers who had used Bandura's (1977, 1997) theory as a framework (Ashton et al., 1983; Ashton & Webb, 1986; Gibson & Dembo, 1984; Hoy & Woolfolk, 1993; Woolfolk & Hoy, 1990).

Studies conducted since the mid-1980s rely on Bandura's (1977) social cognitive and self-efficacy (1997) theories to guide explanations of the teacher efficacy construct. Equipped with this framework, researchers have provided an explanation of teacher efficacy that has remained stable over the last two decades (Ashton et al., 1983; Ashton & Webb, 1986; Gibson & Dembo, 1984; Hoy & Woolfolk, 1993; Tschannen-Moran & Hoy, 2001; Woolfolk & Hoy, 1990). Therefore, for the proposed study, teacher efficacy will be defined as the belief a teacher has about his or her abilities to influence or bring about the desired outcomes of student engagement and learning (Bandura, 1997).

Descriptive and Contextual Characteristics

In the years following the RAND research, numerous studies have been conducted to determine factors that predict teaching efficacy. For example, Ross et al. (1996), in their study of within-teacher and between-teacher factors, found that the efficacy of secondary teachers varied among teaching assignments. They also found that teachers' perception of student engagement was a strong predictor of teaching efficacy. Furthermore, their research indicated that 21% of the variance in teacher efficacy could be attributed to within-teacher factors.

With each study that has been conducted, demographic variables have been included in order to describe and observe differences in teacher efficacy among various groups of teachers. Such demographic variables include: gender, race/ethnicity, teaching area, years of teaching experience, and degree level.

Gender. Previous studies have shown that teacher efficacy differs among male and female teachers. For example, Guskey (1981) found that female teachers assume a greater level of responsibility for student achievement than do male teachers. Ashton and Webb (1986) also recognized that gender may play a role in teachers' sense of efficacy. Raudenbush et al. (1992) found that females reported higher teacher efficacy than males. Recent studies have also found a positive relationship between female gender and teacher efficacy (Cheung, 2008; Shahid & Thompson, 2001).

Race/ethnicity. Race/ethnicity is another factor which has also been positively correlated with teacher efficacy. Beady and Hansell (1981) studied the influence of teachers' race/ethnicity on expectations for student achievement. They found that teacher beliefs and expectations of students were positively related to the teacher's race. Likewise, Dee (2005) also discovered race had a consistently large effect on teacher perceptions of performance. Such effects also tended to be concentrated among students of low socioeconomic status, as well as those in the southern part of the United States.

Teaching area. When observed as a factor of teacher efficacy, teaching area has also shown to have a positive relationship (Ashton & Webb, 1986). Raudenbush et al. (1992), in their study of contextual effects on the self-perceived efficacy of high school teachers, found that self-efficacy has a contextually situated component. Their results indicated a strong relationship

between self-efficacy and subject area. Likewise, Ross et al. (1996) found that higher teacher efficacy was attributed to teaching area.

Years of Experience. Research has shown that teacher efficacy increases with experience (Dembo & Gibson, 1985; Hoy & Woolfolk, 1993). Shahid and Thompson (2001) discovered a positive relationship between teacher efficacy and years of experience. Likewise, Cheung (2008) found that years of teaching experience had a significant relationship to teacher efficacy. Penrose, Perry, and Ball (2007) also found that length of teaching experience was a strong predictor of teacher efficacy.

Degree. Teacher efficacy has also been shown to be positively correlated to certification level or degree (Hoy & Woolfolk, 1993). Darling-Hammond (2000) acknowledged the importance of certification status and degree. Full certification and major in field is a more powerful predictor of student achievement than teachers' education level (i.e., master's degree). These characteristics are very significantly correlated with student outcomes. However, Cheung (2006), in his study of Hong Kong primary in-service teachers, did not find a significant difference among teachers with bachelor's and master's degrees.

Teacher Efficacy and Teacher Abilities, Motivation, and Commitment to Teaching

Teacher efficacy beliefs also influence teacher abilities, motivation, and commitment to teaching (Bandura, 1993, 1997). For example, two teachers may possess the same amount of knowledge regarding instructional methods but their ability to effectively implement the instructional method is dependent upon efficacy beliefs. These efficacy beliefs also play an important role in the motivation a teacher exhibits in the classroom, as well as their commitment to teaching.

Teacher abilities. According to Bandura's (1997) self-efficacy theory, a person's capability is only as good as its execution. When approaching difficult tasks, it is the self-assurance people have in their abilities that determines whether they make good or poor use of their capabilities. Without self-assurance, self-doubt can easily overrule the skills a person may possess. People may possess the same abilities but some may perform poorly and others extraordinarily. The type of performance exhibited is dependent upon differences in self-efficacy thinking.

Another factor which influences abilities is social comparison. People judge their abilities based on how their self comparison to others (Bandura, 1997). Rosenholtz and Simpson (1984) found that students receive this type of influence about their abilities based on grading practices and teacher evaluations of their performances. When people see themselves as being surpassed by others performance, efficacy is diminished. However, when people view themselves as mastering concepts, efficacy is strengthened, thinking becomes more efficient, and performance is improved.

Teachers who believe they have the ability to positively influence student learning and achievement are more willing to implement challenging strategies to achieve instructional goals (Bruce & Ross, 2008). However, if they do not believe in their abilities they will not attempt to exhibit effort beyond their self-assured limits (Bandura, 1993). For example, teachers with low self-efficacy will choose to employ teaching strategies that will not threaten their current ability level. Likewise, they choose not to attempt more challenging instructional strategies, which would exploit their ability and further diminish their efficacy beliefs.

Teacher motivation. According to Bandura (1997), efficacy beliefs contribute to motivation in several ways. Beliefs determine the goals people set, how much effort they will

expend, how long they will persevere when faced with difficulties, and how they will respond when faced with failure.

> When faced with obstacles and failures, people who harbor self-doubts about their capabilities slacken their efforts or give up quickly. Those who have a strong belief in their capabilities exert greater effort when they fail to master the challenge. Strong perseverance usually pays off in performance accomplishments. (p. 131)

Furthermore, motivation is affected by both outcome expectations and efficacy expectations (Bandura, 1977, 1982). Outcomes people anticipate depend on their judgments of how they will perform in situations. If they do not believe the expected outcome will be achieved, they will not be motivated to perform. These efficacy beliefs greatly influence how people motivate themselves (Bandura, 1997).

As a motivational construct, teacher efficacy determines the amount of effort a teacher will expend and the persistence a teacher will demonstrate when faced with obstacles (Tschannen-Moran et al., 1998). Therefore, teachers who are more efficacious, once they have achieved a goal they have been pursuing, will set higher goals for themselves. Teachers with low efficacy beliefs will not attempt challenging situations; they will choose to work within their perceived boundaries of ability (Bandura, 1997).

Commitment to Teaching. Research has shown that teacher efficacy is also related to a teacher's commitment to teaching. Coladarci (1992) conducted a study to examine the degree to which teacher efficacy predicted commitment to teaching. When teachers were asked if they had it to do all over again would they become teachers, Coladarci found that teacher efficacy was the strongest predictor of commitment to teaching. Bandura (1993) supported this finding and noted that people are more committed when efficacy is stronger. However, teachers who lack a secure

sense of efficacy do not demonstrate a commitment to teaching and spend less time on academic matters.

Evans and Tribble (1986) found that preservice teachers with a high level of teacher efficacy were more committed to the profession. Likewise, Hoy, and Woolfolk (1990), in their study of school health and teacher efficacy, found that experienced teachers who had taken extra graduate courses in education had higher efficacy.

Teacher Efficacy and Student Achievement

Teacher efficacy is "powerfully related to many meaningful educational outcomes such as teacher persistence, enthusiasm, commitment and instructional behavior, as well as student outcomes such as achievement, motivation, and self efficacy belief" (Tschannen-Moran & Hoy, 2001, p. 783). When teachers are highly efficacious their students exhibit greater achievement and success.

Teachers with high efficacy use effective classroom management strategies, meet the needs of low ability students, and increase student perceptions of their abilities (Bruce & Ross, 2008). Likewise, teachers who have higher efficacy are less likely to criticize students who respond incorrectly. They are also more likely to use small group instruction to promote student success, rather than instructing the class as a whole (Gibson & Dembo, 1984).

Ashton et al. (1983) found a significant relationship among TE and student achievement. In their study of teacher efficacy, they found that student achievement scores were significantly related to teachers' sense of efficacy, as measured by Metropolitan Achievement Test scores. They discovered that students of teachers with high efficacy attitudes scored higher on these achievement tests than students who had teachers with low efficacy attitudes. They also noted that teachers with high efficacy maintain high academic standards, focus on academic

instruction, monitor on-task behavior of students, and develop a supportive classroom environment.

Research has also shown that teacher efficacy is significantly related to student achievement on standardized reading and math tests. Armor et al. (1976) found that teacher efficacy beliefs were significantly related to the reading gains of black children. Ashton and Webb (1986) reported that teacher efficacy beliefs were predictive of students' level of mathematical and language achievement over the course of the academic year. Likewise, Rosenholtz (1989) found that teacher efficacy predicted math and reading achievement of students in the fourth grade. Berman and McLaughlin (1977) also discovered that teacher efficacy was the most significant factor affecting the implementation of projects that led to increased student achievement.

Research has revealed that high and low efficacy teachers exhibit different behaviors, which result in differences in student achievement (Gibson & Dembo, 1984). Goddard and Goddard (2001) stated that ―the relationship between teacher efficacy and student achievement appears to be indirect, with teacher efficacy influencing numerous teacher behaviors that, in turn, promote student achievement" (p. 808). Low efficacy teachers tend to focus more of their attention on high achieving students (Ashton et al., 1983). Midgely, Feldlaufer, and Eccles (1989) found that students who moved from a high-efficacy teacher to a low efficacy teacher perceived lower expectations for their performance. Also, student perceptions of the difficulty of subject matter increased when moved to a low efficacy teacher.

Ashton and Webb (1986) observed that teachers with a high sense of efficacy beliefs used instructional strategies that promoted an expectation of achievement. These teachers also provided a classroom environment that focused on academic work and interpersonal

relationships. High efficacy beliefs of teachers were also predictive of their students' level of mathematical and language achievement.

Interestingly, student achievement is also reciprocally related to teacher efficacy (Bandura, 1997). Tschannen-Moran et al. (1998) noted that as student academic achievement increases, efficacy beliefs of teachers are enhanced, which further enhances student achievement. Yet, when low efficacy teachers doubt they can do anything to impact student achievement, they are less likely to put forth the effort to teach low-achieving students (Ashton & Webb, 1986; Gibson & Dembo, 1984).

Teacher Efficacy and Instructional Practices, Classroom Management, and Student Engagement

Teacher efficacy studies have revealed that the instructional practices, classroom management strategies, and student engagement of teachers who are more efficacious differ from those with low efficacy (Goddard et al., 2000; Gordon, 2001). These differences have been shown to influence the way in which teachers approach daily tasks and activities with students.

Instructional practices. Woolfolk and Hoy (1990) found that teacher efficacy affects teachers' instructional practices. Teachers with high efficacy were most receptive to the implementation of new instructional practices (Guskey, 1988). According to Bandura (1993), teachers with a low sense of efficacy favor a custodial orientation of teaching strategies. Such teachers rely on extrinsic factors and negative sanctions to get students to study. However, teachers who have strong belief in their instructional efficacy support the development of intrinsic factors and rely on students' self-directed academic pursuits.

Ashton and Webb (1986) also observed that teachers with low efficacy preferred not to use small group instruction. Low efficacy teachers also group students based on ability and give

more attention, more assignments, and more praise to high ability students (Ashton et al., 1983). Yet, high efficacy teachers who believe in their ability to promote student learning create mastery experiences that enhance students' judgments of their abilities.

Classroom management. Before teachers can teach students anything, it is necessary to develop classroom management strategies. Learning to manage students is the first important task of teaching, which often becomes a measure of teaching potential (Rosenholtz, 1989). However, high and low efficacy teachers approach the task differently (Ashton et al., 1983; Hoy & Woolfolk, 1990).

Teachers who doubt their teaching efficacy tend to use harsh methods when attempting to control student behavior and are more likely to have disorderly classes than those who viewed themselves as more efficacious. Ashton et al. (1983) found that ~~h~~high-efficacy teachers were not as likely as their low-efficacy colleagues to appear angered or threatened by the misbehavior of students" (p. 10). On the other hand, low efficacy teachers perceived student behavior as threatening to the order of the class. High efficacy teachers also set clear expectations for classroom procedures and were consistent with enforcing such procedures. They were also more likely to keep students on task and remain on task themselves.

Ashton and Webb (1986) noted that teachers who believed in their teaching abilities provided a warmer classroom climate than less confident teachers. They also used more praise, more nonverbal signs of approval and avoided negative behaviors, such as yelling, giving directions without reasons, and punishing students.

Student engagement. In terms of student engagement and the importance of a classroom environment, Bandura (1997) stated that the task and responsibility of creating a positive learning environment rests on the talents and self-efficacy of teachers. Teachers with a

strong sense of teaching efficacy can motivate their students and improve learning. However, teachers with a low sense of instructional efficacy rely on negative sanctions to get students to study (Bandura, 1993).

Gibson and Dembo (1984) discovered that classroom observation data revealed differences in student engagement between high and low efficacy teachers. Students of low efficacy teachers spent more time off-task and received no redirection from the teacher. On the other hand, teachers with high-efficacy were found to achieve more student on-task behavior from everyone in the class while instructing small groups.

Following these findings, research on the use of instructional time and student engagement in learning activities has continued to reveal a link to teacher efficacy (Ashton et al., 1986; Benz, Bradley, Alderman, & Flowers, 1992). Raudenbush et al. (1992) found that student engagement was strongly related to teacher efficacy. Their analysis also revealed that teachers view low-track students to be less engaged than high-track students. Thus, they proposed that track differences (non-academic, academic, and honors) for students influenced teacher efficacy, which in turn affected student engagement.

Ross et al. (1996) confirmed previous findings in their study of within-teacher and between-teacher factors. They found that teacher perception of student engagement was significantly related to teaching efficacy. Teachers with high efficacy spend more time engaging students in learning subject matter and were more effective (Gordon, 2001).

Historical Development of Teacher Efficacy Measures

The study of teacher efficacy has been guided by three dominant theoretical frameworks: Rotter's (1966) social learning theory and Bandura's social cognitive (1977) and self-efficacy (1997) theories. Throughout each of these studies, researchers have developed several measures

to capture the meaning of this complex construct (Tschannen-Moran & Hoy, 2001). A summary of teacher efficacy measures is provided in Table 1.

Teacher Efficacy Measures Grounded in Social Learning Theory

The first studies of teacher efficacy were grounded in Rotter's (1966) social learning theory. RAND researchers posed two items in their study of teacher characteristics and student learning to measure teachers' feelings of classroom efficacy (Armor et al., 1976). The first item asked whether the teacher felt that "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" (p. 23). The second asked whether the teacher thought "if I try really hard, I can get through to even the most difficult or unmotivated students" (p. 23). These questions were then combined into a single measure of efficacy.

RAND researchers conceptualized efficacy as the extent to which teachers believe they have the ability to produce an effect on student learning (Armor et al., 1976). Teachers who agree student learning is dependent upon the environment believe that reinforcement of their teaching abilities is beyond their control or external to them. However, teachers who have confidence in their abilities to teach students, regardless of the environment, believe that reinforcement of their teaching abilities is within their control or is internal. Teacher efficacy, when based on social learning theory, is the extent to which teachers believe the control of reinforcement for learning is either external or internal (Armor et al., 1976; Tschannen-Moran et al., 1998)

Armor et al. (1976) found that teacher efficacy was significantly related to student gains in reading achievement of African American students. From their analysis, it was determined that teacher efficacy does matter for the education of students studied, over and above the

importance of student background characteristics such as socioeconomic status and prior reading knowledge" (p. 50).

Following the RAND study, researchers have developed instruments to measure and further promote the study of teacher efficacy (Ashton & Webb, 1986; Dellinger, Bobbett, Olivier, & Ellett, 2008; Gibson & Dembo, 1984; Guskey, 1981; Rose & Medway, 1981; Tschannen-Moran & Hoy, 2001). With the development of each instrument, the goal has been to improve the measurement and understanding of teacher efficacy.

Responsibility for student achievement. Guskey (1981) developed a 30-item instrument which measured Responsibility for Student Achievement (RSA) to better understand attributional dimensions in classroom teachers. Rotter's (1966) locus of control and Weiner's (1979) attributional theories were used to guide item construction. The survey was administered to 215 elementary and secondary teachers from a metropolitan school district. The RSA provided a total overall score for how much a teacher assumed responsibility for student outcomes. A factor analysis indicated that there were two separate subscale scores for ~~b~~beliefs in internal responsibility for classroom success (R+ score) and for classroom failures (R- score)" (Guskey, p. 44).

Guskey (1982) conducted a second study to examine the differences in teachers' perceptions of personal control over student learning outcomes. This study involved 184 elementary and secondary teachers in two metropolitan school districts. In addition to using the RSA, Guskey also included the two RAND items from Armor et al. (1976) and compared scores. Correlations between the weights assigned to the RSA attribution categories (R+, R-) and the two RAND items measuring teacher efficacy were calculated. Significant positive correlations between teacher efficacy and responsibility for student success (R+) and student failure (R-)

were revealed. Findings from this study revealed that teacher efficacy influences student achievement. Teachers generally attributed student success to the teachers' internal attributes of ability and effort, rather than to the skills or abilities students possessed. A review of literature yielded no results of other studies that had used this scale.

Teacher locus of control. Rose and Medway (1981) developed an instrument called the Teacher Locus of Control (TLC). Rotter's (1966) social learning theory and Weiner's (1979) attribution theory served as the foundation for item development. This instrument was composed of 28 items that were designed to measure teachers' expectations for internal versus external control over student success and failure within the classroom.

Principal component factor analysis was conducted and revealed two separate subscales, one for responsibility of student success (I+) and one for responsibility of student failure (I-). Findings revealed that the TLC scale proved to be a feasible method of assessing teachers' perceptions of control within the classroom environment (Rose & Medway, 1981). The TLC scale was also found to be internally consistent and was more significantly correlated with classroom teaching behaviors than Rotter's I-E scale, which was a more generalized measure of control beliefs. Tschannen-Moran and Hoy (2001) noted that ~~"s~~cores on the TLC have been weakly but significantly related to the individual RAND items (GTE and PTE) as well as to the sum of the two RAND items (TE) with correlations generally ranging from 0.11 to 0.41" (p. 786).

Teacher Efficacy Measures Grounded in Social Cognitive Theory and Self-Efficacy Theory

The second dominant theoretical frameworks that have guided the development of scales to measure teacher efficacy are Bandura's social cognitive (1977) and self-efficacy (1997) theories. Social cognitive theory defines human behavior as the interaction between personal

factors, behavior, and the environment. Self-efficacy theory refers to the belief an individual has in his or her abilities to organize and execute a course of action in order to achieve a task.

Webb efficacy scale. The Webb Efficacy scale (Ashton et al., 1982) was based on Bandura's (1977) social cognitive theory. This scale consisted of seven items with a forced-choice format, which sought to reduce social desirability bias issues. Each of the seven items contained two responses, participants were to select the response they agreed with most strongly. Teachers were asked to select one of two statements which described their view of various teaching situations: (a) a teacher should not be expected to reach every child or (b) every child is reachable. Webb found that teachers with a higher score were less likely to demonstrate anger or impatience in interactions with students. Other than the original study, no other studies have used this scale. Ashton and Webb (1986) noted that the Webb Efficacy measure had psychometric limitations. The Webb Efficacy measure, "was developed to reduce the problem of social desirability bias by using a forced-choice format with choices matched for social desirability" (p. 148). More than 10% of the respondents refused to make a choice on at least one of the seven items. Internal consistency of the scale was also deemed inadequate. In three samples of teachers, reliability estimates ranged from .33 to .51.

Ashton vignettes. Ashton et al. (1984) developed the Personal Teaching Efficacy Vignette scale, also referred to as the Ashton Vignettes, to determine if a more comprehensive conceptualization of efficacy would be useful. Based on Bandura's (1977) social cognitive and self-efficacy theories, this 25-item instrument consisted of situations concerning various aspects of teaching that include motivation, discipline, instruction, planning, assessment, and working with parents. Two forms, one with a self-reference approach and the other with a norm-reference approach, were used in this study. Ashton et al. (1984) found that teachers perceived

their efficacy in terms of a norm rather than a self-referenced construct. The norm-referenced vignettes were significantly correlated to the RAND items, whereas the self-referenced vignettes were not significantly correlated.

For this 50-item questionnaire, teachers were asked to estimate how effectively they would handle the proposed situation by responding to a Likert-type scale ranging from extremely ineffective (1) to extremely effective (7). The vignettes that asked teachers to compare themselves to other teachers were found to be significantly correlated with the RAND items. Ashton et al. (1984) found this measure to be internal consistent, but noted that it did not correlate significantly with student achievement. Similar to the Webb Efficacy scale, Ashton and Webb (1986) noted that the Efficacy Vignette measure had psychometric limitations. A review of literature produced no results of other studies that used this instrument.

Teacher efficacy scale. Building on the initial work of the RAND studies, Gibson and Dembo (1984) developed a 30-item measure called the Teacher Efficacy scale (TES). Bandura's (1977) social cognitive theory served as the framework for item development. The questionnaire was administered to 208 elementary teachers in 13 schools from two neighboring districts. Gibson and Dembo conducted factor analysis and found that two factors emerged: personal teaching efficacy and teaching efficacy.

Personal teaching efficacy accounted for 18.2% of the total variance and represents the ~~"b~~belief that one has the skills and abilities to bring about student learning" (Gibson & Dembo, 1984, p. 573). Teaching efficacy accounted for 10.6% of the total variance and represents the belief that the teacher's ability to influence student learning is limited by factors external to the teacher, such as home environment and family background. Their results provided empirical support for the contention of Ashton et al. (1982) that teacher efficacy is comprised of two

factors. Gibson and Dembo stated that both factors "lend support to the applicability of Bandura's conceptualization of self-efficacy in research on teacher efficacy" (p. 574). However, they cautioned that future studies should explore the elements of Bandura's theory of self-efficacy, as related to teacher efficacy.

Subsequent studies confirmed Gibson and Dembo's (1984) findings of a two-factor structure (Anderson, Greene, & Loewen, 1988; Hoy & Woolfolk, 1993; Moore & Esselman, 1992; Soodak & Podell, 1996). Although Soodak and Podell confirmed the two factor structure, they found inconsistencies in the loading of items when conducting a factor analysis. For example, one GTE item loaded on the PTE factor. They proposed that future research should address these inconsistencies, which may be the result of grammatical patterns among items, by controlling the "grammatical structure to ensure that the factors reflect conceptual and not grammatical differences" (p. 410). Tschannen-Moran and Hoy (2001) recognized that the Gibson and Dembo (1984) instrument had been the most widely used measure of teacher efficacy to date. However, there were conceptual and statistical problems.

Following Gibson and Dembo's (1984) development of the Teacher Efficacy scale, additional research on teacher efficacy confirmed the existence of a two-factor structure (Hoy & Woolfolk, 1993; Moore & Esselman, 1992; Soodak & Podell, 1996; Woolfolk & Hoy, 1990). However, Woolfolk and Hoy (1990) challenged the theoretical assertions of Ashton et al. (1984) and Gibson and Dembo (1984) that teacher efficacy is an outcome expectancy.

> For Bandura, an outcome expectation is a judgment of the likely consequences of an action, whereas an efficacy expectation is a judgment about ability to perform an action. The question of whether teachers can override the effects of adverse background influences (RAND Item 1) is an efficacy expectation, not an outcome expectation,

> because it involves the potential to perform. . . Thus, the question of whether teaching can overcome the influence of student background is not an outcome expectation as described by Bandura. (Woolfolk & Hoy, 1990, p. 82)

Hoy and Woolfolk's (1990) study on prospective teachers' sense of efficacy involved 182 liberal arts majors enrolled in a teacher preparation program, 78 of which were seeking secondary certification. A modified version of the Teacher Efficacy scale (Gibson & Dembo, 1984) was used and the two original RAND items were included, resulting in a total of 22 items. Responses to each item were recorded using a 6-point Likert scale ranging from *strongly agree* to *strongly disagree*. Factor analysis was performed to confirm the existence of a two-factor structure for the teacher efficacy construct, teaching efficacy and personal efficacy.

Results confirmed the existence of a two-factor structure for the constructs, teaching efficacy and personal efficacy. However, it was discovered that personal efficacy could be further divided into two factors. The first factor related to responsibility for positive student outcomes and the other to responsibility for negative student outcomes (Woolfolk & Hoy, 1990). They also noted that ―it was enlightening to test relationships using the independent dimensions of efficacy. The findings suggest that relationships between efficacy and other important variables need to be carefully specified" (p. 88). Woolfolk and Hoy proposed that studies that combine the two dimensions of teacher efficacy into one index, such as the one conducted by Ashton and Webb (1986), were likely to miss important relationships.

Similar to Woolfolk and Hoy's (1990) findings, Guskey and Passaro (1994) also suggested that teacher efficacy consisted of two separate dimensions. However, their explanation of the two dimensions represented internal and external control, which was consistent with Rotter's (1966) locus of control. Their sample consisted of 342 preservice and

experienced teachers of three suburban/rural school districts in two different states. The 21-item instrument was composed of items from Gibson and Dembo (1984) and Woolfolk and Hoy's (1990) studies, along with the two RAND items. Principal components factor analysis was conducted to generate a two-factor solution.

Their findings support that teacher efficacy is a multidimensional construct, consistent with the work of Ashton and Webb (1986), Gibson and Dembo (1984), and Woolfolk and Hoy (1990). However, they proposed that the personal versus teaching efficacy dimensions identified by previous researchers masked the internal versus external distinction of the construct and ~~–a~~s a consequence, confounded their interpretations of results" (Guskey & Passaro, 1994, p. 639).

Soodak and Podell (1996) also conducted a study to explore the dimensions of teacher efficacy. Using a modified version of the Gibson and Dembo (1984) Teacher Efficacy scale, 310 teachers responded to their ~~–b~~eliefs regarding both academic and behavioral situations" (Soodak & Podell, p. 403). Principal components factor analysis was performed to examine the two factor solution of Gibson and Dembo (1984). However, they found that a three-factor solution accounted for 30.7% of the variance. They labeled these three factors personal efficacy, outcome efficacy, and teaching efficacy.

According to Soodak and Podell (1996), personal efficacy refers to the teacher's belief that he or she possesses teaching skills. Outcome efficacy refers to the belief that when teaching skills are employed, desired student outcomes will be achieved. Teaching efficacy is then defined as the belief that teaching can overcome effects of external or outside influences. They believed that each of these factors more accurately represented Bandura's (1993) original conceptualization of teacher efficacy. However, this contradicts Bandura's previous assertion that an efficacy expectation is different than an outcome expectation.

Unlike Soodak and Podell (1996), Ross (1994) recognized theoretical problems with previously developed instruments. He observed that the existing instruments

> overlap with locus of control, confuse efficacy with outcome expectancy, are susceptible to response bias (particularly in the general teaching efficacy scale which contains only a single negatively worded item), and are too general to meet Bandura's definition of self-efficacy as a situation specific construct. (p. 5)

Science Teaching Efficacy Belief instrument. Understanding that teacher efficacy is situation specific, researchers modified the Gibson and Dembo (1984) instrument to explore teacher efficacy within specific curriculum areas (Enochs et al., 1999; Riggs & Enochs, 1990; Rubeck & Enochs, 1991). Riggs and Enochs developed an instrument called the Science Teaching Efficacy Belief Instrument (STEBI) to measure the efficacy of science teachers. They found two separate factors, one called personal science teaching efficacy and another called science teaching outcome expectancy. Rubeck and Enochs developed yet another scale, called the Chemistry Teaching Efficacy scale. This scale was developed to differentiate chemistry teaching efficacy from science teaching efficacy. In an effort to capture the domain of classroom management, Emmer (1990) modified the Gibson and Dembo instrument once more. This study yielded three efficacy subscales classroom management and discipline efficacy, personal teaching efficacy, and external influences.

Teacher Self-Efficacy scale. In an attempt to provide further clarification of the construct, Bandura (1997) developed his own teacher self-efficacy scale. This instrument consisted of 30 items with seven subscales; efficacy to influence decision making, efficacy to influence school resources, instructional efficacy, disciplinary efficacy, efficacy to enlist parental involvement, efficacy to enlist community involvement, and efficacy to create a positive school

climate. Bandura noted that multifaceted teacher efficacy scales allow researchers to select instruments that are most relevant to the domains being investigated. This scale attempted to satisfy this idea by measuring efficacy beliefs without becoming too narrow or specific. A review of literature yielded no other studies that had used this instrument.

Although Bandura (1997) acknowledged that multi-item measures are an improvement over single-item ones, such as those found in the RAND study, he argued that the instruments created were too general rather than being tailored to instructional domains. He recognized that teachers' sense of instructional efficacy was not consistent across all subjects and scales attempting to measure teaching efficacy should be linked to various instructional activities. For example, teacher efficacy is dependent on more than a teacher's ability to transmit subject matter. Maintaining an orderly classroom conducive to learning, securing parental involvement in academic activities, and offsetting social influences that seek to undermine students' commitment to academic goals are additional areas that influence teacher efficacy.

Ohio State Teacher Efficacy scale. Tschannen-Moran and Hoy (2001) recognized that there was still much confusion over existing instruments which attempted to measure such a complex construct as teacher efficacy.

> Studies of teacher efficacy have frequently found two separate dimensions or factors, although considerable confusion and debate have arisen over their meaning. While there is general agreement that the first factor, commonly called personal teaching efficacy, has to do with one's own feelings of competence as a teacher, the meaning of the second factor has been in question. (Tschannen-Moran & Hoy, 2001, p. 792)

Therefore, they began work on a new measure, the Ohio State Teacher Efficacy scale (OSTES). Consistent with Bandura's self-efficacy theory, they proposed that teacher efficacy

measures should explore teachers' perceived competence across the range of activities they are asked to perform in the classroom. The original instrument consisted of 52 items, which was eventually reduced to two forms: a long form with 24 items and a short form with 12 items. Both forms were subjected to two separate factor analyses. The results identified three dimensions of the teacher efficacy construct labeled efficacy for instructional strategies, student engagement, and classroom management. Both forms proved to be a useful tool for exploring the construct of teacher efficacy. A review of literature revealed that the OSTES, also referred to as the Teachers' Sense of Efficacy scale (TSES), has been widely used by researchers in the study of teacher efficacy.

Construct validity of the OSTES was examined by assessing the correlation of this measure with existing measures. Tschannen-Moran and Hoy (2001) sampled 410 preservice and inservice teachers using this new measure; 29% taught high school, 29% taught middle school, 37% taught elementary grades, and 5% taught preschool. Participants also responded to the RAND items and the Hoy and Woolfolk (1993) 10-item version of the Gibson and Dembo Teacher Efficacy scale. Total scores on the OSTES were positively correlated to both RAND items (r=0.18 and 0.53, p<0.01), as well as both factors, PTE (r=0.64, p<0.01) and GTE (r=0.16, p<0.01), of the Gibson and Dembo (1984) instrument. However, Tschannen-Moran and Hoy (2001) recognized that the lower correlations between the GTE factor and other measures suggested that this scale was not as successful in capturing the essence of efficacy. The OSTES addresses limitations of previously developed scales by including a wide range of teaching tasks which encompass the three dimensions of teacher efficacy that ~~r~~represent the richness of teachers' work lives and the requirements of good teaching" (p. 801).

Tschannen-Moran and Hoy (2007) also used the TSES in their study which examined the contextual factors that contribute to novice and experienced teachers' sense of efficacy. The sample consisted of 255 teachers; 69% taught elementary and middle school, and 31% taught high school. Due to Bandura's (1997) contention that efficacy beliefs are formed in the early stages of learning, and once established, become resistant to change, they divided the sample into two subsamples: novice teachers with 3 or less years of experience (*n*=74) and career teachers with 4 or more years of experience (*n*=181).

Since the TSES was a relatively new measure, Tschannen-Moran and Hoy (2007) used factor analysis and reliability analysis to test the scale. Multiple regression was then used to explore the influence of various sources of efficacy beliefs among novice and career teachers. The TSES reliability of the 24-item scales was .93. Subscale reliabilities for TSES subscales were .87, .88, and .84.

Klassen et al. (2009) administered the 12-item version of the TSES to six groups of teachers from five countries located in North America, Asia, and Europe. They also included four groups of elementary and middle school teachers from Canada, Cyprus, Korea, and the United States, along with two groups of secondary teachers from Canada and Singapore. These groups were chosen to test validity across grade levels of schools, as well as cultural and geographical settings. The sample consisted of 709 elementary and middle school teachers and 502 secondary teachers.

The TSES showed convincing evidence of invariance of factor forms, factor loadings, and factor variances and covariances across groups of teachers within culturally similar regions in North America and East Asia, and across six groups of teachers from five countries in North America, East Asia, and Europe" (Klassen et al., 2009, p. 73). However, one limitation of the

study was that teachers were not randomly selected, therefore it was noted that the samples may not be representative of the population of teachers in each country.

Teachers' Efficacy Beliefs System-Self Form. Following the development of the OSTES, Dellinger et al. (2008) created the Teachers' Efficacy Beliefs System-Self form (TEBS-Self) to measure teachers' self-efficacy beliefs. This instrument was developed to provide a more accurate reflection of Bandura's (1977) original definition of self-efficacy. They argued that there is a need for a new measure to assess teachers' efficacy beliefs and that existing measures of teacher efficacy do not accurately reflect the theory of self-efficacy. This argument is based on the premise that teacher efficacy and teacher self-efficacy beliefs are distinctly different constructs. However, they noted that Tschannen-Moran and Hoy (2001) improved upon the measurement of this construct with the development of the OSTES.

The TEBS-Self consists of 30 items, each with a 4-point scale. Dellinger et al. (2008) described four studies, three of which were unpublished dissertations using this measure. Data from each study were assessed using principal component analysis and reliability analysis. From these studies it was determined that there were similarities in the components and how items were distributed among each. However, some differences did exist.

Findings from each of these unpublished dissertations revealed six subscale factors: monitoring and feedback for learning, classroom management, planning and accommodating for individual differences, motivation of students, managing learning routines, and higher order thinking skills. Two of these, managing learning routines and higher order thinking skills, were only used in two of the studies. Motivation of students was used in only one study.

Dellinger et al. (2008) proposed that the TEBS-Self provides a new way to measure teacher self-efficacy and can be useful in assessing teachers as they work in their classrooms.

However, due to the lack of a well established factor structure, they recommend that future studies conduct confirmatory factory analytic procedures. Dellinger et al. note that it is important to

> develop a consensus about the factor structure of scores generated from the TEBS-Self, as the three studies presented here did not reach a complete consensus in this aspect. This was possibly due to the differences in sample size or characteristics, and/or differences in factor and item selection criteria. Additionally, it is important to investigate whether teachers in other contexts besides K-6 elementary schools (e.g., middle schools, high schools, special education classrooms) respond in a similar way. (p. 763)

Table 1

Summary of Teacher Efficacy Measures

Measure	Theoretical Framework	Task Focus
Rand Items (Armor et al., 1976)	Rotter (1966) Social Learning	Student Motivation Instructional effectiveness
Responsibility for Student Achievement (Guskey, 1981)	Rotter (1966) Social Learning Weiner (1979) Attribution	Student performance Student motivation Instructional effectiveness Teacher approval
Teacher Locus of Control (Rose & Medway, 1981)	Rotter (1966) Social Learning Weiner (1979) Attribution	Student performance Instructional effectiveness Classroom management Social development
Webb Efficacy Scale (Ashton et al., 1982)	Bandura (1977) Social Cognitive	Student performance Student motivation Class groupings
Ashton Vignettes (Ashton, et al., 1982)	Bandura (1977) Social Cognitive	Student performance Student motivation Classroom management Instructional practices Professional consultancy
Teacher Efficacy Scale (Gibson & Dembo, 1984)	Bandura (1977) Social Cognitive	Student performance Instructional practices Classroom management
Teacher Self-Efficacy Scale (Bandura, 1997)	Bandura (1997) Self-Efficacy	Instructional practices Classroom management Decision making Resources Parental involvement Community involvement School climate
Ohio State Teacher Efficacy Scale (Tschannen-Moran & Hoy, 2001)	Bandura (1997) Self-Efficacy	Instructional practices Classroom management Student engagement
Teacher Efficacy Belief System-Self Form (Dellinger et al., 2008)	Bandura (1977) Social Cognitive and Self-Efficacy	Communication Classroom management Accommodation of differences Student motivation Management of learning routines Higher order thinking skills

Recent Studies of Teacher Efficacy Using the TSES

More recently, Wolters and Daugherty (2007) used the 24-item TSES in their study of the influence of experience, grade level taught, and classroom goal structures on teacher efficacy. The sample consisted of 1,024 teachers that taught pre-kindergarten through 12th-grade in a large suburban school district in Texas.

Factor analysis was conducted to examine the factor structure of the TSES. The analyses revealed that ~~in~~individual factor loadings generally were strong and consistent with earlier findings in that they supported factors representing self-efficacy for instruction, self-efficacy for management, and self-efficacy for engagement" (Wolters & Daugherty, 2007, p. 185).

Knoblauch and Hoy (2008) investigated student teachers' efficacy beliefs, collective teacher efficacy beliefs, and perceived cooperating teachers' efficacy beliefs. The sample consisted of 102 student teachers from a mid-sized university in the Midwest. Each student teacher responded to the 12-item TSES. They found the reliability coefficient for this measure, Cronbach's α was .92, to be consistent with reliability coefficients of similar studies. Multiple regression was used to identify factors that were predictive of student teachers' sense of efficacy. Their findings support Bandura's (1997) self-efficacy theory, which served as a framework for item construction for the TSES.

Fives and Buehl (2010) also conducted a study to examine the factor structure of both forms of the TSES, the 12-item and 24-item. The sample consisted of 102 experienced teachers representing all grade levels from the mid-Atlantic region of the United States, and 270 preservice teachers from teacher education classes at universities in the mid-Atlantic, mid-South, and Southwest regions of the United States.

Data were analyzed using exploratory factor analytic procedures. Examination of the items revealed the same three dimensions identified by Tschannen-Moran and Hoy (2001), classroom management, instructional practices, and student engagement. Fives and Buehl (2010) contend that the findings from their study are important to anyone researching the efficacy of preservice or teachers within their first three years of teaching.

Strengths and Limitations of Existing Research

A review of the literature has revealed that a variety of measures and designs have been used to examine teacher efficacy. Of the research presented, three measures have dominated these studies: the two RAND items (Armor et al., 1976), Gibson and Dembo's (1984) Teacher Efficacy scale (TES), and Tschannen-Moran and Hoy's (2001) Teachers' Sense of Efficacy scale (TSES). However, there have been measures created that were unique to an individual study (Ashton et al., 1982; Ashton et al., 1984; Guskey & Passaro, 1994).

Teacher efficacy has been measured with items in which teachers responded with how responsible they believed themselves to be for student success and failure (Guskey, 1988; Rose & Medway, 1981). Other measures have focused on subjects taught (Ross et al., 1999), the influence of student achievement and workplace context on teacher efficacy (Moore & Esselman, 1992), the likelihood that students of certain ethnic groups would complete high school or college (Beady & Hansell, 1981), the development of preservice teachers' efficacy beliefs (Charalambous et al., 2007), and the relationship between teacher efficacy and emotional intelligence (Rastegar & Memarpour, 2009). The variety of measures indicates that the samples and dimensions of teacher efficacy differ. Therefore, based on construct dimensions, contextual factors, and sampling designs, comparisons of existing studies to the proposed study may be

inappropriate. However, each of the previous studies contributes to an understanding of the teacher efficacy construct and provides guidance for this study, as well as future research.

Instrument Selection for Proposed Study

The measurement of teacher efficacy presents a complex problem. Researchers have created multiple instruments based on different theoretical frameworks with varying subscale factors. Some of these instruments were used only once, while others have been more widely accepted. Yet, researchers have continued to debate the ability of each instrument to adequately measure such an elusive construct.

With the creation of each instrument, researchers have sought to improve upon previously developed scales. Tschannen-Moran and Hoy (2001) recognized that ~~th~~he conceptual confusion around the concept of teacher efficacy has made developing appropriate measures of efficacy difficult" (p. 792). In order to solve this issue, Bandura (2006) advised that ~~e~~fficacy scales must be tailored to the particular domain of functioning that is the object of interest" (p. 307).

A review of literature has revealed that there are two potential instruments for use with the proposed study; the Teachers' Sense of Efficacy scale (TSES), developed by Tschannen-Moran and Hoy (2001), and the Teachers' Efficacy Beliefs System-Self form (TEBS-Self), developed by Dellinger et al. (2008). Both are based on Bandura's theoretical framework of self-efficacy. TSES item development was founded on the more recent definition of Bandura's (1997) self-efficacy theory. However, the TEBS-Self used the previously published definition of self-efficacy (1977) to guide item development.

Both of these studies attempted to accurately describe and measure the construct of teacher efficacy. Tschannen-Moran and Hoy (2001) recognized that ~~in~~ order to be useful and

generalizable, measures of teacher efficacy need to tap teachers' assessments of their competence across the wide range of activities and tasks they are asked to perform" (p. 795). Likewise, Dellinger et al. (2008) observed that previous measures had "failed to conceptualize, measure, and analyze teacher efficacy in terms of the multidimensional task requirements of teaching" (p. 755).

Although both measures were created to improve previously developed scales, according to Bandura (2006) each efficacy item should accurately reflect the construct being measured because

> self-efficacy is concerned with perceived capability. The items should be phrased in terms of *can do* rather than *will do*. Can is a judgment of capability; will is a statement of intention. Perceived self-efficacy is a major determinant of intention, but the two constructs are conceptually and empirically separable. (p. 308)

In their development of the TSES, Tschannen-Moran and Hoy (2001) began the stem of each item with "How much can you do". Dellinger et al. (2008) began the stem of each item with "My belief in my ability", which elicited different responses than the traditional item stem used on the TSES. By using the *belief* stem, Dellinger and her colleagues attempted to remain consistent with the language of self-efficacy theory. However, the resulting factor structure was different than the one produced by the TSES.

After repeated tests, the TSES revealed a stable three-factor structure which measured efficacy in instructional practices, classroom management, and student engagement. The TEBS-Self revealed six subscale factors (monitoring and feedback for learning, classroom management, planning and accommodating for individual differences, motivation of students, managing learning routines, and higher order thinking skills) that were not consistent across all tests. The

TSES is superior to other measures ―of teacher efficacy in that it has a unified and stable factor structure and assesses a broad range of capabilities that teachers consider important to good teaching, without being so specific as to render it useless for comparisons of teachers across contexts, levels, and subjects" (Tschannen-Moran & Hoy, 2001, p. 802).

CHAPTER 3

METHOD

Purpose of Study

The purpose of this survey study was to examine the influence of descriptive and contextual characteristics on the perceived teaching efficacy of secondary teachers within public schools in the State of Georgia, with special emphasis on career and technical education teachers. Contextual characteristics included gender, race/ethnicity, subject area taught, years of teaching experience, and certificate level. Teacher efficacy was defined as the belief a teacher has about his or her abilities to influence or bring about the desired outcomes of student engagement and learning (Bandura, 1977). Three distinct aspects of the teacher efficacy construct were measured, including instructional strategies, classroom management, and student engagement.

Research Questions

1. What are the characteristics of secondary teachers in relation to gender, ethnicity, subject area taught, years of teaching experience, and degree level?
2. Does teacher efficacy differ in the subscale areas of instructional practices, classroom management, and student engagement for CTE and academic teachers?
3. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by gender?

4. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by ethnicity?
5. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by years of teaching experience?
6. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by degree level?

Design

This study will use a descriptive survey research design with data gathered using a questionnaire to examine teacher efficacy among secondary educators. Numerous studies have been conducted to examine the construct, teacher efficacy, among educators at all levels of teaching (Goddard, Hoy, & Hoy, 2000; Guskey & Passaro, 1994; Raudenbush, Rowan, & Cheong, 1992; Ross, Cousins, & Gadalla, 1996; Ross & Gray, 2006; Shidler, 2009). Although teacher efficacy has been studied at many different levels, little is known about the teaching efficacy of career and technical education teachers. Therefore, this study examines the teacher efficacy of all secondary educators but emphasizes secondary career and technical educators.

Descriptive research studies provide information about characteristics such as abilities, preferences, and behaviors of individuals or groups (Fraenkel & Wallen, 2003). Descriptive studies allow researchers to observe variables as they exist, provide information about educational phenomenon, and serve as a basis for understanding or implementing change. Such

knowledge has helped to implement educational reform of practices and policies (Gall, Gall, & Borg, 2007).

Two types of descriptive research exist; the first measures characteristics of a sample at one point in time and the second follows or observes a sample over time. Data collected from a sample at one point in time is referred to as cross-sectional (Fraenkel & Wallen, 2003). Longitudinal data is collected at different points in time from a sample in order to study changes or continuity in the sample population's characteristics (Gall et al., 2007). This study will use a cross-sectional survey method to collect data at one point in time from the sample.

A limitation of descriptive research is that it does not allow researchers to have a more complete understanding of people and things (Fraenkel & Wallen, 2003). In order to gain a better understanding of the interaction of variables and to determine relationships among these, Fraenkel and Wallen proposed that causal-comparative research would provide a more in-depth analysis. However, due to the limited information on teaching efficacy of career and technical educators, descriptive research is a starting point that will allow for an understanding of this construct among the group.

Survey research can be used to achieve the purposes of various research designs, such as descriptive, causal-comparative, and case-study designs (Gall et al., 2007). The method of choice for this descriptive study was survey research, which allowed for the collection of data from a sample that had been randomly selected to represent a population. Surveys allow researchers to learn more about the opinions and behaviors of a population. Results of analyses from a randomly selected sample can be generalized to the population from which it was drawn.

When determining if survey research is appropriate for a study, Hill (2001) suggested using the following criteria: (a) survey instruments provide a reasonable solution when the

sample size is large, (b) content of the survey must be clearly stated and easily understood, (c) availability and willingness of the population selected to participate in the survey, and (d) a large geographic region is used. The proposed study meets the criteria suggested by Hill and used a descriptive research design with an Internet-based survey, which allowed for the collection of data from a sample that had been randomly selected to represent a population.

Survey Process

After determining the appropriateness of survey research for a study, Dillman et al. (2009) proposed a plan that encourages people within a selected population to respond. This plan includes the selection of a research population and sample, types of methods used when contacting participants, incentives to respondents, any additional materials provided to respondents, characteristics of the questionnaire, and the organization and structure of individual questions.

Advantages and disadvantages. For more than 75 years, surveys have been used to gather data on the beliefs and opinions of populations (Dillman, Smyth, & Christian, 2009). During this time, the methods of gathering survey responses have evolved. Through the 1960s, there were high face-to-face interactions. Surveyors would visit with respondents individually to gather information. Response rates were as high as 70%, 80%, or 90%. Then, during the 1970s and 1980s, cultural and technological changes ushered in an era of dependency on remote interaction through telephone communications and mail. The expansion of telecommunications networks made it easier for surveyors to contact respondents. During this time, mail surveys also became more efficient. The invention of copy machines allowed surveyors to produce mass quantities of surveys for respondents. Both telephone and mail survey methods reduced the distance barrier and made it easier for surveyors to gather data from a population.

From the 1990s to present, cultural and technological changes have continued to produce more challenges and innovations (Dillman et al., 2009). With the advent of gated communities and locked apartment buildings, surveyors became more reliant on telecommunications technologies to gather data. Such methods resulted in the mistrust of callers and people not responding to survey calls.

Innovative computer technologies have also had a significant impact on the use of internet-based surveys (Dillman et al., 2009). As with previous methods, internet surveys have faced many challenges. Significant portions of the U.S. population have not had access to the internet. In recent years, there has been a significant increase in the number of people gaining access to the internet. However, Internet-based survey methods are still limited to populations with high access rates and skill levels, such as employees of organizations who use the internet for day-to-day operations.

While there are several administration options for conducting a survey, this study used an Internet-based survey since the identified population had access to the internet and email from their schools. Internet-based surveys also produce results faster and have a significantly lower cost than the more traditional survey methods (Dillman et al., 2009). Like mail surveys, Internet-based survey methods must be designed effectively to gather high quality data from respondents. Dillman et al. identified several guidelines for Internet-based surveys:

- personalize all contacts to respondents;
- send a token of appreciation with the survey request;
- use multiple contacts to respondents and vary the message of each;
- time all contacts with the population in mind;
- consider using alternative modes to contact respondents when necessary;

- keep email contacts brief and direct;
- make sure emails will not be flagged as spam;
- carefully select all information included in emails;
- provide clear instructions on how to access the survey;
- assign each sample member a unique ID number;
- understand the limitations of the web server being used for the survey;
- establish a procedure for resending emails that are rejected or bounced back;
- establish procedures for addressing returned incentives;
- establish procedures for responding to participant inquiries; and
- implement a process for monitoring survey progress and evaluating early responses.

Advantages of Internet-based survey research include cost-savings, ease of data analysis, faster transmission time, easy use of pre-letters (invitations), more candid responses, and quicker response time with increased magnitude of coverage (Thach, 1995). Another advantage is the ability to collect information from a large geographic region when "breadth over depth of information is needed" (Hill, 2001, p. 203). Surveys are also most appropriate when the type of information collected is sensitive. Respondents are more willing to respond truthfully to sensitive topics when their anonymity is assured.

Disadvantages of survey research include limitations on the type of data collected, length of survey, respondent attitudes to survey questions, presentation of survey, limited opportunity for follow-up or inquiry of responses, and limited response formats (Hill, 2001). To address these disadvantages, Gall et al. (2007) suggested to avoid using surveys that are too long, to make sure respondents have knowledge of the topic covered, include language that is

comprehensible to respondents on the survey, and select a format that is appropriate for purposes of the study.

Response rates. To conduct a survey that accurately reflects the views of a population, Dillman et al. (2009) recommended reducing non-response error rates. Low response rates reduce the effective sample size for a study and decrease reliability estimates generated from the data (Whipple & Muffo, 1982). When response rates are low, there is increased potential for error (Fowler, 2009). Should response rates not be high enough, critics of the survey would have a valid argument for the data gathered not being credible. Therefore, it is imperative that survey research seek to reduce nonresponse rates. However, Fowler stated this is difficult to accomplish, but recognized that people with roles relevant to the survey topic, and who are interested in the subject, have a greater impact on response rates received.

External validity and reliability of results are increased when nonresponse rates are decreased. Whipple and Muffo (1982) reviewed techniques to address nonresponse; however these improve only external validity. These techniques include assuming that nonrespondents possess the same key characteristics as respondents, comparing demographics of nonrespondents and respondents to show that the two groups do not differ significantly, and conducting follow-up interviews to determine if differences exist between the two groups. Each of these methods presents a viable way to reduce nonresponse bias, possessing both advantages and disadvantages.

When assuming that nonrespondents and respondents possess the same characteristics, estimated results assume equality of the two groups, —which is simply a matter of blind faith and is not a recommended procedure" (Whipple & Muffo, 1982, p. 5). And although comparing demographics of both groups to show that they do not differ significantly is an improvement, essential attributes being investigated may be independent of the available demographics for the

study. The last technique, follow-up interviews, is the most desirable but also the most burdensome. This method can also prove to be expensive and time consuming. An additional issue arises with follow-up interviews not evident in the previous two techniques, interviewer bias. Measurement differences exist between self-respondents and responses gathered by interviewers. Although this method may improve external validity by increasing response rates, internal validity of the data gathered is compromised.

To ensure a high response rate for the proposed study, Krejcie and Morgan's (1970) table for determining a random sample of a given population size was used to determine the total number of secondary teachers needed in order to generalize findings of this study to the selected population. Dillman (2007) and Mertler (2003) have shown that response rates of internet-based surveys range from 13% to nearly 60%. To achieve the desired sample size, Krueger (2001) recommends calculating the desired sample size based on a 50% response rate. For this study, the desired sample size was multiplied by two to account for an estimated 50% response rate.

Participants

Prior to distributing surveys, a population is selected from which a sample is drawn. The population includes all members of a set of people from which the researcher wishes to generalize results of the study (Gall et al., 2007). After defining the target population, a random sample is then selected from the population. When used, a random sampling method produces a group of individuals that are representative of the entire population (Fraenkel & Wallen, 2003).

Various methods of random sampling exist for researchers to use: simple random sampling, systematic sampling, and stratified sampling (Frankel & Wallen, 2003). A simple random sample is a method where every possible sample of *n* selected from a population has the

same probability of selection. Simple random sampling is used when a complete list of the population is readily available.

Systematic sampling is used when the list of the population is large and would be too cumbersome for a simple random sampling method (Biemer & Lyberg, 2003). For example, selecting a sample of 500 from a list of 5000 using a random number selection process would be labor intensive. However, when using systematic sampling, the selection process is easier. For this method, every tenth name on the list would be selected, a process that is much easier to conduct because the interval between selections remains constant.

Stratified random sampling is similar to systematic sampling; however the goal is to organize the population into homogenous subsets which contain similar characteristics of interest. This method produces estimates of the entire population which are much more precise than unstratified sampling methods and decreases sampling error (Biemer, Lyberg, 2003; Kish, 1965; Rubin & Babbie, 2007). Jaeger (1984) noted that stratified random sampling is quite useful in research applications in education and in social and behavior sciences.

When using stratified random sampling, samples selected from the population of interest may be proportionate or disproportionate (Rubin & Babbie, 2007). For proportionate samples, an equal number of cases are drawn from each strata or subset. Disproportionate samples are used when seeking to generalize findings to smaller subsets. For example, when analyzing groups based on ethnicity, some ethnic groups may be represented by only a handful of cases. Disproportionate sampling gives smaller subsets a disproportionately better chance of being selected than cases from larger subgroups.

The population used for this study was all secondary academic and CTE teachers in the Griffin RESA region of the state of Georgia. Teachers of math, science, social studies and

language arts are classified as academic teachers. Teachers of agriculture, architecture, construction, communication, transportation, business and computer science, culinary arts, family and consumer sciences, engineering and technology, government and public safety, healthcare science, and marketing are classified as career technical education teachers.

Data obtained from the state Department of Education indicate that the number of secondary academic and CTE teachers employed in the Griffin RESA region of the state of Georgia was 1,295 for the 2010-2011 school year. Of the 1,295 secondary teachers employed in the Griffin RESA region of Georgia, there were 1, 095 academic and 200 CTE teachers. A stratified random sampling procedure was used to select participants for this study.

Krejcie and Morgan's (1970) table for determining a random sample of a given population size recommended that a sample of 278 secondary academic and 132 CTE teachers were needed in order to generalize findings of this study to the selected population. However, Rubin and Babbie (2007) suggest using disproportionate sampling when seeking to analyze groups that may be underrepresented by simple sampling procedures. Therefore, 200 academic and 200 CTE teachers were selected for the study.

After determining the number of academic and career technical education teachers available for the study, participants were randomly selected using a stratified sampling procedure. The list of teachers was arranged alphabetically and then assigned consecutive numbers to be used in the selection process. Using the assigned numbers, an internet-based random number generator program was used to identify participants for the sample. Participant emails were located using each school's list of teacher email addresses or the participant's individual school system website. When email addresses were unavailable through the school's list of email addresses or the school system website, participants were contacted by phone to

identify email addresses. Once all email addresses were identified, participants were notified electronically of the purpose of the study and the random selection process. The notification contained instructions about accessing the survey instrument through a web-based program.

Instrumentation

The survey instrument used for this study was the Teachers' Sense of Efficacy scale long form (TSES), developed by Tschannen-Moran and Hoy (2001) (see Appendix B). This instrument was developed to measure a teachers' sense of efficacy, the belief a teacher has about his or her abilities to influence or bring about the desired outcomes of student engagement and learning (Bandura, 1977). The instrument extends the research of Bandura's (1977) self-efficacy theory and includes subscale factors of previously developed efficacy scales (including Ashton et al., 1982; Gibson & Dembo, 1984; Guskey, 1981; Rose & Medway, 1981).

Previously developed scales included factors of general teaching efficacy (GTE) and personal teaching efficacy (PTE). General teaching efficacy is closely associated with the outcome expectancy component of Bandura's (1977) social cognitive theory. Outcome expectancy is a person's assessment of their capabilities to bring about desired results. The personal teaching efficacy factor focuses on a teacher's own feelings of competence as a teacher. The TSES includes both factors, by allowing teachers to assess their competence on a wide range of activities and tasks. Yet, the instrument remains generalizable to teachers across subject areas, grade levels, and experience levels (Tschannen-Moran & Hoy, 2001).

Two forms of the TSES were developed, a long form with 24 items and a short form with 12 items. Both measure three subscale factors that include efficacy in instructional practices, classroom management, and student engagement. The stem of each item asks, "How much can you do?" Sample items include "How much can you do to motivate students who show low

interest in schoolwork?" —How much can you assist parents in helping their children to do well in school?" and —How much can you gauge student comprehension of what you have taught?" A 9-point scale is used for each item, ranging from 1=Nothing to 3=Very little to 4=Some influence to 7=Quite a bit to 9=A great deal. For this study, there were five demographic questions added to the instrument including gender, race/ethnicity, subject area taught, years of teaching experience, and certificate level.

Tschannen-Moran and Hoy (2001) developed the TSES based on a 3-factor structure that emerged when the tested constructs were subjected to factor analysis. The three resulting factors were efficacy in instructional practices, classroom management, and student engagement. When scores of the TSES were compared to scores of previously developed efficacy scales, (Rand Items, the Hoy and Woolfolk [1993] 10-item adaptation of the Gibson and Dembo TES), total scores of the TSES were found to be positively correlated to each of these measures. —Reliabilities for the teacher efficacy subscales were 0.91 for instruction, 0.90 for management, and 0.87 for engagement" (p. 799).

Principal-axis factor analysis was conducted for both forms, long and short, of the TSES to examine the appropriateness of calculating a total score for the 24 and 12 items (Tschannen-Moran & Hoy, 2001). It was discovered that both forms produced reliability scores of 0.94 for the 24-item scale and 0.90 for the 12-item scale. Tschannen-Moran and Hoy determined that the subscale scores and total scores of both forms could be used to measure teacher efficacy.

Validity and Reliability

Construct validity was assessed by testing the correlation of the TSES to other existing measures of teacher efficacy (Tschannen-Moran & Hoy, 2001). Results of the analysis indicated that the TSES could be considered reasonably valid and reliable. According to Tschannen-

Moran and Hoy, either the 24 or 12 item forms are of reasonable length and should prove to be a useful tool for researchers to use when exploring the construct of teacher efficacy. They also note that pre-existing scales lack the ability to assess the measurement of "teaching in support of student thinking, effectiveness with capable students, creativity in teaching, and the flexible application of alternative assessment and teaching strategies" (p. 801). The TSES addresses these limitations by assessing a broader range of teaching tasks.

Additional studies (Charalambous et al., 2003; Yeo, Ang, Chong, Huan, & Quek, 2008) have used the TSES to measure teacher efficacy. The findings in each of these studies support that the TSES can effectively measure teacher efficacy. Klassen et al. (2009) conducted a study of the TSES across five countries. "The TSES showed convincing evidence of reliability and measurement in variance across the five countries" (p. 67). Each of these studies provides evidence that the TSES developed by Tschannen-Moran and Hoy (2001) provides a valid and reliable measurement of the teacher efficacy construct across diverse settings.

Although previous studies have supported the validity and reliability findings originally reported by Tschannen-Moran and Hoy (2001), Hill (2001) recommended that validity and reliability be established for each new administration of an administration as well. Regardless of the source of the instrument used in survey research, content validity, predictive or concurrent validity, and construct validity should be assessed (Creswell, 2003; Hill). Content validity demonstrates that the instrument measures the content it is intended to measure. Predictive or concurrent validity confirm whether the instrument results correlate to previously reported results. Construct validity indicates that the instrument measures the concept being studied.

Hill (2001) also suggested performing calculations of internal consistency to assess the reliability of the instrument. Researchers can use the results of a single administration of a survey

to determine internal consistency (Gloeckner, Gliner, Tochterman, & Morgan, 2001). One of the most common methods used to determine internal consistency is Cronbach's alpha, which is best suited for surveys which have a Likert-type scale. This method is the most commonly used index of reliability in educational and psychological research, because it takes only one administration of the instrument and can be done using the data from the actual study. Even the reliability of a scale has been published previously, Gloeckner et al. suggests that researchers calculate the reliability of scores for their own study.

Tschannen-Moran and Hoy (2001) reported reliability estimates of 0.91 for instructional practices, 0.90 for classroom management, and 0.87 for student engagement. Subscale scores for this study were tested for reliability using Cronbach's alpha method. The reliability scores were .81 for instructional practices, .81 for classroom management, and .82 for student engagement.

Independent variables for this study included gender, race/ethnicity, subject area taught, years of teaching experience, and certificate level. Gender had two categories, male and female. Ethnicity had two categories, white and non-white. Subject area had two categories, academic (math, science, social studies, and language arts) and career technical education. Years of teaching experience was a continuous variable. Certificate level had two categories, bachelor's and graduate.

Dillman et al. (2009) suggests that a panel of experts be convened to review the instrument and determine content and face validity. A panel of experts is able to look at the questions and determine whether the instrument measures the intended construct. For this study, a panel of experts was asked to review the TSES and determine face and content validity. Each person on the panel had prior experience with instrument development and the administration of survey instruments.

Gall et al. (2007) stated that a pilot test should be conducted prior to data collection. Pilot testing was conducted to re-establish validity and reliability of scores that were collected from the sample (Creswell, 2003; Dillman et al., 2009; Hill, 2001). Kruger (2001) suggested selecting a small sample size, between 10 and 30 individuals, to participate in the pilot testing. The pilot test group consisted of five academic teachers and five career technical teachers from the Newton County School System. The pilot test survey was administered in the same manner as to those selected for the main study. In addition to their responses on the survey, participants were asked to determine if the directions were clear, if additional information is needed, and to report the length of time it will take to complete the test. Responses were then downloaded into SPSS software to be analyzed and to determine whether individual questions and scales appeared to measure the teacher efficacy construct and subscales as intended. Subscale scores for the pilot study were tested for reliability using Cronbach's alpha method. The reliability scores were .84 for instructional practices, .81 for classroom management, and .82 for student engagement.

Procedure

An initial meeting was held with personnel from the Georgia State Department of Education to explain the goals and purpose of the study. Following the meeting, written permission was obtained from the Georgia Department of Education and the University of Georgia Institutional Review Board (IRB) to conduct this study. Participants were then randomly selected from the Georgia State Department of Education list of currently employed secondary teachers in the Griffin RESA region. The list of teachers were assigned consecutive numbers to be used in the selection process. Participants were then selected using an internet-based random number generator program (Retrieved from http://www.randomizer.org/form.htm on 10/01/09).

Following Dillman's (2007) Tailored Design Method, an initial email was sent to randomly selected individuals on day one to notify them of their selection and the purpose of the study (see Table 1). A second email was sent on day eight to follow up with participants that had not completed the survey. A third email was sent on day 15 to participants who had not attempted to complete the survey or who had not participated at all. The purpose of third and subsequent emails to participants was an effort to reduce the nonresponse rate (Dillman, 2007; Fowler, 2009).

Advantages to this type of survey research include cost-savings, ease of data analysis, faster transmission time, easy use of pre-letters (invitations), more candid responses, and quicker response time with increased magnitude of coverage. Confidentiality, response rates and technical problems with hardware or software are disadvantages of this type of research (Dillman et al., 2009; Thach, 1995).

All participants were given the same survey and informed that their participation and responses were kept anonymous. To ensure confidentiality, only the researcher had access to the data. Participants were also given the opportunity to participate by completing a paper copy of the survey. Providing more than one option to participants has been shown to improve response rates (Dillman et al., 2009). All data collected for the study will be maintained for a period of five years as required by APA guidelines. Table 1 provides a timeline of the major steps completed for this study.

Table 2

Timeline of Data Collection

Objective	Sept	Oct	Nov
Meet with personnel from Georgia Department of Education to get approval	↔		
Notify participants of study, selected through randomized process		↔	
Open access to electronic survey		↔	
Close access to electronic survey			↔
Determine if additional responses are needed			↔
Provide additional time for responses if needed			↔

Data Analysis

Through the use of descriptive statistical analysis, this study examined descriptive and contextual characteristics of the perceived efficacy of secondary academic and career technical education teachers. Characteristics included gender, race/ethnicity group, subject area taught, years of teaching experience, and certificate level. The teacher efficacy construct was measured by gathering data on instructional practices, classroom management, and student engagement (Tschannen-Moran & Hoy, 2001).

Statistical analysis included the use of descriptive statistics and several series of one-way and two-way analysis of variance (ANOVA). One-way ANOVA was used to determine if there was a statistically significant difference between subject area taught (academic or CTE) and the three efficacy subscale constructs of teacher efficacy using an alpha level of .05. Two-way ANOVA analysis was then used to determine if there was a statistically significant difference between each independent variable and the three efficacy subscale constructs of teacher efficacy

when grouped by subject area taught. Statistical Package for the Social Sciences (SPSS) version 19 software was used to conduct each of the statistical procedures listed in Table 2.

Table 3

Analysis Strategy

Questions	Independent variables	Dependent variable	Statistical Procedure
What are the characteristics of secondary teachers in relation to gender, ethnicity, subject area taught, years of teaching experience, and degree level?	Demographic Information: <u>Gender (Categorical)</u> Female = 0 Male = 1 <u>Ethnicity (Categorical)</u> Black = 0 White = 1 Hispanic = 2 Asian = 3 Native American = 4 Multiracial = 5 <u>Subject Area (Categorical)</u> Math = 0 Science = 1 English =2 Social studies = 3 CTE = 4 <u>Years of teaching experience (Continuous)</u> <u>Certificate level (Categorical)</u> 4 year Bachelor = 0 5 year Master = 1 6 year Specialist = 2 7 year Doctoral = 3		Descriptive statistics (mean, standard deviation, sample distribution)
Does teacher efficacy differ in the subscale areas of instructional practices, classroom management, and student engagement for CTE and academic teachers?	Subject area (Categorical) CTE = 1 Academic = 2	Teacher efficacy (Continuous) Subscale mean scores: • Instructional practices • Classroom management • Student engagement	(3) one-way ANOVA Effect size

table continues

Questions	Independent variables	Dependent variable	Statistical Procedure
Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by gender?	Gender (Categorical) Female = 0 Male = 1	Teacher efficacy (Continuous) Subscale mean scores: • Instructional practices • Classroom management • Student engagement	(3) two-way ANOVA Effect size
Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by ethnicity?	Ethnicity (Categorical) White = 0 Non-white = 1	Teacher efficacy (Continuous) Subscale mean scores: • Instructional practices • Classroom management • Student engagement	(3) two-way ANOVA Effect size
Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by years of teaching experience?	Years of teaching experience (Categorical) 0 – 3 years = 0 4 or more years = 1	Teacher efficacy (Continuous) Subscale mean scores: • Instructional practices • Classroom management • Student engagement	(3) two-way ANOVA Effect size
Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by degree level?	Certificate level (Categorical) 4 year Bachelor = 0 Graduate = 1	Teacher efficacy (Continuous) Subscale mean scores: • Instructional practices • Classroom management • Student engagement	(3) two-way ANOVA Effect size

Descriptive statistics organize and summarize a set of numerical data which permit researchers to describe information calculated from a sample drawn from a population (Fraenkel & Wallen, 2003). Such statistics include the mean, median, frequency distributions, analysis of variance (ANOVA), and effect sizes. By examining descriptive statistics of the sample,

researchers can gather more accurate information about the characteristics of the population (Gall et al., 2007).

Of further interest to researchers is the degree of variability among numerical data. This variability can be observed through distributions of scores; however the most useful index of variability is standard deviation, which represents the spread of distribution (Fraenkel & Wallen, 2003). Like the mean of a sample, standard deviation remains stable. Together, the mean and standard deviation provide a good description of how members of a sample scored on a particular measure (Gall et al., 2007).

Frequency distributions organize categorical data and indicate the number of subjects receiving each score (Fraenkel & Wallen, 2003). These distributions can then be used to prepare graphical displays of information that otherwise are difficult to visualize and are useful in comparing two or more groups. Many distributions tend to follow a normal shape, yet data can skew the results negatively or positively (Keppel & Wickens, 2004). In such situations, further analysis is needed to examine differences among groups. Participants whose scores differ markedly from other participant scores are referred to as outliers (Huck, 2008). Such scores can distort the results produced during the statistical analysis, unless the sample size is large. Boxplots can be used to detect outliers. When outliers are more than three standard deviations from the mean, it is appropriate to exclude them from the analysis (Keppel & Wickens).

Analysis of Variance

When examining the differences among more than two groups, an analysis of variance (ANOVA) is used. An ANOVA compares the amount of between group variance in respondent scores with the amount of with-in group variance. Another statistical procedure, the t-test, produces the same information but would require many individual t-tests to be conducted. Using

an ANOVA will reduce the need for individual comparisons among groups, while producing an *F* value that will indicate whether differences among the groups are statistically significant (Fraenkel & Wallen, 2003; Keppel & Wickens, 2004).

Although an ANOVA may produce an *F* value that is statistically significant, it will not determine which means are actually different (Fraenkel & Wallen, 2003). To further analyze the differences among group means, post-hoc tests or multiple comparison tests are used (Huck, 2008). The three most frequently used procedures are the Bonferroni, Tukey, and Scheffé tests. Of these, the Bonferroni test is the most widely used and provides protection against a Type I error, not rejecting a null hypothesis when it is false (Huck, 2008; Keppel & Wickens, 2004). If significant differences were found, the Bonferroni post-hoc test was conducted to further evaluate differences among the means.

For a one-way ANOVA, each individual must have scores on two variables: an independent variable, with two or more levels, and a dependent variable. Individual scores are then converted and expressed as deviations from the grand mean, or group mean. These deviations are then partitioned into two components, between-group and with-in group deviations, which are then transformed into variances. This variance is the average of the squared deviations from the mean (Keppel & Wickens, 2004).

Upon completion of a one-way ANOVA, a test statistic, known as the *F* ratio is produced. The *F* ratio indicates whether the null hypothesis is true or false. When the *F* ratio is approximately 1.0, the null hypothesis is true, if the value is greater than 1.0, the null hypothesis is false (Fraenkel & Wallen, 2003; Keppel & Wickens, 2004). The *F* ratio, along with an a priori alpha level, is used to determine if the null hypothesis is rejected or accepted. If the null hypothesis is rejected, then at least one group mean is different.

Analysis of variance assumptions. Prior to determining if an ANOVA should be used for statistical analysis, several assumptions must be met. Key assumptions of the ANOVA include: independence, normality and homogeneity. Independence means that each score is independent of every other score, within or across groups. This assumption is violated when one participant knows or is aware of how another participant has responded which then influences his or her decision or response.

Normality assumes that the scores of the sample population have a normal distribution. The *F* distribution is based on the assumption of the normal distribution. If this assumption is violated, the *F* statistic obtained from the analysis of variance may not be consistent with the theoretical distribution of *F*. However, the central limit theorem states that as the sample size increases, the mean will come to have a normal distribution (Keppel & Wickens, 2004). Once the sample size becomes larger than a dozen, concerns about the assumption of normality decrease. The *F* test (ANOVA) is then said to be robust in regards to violations of normality. However, further analysis is needed to determine if there are outliers. Outliers tend to have a disproportionate influence on the mean and inflate the variance (Gall et al., 2007; Keppel & Wickens).

The third assumption, homogeneity of variance, states that the distributions in shape of the groups do not differ. However, variances in differences do pose more serious problems. Procedures used to check for heterogeneity of variance are the Levene or Brown-Forsythe test. Levene's test measures the deviation scores distance from the mean of the group, whereas the Brown-Forsythe test uses the median (Keppel & Wickens, 2004). However, the Brown-Forsythe test is a more robust test when sample sizes are unequal or the normality distribution assumption is violated (Hayes, 2004). When Levene's test yields a p-value near .05, it is recommended that

the Brown-Forsythe test be used to compare variances. Should the Brown-Forsythe test yield a more significant p-value, the result should be used to determine the decision of the statistical analysis (Hayes, 2004).

When using a one-way or two-way ANOVA, key assumptions of independence, normality and homogeneity must be met. The use of a one-way or two-way ANOVA is then dependent on the number of variables involved in the study. A one-way ANOVA is appropriate for studies with one independent variable, which contain more than two levels, and one dependent variable. When there are more than two independent variables, a one-way ANOVA would be inappropriate. A two-way ANOVA is used when there are more than two independent variables, with multiple levels, and one dependent variable (Fraenkel & Wallen, 2003; Gall et al., 2007; Keppel & Wickens, 2004).

Effect size. Although an ANOVA may indicate a statistically significant difference among group means, this does not tell whether the effect is large enough to be important. To determine whether the difference is practically significant, an effect size should be computed. Calculating an effect size will permit the researcher to assess the magnitude of differences among groups and the practical importance of those differences (Fraenkel & Wallen, 2003; Gall et al., 2007; Rojewski, 2001). An effect size takes into account the size of the difference between means, regardless of whether it is statistically significant (Fraenkel & Wallen). The larger the effect size, the greater the difference between the groups (Gall et al.). Several effect size estimates are available and are classified into two categories: variance-accounted for measures and standardized differences (Rojewski).

When using the omnibus F test to compare several populations, the most common effect size measures are eta-squared or omega-squared (Keppel & Wickens, 2004). Values of these

effect size measures range between zero and one and reflect the proportion of variance in the dependent variable that is explained by the independent variable. However, Olejnik and Hess (2001) suggest that these effect size measures are not very meaningful to the typical researcher. The proportions represented by the eta-squared and omega-squared effect size measures are independent of the outcome measures.

Olejnik and Hess (2001) preferred the use of an index of effect that reports findings that can be translated in terms of measures taken, such as Cohen's *d*. When two populations are compared in this index, the difference between the sample means is divided by the pooled standard deviation. The difference between group means is then expressed in standard deviation units. When using Cohen's *d*, a small effect (d=0.2) captures about 1% of the variance, a medium effect (d=0.5) captures about 6% of the variance, and a large effect (d=0.8) captures as least 15% of the variance (Keppel & Wickens, 2004).

CHAPTER 4

RESULTS

The purpose of this survey study was to examine the influence of contextual and descriptive characteristics on the perceived teaching efficacy of secondary teachers within public schools in the State of Georgia. Contextual and descriptive characteristics included gender, race/ethnicity, subject area taught, years of teaching experience, and certificate level. Teacher efficacy was defined as the belief a teacher has about his or her abilities to influence or bring about desired outcomes of student engagement and learning (Bandura, 1977). Three distinct aspects of the teacher efficacy construct were measured using the Teachers' Sense of Efficacy scale – long form (TSES; Tschannen-Moran & Hoy, 2001), which included instructional practices, classroom management, and student engagement. Findings related to the following research questions are presented within this chapter.

Research Questions

1. What are the characteristics of secondary teachers in relation to gender, race/ethnicity, subject area taught, years of teaching experience, and degree level?
2. Does teacher efficacy differ in the subscale areas of instructional practices, classroom management, and student engagement for CTE and academic teachers?
3. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by gender?

4. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by race/ethnicity?
5. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by years of teaching experience?
6. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by degree level?

Research Question 1

What are the characteristics of secondary teachers in relation to gender, ethnicity, subject area taught, years of teaching experience, and degree level?

Of the 403 secondary teachers selected to participate in the study, 159 responded to the survey which resulted in an initial response rate of 39%. A non-response analysis was conducted to examine differences between respondents and non-respondents in order to reveal any bias that may exist within the dataset. The non-response analysis revealed that there were no significant differences between early and late responders. Thirteen potential participants were removed from the analysis due to missing data either on demographic questions or TSES questions. One participant, identified as an outlier, was removed. In the sample studied, 79 were CTE teachers and 67 were academic teachers. Academic teachers were defined as those who were assigned to teach math, science, social studies, or language arts. Race/ethnicity was measured as white and non-white, due to the small percentage of minority teachers employed in the state of Georgia and represented in the sample. The sample included 112 (77%) white teachers and 34 (23%) non-

white teachers. There were 98 (67%) females and 48 (33%) males. Of the respondents surveyed, 40 (27%) held a bachelors degree and 106 (73%) held a graduate degree. Demographic information for respondents is presented in Table 4.

Table 4

Demographic Data of Respondents

	Academic (*n* = 67)		CTE (*n* = 79)	
	n	%	*n*	%
Gender				
Female	44	65.7	54	68.4
Male	23	34.3	25	31.6
Ethnicity				
African American	10	14.9	20	25.3
Asian	0	0.0	1	1.3
Caucasian	57	85.1	55	69.6
Hispanic	0	0.0	2	2.5
Multiracial	0	0.0	1	1.3
Native American	0	0.0	0	0.0
Degree level				
Bachelor	18	26.9	22	27.8
Master	35	52.2	43	54.4
Specialist	10	14.9	13	16.5
Doctoral	4	6.0	1	1.3

Years of experience for the entire sample ranged from 0 to 38, with a median teaching experience of nine years and mean years of teaching experience equal to 10.61 (*SD* = 7.9). Demographic information for respondent's years of experience by teacher type is presented in Table 5.

Table 5

Demographic Information of Respondents by Years of Teaching Experience

	N	Mean	Median	*SD*	Min	Max
Academic	67	12.48	10.00	7.83	1	33
CTE	79	9.03	7.00	7.65	0	38

Boxplots were used to identify outliers. Outliers were defined as scores at least three standard deviations above or below the mean (Keppel & Wickens, 2004). One participant's scores on all three subscales (instructional practices, classroom management, and student engagement) of the TSES were at least three standard deviations below the mean. The identified outlier was removed from the data before conducting statistical analysis on the remaining research questions.

For the remaining research questions, the TSES was used to measure self-efficacy beliefs of respondents in the areas of instructional practices, classroom management, and student engagement. The TSES long form consists of 24 questions and uses a 9-point scale. The scale ranges from 1=Nothing to 3=Very little to 4=Some influence to 7=Quite a bit to 9=A great deal. Instructional practices included eight questions on the TSES; items 7, 10, 11, 17, 18, 20, 23, and 24. Classroom management was represented by eight questions; items 3, 5, 8, 13, 15, 16, 19, and 21. Student engagement was represented by eight questions; items 1, 2, 4, 6, 9, 12, 14, and 22. Each subscale had a total possible score of 72 points. An alpha level of .05 was used for all statistical analyses (Gall, Gall, & Borg, 2007; Keppel & Wickens, 2004).

Research Question 2

Does teacher efficacy differ in the subscale areas of instructional practices, classroom management, and student engagement for CTE and academic teachers?

A one-way ANOVA was used to assess CTE and academic teacher efficacy differences. The overall mean score for both groups was 53.54 (*SD* = 7.37). Descriptive statistics appear in Table 6. According to Tschannen-Moran and Hoy (2001), a score in this range for any of the three subscales (instructional strategies, classroom management, and student engagement) indicates a higher level of efficacy for the subscale. Results of the ANOVA are displayed in Table 7. There were no statistically significant differences in any of the three subscale areas between academic and CTE teachers.

Table 6

Descriptive Statistics of Teacher Efficacy Scores for Academic and CTE Teachers

	N	M	*SD*	Min	Max
Instructional Practices					
Academic	66	53.55	7.26	38	66
CTE	79	53.53	7.51	33	71
Total	145	53.54	7.37	33	71
Classroom Management					
Academic	66	57.86	6.75	42	72
CTE	79	57.05	7.55	41	72
Total	145	57.42	7.18	41	72
Student Engagement					
Academic	66	55.80	7.37	40	72
CTE	79	55.04	8.30	37	72
Total	145	55.39	7.87	37	72

Table 7

ANOVA of Teacher Efficacy Scores for Academic and CTE Teachers

	SS	*df*	*MS*	*F*	*p*
Instructional Practices					
Between groups	.007	1	.007	.000	.991
Within groups	7822.035	143	54.700		
Total	7822.041	144			
Classroom Management					
Between groups	23.768	1	23.768	.459	.499
Within groups	7405.570	143	51.787		
Total	7429.338	144			
Student Engagement					
Between groups	21.047	1	21.047	.338	.562
Within groups	8897.325	143	62.219		
Total	8918.372	144			

Research Question 3

Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by gender?

Three two-way analyses of variance were conducted to determine whether there were any differences between teacher type (CTE or academic) and gender across the dependent variable (teacher efficacy) for instructional practices, classroom management, and student engagement.

A two-way ANOVA indicated a nonsignificant interaction between teacher type and gender on the TSES (Tschannen-Moran & Hoy, 2001) subscale of instructional practices. Results are displayed in Table 8. Because there was no significant interaction effect, simple

main effects were evaluated separately. Simple main effects for teacher type and gender on the instructional practices subscale were also nonsignificant.

Table 8

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Gender for Instructional Practices

Source	*SS*	*df*	*MS*	*F*	*p*
Instructional Practices					
Teacher type	4.069	1	4.069	.074	.786
Gender	32.560	1	32.560	.592	.443
Teacher type x Gender	32.560	1	32.560	.592	.443
Error	7751.537	141	54.975		
Total	7822.041	144			

Results of the second two-way ANOVA indicated a nonsignificant interaction between teacher type and gender, F (1, 141) = 2.497, p = .116, on the TSES (Tschannen-Moran & Hoy, 2001) subscale of classroom management. Because there was no significant interaction effect, simple main effects were evaluated separately. Simple main effects for teacher type and gender on the classroom management subscale were nonsignificant. Results are displayed in Table 9.

Table 9

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Gender for Classroom Management

Source	*SS*	*df*	*MS*	*F*	*p*
Classroom Management					
Teacher type	.214	1	.214	.004	.948
Gender	87.531	1	87.531	1.720	.192
Teacher type x Gender	127.042	1	127.042	2.497	.116
Error	7173.562	141	50.876		
Total	7429.338	144			

Results of the third two-way ANOVA indicated a nonsignificant interaction between teacher type and gender on the TSES (Tschannen-Moran & Hoy, 2001) subscale of student engagement. Because there was no significant interaction effect, simple main effects were evaluated separately. Simple main effects for teacher type and gender on the classroom management subscale were also nonsignificant. Results are displayed in Table 10.

Table 10

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Gender for Student Engagement

Source	*SS*	*df*	*MS*	*F*	*p*
Student Engagement					
Teacher type	1.322	1	1.322	.022	.883
Gender	127.888	1	127.888	2.117	.148
Teacher type x Gender	225.361	1	225.361	3.731	.055
Error	8515.962	141	60.397		
Total	8918.372	144			

Research Question 4

Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by ethnicity?

A two-way ANOVA was conducted to determine whether there were any differences between teacher type (CTE or academic) and race/ethnicity (white or non-white) across the dependent variable (teacher efficacy) in the subscale areas of instructional practices, classroom management, and student engagement. Results of the ANOVA indicated a nonsignificant interaction between teacher type and ethnicity. Simple main effects were then evaluated and

revealed nonsignificant effects for teacher type and race/ethnicity. Results are displayed in Table 11.

Table 11

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Ethnicity for Instructional Practices

Source	*SS*	*df*	*MS*	*F*	*p*
Instructional Practices					
Teacher type	16.457	1	16.457	.298	.586
Ethnicity	35.592	1	35.592	.645	.423
Teacher type x Ethnicity	28.604	1	28.604	.519	.473
Error	7774.844	141	55.141		
Total	7822.041	144			

Results of the second two-way ANOVA indicated a nonsignificant interaction between teacher type and ethnicity on the TSES (Tschannen-Moran & Hoy, 2001) subscale of classroom management. Because there was no significant interaction effect, simple main effects were evaluated separately. Simple main effects for teacher type and race/ethnicity on the classroom management subscale were also nonsignificant. Results are displayed in Table 12.

Table 12

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Ethnicity for Classroom Management

Source	*SS*	*df*	*MS*	*F*	*p*
Classroom Management					
Teacher Type	21.796	1	21.796	.415	.520
Ethnicity	.141	1	.141	.003	.959
Teacher Type x Ethnicity	2.363	1	2.363	.045	.832
Error	7403.167	141	52.505		
Total	7429.338	144			

Results of the third two-way ANOVA indicated a nonsignificant interaction between teacher type and race/ethnicity on the TSES (Tschannen-Moran & Hoy, 2001) subscale of student engagement. Because there was no significant interaction effect, simple main effects were evaluated separately. Simple main effects for teacher type and race/ethnicity on the student engagement subscale were also nonsignificant (see Table 13).

Table 13

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Ethnicity for Student Engagement

Source	*SS*	*df*	*MS*	*F*	*p*
Student Engagement					
Teacher Type	113.150	1	113.150	1.820	.179
Ethnicity	76.353	1	76.353	1.228	.270
Teacher Type x Ethnicity	101.849	1	101.849	1.638	.203
Error	8766.004	141	62.170		
Total	8918.372	144			

Research Question 5

Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by years of teaching experience?

A two-way ANOVA was conducted to determine whether there were any differences between teacher type (CTE or academic) and years of teaching experience (0-3 yrs. or 4 or more yrs.) across the dependent variable (teacher efficacy) in the subscale areas of instructional practices, classroom management, and student engagement. Results of the ANOVA indicated a nonsignificant interaction between teacher type and years of teaching experience. Simple main

effects were evaluated and revealed nonsignificant effects for teacher type and years of teaching experience. Results are displayed in Table 14.

Table 14

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Years of Teaching Experience for Instructional Practices

Source	*SS*	*df*	*MS*	*F*	*p*
Instructional Practices					
Teacher type	1.114	1	1.114	.020	.887
Years of experience	17.427	1	17.427	.315	.575
Teacher type x Years of experience	.324	1	.324	.006	.939
Error	7799.616	141	55.316		
Total	7822.041	144			

Results of the second two-way ANOVA indicated a nonsignificant interaction between teacher type and years of teaching experience on the TSES (Tschannen-Moran & Hoy, 2001) subscale of classroom management. Because there was no significant interaction effect, simple main effects were evaluated separately. Simple main effects for teacher type and years of teaching experience on the classroom management subscale were also nonsignificant. Results are displayed in Table 15.

Table 15

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Years of Teaching Experience for Classroom Management

Source	*SS*	*df*	*MS*	F	*p*
Classroom Management					
Teacher type	.019	1	.019	.000	.985
Years of experience	77.798	1	77.798	1.501	.223
Teacher type x Years of experience	2.773	1	2.773	.053	.817
Error	7310.512	141	51.848		
Total	7429.338	144			

Results of the third two-way ANOVA indicated a nonsignificant interaction between teacher type and years of teaching experience on the TSES (Tschannen-Moran & Hoy, 2001) subscale of student engagement. Because there was no significant interaction effect, simple main effects were evaluated separately. Simple main effects for teacher type and years of teaching experience on the student engagement subscale were also nonsignificant. Results are displayed in Table 16.

Table 16

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Years of Teaching Experience for Student Engagement

Source	*SS*	*df*	*MS*	*F*	*p*
Student Engagement					
Teacher type	6.922	1	6.922	.111	.740
Years of experience	94.717	1	94.717	1.517	.220
Teacher type x Years of experience	26.096	1	26.096	.418	.519
Error	8802.262	141	62.427		
Total	8918.372	144			

Research Question 6

Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by degree level?

A two-way ANOVA was conducted to determine whether there were any differences between teacher type (CTE or academic) and degree level (bachelor or graduate) across the dependent variable (teacher efficacy) in the subscale areas of instructional practices, classroom management, and student engagement. Results of the ANOVA indicated a nonsignificant interaction between teacher type and degree level. Simple main effects were then evaluated and also revealed nonsignificant effects for teacher type and degree level. Results are displayed in Table 17.

Table 17

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Degree Level for Instructional Practices

Source	*SS*	*df*	*MS*	*F*	*p*
Instructional Practices					
Teacher type	33.426	1	33.426	.616	.434
Degree level	24.455	1	24.455	.450	.503
Teacher type x Degree level	153.678	1	153.678	2.830	.095
Error	7655.729	141	54.296		
Total	7822.041	144			

Results of the second two-way ANOVA indicated a nonsignificant interaction between teacher type and degree level, F (1, 141) = 1.127, p = .290, on the TSES (Tschannen-Moran & Hoy, 2001) subscale of classroom management. Because there was no significant interaction effect, simple main effects were evaluated separately. Simple main effects for teacher type and

degree level on the classroom management subscale were also nonsignificant. Results are displayed in Table 18.

Table 18

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Degree Level for Classroom Management

Source	*SS*	*df*	*MS*	*F*	*p*
Classroom Management					
Teacher type	.653	1	.653	.013	.911
Degree level	5.420	1	5.420	.104	.747
Teacher type x Degree level	58.624	1	58.624	1.127	.290
Error	7336.559	141	52.032		
Total	7429.338	144			

Results of the third two-way ANOVA indicated a nonsignificant interaction between teacher type and degree level on the TSES (Tschannen-Moran & Hoy, 2001) subscale of student engagement. Because there was no significant interaction effect, simple main effects were evaluated separately. Simple main effects for teacher type and degree level on the student engagement subscale were also nonsignificant (see Table 19).

Table 19

Two-Way ANOVA of Teacher Efficacy Subscale Scores Between Teacher Type and Degree Level for Student Engagement

Source	*SS*	*df*	*MS*	*F*	*p*
Student Engagement					
Teacher type	4.030	1	4.030	.064	.801
Degree level	1.587	1	1.587	.025	.874
Teacher type x Degree level	20.023	1	20.023	.318	.574
Error	8874.126	141	62.937		
Total	8918.372	144			

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter provides a summary of the study and discusses major findings. A discussion of limitations, along with recommendations for further research on teacher efficacy is also provided.

Summary of Research Study

Current reform movements, prompted by the U.S. Department of Education's landmark report, *A Nation at Risk: The Imperative for Educational Reform* (1983), have increased the nation's focus on accountability and teacher effectiveness. However, little has been done to address teacher effectiveness. One way to characterize effective teachers is to identify those who possess high levels of efficacy (Armor et al., 1976). Efficacy is defined as the belief an individual has in his or her abilities to influence or bring about desired outcomes (Bandura, 1997). In fact, an important link between teacher efficacy and student achievement has been established. Studies have shown that when teachers are highly efficacious their students exhibit greater achievement and success (Ashton et al., 1983; Bandura, 1993; Dembo & Gibson, 1985; Gibson & Dembo, 1984; Goddard et al., 2000; Moore & Esselman, 1992; Ross, 1992, 1994; Tschannen-Moran et al., 1998).

Effective teachers share a common set of practices (Armor et al., 1976; Ashton & Webb, 1986; Brandt, Hayden, & Brophy, 1975; Ross, 1992; Sanders & Rivers, 1996). Such practices include maintaining high academic standards, setting clear expectations, focusing on academic instruction, and maintaining student on-task behavior (Ashton, Webb, & Doda, 1983; Ding &

Sherman, 2006). Effective teachers also believe that student achievement can be influenced by a greater academic focus in the classroom, extensive content coverage, monitoring student performance, and use of large group instruction (Gibson & Dembo, 1984). Furthermore, effective teachers have very positive beliefs about their teaching abilities (Brandt et al., 1975; Guskey, 1988).

Teachers who possess a positive belief in their ability to teach and increase student achievement have higher self-efficacy (Allinder, 1994; Bandura, 1977; Dembo & Gibson, 1985; Tschannen-Moran & Hoy, 2001). The importance of teachers' self-efficacy was first recognized by RAND researchers in a study of teacher characteristics and student learning (Armor et al., 1976). Over the past three decades, research has been conducted to further examine the concept teacher self-efficacy (Ashton, Buhr, & Crocker, 1984; Ashton et al., 1983; Gibson & Dembo, 1984; Hoy & Woolfolk, 1993; Moore & Esselmann, 1992; Soodak & Podell, 1996; Tschannen-Moran & Hoy, 2001; Tschannen-Moran, Hoy, & Hoy, 1998). However, these studies have focused on the self-efficacy beliefs of academic teachers, and have neglected teacher efficacy of secondary career and technical educators (CTE) (Armor et al., 1976; Ashton & Webb, 1986; Ashton et al., 1983; Gibson & Dembo, 1984; Guskey, 1988; Hoover-Dempsey et al., 1987; Hoy & Woolfolk, 1993; Rose & Medway, 1981).

This lack of research on teacher efficacy of secondary career and technical educators has created a barrier to instructional reform efforts that seek to improve teacher effectiveness and student achievement. Current federal legislation, Carl D. Perkins Career and Technical Education Act, mandates that career and technical educators increase student achievement in not only career-related competencies, but academic ones, as well (Castellano, Stringfield, & Stone, 2003). However, due to the limited understanding of teacher efficacy among career and

technical teachers, such efforts are restricted. If teachers do not believe in their abilities to impact student learning, reform efforts will make little difference (Darling-Hammond, 2000). "In these days of hard-nosed accountability, teachers' sense of efficacy is an idea that neither researchers nor practitioners can afford to ignore" (Tschannen-Moran & Hoy, 2001, p. 803).

Therefore, the purpose of this survey study was to examine the influence of descriptive and contextual characteristics on the perceived teaching efficacy of secondary teachers within public schools in the State of Georgia, with a special emphasis on career and technical education teachers. Contextual characteristics included gender, race/ethnicity, subject area taught, years of teaching experience, and teaching certificate level. Teacher efficacy was defined as the belief teachers have about their abilities to influence or bring about the desired outcomes of student engagement and learning (Bandura, 1977). Three distinct aspects of the teacher efficacy construct were measured, including instructional strategies, classroom management, and student engagement.

Bandura's (1997) self-efficacy theory served as the theoretical framework for this study. Self-efficacy theory refers to the belief an individual has in his or her abilities to organize and execute a course of action in order to achieve a task. Bandura's work, along with subsequent research based on his self-efficacy theory, has shown that efficacy beliefs interact with the skills a person possesses, which influence actions or behaviors (Ashton et al., 1982; Gibson & Dembo, 1984; Tschannen-Moran & Hoy, 2001). For teachers, efficacy beliefs influence actions or behaviors within the classroom, which in turn affect student learning.

The importance of this study lies in the better understanding gained about the teacher efficacy of career and technical education teachers. Greater accountability and focus on teacher effectiveness has prompted researchers to explore the important link between teacher efficacy

and student achievement (Ashton et al., 1983; Bandura, 1993; Dembo & Gibson, 1985; Gibson & Dembo, 1984; Goddard et al., 2000; Moore & Esselman, 1992; Ross, 1992, 1994; Tschannen-Moran, et al., 1998). However, to date, research has focused only on academic teachers.

This study was guided by the following research questions:

1. What are the characteristics of secondary teachers in relation to gender, ethnicity, subject area taught, years of teaching experience, and degree level?
2. Does teacher efficacy differ in the subscale areas of instructional practices, classroom management, and student engagement for CTE and academic teachers?
3. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by gender?
4. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by ethnicity?
5. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by years of teaching experience?
6. Is there a statistically significant interactive effect between CTE and academic teachers' efficacy in the subscale areas of instructional practices, classroom management, and student engagement when grouped by degree level?

Research Design

This study used a descriptive survey research design. Descriptive research studies provide information about characteristics such as abilities, preferences, and behaviors of

individuals or groups (Fraenkel & Wallen, 2003). Descriptive studies allow researchers to observe variables as they exist, provide information about educational phenomenon, and serve as a basis for understanding or implementing change. Such knowledge has helped to implement educational reform of practices and policies (Gall, Gall, & Borg, 2007).

The dependent variable, teacher efficacy, was comprised of three subscales: efficacy in instructional practices, efficacy in classroom management, and efficacy in student engagement. Independent variables included gender, race/ethnicity, subject area taught, years of teaching experience, and certificate level.

Population and Sample

The population for this study contained all secondary academic and CTE teachers in the Griffin Regional Educational Service Agency (RESA) region of the state of Georgia. Teachers of math, science, social studies, and language arts were classified as academic teachers. Teachers of agriculture, architecture, construction, communication, transportation, business and computer science, culinary arts, family and consumer sciences, engineering and technology, government and public safety, healthcare science, and marketing were classified as career-technical education (CTE) teachers. A proportional sample of teachers randomly selected from a population included 1,095 academic and 200 CTE teachers. The sample consisted of 403 secondary teachers. Of those selected to participate, 159 responded; 67 were academic teachers and 79 were CTE teachers.

Instrument

The survey instrument for this study was the Teachers' Sense of Efficacy scale—Long Form (TSES), developed by Tschannen-Moran and Woolfolk Hoy (2001) (see Appendix B) and

based on Bandura's (1977) self-efficacy theory. The TSES measures three subscale factors that include efficacy in instructional practices, classroom management, and student engagement.

Each of the three subscales on the TSES is measured by eight items. A 9-point scale is used for each item, ranging from 1=Nothing to 3=Very little to 4=Some influence to 7=Quite a bit to 9=A great deal. Five demographic questions were added to the instrument including gender, race/ethnicity, subject area taught, years of teaching experience, and certificate level.

Construct validity of the TSES was assessed by by correlating TSES items to other existing measures of teacher efficacy (Tschannen-Moran & Hoy, 2001). Results indicated that the TSES could be considered reasonably valid and reliable. Tschannen-Moran and Hoy reported reliability estimates of 0.91 for instructional practices, 0.90 for classroom management, and 0.87 for student engagement. Subscale scores for this study were tested for reliability using Cronbach's alpha method. Obtained reliability scores were .81 for instructional practices, .81 for classroom management, and .82 for student engagement. Overall, the scores for the TSES resulted in a high global reliability of .93.

Data Analysis

Statistical analysis included the use of descriptive statistics and several series of one-way and two-way analysis of variance (ANOVA) procedures. One-way ANOVA was used to determine if statistically significant differences existed between subject area taught (academic or CTE) and the three efficacy subscale constructs of teacher efficacy using an alpha level of .05. Two-way ANOVA analysis was then used to determine if there was a statistically significant difference between each independent variable and the three efficacy subscale constructs of teacher efficacy when grouped by subject area taught. Statistical Package for the Social Sciences (SPSS) version 19 software was used to conduct each statistical procedure.

Summary of Findings

Of the 146 teachers that responded, 77% were White and 23% were African American, Asian, Hispanic, or multiracial. Sixty-seven percent were female and 33% were male. Twenty-seven percent held a bachelor degree and 73% held a graduate degree. Years of teaching experience ranged from 0 to 38, with a median teaching experience of 9 years. No statistically significant interactive or main effects were detected between academic and CTE teachers on any of the three teacher efficacy subscale areas (instructional practices, classroom management, and student engagement) when grouped by gender, years of teaching experience, or certificate level.

The following section provides a discussion of the findings, limitations, theoretical and practical significance, and recommendations for future research for each question of the study.

Discussion of Findings and Recommendations

Research Question 1

Demographic characteristics of the sample reflected the population of the study, which focused only on academic and CTE secondary teachers within a specified geographic region. Moreover, demographic characteristics of the sample were also reflective of the population of secondary teachers in Georgia (see Appendix I). However, the generalizability of these findings to a larger group of secondary academic and CTE teachers is not warranted. Even so, results of this study do provide an understanding of the teacher efficacy construct among these groups (Fraenkel & Wallen, 2003; Gall et al., 2007).

Research Question 2

Previous research has shown that teacher efficacy differs among teachers when grouped by subject area (Raudenbush et al., 1992; Ross et al., 1996). Following Bandura's (1986) theory that self-efficacy is contextually situated, Raudenbush et al. suggested that efficacy beliefs would

be influenced by the various classes taught by secondary teachers. Their findings revealed a significant difference among academic and vocational (CTE) teachers. However, findings of the present study did not reveal significant differences between academic and CTE teachers.

Unlike previous research (e.g., Raudenbush et al., 1992; Ross et al., 1996, 1999), I did not examine teacher efficacy on the basis of the curriculum track (i.e., non-academic, academic, honors) of courses taught. Previous studies revealed that track level had a significant influence on teacher efficacy. Ashton et al. (1983) also found that teachers felt more capable of teaching higher track students. However, the influence of track was significantly diminished among heterogeneously grouped classes of students. Results of this study may be attributed to the heterogeneous groupings of classes. Ross (1994) notes the influence of track also diminishes as students become more actively engaged in academic tasks. CTE classes provide an actively engaging academic environment by providing learning activities that link learning to the broader context of the community (Castellano et al., 2003). Therefore, CTE teachers may possess similar efficacy beliefs as academic teachers due to the influence of the classroom environment.

Theory suggests that an individual's efficacy beliefs vary from situation to situation (Bandura, 1997). Factors which influence efficacy beliefs of secondary teachers include the different types of classes taught each day, class size, academic abilities of students, and students' grade levels (Ross et al., 1996). Each of these factors poses a different set of circumstances and challenges that may influence teacher efficacy beliefs. Although this study did not find a significant difference among teacher efficacy of academic and CTE teachers, future research should be conducted to further examine efficacy beliefs of more specific teacher groups based on track level (i.e., CTE, honors).

Research Question 3

No significant differences were detected between academic and CTE teachers' efficacy when grouped by gender. In contrast, previous studies have shown that females report higher levels of teacher efficacy than males (Ashton & Webb, 1986; Cheung, 2008; Guskey, 1981; Raudenbush et al., 1992; Ross et al., 1996). Theory suggests that gender either negatively or positively influences efficacy beliefs based on career area. For example, males demonstrate higher efficacy beliefs in scientific and technological careers than females. Likewise, females demonstrate higher efficacy beliefs in careers that are predominantly female (i.e., teaching). Bandura (1997) stated that differences in efficacy beliefs of males and females are attributed to social expectations rather than biologically ordained.

Low sample size may have contributed to the non-significant findings of this study. Sample sizes that are too small may not be representative of the population studied (Fowler, 2009; Keppel & Wickens, 2004). The initial response rate of this study was 39%. Of the participants that responded, there were 98 (67%) females and 48 (33%) males. Dillman (2007) and Mertler (2003) have noted that response rates of internet-based surveys range from 13% to almost 60%. However, when response rates are low, there is an increased potential for error (Dillman et al., 2009). Nonresponse becomes a source of error when those who did not respond are biased to the content of the survey (Fowler, 2009).

Although the findings of this study do not support theory, further research is needed to determine if socially conferred gender differences among teachers is diminishing. Previous studies that identified differences in teacher efficacy of males and females examined teachers from specific grade levels, subject areas, and track levels (Cheung, 2008; Guskey, 1981; Shahid & Thompson, 2001). For example, Raudenbush et al. (1992) found that teacher efficacy of

males and females differed when grouped by subject area and track level. Additional research should be conducted to examine efficacy differences among male and female secondary academic and career and technical teachers when grouped by grade level, subject area (i.e., math, science, social studies, business, health occupations, marketing, and technology), and track level (i.e., honors, college preparatory, career and technical).

Research Question 4

In previous studies, race/ethnicity had been positively correlated with teacher efficacy. Beady and Hansell (1981) found that Black teachers had higher efficacy scores than White teachers. Dee (2005) discovered that race had a consistently large effect on teacher perceptions of their abilities to impact student performance. When teachers were assigned to students demographically similar to themselves, their beliefs in the student's academic achievements were increased. Such effects also tended to be concentrated among students of low socioeconomic status, as well as those in the southern part of the United States. Likewise, Ferguson (1998) noted that demographic characteristics, such as teacher race, influenced the teacher's expectations of students. In some cases, teacher biases towards black students resulted in decreased achievement. However, the present study did not find a significant difference between academic and CTE teachers' efficacy when grouped by ethnicity.

Raudenbush et al. (1992) suggested that different socialization experiences associated with teachers' ethnicity may produce higher efficacy beliefs. Through customs and social practices, values and behavioral standards are molded for ethnic groups (Bandura, 1997). Theory suggests people who accept a more positive evaluation of their ethnic group will hold themselves in high regard, whereas groups that are devalued by others will view themselves as less competent regardless of their talents. Based on these complexities, Bandura suggests that

simply categorizing people into different ethnic groups will likely produce highly variable, if not misleading, findings. Therefore, participants of this study may have a more positive evaluation of their ethnic group, or have been exposed to socialization experiences which have resulted in higher efficacy beliefs. Perhaps the cultural values or practices of local schools, geographic areas or even the CTE areas to which teachers are tied may hold more connection for them than their racial connections. Yet, teachers who strongly link their identity to their ethnic culture may have developed a bicultural orientation in which they take in the mainstream culture while maintaining a firm ethnic identity.

Research Question 5

Research has shown that teacher efficacy increases with experience (Bandura, 1997; Cheung, 2008; Dembo & Gibson, 1985; Goddard, Hoy, & Hoy, 2004; Hoy & Woolfolk, 1993; Penrose, Perry, & Ball, 2007). Tschannen-Moran and Hoy (2007) found that experienced teachers had higher efficacy beliefs in areas of instructional strategies and classroom management than novice teachers. According to Bandura (1997), years of teaching experience contributes to mastery experiences, which serves as the major source of efficacy beliefs. Therefore, as years of teaching experience increases, self-efficacy beliefs increase. However, I did not find a significant difference between academic and CTE teachers' efficacy when grouped by years of teaching experience. Low sample size for each group in the study may have contributed to the non-significant findings. Samples sizes that are too low will result in reduction of statistical power to detect differences (Keppel & Wickens, 2004). Of the participants who responded, 4 academic and 18 CTE teachers had three or less years of teaching experience. However, there were 62 academic and 61 CTE teachers with four or more years of teaching experience.

Further research is recommended to examine the influence of years of experience and/or career stage placement on teacher efficacy. A limitation of this study is the grouping used for years of experience, which could have been grouped differently. Teachers were grouped into two categories; 0-3 years and 4 or more years. Soodak and Podell (1997) found that efficacy beliefs decreased during the first two years of teaching and then increased as teachers gained more experience. Theory suggests that performance accomplishments increase efficacy beliefs but are dependent on the timing and pattern of experiences (Bandura, 1997). Cheung (2008) also noted that teachers with more experience are able to handle different situations and reflect on ways to improve, which results in increased efficacy beliefs when handling similar situations in the future.

Research Question 6

Teacher efficacy has also been shown to be positively correlated to certification level or degree (Hoy & Woolfolk, 1993). Darling-Hammond (2000) acknowledged the importance of certification status and degree but noted that full certification and major in field is a more powerful predictor of student achievement than teachers' education level (i.e., master's degree). While I did not find a significant difference between academic and CTE teachers' efficacy when grouped by degree level, my findings do support Cheung's (2006) study of Hong Kong primary in-service teachers which did not reveal a significant difference among teachers with bachelor's and master's degrees.

Hoy and Woolfolk (1990) found that teachers who had taken graduate level courses were more likely to have stronger efficacy beliefs than those who had not. They noted that teachers who are more highly motivated may seek additional education. More efficacious teachers, once they have achieved a goal they have been pursuing, will set higher goals for themselves.

Teachers with low efficacy beliefs will not attempt challenging situations; they will choose to work within their perceived boundaries of ability. According to theory, the acquisition of knowledge requires a higher level of efficacy in order to overcome hindrances to significant accomplishments (Bandura, 1997). Results of this study may be attributed to the fact that teachers who responded have a stronger interest the profession and therefore possess higher efficacy beliefs, regardless of educational level attained.

Further research is recommended to examine the influence of advanced knowledge on teacher efficacy. A limitation of this study is that only advanced educational opportunities for degree were examined. However, according to theory, advanced knowledge may be gained through professional development opportunities not leading to an advanced degree (Bandura, 1997). Hoy and Woolfolk (1990) noted that teachers who are more motivated may seek additional knowledge rather than advanced education, which would therefore influence teacher efficacy.

Summary

This study was designed to provide an understanding of the teacher efficacy construct for career and technical educators. Previous research has established the importance of this construct and its impact on student achievement, yet these studies have focused only on academic teachers and neglected career and technical educators (Armor et al., 1976; Ashton & Webb, 1986; Ashton et al., 1983; Gibson & Dembo, 1984; Guskey, 1988; Hoover-Dempsey et al., 1987; Hoy & Woolfolk, 1993; Rose & Medway, 1981). However, since teacher efficacy is situation specific, these general studies cannot be readily extrapolated to all teachers (Enochs, Posnanski, & Hagedorn, 1999; Gibson & Dembo, 1984; Riggs & Enochs, 1990; Rubeck &

Enochs, 1991). Therefore, findings of this study contribute to limited research on the teacher efficacy of career and technical educators.

It is hoped that this research will contribute to a research base that has the potential to make a positive difference in education. If teacher efficacy beliefs were taken seriously, a better understanding of teacher efficacy could provoke changes in teacher preparation and mentoring programs (Tschannen-Moran & Hoy, 2001). Such changes, if focused on increased mastery experiences of teachers, would result in increases in teacher efficacy (Bandura, 1997). As evidenced in research, increases in teacher efficacy lead to increases in student achievement (Armor et al., 1976; Ashton & Webb, 1986; Ross, 1992, 1994).

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APPENDIX A

SURVEY DEMOGRAPHIC QUESTIONS

Demographic Questions

Check or complete the appropriate demographic items below:

Highest college degree attained (check only the highest):

- Bachelor
- Masters
- EdS – Specialist
- EdD
- PhD

Enter the number of years of teaching experience you have as of the beginning of the 2010-2011 school year:

-

Enter the number of years you have been teaching at your current school.

-

Subject area currently teaching (2010-2011 school year)

- English/Language Arts
- Math
- Science
- Social Studies
- Agriculture
- Architecture
- Construction
- Communication

- Transportation
- Business & Computer Science
- Culinary Arts
- Family & Consumer Sciences
- Engineering & Technology
- Government & Public Safety
- Healthcare Science
- Marketing

Gender

- Male
- Female

Race/Ethnicity

- African American
- Asian
- Caucasian
- Hispanic
- Native American
- Multiracial

APPENDIX B

TEACHER SELF EFFICACY SCALE

Teachers' Sense of Efficacy Scale[1] (long form)

Teacher Beliefs	How much can you do?								
Directions: This questionnaire is designed to help us 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. Your answers are confidential.	Nothing		Very Little		Some Influence		Quite A Bit		A Great Deal
1. How much can you do to get through to the most difficult students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2. How much can you do to help your students think critically?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3. How much can you do to control disruptive behavior in the classroom?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
4. How much can you do to motivate students who show low interest in school work?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5. To what extent can you make your expectations clear about student behavior?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6. 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)
7. How well can you respond to difficult questions from your students ?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
8. How well can you establish routines to keep activities running smoothly?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
9. How much can you do to help your students value learning?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
10. How much can you gauge student comprehension of what you have taught?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
11. To what extent can you craft good questions for your students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
12. How much can you do to foster student creativity?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
13. How much can you do to get children to follow classroom rules?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
14. How much can you do to improve the understanding of a student who is failing?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
15. How much can you do to calm a student who is disruptive or noisy?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
16. How well can you establish a classroom management system with each group of students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
17. How much can you do to adjust your lessons to the proper level for individual students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
18. How much can you use a variety of assessment strategies?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
19. How well can you keep a few problem students form ruining an entire lesson?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
20. To what extent can you provide an alternative explanation or example when students are confused?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
21. How well can you respond to defiant students?	(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)
24. How well can you provide appropriate challenges for very capable students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

APPENDIX C

PERMISSION TO USE TSES SURVEY INSTRUMENT

THE OHIO STATE UNIVERSITY COLLEGE OF EDUCATION AND HUMAN ECOLOGY

ANITA WOOLFOLK HOY, PH.D.

PROFESSOR
PSYCHOLOGICAL STUDIES IN EDUCATION

Dear

You have my permission to use the *Teachers' Sense of Efficacy Scale* in your research. A copy of both the long and short forms of the instrument as well as scoring instructions can be found at:

http://www.coe.ohio-state.edu/ahoy/researchinstruments.htm

Best wishes in your work,

Anita Woolfolk Hoy

Anita Woolfolk Hoy, Ph.D.
Professor

COLLEGE OF EDUCATION
29 WEST WOODRUFF AVENUE
COLUMBUS, OHIO 43210-1177

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APPENDIX D

GEORGIA DEPARTMENT OF EDUCATION PERMISSION TO USE TEACHER INFORMATION

From: Gregg Stevens [GStevens@doe.k12.ga.us]
Sent: Monday, August 23, 2010 3:38 PM
To: Allison Jordan
Cc: Gary Steppe; Carol Cannon
Subject: Re: Assistance Needed

Ms. Jordan,

Mr. Gary Steppe forwarded me your email regarding email addresses for current teachers. Teachers' work emails are collected by the Georgia Department of Education in October and are available through the Open Record Act shortly thereafter. You may contact Carol Cannon in my office at 404-656-4689 or at ccannon@doe.k12.ga.us to request information under the Open Records Act. We prefer to receive all requests in writing so we can be sure to provide you the information you need. Once we receive your request, we will forward it to a data analyst who will pull the data. If it takes him more than 15 minutes of work to pull the reports you need, we will charge the hourly salary of the lowest compensated person capable of doing the work. You will be provided an estimate of any costs before we begin any work.

All the best,

Gregg Stevens
Assistant General Counsel
Legal Services Office
Georgia Department of Education
2052 Twin Towers East
205 Jesse Hill Jr., Dr. SE
Atlanta, GA 30334
gstevens@doe.k12.ga.us
404-656-4689
http://www.gadoe.org

APPENDIX E

IRB APPROVAL

The University of Georgia

Office of The Vice President for Research
DHHS Assurance ID No. : FWA00003901

Institutional Review Board
Human Subjects Office
612 Boyd GSRC
Athens, Georgia 30602-7411
(706) 542-3199
Fax: (706) 542-3360
www.ovpr.uga.edu/hso

APPROVAL FORM

Date Proposal Received: 2010-09-09 **Project Number:** 2011-10178-0

Name	Title	Dept/Phone	Address	Email
Dr. Jay W. Rojewski	PI	Dept. of Workforce Education 210 Rivers Crossing 2639 706-542-4461		rojewski@uga.edu
Ms. Mary Allison Jordan	CO	WELSF 404-580-6495	45 Fiddle Creek Social Circle, GA 30025	jordan07@uga.edu

Title of Study: Influence of Contextual Characteristics on Teaching Efficacy of Secondary Teachers

45 CFR 46 Category: Administrative 2
Parameters:
None;

Change(s) Required for Approval:
Receipt of Recruitment Materials;
Revised Application;
Revised Consent Document(s);

Approved : 2010-10-13 **Begin date : 2010-10-13** **Expiration date : 2015-10-12**

NOTE: Any research conducted before the approval date or after the end data collection date shown above is not covered by IRB approval, and cannot be retroactively approved.

Number Assigned by Sponsored Programs:

Funding Agency:

Your human subjects study has been approved.

Please be aware that it is your responsibility to inform the IRB:
. . . of any adverse events or unanticipated risks to the subjects or others within 24 to 72 hours;
. . . of any significant changes or additions to your study and obtain approval of them before they are put into effect;
. . . that you need to extend the approval period beyond the expiration date shown above;
. . . that you have completed your data collection as approved, within the approval period shown above, so that your file may be closed.

For additional information regarding your responsibilities as an investigtor refer to the IRB Guidelines.
Use the attached Researcher Request Form for requesting renewals, changes, or closures.
Keep this original approval form for your records.

Chairperson or Designee,
Institutional Review Board

APPENDIX F

FIRST EMAIL INVITATION TO PARTICIPATE IN THE STUDY

Teacher Beliefs Survey

This survey is being used to gather information about teacher beliefs about student engagement, instructional strategies, and classroom management in the state of Georgia. Your responses are very important and highly valued. This survey consists of 24 questions related to teacher beliefs and 5 demographic questions. Your participation in this survey is entirely voluntary and all of your responses will be kept confidential. No personally identifiable information will be associated with your responses in any reports of this data.

Please complete all items on the survey until you reach the final page, indicating that you have completed the survey. Please complete the survey by **November 3, 2010**. The survey will take approximately 15 minutes to complete.

The survey displays best in Internet Explorer. Please note you may need to turn off your pop-up blocker feature in Internet Explorer in order to complete the survey. If you have any questions or need assistance while taking the survey, please contact me at jordan07@uga.edu. If you would prefer a hard copy of the survey, please email or call me and I will mail a copy to you.

I appreciate your time in completing this survey. Again, thank you for your honest responses and your participation! It is only through the help of teachers like you that information can be gathered that will provide a better understanding of teacher beliefs in Georgia.

To participate in the study, please click the following ~~"b~~egin survey" hyperlink. After completing all survey questions, click submit. Thank you again for taking the time to provide your responses.

If you need assistance or have questions while completing the survey, please contact:

Allison Jordan
jordan07@uga.edu
(404)580-6495

Begin Survey

If you are resuming your survey, please enter your return code here: _____

APPENDIX G

SECOND EMAIL INVITATION TO PARTICIPATE IN THE STUDY

Dear [NAME]:

Last week you were sent an email asking you to respond to a brief survey about teacher efficacy beliefs. Your responses to this survey are important and will contribute to a better understanding of teacher efficacy in the state of Georgia.

This survey is short and should take approximately 15 minutes to complete. If you have already completed the survey, I appreciate your participation. If you have not yet responded to the survey, I encourage you to take a few minutes to provide your responses. Your responses are very important for the study and are needed to provide a more accurate understanding of teacher efficacy in Georgia.

Please click on the link below to go to the survey website or copy and paste the link into your internet browser and then begin the survey. If you would prefer a hard copy of the survey, please send an email to jordan07@uga.edu, and I will mail it to you.

Survey Link: http://www.surveymonkey.com/

Your response is important. Thank you for your time and participation in this research study.

Sincerely,

Allison Jordan, Ed.D. Candidate
Work-Based Learning Coordinator
Business & Computer Science Teacher
Alcovy High School

APPENDIX H

THIRD EMAIL INVITATION TO PARTICIPATE IN THE STUDY

Dear [NAME]:

Last week you were sent an email asking you to respond to a brief survey about teacher efficacy beliefs. Your responses to this survey are important and will contribute to a better understanding of teacher efficacy in the state of Georgia.

This survey is short and should take approximately 15 minutes to complete. If you have already completed the survey, I appreciate your participation. If you have not yet responded to the survey, I encourage you to take a few minutes to provide your responses. Your responses are very important for the study and are needed to provide a more accurate understanding of teacher efficacy in Georgia.

Please click on the link below to go to the survey website or copy and paste the link into your internet browser and then begin the survey. If you would prefer a hard copy of the survey, please send an email to jordan07@uga.edu, and I will mail it to you.

Survey Link: http://www.surveymonkey.com/

Your response is important. Thank you for your time and participation in this research study.

Sincerely,

Allison Jordan, Ed.D. Candidate
Work-Based Learning Coordinator
Business & Computer Science Teacher
Alcovy High School

APPENDIX I

GEORGIA DEPARTMENT OF EDUCATION TEACHER DEMOGRAPHIC INFORMATION

Demographic Data of Teachers Employed by the Georgia Department of Education, 2010

Characteristic	PK – 12 Teachers
Positions	116,811
Personnel	
Full-time	113,976
Part-time	4,735
Gender	
Male	23,009
Female	95,702
Certificate Level	
4 Yr Bachelor's	49,854
5 Yr Master's	51,305
6 Yr Specialist's	15,405
7 Yr Doctoral	1,639
Other	508
Ethnicity	
Black	26,858
White	89,081
Hispanic	1,473
Asian	871
Native American	171
Multiracial	257
Years Experience	
<1	7,954
1-10	52,876
11-20	33,214
21-30	19,554
>30	5,113