DIFFERENCES: THE EFFECTS OF TEACHER EFFICACY ON STUDENT ACHIEVEMENT IN AN URBAN DISTRICT

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Abstract

The purpose of this study was to examine the difference in the effects of teacher efficacy on student achievement in Title I and Non-Title I schools. With the exception of teacher efficacy, there have been few studies reporting a consistent and significant relationship between teacher characteristics, student behavior, and student achievement (Woolfolk and Hoy, 1990). Utilizing the Teacher Sense of Efficacy Scale, formerly known as the Ohio State Teacher Efficacy Scale, the researcher determined the teacher efficacy levels in Title I and Non-Title I schools within an urban district.

A two-way ANOVA was used to examine whether there is a statistically significant main effect between teacher efficacy and student achievement within an urban school district. The main effect of teacher efficacy on student achievement was examined by comparing the student achievement of schools on the Fourth Grade Virginia Standards of Learning Reading and Mathematic Assessment to determine if there was a significant difference in the mean score between these two groups. A t-test was used as a follow-up test of simple significant main effect and interaction effect.

The correlation between all schools and overall teacher efficacy indicated a positive relationship between teacher efficacy and math scores and efficacy of instructional strategies and math scores. Moreover, the results indicated a positive relationship between overall teacher efficacy, efficacy of student engagement, and efficacy of instructional strategies and math scores. There was no relationship between efficacy levels and student achievement when just examining Non-title I Schools.

The first ANOVA indicated no statistically significant interaction between efficacy level and school type, but significant main effects for efficacy level, and school type. This test indicated the presence of significant differences in reading achievement in Title I schools. The second ANOVA indicated no significant interaction between efficacy level and school type, but significant main effect for efficacy level, and no significant main effect for school type. The t-test revealed no significant differences in top quartile and bottom quartile schools in math achievement for Title I and Non-Title I schools.

An independent sample t-test was used in order to determine whether there was a significant difference between the overall efficacy levels and efficacy levels in the three dimensions of teachers in Title I schools and Non-Title I schools. The test indicated there was no significant difference in the mean scores of Title I and Non-Title I teachers on the overall efficacy scale, nor in the three dimensions.

Descriptive statistics and pair sample t-test were used to answer questions four and five. The test indicated that Title I and Non-title I teachers scored highest in the dimension labeled efficacy for instructional strategies. There was a statistically significant difference in the mean scores of student engagement / instructional strategies and student engagement / classroom management in both Title I and Non-Title I teachers.

High levels of teaching efficacy may serve as a necessary component for teaching students who are difficult ‘to reach’. Therefore it is imperative that teacher efficacy levels be considered before placing teachers in schools. It may become increasingly important for human resource to gauge a teacher’s efficacy level during the hiring process and the placement of new teachers.

Principals must be dedicated to finding ways to increase efficacy levels in their teachers. Longitudinal studies that examine teacher efficacy levels in various teaching environments such as urban, suburban, rural, high SES, low SES, and other similar classifications would be useful.

Dedication

This dissertation is dedicated to my Lord and Savior Jesus Christ without whom I would have never made it this far. To my loving husband, my best friend, and confidante who encouraged me unfailingly, provided ongoing support and kind words, motivated me, and had confidence in me. To my three sons, Tre's, Joshua, and Jacob, who unselfishly allowed their mother to take time from them in order to complete this research project. To my parents who have always been wonderful examples and who taught me the importance of stretching myself. I thank them for loving me unconditionally and for providing me with encouragement in my educational pursuits. Many thanks are due to so many people for their assistance and support of this research project: I would like to express my sincere gratitude and appreciation to each of you. Lastly, I thank my friends, leader, and mentor for encouraging and supporting me.

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Chapter 1

INTRODUCTION

"If I have the belief that I can do it, I shall surely acquire the capacity to do it even if I may not have it at the beginning."

Mahatma Gandhi

Throughout the history of America it has been noted that a good education is a major key to a successful and prosperous life. Educated people are able to add productive input into society. These people make the bulk of the decisions that affect our ever-changing country. With the No Child Left Behind Act, educators have been given the enormous task of ensuring that all students are academically proficient by 2014.

Prior to the No Child Left Behind Act, many educators and researchers examined the significance of a quality education. The U.S. Department of Education's National Commission on Excellence in Education published A Nation At Risk (NAR), a significant contribution to the literature on this topic. The report addressed such areas as graduation requirements, higher standards for academic performance, increased instructional time, teacher preparation and development programs, and accountability for educators and elected officials (NAR; National Commission on Excellence in Education [NCEE], 1983). The report addressed concerns about the country's educational system and the fact that the United States was falling dramatically behind other countries in core academic areas.

Although NAR had a significant impact in shaping the dialogue on educational policy over the last two decades, it did not place a huge obligation on accountability. It spoke of holding educators and policy makers responsible for educating America's children. However, there was no formal assessment used to measure a school's ability to give a quality education to their students, nor were there penalties attached to schools that

appeared to be unproductive. Moreover, there were no timelines to indicate how soon things needed to be turned around. The No Child Left Behind (NCLB) Act did just that.

The No Child Left Behind Act (NCLB) signed by President George Bush on January 8, 2002, is an effort to close the achievement gaps (NCLB; U.S. Department of Education, 2001). NCLB was designed to promote equal academic achievement for all students without lowering standards. The act places special emphasis on specific sub-groups of students. It encourages a quality educational program for sub-groups by requiring states to disaggregate assessment results by subgroups; SES, race/ethnicity, limited English proficiency, and disability category (U.S. Department of Education, 2001). It then looks at the percentage of students tested and the percentage of students passing the test.

Local districts and schools must show Adequate Yearly Progress (AYP) with all sub-groups in order to meet the requirements of NCLB. Should a Title I school not meet AYP for two consecutive years, they will receive the needs improvement label and the district is required to develop a two-year plan to turn the school around. Students attending the school must be offered the opportunity to transfer out of the school. Students at these schools must be allowed to transfer to another public or public charter school that has not been identified as needing improvement. The state must utilize Title I funds to accomplish that goal.

If the Title I school does not improve after three years, the school must continue with the action put into place during the second year. Students from low-income families become eligible to receive supplemental educational services by a state approved provider. Improvement must be made by the end of the third year or the state must

consider replacing staff members and fully implementing a new curriculum. Additional and even more severe measures might be taken which would allow the state or a private company to take over the operations of the school.

States are allowed to utilize their current assessment tools to determine adequate yearly progress. Assessments should be aligned with the state's standards and progress should be measured in the areas of reading, math, and science. By the year 2014, all schools must have one hundred percent of their students performing at proficiency or above on the state's assessment system. NCLB's goal is to close achievement gaps. School leaders must now focus on the goal of total student achievement. With this act in place, school leaders can no longer hide the deficiencies of a particular sub-group. Schools can no longer receive praise because eighty-five percent of their students are achieving while the fifteen percent who do not achieve all belong to the same sub-group.

Researchers have made numerous attempts to gain a clearer understanding of the achievement gap problem. Many researchers and government officials are reporting that the quality of schools and teachers have a huge impact on student achievement. Further, they recognize that a teacher's knowledge and teaching strategies can be just as an important influence on student achievement as a student's family characteristics and ethnicity (Taylor et al., 2003).

Research shows that elementary students who studied with effective teachers three years in a row, score an average of 18 percentile points higher on standardized mathematical skill and 11 percentile points higher in reading, than students who studied with less effective teachers (Darling-Hammond, 2000). Students who work with effective

teachers produce dramatic gains in academic achievement regardless of whether they were low, middle, or high achievers.

Background of the Problem

With the growing diversity of students in classrooms today and higher standards of accountability, teachers may find their job even more demanding. Many times, teachers of at-risk students feel that they have even more pressure on them. There are also many teachers who feel unprepared to teach students from diverse backgrounds (Tucker et. al., 2005). They start to believe that they cannot truly make a difference in the academic lives of these students.

Teacher efficacy has been defined as "the extent to which the teacher believes he or she has the capacity to affect student performance" (Berman, et al,. 1977, p. 137) or as a "teachers" belief or conviction that they can influence how well students learn, even those who may be difficult or unmotivated" (Guskey & Passaro, 1994, p.628). It has been found that specific teacher attitudes and beliefs have increased students' academic achievement (Ashton & Webb, 1986; Moore & Esselman, 1992; Ross, 1992; Tournaki & Podell, 2005). Researchers and policy makers are urging teachers to take responsibility by examining ways they affect the learning of all students (Parsley & Corcoran, 2003).

Of all the factors that affect academic performance of at-risk students, teachers have the most impact on a student's school experience (Stronge, 2007). Teachers who develop positive relationships with their students have students who adjust in a more positive manner to the bureaucratic structure of school. In addition, relationships that students have with their primary school teacher, greatly influences their academic

achievement throughout their school career (Esposito 1999). The relationship also influences the teacher's efficacy level and his or her ability to be a good teacher.

Purpose of the Study

The purpose of this study was to determine if there is a difference in the effects of teacher efficacy on student achievement in Title I and Non-Title I Schools and to determine if efficacy levels have a greater impact on at-risk studnts. Specifically, the research sought to identify any possible relationships between a teacher's level of efficacy and student achievement scores on the Fourth Grade Virginia Standards of Learning Reading and Mathematic Assessments. The researcher examined teachers' efficacy levels in Title I and Non-Title I schools utilizing the Teacher Sense of Efficacy Scale. This scale, created by Tschannen-Moran and Woolfolk-Hoy, not only measures a teacher's sense of overall efficacy but it also measure their perceived efficacy in three distinct aspects of teaching; efficacy for instructional strategies, efficacy for classroom management, and efficacy for student engagement (Tschannen-Moran & Hoy, 2001).

Significance of the Study

This review of the research literature related to teacher efficacy addressed its effects on academic achievement of all students, the effects that staff development has on teacher efficacy, teaching efficacy and its relationship to teacher preparation programs and teacher efficacy as it relates to students with disabilities (Ashton & Webb, 1986; Moore & Esselman, 1992; Ross, 1992; Tournaki & Podell, 2005). Of the studies reviewed, none of them addressed the levels of efficacy in Title I schools. This study specifically addressed the effects of teachers' efficacy level on at-risk elementary age students by investigating teachers' efficacy levels in Title I schools. Moreover, the

study compared teachers' efficacy levels at Title I and Non-Title I Schools. This study adds to the scholarly research and literature in the field of at-risk students and teacher efficacy by merging these two constructs. Adding to this scholarly research helps to advance the closing of achievement gaps between at-risk and non-at-risk students.

Research Questions

The quality of one's education will determine his or her future (Plato, 1985). Every educator must take these words to heart, helping all students to achieve to the best of his or her ability. Teachers exert powerful influence on a student's potential success or failure, particularly when the student is at-risk.

The purpose of this study was to determine if there is a difference in the effects of teacher efficacy on student achievement in Title I and Non-Title I schools and to determine if efficacy levels have a greater impact on at-risk students. The study was designed to answer the following research questions:

> Are students who are enrolled in classes where the teacher has a high sense of efficacy outperforming students who are enrolled in classes where the teacher has a lower sense of efficacy? Further, does a teacher's efficacy level have a greater impact on students who have been identified as at-risk?

<u>Specifically</u>

a. What is the relationship between teacher personal efficacy and student achievement as measured by the TSES and the fourth grade Standard of Learning Assessments in math and reading?
b. Does the relationship between teacher personal efficacy scores and student achievement differ in Title I and Non-Title I students?

c. Is there a significant difference in the personal efficacy levels of teachers in Title I schools and Non-Title I schools?
d. What dimensions of efficacy do teachers in Title I schools score consistently higher as measured by the TSES and is there a statistical difference in the mean scores between dimensions?
e. What dimensions of teacher efficacy do teachers in Non-Title I schools score consistently higher as measured by the TSES and is there a statistical difference in the mean scores between dimensions?

Theoretical Framework

The theoretical framework is grounded in Bandura's (1986) *self-efficacy theory.* Self-efficacy is anchored in a bigger theory known as the social cognitive theory. This theory suggests that human achievement depends on interactions between one's behaviors, personal factors (e.g., thoughts, beliefs), and environmental conditions (Bandura, 1986, 1997). Bandura states that people gain data to assess their self-efficacy from four things, their actual performances, their vicarious experiences, the persuasions they receive from others, and their physiological reactions. He goes on to state that self-efficacy beliefs directly affect task choice, effort, persistence, resilience, and achievement (Bandura, 1997). When examining people who question their capabilities and those who do not, those who feel efficacious concerning a task participate more readily, work harder, persist longer when they encounter difficulties, and achieve at a higher level.

Efficacy is based on the notion that psychological procedures act as a way of creating and strengthening expectations of personal efficacy. Bandura explains that within this analysis, efficacy expectations are distinguished from response-outcome

expectancies (1977). Outcome expectancy deals with a person's perception that doing a specific task will lead to a certain reward or punishment (outcome). In contrast, an efficacy expectation is a person's belief that they can perform the task that will produce the outcome. Outcome and efficacy expectations differ in that a person may know what it takes to achieve a certain outcome (e.g. if I attend college I can get a better job). But, if they do not believe they can accomplish the task, (e.g. academic rigor of college) the knowledge of what it takes to handle the task is useless.

A person's level of self-efficacy can affect both initiation and persistence of a certain task. Efficacy levels can predict if a person attempts to perform a specific task and how long a person will persist at that task if initially things don't go as expected. According to Bandura, at the initial level, perceived self-efficacy influences choice of behavioral settings. People fear and tend to avoid threatening situations they believe exceed their coping skills. The opposite is also true. People get involved in activities and behave assuredly when they judge themselves capable of handling situations that would otherwise be intimidating (Bandura, 1977).

All efficacy beliefs constructs – student, teacher, and collective – are future oriented judgments about capabilities to organize and execute the course of action required to produce given attainments in specific situations on context (Bandura, 1977). This study specifically explores the teacher efficacy construct.

Conceptual Framework

This study was designed around the conceptual framework of C. Patrick Proctor (1984). His model highlights the importance of teacher efficacy for student learning. The model clearly defines factors of student achievement that are under the influence of

educators. The model begins with student characteristics. Many factors such as race, gender, economic level, and past academic performance influence teacher efficacy levels. The variable was also reported to have an influence on the climate of the school. Teacher efficacy has a direct affect on the climate of the school, because teachers with a lower

Conceptual Framework

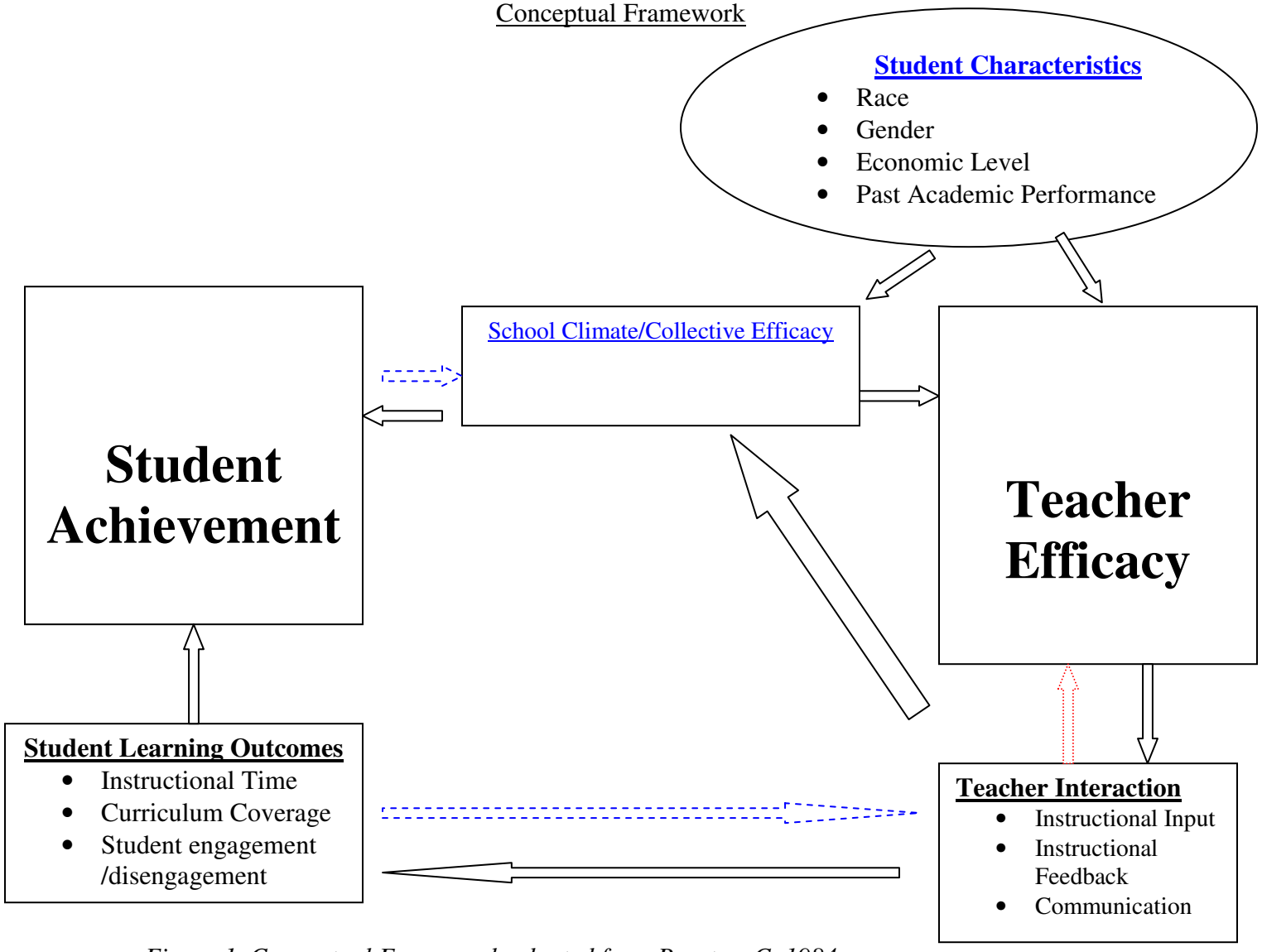

Figure 1. Conceptual Framework adapted form Proctor, C. 1984

sense of efficacy tend to have negative interactions with their colleagues. These interactions are usually focused on the student's believed inability to perform at high standards or the teacher's inability to educate the student due to (the student's) home

environment. Teacher efficacy not only affects the types of interactions that a teacher will have with their colleagues but it also affects interactions with their students. This variable controls the teacher's classroom behaviors (Cruickshank's, 1985) which places a strain on the teacher's ability to cover the curriculum and maintain student engagement (student learning outcomes).

The result of all factors and variables in Proctor's (1984) model is the student's achievement level (McIlrath & Huitt, 1995). Based on the model, it is hypothesized that there is a cyclical relationship among the variables. The result of all these factors in Proctor's model (1984) is the hypothesis that a cyclical relationship exists among all these variables. Proctor's main concept is that achievement in a specific classroom during a particular school year is not an end in itself and it is affected by teacher efficacy.

Definition of Terms

Below are definitions of terms used throughout this study. These definitions are related specifically to this study.

Teacher efficacy has been defined as "the extent to which the teacher believes he or she has the capacity to affect student performance" (Berman, et al,. 1977, p. 137) or as "teachers' belief or conviction that they can influence how well students learn, even those who may be difficult or unmotivated" (Guskey & Passaro, 1994, p.4). Teacher efficacy is generally evaluated based on two constructs, general efficacy and personal efficacy. General efficacy refers to a teacher's outcome expectations concerning the teaching profession as a whole, while personal efficacy refers to a teacher's beliefs about their personal ability to execute a particular course of action to bring about student

achievement. This study utilizes the Teachers' Sense of Efficacy Scale to measure teachers' personal sense efficacy.

At-risk student is defined in this study as a student who is from low SES backgrounds. This student typically attends a Title I schools and receives free or reduced lunch. They sometimes have family problems such as drug addictions, parents who are incarcerated, and/or mother's with a minimum education. Disproportionate numbers of at-risk students are minority males. Students who are both low income and minority status are more likely to be labeled at risk than any other sub-group. As indicated in the definition, there are several factors which would cause a child to be considered an at-risk student, however, for the purpose of this study the researcher focuses only on social economic factor.

Limitations and Assumptions

Research studies conducted on intact classrooms in natural school settings have been categorized as non-experimental research. They contain limitations within the research design that hinder the researcher's ability to generalize results to populations other than those being studied. The researcher was not able to control extraneous influences other than social economic status. Further, the researcher did not have access to students individual test scores, instead schools overall pass rates were used to assess student achievement.

This study was limited to fourth grade teachers and students in an urban school district in southeastern Virginia. Because the district is urban, the information obtained from this research cannot be generalized to at-risk students in dissimilar settings.

This study made the assumption that teachers were honest when completing the survey. There are always limitations to survey research. Respondents sometimes answer the questions in the manner that they think the researcher would expect them to answer. Their answers are sometimes not an indication of how they truly feel or act. This occurs mostly when they feel that their livelihood could be at stake.

Organization of Study

This study is divided into five chapters. In Chapter 1, the background of the problem, purpose of the study, significance of the study, theoretical framework, conceptual framework, definition of terms, and limitations and assumptions are presented. Chapter II is a review of the literature. The research review covers the context and significance of teacher efficacy as it relates to at-risk students. Additionally, it will review literature concerning teachers' perceptions and expectations of at-risk students. Chapter III discusses data collection and the method of analysis. An explanation of the population of the study, the way the samples were drawn, the development of the survey instruments and the steps taken to ensure their validity and reliability, the data collection procedures, and methods of analysis of the data are explained. Chapter IV presents the results of the study. Descriptive statistics and results of this quantitative study are included. Chapter V contains a summary of other research findings, the researcher's reflection, implications for practice, limitations of the study, and recommendations for future research.

CHAPTER II

REVIEW OF LITERATURE

Historical Prospective

The study of teacher efficacy began over three decades ago. Researchers have considered teacher efficacy – teacher's beliefs in their ability to affect student outcomes – to be a crucial factor in student achievement (Ashton, 1984: Amor et al., 1976; Gibson and Dembo 1984; Woolfolk and Hoy, 1990).

Teacher efficacy is influenced by the locus of control theory (Rotter, 1966) and Bandura's self-efficacy theory (1986). Researchers who use Rotter's locus of control framework typically divide teacher efficacy into two categories: general teacher efficacy – beliefs in the ability of teachers in general to influence student outcomes; and personal teacher efficacy – teachers' beliefs in their ability to influence student outcomes (Tschannen-Moran and Hoy, 2001). When developing teacher efficacy research around Bandura's self-efficacy theory, teacher efficacy is divided into outcome expectancies and efficacy expectancies (Tucker et. al, 2005).

The locus of control construct is formulated around social psychology research that demonstrates an important relationship between individuals' behavior and their perceptions of whether or not events were under their personal control. The locus of control affects a person's decision making. Those who make decisions on their own are considered to have internal locus while those who make decisions based on others have external loci. Rotter (1966) further suggests that people with external loci are more apt to be stressed and suffer from depression as they are more aware of work situations and life strains. Internal locus of control has also been referred to as "self-determination".

Self-efficacy is defined as one's beliefs about his or her ability to perform a specific behavior (Bandura, 1986, 1997). Self-efficacy influences perceptions of one's skills and abilities, and whether these skills/abilities produce effective and competent actions. According to Bandura (1997) there is a mutual association among the cognitive process and behavior change.

There are two components to Bandura's efficacy theory, efficacy expectations and outcome expectations. Efficacy expectation deals with one's conviction that he or she can successfully produce the behaviors that will produce a certain outcome. Outcome expectation involves one's belief that a particular course of action will produce a certain outcome (Bandura, 1977). A person's level of self-efficacy can affect both initiation and persistence on a certain task. Efficacy levels can predict if a person attempts to perform a specific task and how long a person will persist at that task if initially things do not go as expected. According to Bandura, at the initial level, perceived self-efficacy influences choice of behavioral settings. People fear and tend to avoid threatening situations they believe exceed their coping skills, whereas they get involved in activities and behave assuredly when they judge themselves capable of handling situations that would otherwise be intimidating (Bandura, 1977). All efficacy beliefs constructs – student, teacher, and collective – are future oriented judgments about capabilities to organize and execute the course of action (self-efficacy) required to produce given attainments in specific situations on context (outcome expectancy) (Bandura, 1977).

Research on teacher efficacy began with the notable Rand studies (Henson, 2002). The Rand researchers evaluated whether teachers believed they could control the reinforcement of their actions. The study was formulated around Rotter's (1966) locus of

control theory. The Rand researchers developed two items that were based on the locus of control orientation. The first item was "when it comes right down to it, a teacher really cannot do much because most of a student's motivation and performance depends on his or her home environment." The second was, "if I really try hard, I can get through to even the most difficult or unmotivated students" (Armor et. al, 1976, p. 23).

The original purpose of the Rand study was to identify the school and classroom policies and other factors that were most successful in raising the reading scores of inner-city children. Twenty elementary schools were selected for analysis. The schools displayed large or consistent gains for the sixth grade on the CTBS Reading examination. The researchers gathered information on school leadership, reading program content and implementation, classroom atmosphere, and teacher attributes by interviewing principals and reading specialists. The researchers concluded that the greater the teachers' efficacy, the more their students advanced in reading achievement.

Berman and McLaughlin (1977) conducted another study under the leadership of the Rand Cooperation. This study evaluated 100 Title III projects of the 1965 Elementary and Secondary Education Act. They found that "above all, teachers' sense of efficacy emerged a powerful explanatory variable….Indeed the regression coefficient of the effects of a sense of efficacy are among the strongest relationships identified in our analysis" (p.136).

Most of the early studies were developed around trying to measure a teacher's sense of efficacy quantitatively. Because the construct was so elusive and developed around two different theoretical models, measuring it using numbers was complex and

complicated. However, regardless of the obstacles, an abundance of useful information came out of this research (Tschannen-Moran & Hoy, 2001).

Ashton and Webb were the pioneers of the teacher efficacy measurement research. They were among the first researchers to develop a multi-dimensional model of teacher efficacy, based primarily on Bandura's social cognitive theory (Guskey, 1994). Teacher interviews and correlational data provide support for at least two different efficacy dimensions (Ashton & Webb, 1982; Gibson and Dembo, 1984). The researchers felt that a teacher's outcome expectations concerning the teaching profession itself were reflected in a dimension they labeled teaching efficacy. An individual's personal ability to execute particular courses of action to bring about desired results were referred to as personal efficacy. Ashton and Webb believed that these two dimensions could operate independently. In other words, a teacher could believe that teaching is a powerful factor in student learning, but not believe in their ability to affect student learning. On the contrary, some teachers could believe that the teaching profession has little impact on student learning and that home environment is the key factor to a student's success, but feel that they are the exception to the rule and can make a difference in even the most difficult student.

Gibson and Dembo (1984) completed one of the first studies aimed at attempting to measure the dimensions of teacher self-efficacy. The two researchers felt the original RAND questions were more aligned with Bandura's social cognitive theory. They stated,

> If we apply Bandura's theory to the construct of teacher efficacy, outcome expectancy would essentially reflect the degree to which teachers believed 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 be teachers' evaluation of their abilities to bring about positive student change. (Gibson and Dembo, 1984, p.570)

Their instrument was based on Ashton and Webb's conceptual model. The original scale began with 53 sample items which were administered to 90 teachers. Preliminary data analysis of pilot items involved principal factors analysis, elimination of items with poor variability, and maintenance only of those items that loaded clearly on one of the substantial factors (Gibson and Brown, 1982). The researchers revised the remaining items ensuring that there were no ambiguities or improper item construction (Gibson and Dembo, 1984). The revised teacher efficacy scale was 30 items long and written in Likert format.

The thirty item survey was administered to 208 elementary school teachers selected from thirteen elementary schools in two neighboring unified school districts. Sixty-five percent of the sample population had six or more years of teaching experience. The researchers ran a principal-factor analysis. The analysis was used to infer the existence of two independent dimensions (r=.19). They eliminated items with a factor pattern coefficient less the .45. This reduced the survey from thirteen items to sixteen items. Factor 1 was labeled PE (personal efficacy). It accounted for 18.2% of the total variance with a Cronbach's α coefficient of .78. Factor 2 was labeled TE (Teacher Efficacy or General Teacher Efficacy). This factor accounted for 10.6% of the total variance with a Cronbach's α coefficient of .75. This measurement instrument became

one of the most frequently used for assessing teacher efficacy (Brouwers & Tomic, 2003).

Gibson and Dembo felt that their findings were consistent with Bandura's model which states that PE corresponds to self-efficacy and TE measures an outcome expectancy dimension. They found that teachers who scored high on both Personal Efficacy and Teacher Efficacy would persist longer, provide greater academic focus in the classroom, and exhibit different types of feedback than teachers who scored lower on the efficacy scale (Gibson and Dembo, 1984).

Woolfolk and Hoy (1990) extended the research of teacher efficacy to pre-service teachers. They administered a version of Gibson and Dembo's Teacher Efficacy Scale (TES). They also included in the survey two items concerning how teachers felt about their preparation program and the two original Rand items. This survey was administered to 182 undergraduate liberal art majors enrolled in the teacher preparation program in a state university located on the eastern region of the United State. The population consisted of 155 women and 27 men; 87% were sophomores, with the remaining 13% equally divided between freshmen and seniors. One hundred four of the subjects were in the elementary certification program, and 78 were seeking secondary certification.

Results from a principal axis factor analysis of the TES items were interpreted by the researchers to create two dimensions of teacher efficacy that account for 27 % of the variance in the data. Because the factors were essentially uncorrelated (r=.08), it was further argued that the dimensions are independent.

The factor structure and factor pattern coefficients were very similar to those reported by Gibson and Dembo (1984). Woolfolk and Hoy labeled their two factors as

teaching efficacy and personal efficacy just as previous researchers had. They felt that the teacher efficacy was a measure of one's beliefs about the ability of teachers in general rather than a measure of outcome expectation (Denzie, Cooney, McKenzie, 2005). They felt this because the item with the highest factor pattern coefficient for the TE factor reads, "A teacher is very limited in what he/she can achieve because a student's home environment is a large influence on his/her achievement." The Cronbach's coefficients for the scores on the twelve personal efficacy items and the eight teacher efficacy items were .82 and .74, respectively.

The researchers evaluated Guskey's 1981 assertion that the personal efficacy dimension was actually composed of two components (negative student outcomes and positive student outcomes). The three-factor solution accounted for 32.8% of the variance. Woolfolk and Hoy found their three-factor solution to be in line with Guskey's research findings. However, they decided to adhere to the more prudent two-factor solution because the relationship between efficacy and other pertinent independent variables remained the same whether they used the two- or three-factor solution. Further, they suggested that the factor structure of the Teacher Efficacy Scale be examined in other samples to see if the two facets of personal efficacy were related to other criteria (Woolfolk and Hoy, 1990).

Soodak and Podell joined in the attempt to clarify the meaning and measurement of teacher efficacy. They explored the dimensions of teacher efficacy and its meaning as it related to the construct. They replicated the factor structure obtained by Woolfolk and Hoy in both the two-and three-factor solutions. The researchers' sample consisted of 310 teachers from both urban and suburban schools in the New York Metropolitan area

(Soodak and Podell, 1996). These teachers' mean number of years in the profession was 9.2. The researchers addressed the teachers' efficacy level by using an adapted version of Gibson and Dembo's (1984) Teacher Efficacy Scale. Soodak and Podell added eighteen additional items. Ten new items pertained to students' behavior or emotional state. Five of the ten referred to positive conditions and five of the ten referred to negative conditions (Soodak and Podell, 1996). The researcher also added three items pertaining to heredity, three pertaining to the influence of viewing violence on television and two items referring to the impact of diet (Soodak and Podell, 1996). At the conclusion of their study, the researchers found that in fact there were three dimensions of teacher efficacy, although they disagreed with their interpretation of the third dimension. In their study, Soodak and Podell labeled the third dimension outcome expectancy. Unlike Woolfolk and Hoy (1990), who also found three dimensions in teacher efficacy, Soodak and Podell did not believe that personal efficacy should be divided into beliefs and one's responsibility for positive and negative outcomes. They believed that personal efficacy (PE) referred to teachers' beliefs about their teaching skills, while outcome expectancy (OE) refers to their beliefs about the effectiveness of implementing those skills (Soodak and Podell, 1996). This corresponds with earlier research findings (Soodak and Podell, 1993).

In 2001, researchers Tschannen-Moran and Hoy set out to develop a new teacher efficacy scale. The researchers felt that there was a great deal of confusion concerning the two dimensions of teacher efficacy, general efficacy and personal efficacy (Tschannen-Moran & Hoy, 2001). They also felt that there were no "assessments 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). They explored several possible formats including a Likert-type scale similar to the Gibson and Dembo instrument (Tschannen-Moran & Hoy, 2001). The researchers decided to base their new instrument on Bandura's scale. The new instrument included an expanded list of teacher capabilities. They added new items to reflect areas of teaching not represented on the Bandura Scale. Fifty-two items were generated. Of the 52 items, 23 items were derived from Bandura's scale. After field testing the instrument and removing and adding several questions, a 24 items (long format) – 13 items (short format), survey was in place. The assessment contains three dimensions of efficacy for instructional strategies, student engagement, and instructional classroom management.

The researchers found that the new scale was far more superior to previous measures in that it had a unified and stable factor structure. It also assesses a broad range of capabilities that teachers consider important to good teaching (see Table 1), without being so specific as to render it useless for comparisons of teachers across contexts, levels, and subjects (2001, p.802).

Table 1 Validity Correlation

	OSTES	Instructional	Management	Engagement	Rand 1	Rand 2	GTE	PTE
OSTES		0.89**	0.84**	0.87**	0.18**	0.53**	0.16**	0.64**
Instructional	0.84**		0.60**	0.70**	0.07	0.45**	0.06	0.62**
Classroom	0.79**	0.46**		0.58**	0.29**	0.46**	0.30**	0.45**
Student	0.85**	0.61**	0.50**		0.11*	0.47**	0.06	0.58**
Rand 1	0.18**	0.08	0.26**	0.11*		0.23**	0.65**	0.12*
Rand 2	0.52**	0.45**	0.39**	0.45**	0.23**		0.13*	0.65**
General Efficacy	0.16**	0.08	0.26**	0.06	0.65**	0.13*		0.07
Personal Efficacy	0.61**	0.60**	0.37**	0.56**	0.12*	0.65**	0.07	

**p<0.01 (2-tailed) * p<0.05 (2-tailed)

Efficacy and SES

The term "at-risk", as it pertains to student groups, first entered the public arena in 1983 as a result of A Nation at Risk (National Commission on Excellence in Education, 1983) (Stronge, 2007). In predicting levels of student achievement or other at risk factors, family income continues to be a reliable indicator (Thompson, 2004). Students from high and middle socioeconomic backgrounds arrive at school better prepared to learn than their low socioeconomic peers (Stronge, 2007). When arriving at kindergarten, thirty-nine percent of students from low social-economic status recognize the letters of the alphabet as compared to eighty-five percent of students from high socioeconomic backgrounds (Neuman, 2003). These children typically begin their school experience with fewer academic skills than their middle-income peers and continue on the low performance track throughout their education (Hauser-Cram, Sirin, & Stipek, 2003). Studies have documented that on average, low-income children's academic progress lags behind their middle-class peers (Hauser-Cram, Sirin, & Stipek, 2003).

Students who are ineligible for federal free lunch programs because their family's income is too high consistently score the highest on the NAEP Test (National Assessment of Educational Progress) in reading, writing, science, mathematics, and United States history. The lowest scores are earned by children who do qualify for lunch programs. The pattern is the same for fourth, eighth and twelfth grade students (Thompson, 2004). Additionally, students who are eligible for free lunch are more likely to dropout due to repeated retentions and, therefore, earn less money during their lifetime (Thompson, 2004). The issue is not only that they fail to achieve academically, but they tend to enter adulthood "illiterate, dependent upon drugs and alcohol, unemployed or under-employed,

as a teenage parent dependent on welfare, or adjudicated by the criminal justice system" (Barr & Parrett, 1995, p.3). Income and class status have become increasingly determined by educational success. The gap in achievement has shifted steadily from being an indicator of educational inequality to being a direct cause of socioeconomic inequality (Johnson, 2000).

Crist (1991) states that "at- risk students report that teachers do not understand them and that the work is too difficult or boring, fear for their physical safety, they cannot complete homework assignments, do not or cannot participate in extracurricular or social activities, and they get little or no support from home" (p. 37)

Of all the factors that affect academic performance of at-risk students, teachers have the most impact on their academic achievement (Parsley & Corcoran, 2003). Effective teachers of at-risk students have been described as "warm demanders" (Howard, 2002). Their students know that they care for them, but also understand that they expect and will not accept anything but the best from them. These teachers work to ensure that students attend school on a regular basis. Most importantly, they see their students as individuals, not as "poor" students or "minority" students (Stronge, 2007).

"Self-efficacy is a critical characteristic needed in teachers of at-risk students" (Stronge, 2007, p. 32). Teachers with high efficacy are not intimidated by their students' backgrounds. They do not allow a student's home life to interfere with their belief in their student's academic capabilities. They do not allow factors such as poverty, lack of parent participation, and other issues to impact their belief that all students can learn. Instead, these factors are seen as surmountable obstacles and ones that can most definitely be overcome (Stronge, 2007).

A study was conducted to correlate teacher efficacy levels and academic predications of students based on characteristics of students (Tournaki & Podell, 2005). The researches found that teachers with low efficacy generally felt that they could not be successful with male students who were inattentive and reading below grade level. Additionally, he found that student characteristics were far more often to interact with TE (i.e., the belief that teaching in general affects student outcomes) than with PE (i.e., the belief that the teacher personally affects student outcomes). His results revealed that not only did teachers with low efficacy scores feel that they could not help the student, these teachers felt that the entire educational system was not advantageous for certain students (Tournaki & Podell, 2005).

A longitudinal study was conducted by a group of researchers concerning teacher efficacy and low achieving students (Midgley, Feldlaufer, & Eccles, 1989). The researchers made two hypotheses: first, that the relationship between changes in students' beliefs before and after the transition to junior high school will be stronger for low – achieving students than for high achieving students. Second, that the differences in pre- and post-transition teachers' sense of efficacy will be stronger for low- achieving students than for higher achieving students. Results of the study proved this to be true. They indicated that changes in the beliefs of low-achieving students across the two years were strongly related to the efficacy beliefs of their pre- and post-transition teachers (Midgley, Feldlaufer, & Eccles, 1989). Simply put, performance levels for low-achieving students have a strong relationship to the efficacy beliefs of their teachers. This finding supported an earlier study that found that teachers' sense of academic futility was more highly correlated with achievement in low SES schools (r=.21) than in high SES school (r=-.03).

Moreover, the correlation between teacher sense of academic futility and mean student self-concept of ability was .07 in high SES schools and .37 in low SES schools (Midgley, Feldlaufer, & Eccles, 1989).

In 2002, a group of researchers conducted a study concerning the correlation between teacher involvement (interaction) and student engagement (Tucker et. al, 2002). Based on their findings, they recommended additional research on the relationship between teacher efficacy and culturally diverse students (Tucker et. al, 2005). The researchers developed a teacher-training program designed to promote teacher efficacy in relation to culturally diverse students. The researchers based their investigation on the findings of Gibson and Dembo (1984). They learned that teachers who believe student learning is influenced by teaching despite home and peer influence and who had confidence in their ability to teach, persisted longer in their teaching efforts, provided greater academic focus in the classroom, gave different types of feedback, and ultimately improved student performance. These teachers persisted because they have confidence in their ability to teach.

Sixty-two teachers (forty-three Caucasian-Americans and nineteen African Americans) with a mean of 14.62 years of teaching experience participated in this study. Thirty-seven teachers were in the intervention group and twenty-five were in the control group. The teachers were recruited from six elementary schools in the southeastern region of the United States that had similar demographic characteristics. In addition, they all received a “D” grade on a statewide comprehensive assessment of student performance. Schools were randomly assigned to one of three conditions: (a) teacher only intervention, (b) school-wide intervention (i.e., training of teachers and non-teaching

school personnel, such as office staff and food service providers), or (c) no training control group. For the purposes of the analyses, the teacher-only and school-wide intervention conditions were collapsed into a single group (n=37).

Teachers in the treatment condition attended a six hour workshop designed to educate teachers about methods and strategies that are most effective with culturally diverse students. A non-mandatory follow-up was conducted nine weeks later. Only 19.4% of the control group attended that follow-up session. All teachers completed a questionnaire packet at baseline and again 12 weeks later.

The training program for teachers was based on Self-Empowerment Theory (Tucker, 1999). Self-Empowerment Theory is similar to other theories of autonomous self-regulated or self-efficacious behavior (Bandura, 1986; Connell, 1991; Connell, Spencer, and Aber, 1994; Connell and Wellborn, 1991; Kanfer, 1990; Zimmerman and Martinzez-Pons, 1988). This theory was developed during extensive research with low-income African American children. It postulates that behavior problems and academic failure, as well as pro-social behavior and academic success, are significantly influenced by the levels of five significant factors (Tucker et. al., 2005, p.31):

(a) self-motivation to achieve academic and social success

(b) perceived self-control over one's behavior and academic success

(c) self-reinforcement for engaging in social and academic success behaviors

(d) adaptive skills for life success

(e) engagement in success behaviors

An analysis of covariance was conducted on culturally sensitive teacher self-efficacy post-test scores, using the pre-test scores. There was a significant main effect for

treatment conditions. This indicated that teachers who participated in the program had a higher sense of efficacy as reported by their pre- and post-test scores as compared to the control group. Given that existing research demonstrates that low SES students are at risk for low teacher- involvement and engagement is critical for academic success, research and intervention strategies are urgently needed to promote teacher-involvement with these students. Numerous studies have suggested that teachers have lower expectations for and fewer interactions with students from low SES backgrounds (Tucker et al., 2005). Because of this, calls for promoting teacher efficacy for working with children from diverse backgrounds have occurred (Frey, 2002).

Efficacy and Student/Teacher Interactions

As indicated earlier in the text, researchers have investigated the adverse effect of teacher and student interactions. Teachers with low efficacy have fewer interactions with students from low SES backgrounds (Tucker et al., 2005). A major part of teacher effectiveness is connected to ethics. These ethics deal with exhibiting care, fairness, and respect for all students. At most times, these ethics can be displayed through social interactions (Stronge, 2007). The researcher argues that constructive social interactions between teachers and students not only contribute to student learning and achievement, but also increase student self-esteem (Stronge, 2007).

Efficacious teachers go beyond a mere respectful relationship to develop a caring relationship with their students (Langer, 2000). Developing positive student relations is a prevention-based discipline tool. Students who feel cared for and valued by their teachers are more likely to perform positively. These students are willing to comply with the teacher's directions and are constantly trying to please them. Quality of

relationships between teachers and students and improved teacher efficacy is the primary focus of many quality schools (Tucker et. al, 2002, Goddard, R. D., et. al., 2004 & Labone, 2004).

A study was conducted to determine the influence of teacher behaviors and student self-system variables on the academic engagement of low-income students (Tucker et al., 2002). The researchers hypothesized that self-system variables would have a direct effect on student engagement and would mediate the relationship between the teacher behavior and student engagement. All of the data collected was self reported by students using the Demographic Data Form. This was constructed by the researchers and selected subscales of the Rochester Assessment Package for Schools – Student Self-Report (RAPS-S). Descriptive statistics and preliminary Pearson correlation analyses were conducted to determine the univariate relations among all variables. Correlations between sex, grade level, and engagement were calculated. The data show a significant correlation between teacher-involvement and student engagement. The researchers found that students who stated their teachers were interested and involved in their lives were more likely to report higher levels of engagement in the learning process.

As indicated by the researchers, the significant findings of the study serve as a reminder of the powerful influence teachers can have in shaping academic success aside from their role as imparters of knowledge (Tucker et al., 2002). A teacher must show students that he or she cares about them as individuals. The teacher should talk with and listen to students discuss academic and personal issues (Parsley & Corcoran, 2003). The first lesson that children must learn is that they are valued. When teachers develop

positive relationships with their students, positive school adjustment is more likely to occur (Esposito, 1999).

Instructional Referrals

New studies have emerged on the issue of efficacy of teachers for students with disabilities and their decision to refer students to special education. These studies have found that teachers who have a higher sense of efficacy are less likely to refer students to special education. Additionally, they are more likely to feel that they can teach any child including a child found to have a learning disability. This is important because more students with disabilities are being included in regular education settings. This means that they are also being taught by teachers who have not had formal training in special education.

When examining teachers' referrals to special education as it relates to efficacy (Coladarci & Breton, 1997; Podell & Soodak, 1993; Soodak & Podell, 1993) researchers found that teachers with higher efficacy made fewer referrals to special education than those with lower efficacy. Coladarci and Breton (1997) found that special education resource room teachers with high efficacy scores were satisfied with their position and felt their instructional supervision was useful. Those with low scores felt differently.

Soodak and Podell conducted four major studies to investigate teacher efficacy and special education. Regular and special education teachers were included in these studies (1993). The independent and dependent variables were teacher efficacy and student problem type and teachers' placement and referral decisions. Regular and special education teachers were assigned case studies describing students with learning or

behavioral problems. Results indicated a correlation between high efficacy scores and teacher agreement with regular education placement.

In a similar study, the researchers investigated teachers' sense of efficacy and biases in their decisions to refer students to special education (Podell & Soodak, 1993). Once again, teachers were asked to read case studies, only this time the studies were about students who had specific academic difficulties. They were asked to judge the appropriateness of the student's regular class placement and whether they would refer the student. Teachers were assigned to groups based on students' socioeconomic status and the cause of learning problems. The results indicated teachers with low efficacy felt regular education was inappropriate when students were both academically challenged and from low socioeconomic backgrounds. In another study, general educators were surveyed concerning their feelings towards the inclusion of students with disabilities in their classrooms. The researchers found that the level of student's disability and the teacher's efficacy level directly influenced their attitude toward inclusion (Soodak, Podell, & Lehman, 1998).

Brownell and Pajares (1996, 1999) studied the association between general education teachers' efficacy and inclusion for students with learning and behavior problems. The researcher concluded that the teachers with higher efficacy had more productive perceptions of their pre-service teacher preparation and these teachers reported that they had more success with students with learning and behavior problems. This study suggests that teacher preparation and professional development affect teacher efficacy beliefs.

Additionally, teachers' decisions regarding difficult-to-teach students and teacher efficacy was investigated (Soodak & Podell, 1994). Teachers were asked to identify the best way to meet the needs of students and to identify suggestions that would be most effective based on a case study. Results indicated that teachers who made more teacher-based strategies scored higher in personal efficacy than teachers who leaned toward referring the student.

A study was conducted to understand teachers' perceptions of learning disabled and behavior problem students in the regular education setting (Lopes et al., 2004). The researchers conducted the study because of the increase of referrals to have inclusion students moved to more restrictive environments. The purpose of this study was to critically examine teachers' perceptions about their work with two kinds of students: students who experienced difficulties learning and students who demonstrated disruptive behaviors. The researchers chose these students because they were the most problematic for teachers and were typically referred to special education programs or were retained multiple times. Significant differences were found for personal teaching efficacy. The secondary regular education teachers' personal efficacy was significantly lower than the primary regular education teachers' and primary and secondary special education teachers'. The results indicated that a teacher's sense of efficacy diminished, as students got older (Lopes et al., 2004).

Teacher efficacy, burnout and special education have been the focus of recent studies (Jennet, Harris, and Mesibov, 2003 & Egyed and Short, 2006). Jennet, Harris and Mesibov (2003) investigated concerns connected to teacher burnout, efficacy level and teachers of autistic students. The purpose of the study was to explore both

teacher efficacy and burnout in teachers of students with autism. It was hypothesized that teachers with a greater commitment to a particular philosophy would have a greater sense of efficacy in teaching and therefore would experience less burnout (Jennet, Harris, & Mesibov, 2003). They concentrated on commitment to philosophy, teacher efficacy, and level of burnout. Participants in the study scored high on teacher efficacy. The results indicated that teachers with a higher sense of efficacy did experience less burnout. In order to prevent attrition in the special education field, it is imperative that teachers have a high level of efficacy.

Egyed and Short (2006) investigated the relationship of teacher efficacy, burnout, and experience to teacher's decisions to refer for special education placement. The researchers hypothesized that teachers with high levels of efficacy are less likely than teachers with low levels of efficacy to refer students with behavior problems to special education and that teachers with high levels of burnout would be more likely to refer behavior problems to special education. Unlike other studies (Coladarci & Breton, 1997; Podell & Soodak, 1993; Soodak & Podell, 1993), the researchers did not find a relationship between decision to refer and teacher sense of efficacy. They did, however, have some very pertinent findings. The result of the study indicated that there is an inverse relationship between teacher efficacy and burnout. Further, it revealed that teachers with more training in behavior management reported lower levels of burnout and higher levels of personal efficacy.

Teachers with low efficacy feel they have little influence on student achievement. These teachers give up more easily when faced with difficult situations, are less likely to find resources, and often times feel that students cannot learn because of the extenuating

circumstances in their lives (Ashton & Webb, 1986; Bandura, 1997). However, teachers with a high sense of efficacy differ in their beliefs about students' capabilities, their capability to teach them, and how they teach them. Efficacious teachers tend to engage in more valuable and superior teacher behaviors that lead to higher student achievement.

Efficacy and Collective Efficacy

Researchers have analyzed the relationship between teacher self efficacy and collective efficacy and found that although the constructs are slightly different, there is a positive relationship between teacher efficacy and collective efficacy (Goddard & Hoy & Hoy, 2004). Teacher and collective efficacy research did not develop at the same time. Collective efficacy emerged as a result of teacher self-efficacy research. As evidence of the impact of teacher efficacy on student achievement came to the forefront, many researchers began to wonder about the impact a teacher's sense of efficacy has on the entire organization. They were also interested in the impact that an organization has on a teacher's sense of efficacy (Goddard and Skrla, 2006). It was discovered that teacher efficacy can predict between-school variance of collective efficacy. This relationship is true for the opposite circumstances as well (Goddard, Hoy, & Hoy, 2004). There are empirical and theoretical linkages among perceived collective efficacy and a teacher's sense of efficacy (Tschannen-Moran & Hoy, 1998; Goddard, Hoy & Hoy, 2004). Collective efficacy is when teachers perceive that the faculty, as a whole, is a capable unit and everyone's actions can positively influence student achievement (Manthey, 2006).

When measuring collective efficacy, Bandura (1997) finds that the determination to use individual or group orientation depends on organizational coupling (Henson,

2002). Organizations that work closely together and rely on one another to complete a specific task (tight coupling) can be assessed with as a whole; while organizations who work independent of one another (loosely coupled) are more properly assessed with a combining of individual scores (Henson, 2002). While teaching is individualized, it does have many group aspects and teachers often work collectively together to change the lives of their students. Elementary schools are considered tightly coupled because of common goals, requirements and actions within teaching positions (Henson, 2002).

Similar to self-efficacy judgments, collective efficacy is associated with the tasks, level of effort, persistence, shared thoughts, stress levels, and achievement of groups (Henson, 2002). Teachers' sense of efficacy partially explains the effect of teachers on student achievement from an organizational perspective. A faculty's sense of collective efficacy helps to explain the differential effect that school cultures have on teachers and students. Some teachers may find themselves in schools where there is low morale and a depressed sense of collective efficacy; whereas, other teachers will work in schools with a high degree of mutuality, shared responsibility, and confidence in the overall capability of the faculty. A teacher with average efficacy beliefs who find themselves in a school with high collective efficacy will most likely increase in their self-efficacy beliefs. However, a teacher with average efficacy who is placed in a school with low moral and a depressed sense of collective efficacy will likely have depressed or a declining sense of efficacy. This point is especially important for new teachers.

Henson (2002) states "if organizational systems can impact individual behavior and perception, and that individual behavior can impact organizational systems, then the role of teacher efficacy and collective efficacy takes on increased importance within

school systems" (pg. 143). It was found that in schools that had a high level of collective efficacy, a teacher whose actions were not similar to the groups' expectations for academic achievement, was usually corrected and quickly modified by others in the group (Goddard, Hoy, & Hoy, 2004). A study was conducted to investigate collective efficacy beliefs in schools serving a student population characterized by a majority of Hispanic students (Goddard & Skrla, 2006). A teacher who was interviewed stated the following:

> We're told it so many times, it's just a part of life, we know that to work here you have to do whatever it takes to get {the students to succeed}. To reach our goal. And, you know, I believe there are enough teachers who have bought into that belief to where if you hear a teacher that may not be quite there, I believe that by the time they hang around, either they will be there, or they'll be out the door…'" (pp. 17-18).

High-self efficacy groups have higher collective efficacy beliefs than low self-efficacy groups. Moreover, high self-efficacy groups use more high-level cognitive skills during group discussions than low self-efficacy groups (Manthey, 2006; Ebmeier, 2003; Fernandez-Ballesteros, Diez-Nicholas & Bandura, 2002). Groups with high collective efficacy are more likely to ask questions that allow for deeper understanding of what it takes to get the job done.

Student Achievement

Although there have been many questions and conflicts about the correct way to measure teacher efficacy, researchers all agree that teacher efficacy is a valuable variable in educational research. Woolfolk and Hoy (1990) stated, "Researchers have found few consistent relationships between characteristics of teachers and the behavior or learning of students. Teachers' sense of efficacy…is an exception to this general rule" (p. 81). A number of studies have been conducted which correlated student achievement and

teachers' beliefs - efficacy levels (Ashton & Webb, 1986; Moore & Esselman, 1992; Ross, 1992; Brown, Anfara, & Roney, 2004; Love & Kruger, 2005; Tournaki & Podell, 2005). Students with teachers who are highly efficacious generally out perform their peers in other classes. This has been borne out through several studies. Teachers' efficacy scores were used to predict student achievement on the Iowa Test of Basic Skills (Moore & Essleman, 1992; Love & Kruger, 2005), the Canadian Achievement Test (Anderson, Greene, & Loewen, 1988), and the Ontario Assessment Instrument Pool (Ross, 1992).

Recently both quantitative and qualitative studies have been conducted to correlate student achievement and teachers' sense of efficacy. Love and Kruger conducted a quantitative study that correlated teachers' beliefs and student achievement (2005). The researchers hypothesized that teachers with a higher belief system (higher efficacy) have students who attain higher levels of academic achievement. They surveyed the beliefs of teachers within six urban schools using a survey adapted from Ladson-Billings (1994). Teachers' beliefs were correlated with students' aggregated achievement scores in mathematics, reading, and language arts standardized tests from the Iowa Test of Basic Skills.

The statements on the survey were organized into six areas or dimensions. The first dimension represented the beliefs about knowledge. Statements regarding recognition appeared in the second dimension. The third, fourth and fifth dimension dealt respectively with social relations in and beyond the classroom, teaching as a profession, and teaching practice. The final dimension gathered clarity in the area of students' needs and strengths (Love and Kruger, 2005).

After calculating the Cronbach alpha on the statements included on the survey, it was found that nine significantly correlated with student achievement, one from the knowledge dimension, four from the social relations dimension, one from teaching as a profession, two from teaching practices, and one from the dimension of students' needs and strengths. The researcher discovered that seven statements that had a significant correlation with student achievement were congruent with the beliefs of successful teachers from prior studies (Lover & Kruger, 2005). The statements were a) ability to connect with students, b) interdependence of students on one another (collaboration) c) seeing and hearing from parents, d) teaching as a "calling", e) switching roles with students in the classroom, and f) believing in the success of all students. Kruger and Love, however, were surprised to find the correlation between teachers who felt that their role was to disseminate knowledge and student achievement as well as the correlation between teachers who used repetition, drill, and practice and student achievement. The researchers felt that the two beliefs may describe a return to a more traditional pedagogy. This study appreciably adds to the body of evidence concerning the effects of teacher belief (efficacy) on student achievement.

Research indicates that teachers with low efficacy behave differently, based on student characteristics. Tournaki and Podell posed the following question "are some teachers more equipped than others in dealing with heterogeneous classrooms" (2005). The researchers found that teacher efficacy had a major affect on how teachers made academic predictions about certain students. Teachers with low efficacy demonstrated a bleak out look on students reading two years below grade level. Low efficacy teachers also felt that students who were inattentive were less likely to achieve academically,

while high efficacy teachers did not single out students based on their attentiveness. Lower efficacy teachers predict poorer academic outcomes based on student characteristics (Tournaki & Podell, 2005).

In order to gain a deeper understanding of teacher efficacy as it relates to student achievement, a qualitative study was conducted by Brown, Anfara, and Roney (2004). The researchers' goal was to find credible justification for the difference in student achievement between high performing middle schools (HPS) and low performing middle schools (LPS). This multi-case study investigated twelve public middle schools in the greater Philadelphia, Pennsylvania area. Through document analysis and convenience sampling, six HPS and six LPS middle schools were identified and chosen utilizing the results of the Pennsylvania State System of Assessment (PSSA) and information reported in the "Report Card on the Schools" (2000).

Semi-structured interviews were conducted with each of the twenty-four participants in this study (two teachers from each of the six HPS and two teachers from each of the six LPS). Each teacher had to have completed at least one full year of teaching at the particular middle school in order to participate. The researchers designed the interview protocol utilizing five categories of observable and measurable elements (i.e.,. structural, attitudinal, skill, climate, and instructional features) that help define and research middle school reform components relative to academic, socio-emotional, and behavior outcomes (Brown, Anfara, & Roney, 2004). Organizational health was divided into three parts – the technical, the managerial, and the institutional. Data from the six HPS and the six LPS middle schools were analyzed according to these three levels. Serious contrasts between high performing and low performing schools with regard to

teacher efficacy, curriculum articulation, student expectations, collegiality, instructional leadership and institutional integrity were found.

Teachers from the HPS usually felt they were aware of the curriculum standards and that they had already met these standards in their classrooms (Brown, Anfara, and Roney, 2004). Many teachers stated that their teaching surpassed the basic standards. They felt that the standards were merely the bare minimum.

Teachers from the LPS, however, felt that the curriculum standards were forced on them via the school district. They also felt that their students had a difficult time achieving these standards. Moreover, the teachers felt that they had a difficult time understanding the relationship of the content standards to what they were actually teaching. Many stated that they taught at a level that was lower than the curriculum and felt disconnected and confused about the nature of the standards themselves (Brown, Anfara, and Roney, 2004). Based on comments made by teachers, it was clear that the efficacy levels of the teachers in HPS were higher than the efficacy levels of teachers in LPS.

Henson (2002) completed a meta-analysis of several studies on teacher efficacy and found that teachers with a higher sense of efficacy are more apt to demonstrate a number of excellent behaviors. These behaviors include using varied methods of instruction, seeking out new information on improved teaching methods, and experimenting with a variety of teaching material. Additionally, Deemer (2004) found that teachers with a higher sense of efficacy used instructional strategies that emphasized creativity, comprehension, and meaningfulness. These highly efficacious teachers also encourage others to use these same techniques.

Specific instructional behaviors are related to teachers with high efficacy. These behaviors include maintaining on-task behaviors in students, focusing on academic instruction, direct instruction, hands-on learning, simulations, inquiry, and other strategies that require higher order skills. These strategies foster academic achievement (Langer, 2000). Researchers have found that one way to engage students and to increase learning is to use a variety of instructional strategies. Swars (2005) found that high efficacy teachers used a wider variety of instructional techniques that include inquiry and student centered teaching strategies. She also found that the teacher's skills in implementing these strategies, distinguishes the more effective from the less effective. Another study found that more efficacious teachers usually used four or more instructional activities with in a single instructional segment in order to engage all their students (Zahorik et al., 2003).

It has been proven that varied instructional methodologies lead to increased engagement (National Academy of Science, 2004). Teachers with a high sense of efficacy are more likely to engage all members of their class. They maximize their instructional time with individual students, leading to an increased opportunity to concentrate on interacting with students in ways that are more engaging and productive.

Not only must teachers ensure that time is allocated for instruction, they must also ensure that during instructional times students are on-task and engaged in the teaching and learning activity. Engagement has been found to be an important contributor to classroom success (Stronge, 2007). A connection was made concerning African American boys and disengagement (Rodkin et al, 2000). Researchers found that African American boys were more likely to become disengaged than members of other sub-

groups (African American girls, Caucasian boys, Caucasian girls, etc.). This is significant because research also confirms the correlation between engagement and students' reading comprehension levels (Taylor et al., 2003). To encourage student involvement in activities and lessons, efficacious teachers use varying strategies, including calling on students in random order, providing any necessary additional clarification and illustration, and finding something positive to say when students do respond or interact. These teachers make every attempt to avoid disengagement. They realize that disengagement could lead to poor school performance (Rodkin et al, 2000).

Feedback is crucial to the continued success and improvement of students. This powerful instructional strategy increases learning outcomes in students (Stronge, 2007; Marzano, 2007). Feedback, however, is only effective when it is given in a timely and formative manner. Two much time between the lesson and or assessment and the feedback has a critical effect on students' achievements (Stronge, 2007). "The longer the delay in giving feedback, the less likely students will respond to the feedback and the less likely learning will be enhanced" (Stronge, 2007 p.89).

Efficacious teachers provide timely formative feedback (Marzano, 2007; Marzano, Pickering, & Pollock, 2001). They do not give assessment just to add a grade in their grade book. Instead they use the information to guide their instruction. They do more than just indicate whether the answer is right or wrong. They give additional information so that students can learn from their mistakes.

Ross, Hogaboam-Gray, and Hannay (2001) conducted a study that found that when students changed grade levels and were assigned to teachers with different levels of self-efficacy than from the previous year they were more likely to see a shift in their

achievement. Students who moved from low efficacious teachers to high efficacious teachers, their performance went up. The researchers contributed the change in student achievement to several factors. They found that teachers with a high sense of efficacy used a wider variety of teaching techniques, took more responsibility to ensure their students were learning, and provided additional support for the difficult to teach students (Ross, Hogaboam-Gray, & Hannay, 2001).

Research suggests that high efficacy teachers believe that it is up to them to provide a wealth of strategies to reach students. They view success in the classroom as a dual responsibility. They expect their students to take a measure of responsibility for their success and they also accept responsibility to ensure positive outcomes for their students. (Allington, 2002). They believe that intelligence is malleable; that all children can learn and that they can help them learn (Deemer, 2004). These teachers believe that they must know their students, their subject, and themselves, while continuing to account for the fact that students learn differently.

Summary

In Chapter 2, a review of literature was presented on the many aspects of teacher efficacy. The chapter began with a historical overview of teacher efficacy. Early teacher efficacy research focused heavily on developing scales to adequately measure teacher efficacy and identify correlations between a teacher's level of efficacy and teacher behavior. This body of research also helped to define the construct. Next, the chapter reviewed current research that focused on the effects of teacher efficacy and on students. The literature reviewed indicted the extreme relationship between teacher efficacy and teacher behavior. Research supported that teacher efficacy was proven to be

critical to teachers in their quests to reach all students. Those teachers who reached a higher level of self-efficacy were more prepared, more organized, and had a greater ability to control classroom situations.

However, very little research has compared the levels of efficacy of teachers based on student groups. Also, there is limited research concerning the differences in the effects of teacher efficacy levels on students from different social economic backgrounds. Teacher efficacy research has pointed to ways to increase student achievement. This study will help to shed light on how the educational system can utilize efficacy research to further close the achievement gap.

CHAPTER III

METHODOLOGY

This chapter describes the methodology that was used in this study. The chapter contains a detailed description of the population that was studied and the research designs and statistical analysis that were employed.

This study sought to discover if there is a relationship between a teacher's efficacy level and student achievement in Title I and Non-Title I students. The Teacher Sense of Efficacy Scale was used to measure teachers' efficacy levels. This scale, created by Tschannen-Moran and Woolfolk-Hoy, not only measures a teacher's sense of overall personal efficacy levels but it also measures their perceived efficacy in three distinct domains; efficacy for instructional strategies, efficacy for classroom management, and efficacy for student engagement (Tschannen-Moran & Hoy, 2001). Because of the nature of this study, the researcher did not measure teachers' general efficacy levels as this data would not have helped in answering the research questions. The fourth grade Virginia SOL English and Math Assessments were also used to measure student achievement.

Research Questions

Research requires questions for which no ready answers are available. The following are the questions that this research investigated:

a. What is the relationship between teacher personal efficacy as measured by the TSES and student achievement as measured by the fourth grade Standard of Learning Assessments in math and reading?

b. Does the relationship between teacher personal efficacy scores and student achievement differ in Title I and Non-Title I students?
c. Is there a significant difference in the personal efficacy levels of teachers in Title I schools and Non-Title I schools?
d. What dimensions of efficacy do teachers in Title I schools score consistently higher as measured by the TSES and is there a statistical difference in the mean scores between dimensions?
e. What dimensions of teacher efficacy do teachers in Non-Title I schools score consistently higher as measured by the TSES and is there a statistical difference in the mean scores between dimensions?

The purpose of this study was to examine the effects of teacher efficacy on student achievement in Title I and Non-Title I schools and determine if efficacy levels have a greater impact on at-risk students. Specifically, the research sought to identify any possible relationships between a teacher's level of efficacy and students' achievement scores on the fourth grade Virginia Standards of Learning Reading and Math Assessment. Additionally, the researcher analyzed the level of personal efficacy in Title I and Non-Title I schools.

As indicated earlier in this study there are students who attend Title I schools that are not considered at-risk students based on the at-risk criteria established in this study. Further, there are students who attend Non-Title I schools who are considered at-risk students. Because the researcher was not privilege to individual student risk factors, the researcher grouped schools based upon the percent of students on free or reduced lunch (Title I or Non-Title I).

The results of the research questions provide educators with more knowledge when filling teaching positions. It also assists in staff development plans to increase the ability of teachers to affect positive outcomes with their students.

Population

The study involved a large urban school district in the Mid-Atlantic part of the country. This large district has thirty-five elementary schools, nine middle schools, five high schools, three early childhood centers, and three alternative schools. The total student population at the time of the study was approximately 35, 000 students. The ethnic breakdown of the students consisted of 63.9 percent African-American, 23.7 percent Caucasian, 6 percent unspecified, 3.9 percent Hispanic, 2.4 percent Asian and .02 percent American Indian. Additional characteristics of the total population are listed in the Table 2.

The study specifically involved all fourth grade students, 7.3 percent of the total student population, and fourth grade teachers from thirty-four of the thirty-five elementary schools in this large district. An elementary school was excluded from the study because the researcher is currently employed there. Of the thirty-four elementary schools participating in the study, 50% (17) of them are Title I and 50% (17) are Non-Title I. Tables 3 and 4 contains the demographic break down of fourth grade students in Title I and Non Title I elementary schools who participated in the study.

Table 2

Characteristics of Total Population in Urban Population

Characteristics of Total Population	2007-2008	Percent
Male	18,057	51.4%
Female	17, 399	48.6%
American Indian	53	0.2%
Asian	852	2.4%
Black	22,444	63.9%
Hispanic	1,366	3.9%
Unspecified	2,110	6.0%
White	8,311	23.7%
Special Education	4,664	13.3%
Free and Reduced Lunch	20,826	59.3%
Limited English Proficient	556	1.6%

Table 3

Student Demographics in Title I Schools

	% of Free and Reduce Lunch	Male	Female	Asian	Black	Hispanic	White	Unspecified
1	54.7%	14	9	0	11	3	7	2
2	59.9%	40	52	4	56	4	25	3
3	62.4%	12	15	2	14	0	6	5
4	65.1%	34	32	3	36	4	17	6
5	65.6%	55	45	2	51	5	48	4
6	70.8%	60	44	2	85	3	8	6
7	73.2%	35	22	0	53	1	2	1
8	76.5%	42	36	0	69	0	4	5
9	79.0%	15	14	0	28	0	0	1
10	81.5%	30	43	0	58	2	6	7
11	84.5%	26	31	1	54	0	0	2
12	86.7%	28	31	0	54	0	3	2
13	86.9%	44	36	0	78	0	1	1
14	90.2%	26	31	0	56	0	0	1
15	91.8%	55	44	0	98	0	1	0
16	93.5%	30	22	0	52	0	0	0
Total	76.4%	546	507	14	853	22	128	46
		51.9	1,053 48.1	1%	81%	2%	12%	4%

Table 4

Student Demographic in Non-Title I Schools

	% of Free and Reduce Lunch	Male	Female	Asian	Black	Hispanic	White	Unspecified
1	28.9%	36	35	2	20	2	42	5
2	30.7%	30	45	0	38	1	34	2
3	32.5%	29	26	1	21	2	29	2
4	41.0%	31	35	2	19	4	30	11
5	41.9%	37	42	1	24	3	42	9
6	46.6%	60	58	5	39	7	52	15
7	51.0%	36	32	6	30	2	26	4
8	51.9%	51	42	4	48	5	24	12
9	57.7%	55	41	0	54	3	33	6
10	58.2%	43	48	4	64	2	16	5
11	58.3%	48	36	2	36	7	27	12
12	58.8%	36	44	0	39	5	28	8
13	59.1%	47	40	7	46	4	24	6
14	59.1%	39	38	5	45	4	15	8
15	59.8%	37	35	0	44	3	19	6
16	61.3%	28	23	2	38	2	6	3
17	64.7%	32	34	0	41	2	13	10
Total	50.6%	675	654	41	646	58	460	124
		51%	1329 49%	3%	49%	4%	35%	9%

The entire targeted population was surveyed. Every teacher teaching fourth grade during the 2007-2008 school year was invited to participate in the study along with their students. The sample included 2,492 students and 130 teachers. The researcher chose to include the entire population and not sample teachers because the population was small enough that every member could be included in the study, this also ensures the validity of the study. This form of surveying is known as a census. A census is the process of obtaining information about every member of a population. It includes a one by one count of an entire population. At times, a census is the only way to get accurate information especially when the population is so small that sampling part of it will not provide accurate estimates of the whole.

Fourth grade was chosen for the study for several reasons. First, they are the newest participants to high stakes testing at the elementary level. Their first Standards of Learning Assessment were administered during the spring of 2006. Because fourth grade was not previously a testing grade, many administrators placed their weaker teachers on that grade level in the past. This practice became detrimental when the state began testing fourth grade students. Further, fourth grade is the time when students are expected to become more independent. Teachers are focused on children's social development and basic skills in grades kindergarten through third. Teachers move from teaching concrete information to abstract information. Fourth grade students are required to use higher level thinking skills more often than they ever have before.

Research Design

The researcher completed a non-experimental research design utilizing survey research. This type of research does not involve using experimentation to get data, but

rather careful observations and description of a phenomenon, often through surveys. Survey research is the most popular research design in social science. It is considered to be quantitative because the results are organized and presented systematically, usually in the form of statistics. This form of research is quite flexible and can appear in a variety of forms. However, all are characterized by the collection of data using standard questionnaire forms. These questionnaires are delivered and administered in many different ways; by telephone, face to face, by postal pencil-and-paper questionnaires, or increasingly by using web-based and e-mail forms.

Survey research design method has often been widely used and accepted to investigate educational issues (Borg and Gall, 1989). According to Borg and Gall (1989, p.416), "it accounts for a large proportion of the research done in the field of education." Primary advantages of this quantitative method are that (a) it reveals the causes of social phenomena, (b) it is objective and outcome-oriented, and (c) it produces hard and replicable data that can be extrapolated to a larger population.

Data Collection Instruments

The study included two data collection components in quantitative design. The first component included Virginia Standards of Learning Assessment for Reading and Mathematics which is administered towards the end of each school year. The schools pass rate as reported in percentages were used to determine student achievement levels. The second component included the Teacher's Sense of Efficacy Scale (TSES). The scale was administered to fourth grade teachers who taught the aforementioned students. Teachers gave their opinions about each of the questions by marking one of the nine responses. The scale responses range from "none at all" (1) to "a great deal" (9), with

"some degree" (5) representing the mid-point between these low and high extremes. They were free to choose any of the nine possible responses, since each represents a degree on the continuum. The results indicate a teacher's level of efficacy with higher scores indicating a more positive efficacy level.

Instrumentation

Fourth grade Reading SOL. The Virginia Standards of Learning Assessments (SOL's) are a state developed criterion-reference test intended to set reasonable targets and expectations for teachers and students (VDOE, 2002). The purpose of the educational assessments are to inform parents and teachers about what students are learning in relation to the Standards of Learning and to hold schools accountable for teaching and learning. The assessments were developed by a Content Review Committee consisting of Virginia Educators, members of the Virginia Department of Education, and a test contractor (VDOE, 2002).

The fourth grade reading assessment contained forty-two items. Eight test items collected data on the reporting category of "use word analysis strategies and information resources" and twenty-seven items collected data on the reporting category of "demonstrates comprehension of printed materials". Seven of the test items were used for field testing purposes only and were not included in the students' test score. Students who took this assessment could fail, pass proficient or pass advance.

As far as construct validity is concerned, correlations between standardized achievement test such as the Stanford 9 and the SOL were in the .50 and .80 region. This is where they were expected to be if the test was valid. If the correlations were too high it

could be said the Standard of Learning Assessments were measuring the same body of knowledge.

The reliability and internal consistency of the Standards of Learning Assessment were tested using a well known reliability statistic known as the Kuder-Richardson Formula 20 (KR-20). The KR-20 of the SOL assessments was tested over a span of three years. The score did not change much. The lowest coefficient across the assessment years was .81 and the highest reliability coefficient was .92 (VDOE, 2002).

Ohio State Teacher Efficacy Scale/ Teachers' Sense of Efficacy Scale. The validity and reliability of the teacher efficacy scale was examined and determined based on three studies, each geared at making the instrument the most valid and reliable that it could possibly be.

In the initial study, participants were asked to respond to a fifty-two item survey using a nine point scale. They were also asked to rate the importance of each item for effective teaching on a four point scale. The fifty-two items were then submitted to principal axis factoring with varimax rotation (Tschannen-Moran & Hoy, 2001). After examining factors, items with a criterion score of .60 were selected for further analysis. This yielded thirty-one items with a score of 0.62 to 0.78 and one item that the participants thought was very important but yielded a score of .595. These thirty-two items were used in the second study.

The second study's validation and reliability test contained 217 new participants. This study reduced the survey to 18 items. The survey developer found that 51% of the variance emerged from the rotation of the 18 items in the respondents' scores (2001). These factors were labeled as efficacy for student engagement, efficacy for instructional

strategies, and efficacy for classroom management (2001). Table 5 shows the Cronbach Alpha for the subscales.

Table 5

Efficacy Subscales (Tschannen-Moran & Hoy, 2001)

Subscales	Cronbach Alpha
Efficacy for student engagement	.82
Efficacy for Instructional strategies	.81
Efficacy for Classroom Management	.72

In order to test construct validity, the survey developer compared the new measures developed with existing measures. Participants were asked to respond to five other surveys developed. Total scores from the new survey related the RAND items, the Gibson and Dembo measure and the General Teacher Efficacy (GTE) factors as indicated in the Table 6.

Table 6

Relationship of TSES to Other Measures (Tschannen-Moran & Hoy, 2001).

RAND	r=.35 and .88	P<0.01
Gibson and Dembo	r = .48	P<0.01
GTE	r = .30	P<0.01

The last and final study was directed at strengthening factors in classroom management. The survey developers created new classroom management items using Emmer's Teacher Efficacy Classroom Management Scale (Tschannen-Moran & Hoy, 2001). They selected management items with the highest Cronbach's alpha scores. The

new reliability scores for the Teachers' Sense Efficacy Scale are listed in the Table 7 below.

Table 7

Reliability Scores – TSES (Tschannen-Moran & Hoy, 2001)

Subscales	Cronbach's Alpha	Inter-correlation
Efficacy for student engagement	.91	.60 p<0.001
Efficacy for Instructional strategies	.90	.70 p<0.001
Efficacy for Classroom Management	.87	.58 p<0.001

Data Collection

This quantitative study was designed to determine whether a significant relationship exists between a teacher's efficacy level and student achievement when controlling for socioeconomic status. While the quantitative methodology attempted to minimize a large portion of the intervening variables that could confuse the results of the study, it was unfortunately impossible to completely control all variations in a complex environment such as a school.

The efficacy scales were mailed to administrators in thirty-four elementary schools. The administrators distributed them to their fourth grade lead teachers who passed them out to their students. Each set of scales sent to schools was color coded so that only the researcher could identify the school. The participants were asked to complete the brief survey and return them to the grade chair. The chair then sent the scales to the researchers via inter-office mail.

The schools pass rate on the Standard of Learning Reading and Math Assessment was collected from the district's data warehouse system. The information was entered into the Statistical Package for Social Sciences (SPSS).

Method of Analysis

Upon receipt of the completed survey instruments, the data were analyzed using the Statistical Package for the Social Sciences (SPSS). The 24 item Teacher Efficacy Scale was scored using a 9-point Likert scale. The researcher did not have to reverse code any of the items as all items were worded in the positive. Each item was entered into SPSS with a score 1 (nothing) – 9 (a good bit) with 9 being the highest. Higher sum scores indicate a stronger sense of efficacy. Subscales were aggregated into composite scores before in order to analyze the data concerning dimensions. Descriptive statistics were run to determine the distribution and detect outliers. The research questions were examined at the .05 level of significance, and were examined using Pearson's product moment correlation, ANOVA, t-test, and descriptive statistics.

Research Question #1: What is the relationship between teacher personal efficacy as measured by the TSES and student achievement as measured by the fourth grade Standard of Learning Assessments in math and reading?

The data pertaining to this question was analyzed using Pearson's product-moment correlation. The Pearson's product-moment correlation was used to determine if a relationship exists between teacher efficacy and student achievement. Three main correlations were run between efficacy of student engagement and SOL pass rates, efficacy of instructional strategies and SOL pass rate, and efficacy of classroom management and SOL pass rate. Student achievement was based on the SOL pass rate

which is the percentage of students who scored a 400 or better on the Standards of Learning Assessment.

Research Question #2: Does the relationship between teacher personal efficacy scores and student achievement differ in Title I and Non-Title I students?

Two-way ANOVA was used to examine whether there is a statistically significant main effect for teacher efficacy and student achievement. The main effect of teacher efficacy on student achievement was examined by comparing student achievement of the top and bottom quartile schools to see if there is significant difference in the means between these two groups. A t-test was used as a follow-up test of simple significant main effect and interaction effect.

Research Question #3: Is there a significant difference in the personal efficacy levels of teachers in Title I schools and Non-Title I schools?

A paired t-test using the .05 level of significance was used in order to determine whether or not there is a significant difference between the efficacy levels of teachers in Title I schools and Non-Title I schools.

Research Question #4: What dimensions of efficacy do teachers in Title I schools score consistently higher as measured by the TSES and is there a statistical difference in the mean scores between dimensions?

To answer this question, the researcher utilized descriptive statistics to calculate the mean score and standard deviation in each of the three dimensions of teacher efficacy.

Research Question #5: What dimensions of teacher efficacy do teachers in Non-Title I schools score consistently higher as measured by the TSES and is there a statistical difference in the mean scores between dimensions?

To answer this question, the researcher utilized descriptive statistics to calculate the mean score in each of the three dimensions of teacher efficacy.

Summary

This quantitative study included an analysis of student achievement scores and the teacher's efficacy score. The student achievement level was determined by collecting data from the 2007-2008 Standards of Learning English and Math Assessments. The teacher's efficacy level was calculated based on their results from the Teachers' Sense of Efficacy Scale. The test scores and teacher efficacy scores were analyzed and correlated utilizing SPSS. The researcher's goal was to demonstrate the relationships between the variables within the research questions by utilizing an experimental quantitative research design.

CHAPTER IV
RESULTS

This chapter contains the results of the data collection of the five research questions that were used to examine the relationship between teacher efficacy and the academic achievement of 4th grade students taught in an urban public school. The research questions were the following:

a. What is the relationship between teacher personal efficacy as measured by the TSES and student achievement as measured by the fourth grade Standard of Learning Assessments in math and reading?
b. Does the relationship between teacher personal efficacy scores and student achievement differ in Title I and Non-Title I students?
c. Is there a significant difference in the personal efficacy levels of teachers in Title I schools and Non-Title I schools?
d. What dimensions of efficacy do teachers in Title I schools score consistently higher as measured by the TSES and is there a statistical difference in the mean scores between dimensions?
e. What dimensions of teacher efficacy do teachers in Non-Title I schools score consistently higher as measured by the TSES and is there a statistical difference in the mean scores between dimensions?

The results of the statistical analyses, including descriptive statistics and inferential statistics, are included in this chapter. The section of descriptive statistics contains demographic data and a summary of the teachers' responses to the Teacher's Sense of Efficacy Scale used in this study. The inferential statistics' section includes the

results of Pearson's product moment correlation analysis, two-way ANOVAs, independent sample t-test, and paired-sample t-tests.

Descriptive Statistics

The complete data was obtained from the demographic questionnaire and the Teacher's Sense of Efficacy Scale instrument which was distributed to the teachers and reported in tables 8 through 11 and summarized graphically in figures 2 through 9. The responses to the efficacy scale are related to the three dimensions of efficacy; instructional strategies, student engagement, and classroom management.

Demographic Data

The total sample was comprised of 109 teachers of which ninety-nine (90.8%) were females and ten (9.2%) were males (see figure 2). Thirty-eight (34.9%) were African-American, sixty-four (58.7%) were Caucasian, and seven (6.4%) identified themselves as 'Other'. Thirty-eight (34.9%) had 0-5 years of teaching experience, thirty-one (28.4%) had 6-10 years of experience, twelve (11%) had 11-15 years of experience, eight (7.3%) had 16-20 years of experience, nine (8.3%) had 21-25 years of experience, and eleven (10.1%) had more than 25 years of experience. Fifty-one (46.8%) have a bachelor's degree, forty-four (40.4%) have a master's degrees, and fourteen (12.8%) have a master's plus thirty. Eleven subjects (10.1%) were under 25 years of age, twenty-seven (24.8%) were between 26-30 years of age, twenty-nine (26.6%) were between 31-40 years of age, nineteen (17.4%) were between 41-50 years of age, eighteen (16.5%) were between 51-60 years of age, and five (4.6%) were over the age of 60. Table 7 provides a summary of the demographic data. It is grouped by total population, Title I school, and Non-Title I schools.

Table 8

Summary of Responses to Demographic Data

	Gender		Ethnicity		Age		Education		Years in Education	
Title I	Male	11.5%	Black	50.0%	Under 25	11.5%	Bachelors	50.0%	1-5	38.5%
	Female	88.5%	White	44.2%	26-30	26.9%	Masters	36.5%	6-10	30.8%
			Other	5.8%	31-40	30.8%	Masters +30	13.5%	11-15	15.4%
					41-50	17.3%			16-20	3.8%
					51-60	11.5%			21-25	7.7%
					Over 60	1.9%			26-30	0%
									31+	3.8%
Non-Title I	Male	7.0%	Black	21.1%	Under 25	8.8%	Bachelors	43.9%	1-5	31.6%
	Female	93%	White	71.9%	26-30	22.8%	Masters	43.9%	6-10	26.3%
			Other	7.0%	31-40	22.8%	Masters +30	12.3%	11-15	7.0%
					41-50	17.5%			16-20	10.5%
					51-60	21.1%			21-25	8.8%
					Over 60	7.0%			26-30	5.3%
									31+	10.5%
Total	Male	9.2%	Black	34.9%	Under 25	10.1%	Bachelors	46.8%	1-5	34.9%
Population	Female	90.8%	White	58.7%	26-30	24.8%	Masters	40.4%	6-10	28.4%
			Other	6.4%	31-40	26.6%	Masters +30	12.8%	11-15	11.0%
					41-50	17.4%			16-20	7.3%
					51-60	16.5%			21-25	8.3%
					Over 60	4.6%			26-30	2.8%
									31+	7.3%

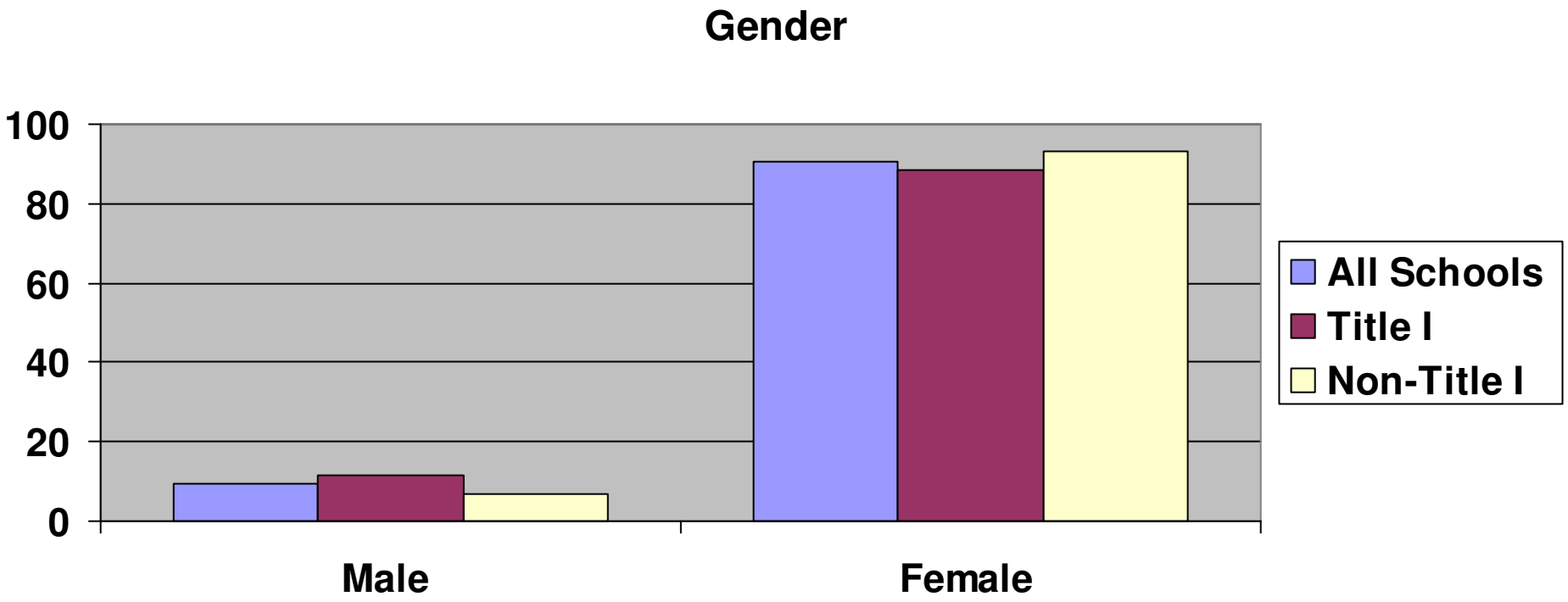

Figure 2

Graph of Demographic Data (Gender) by School Type

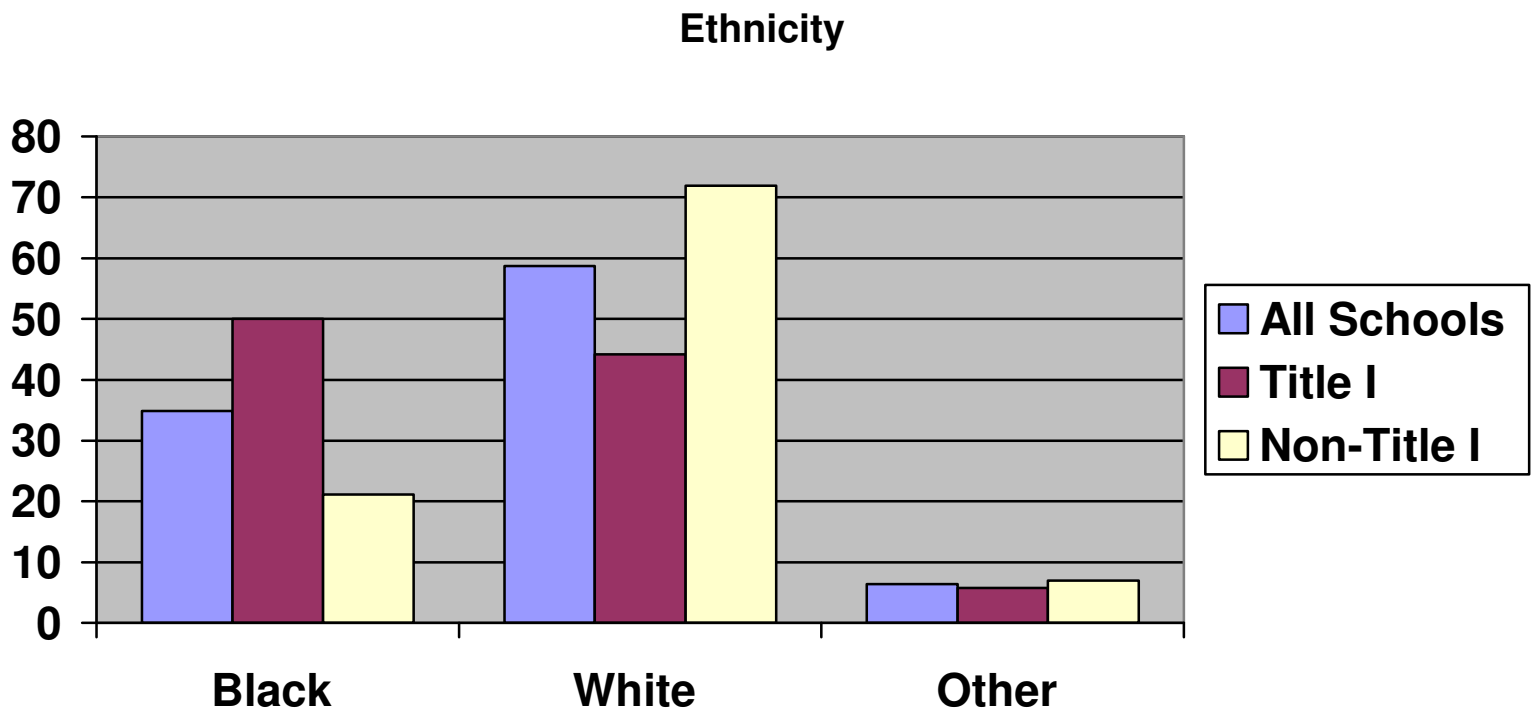

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Figure 3

Graph of Demographic Data (Ethnicity) by School Type

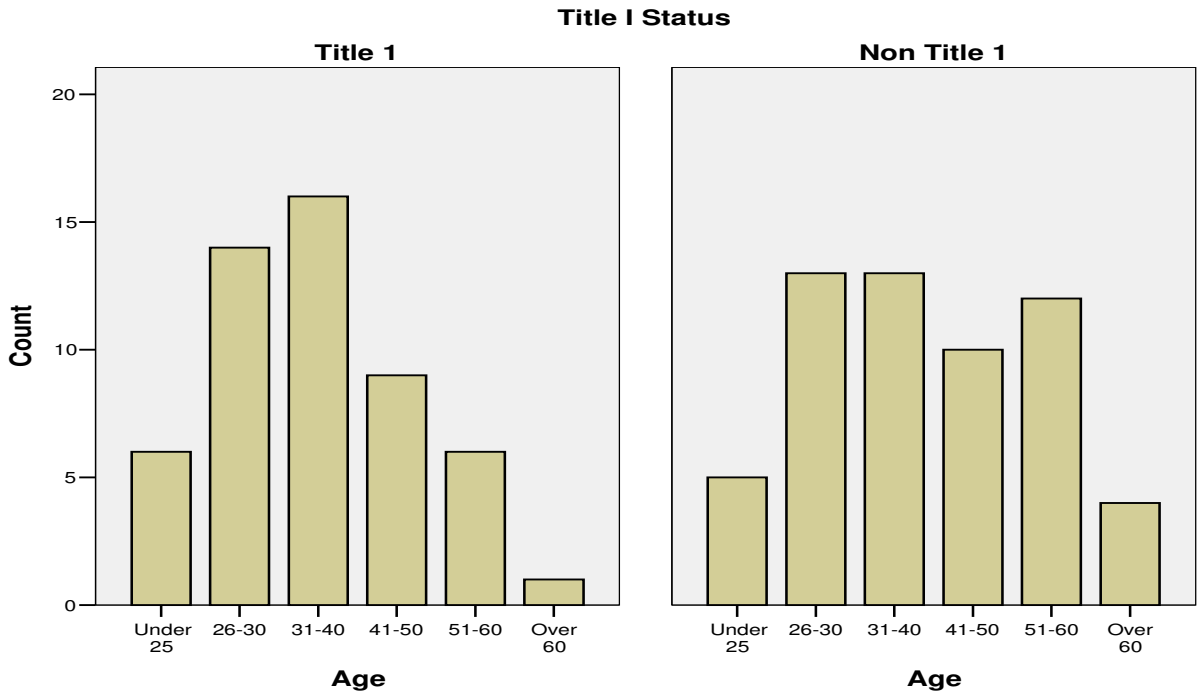

Figure 4

Graph of Demographic Data (Age) by School Type

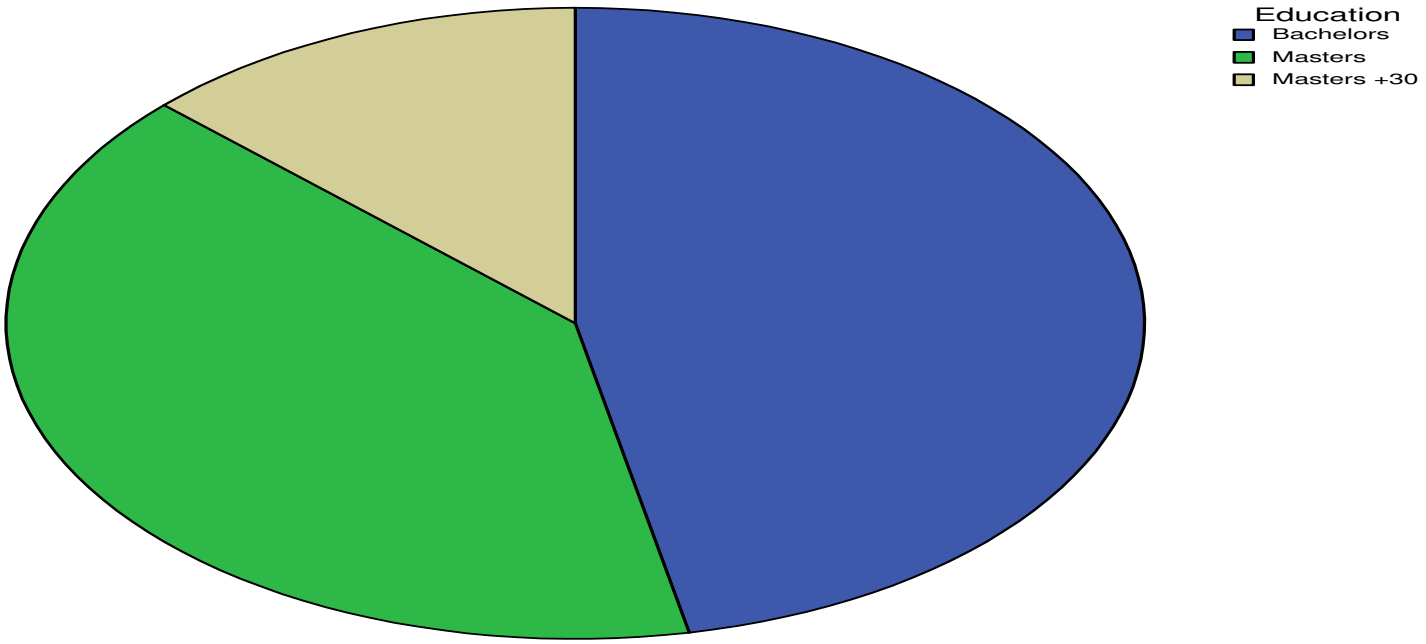

Figure 5

Graph of Demographic Data (Level of Education) by Entire Population

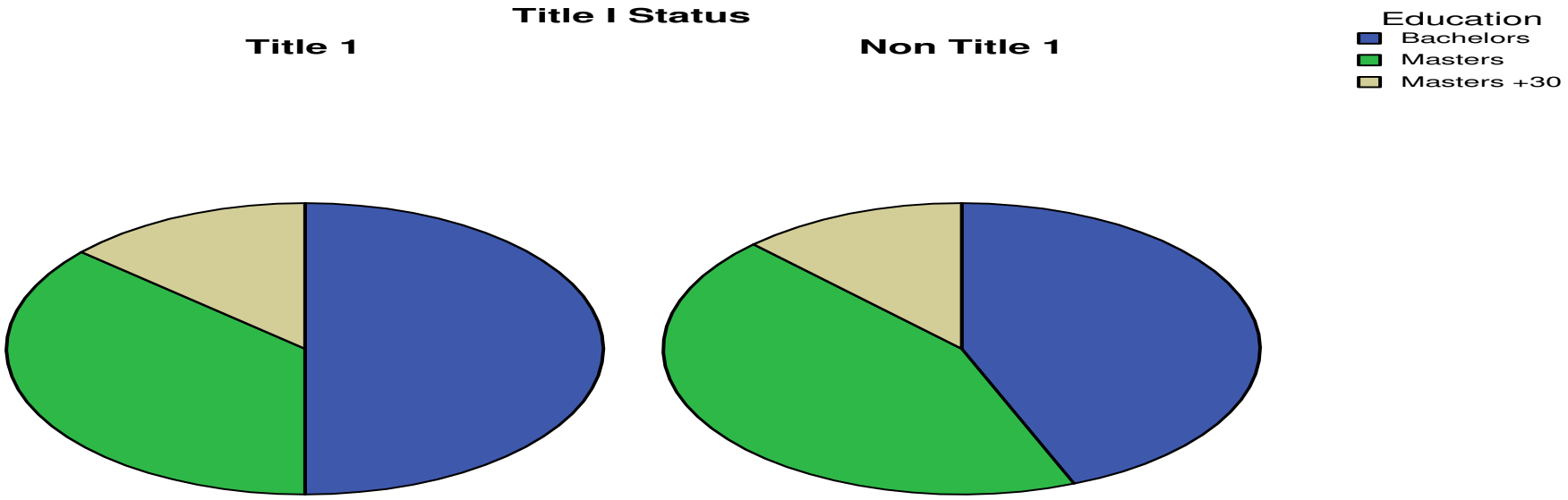

Figure 6

Graph of Demographic Data (Level of Education) by School Type

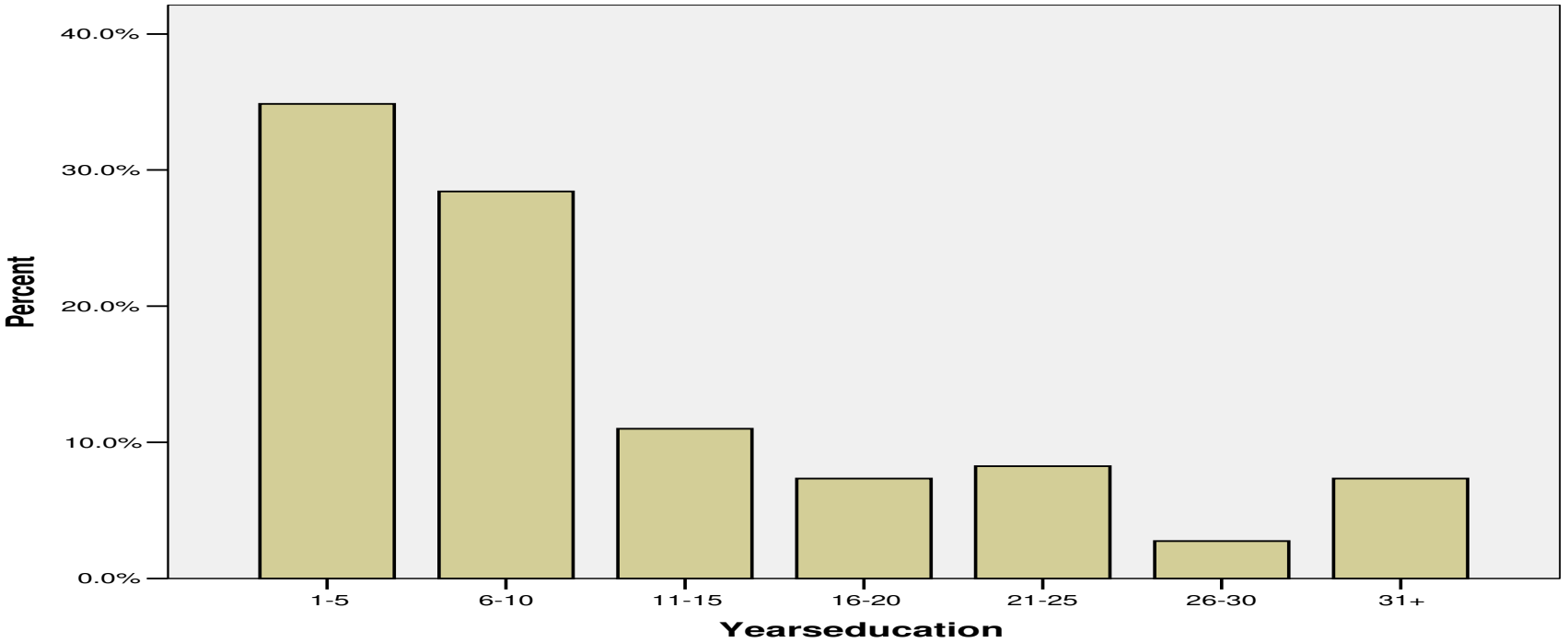

Figure 7

Graph of Demographic Data (Years in Education) by entire population

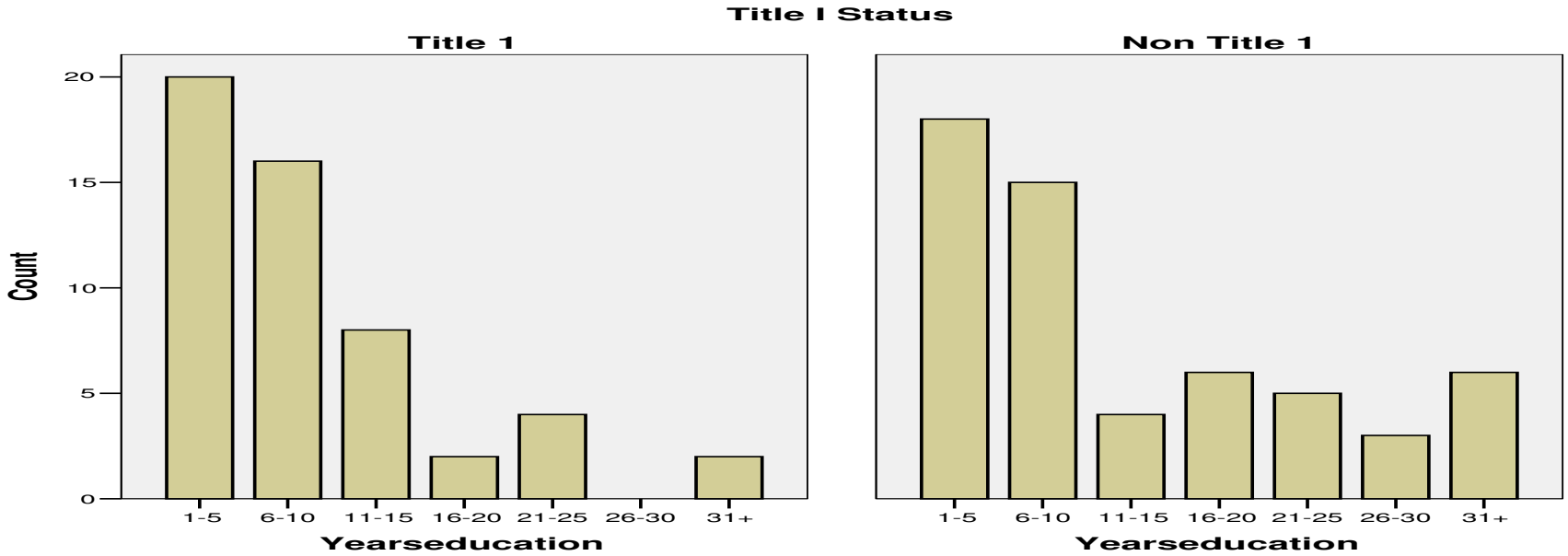

Figure 8

Graph of Demographic Data (Years in Education) by School Type

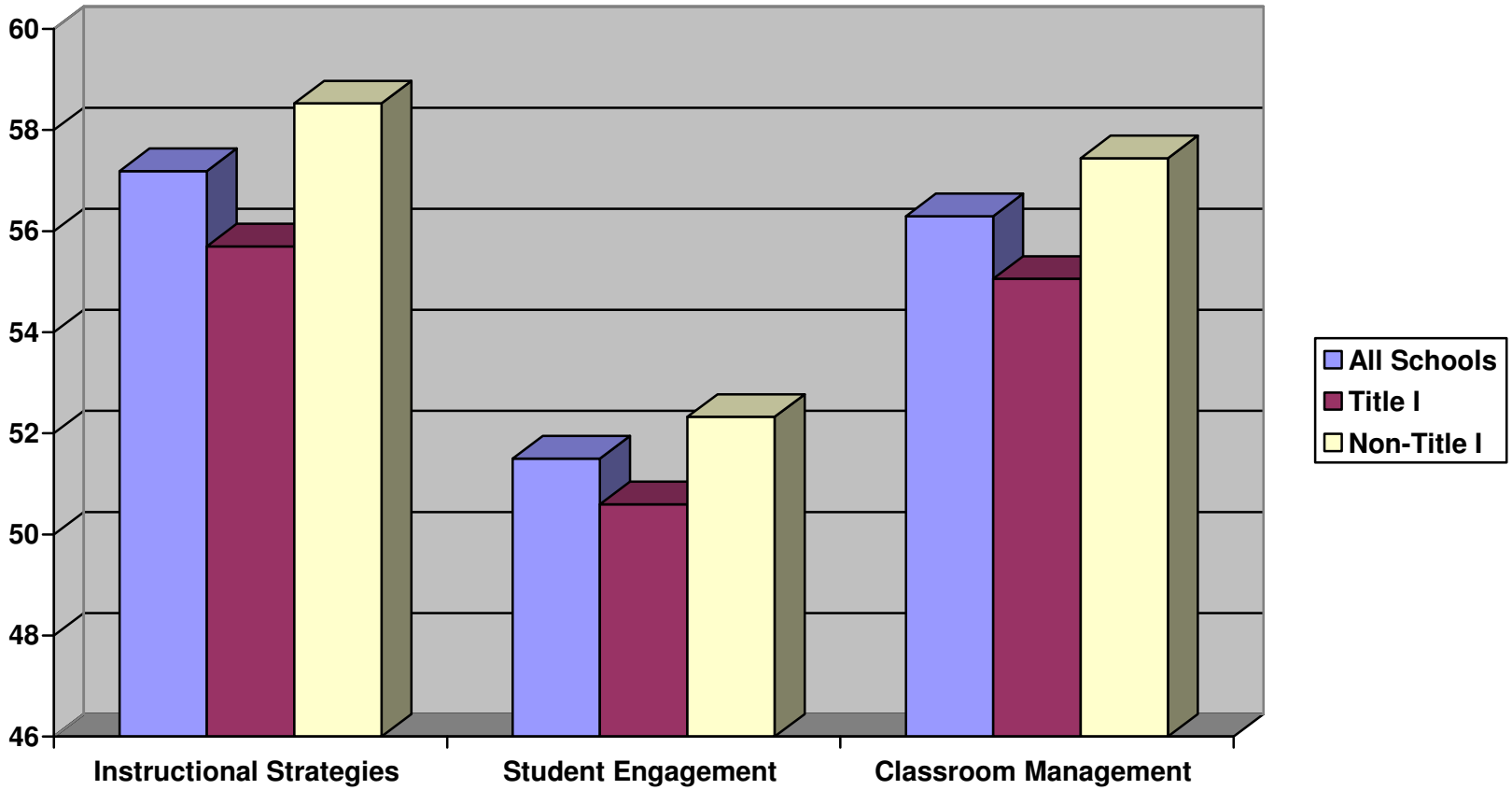

Figure 9

Graph of Mean Scores by Dimensions and School Type

The Teacher Sense of Efficacy Scale (TSES) is a scale developed in 2001 by Tschannen-Moran and Hoy. This scale assesses a teacher's sense of efficacy by measuring their beliefs based on specific questions. The 24- item version (Long Format) of this scale was used to collect teacher sense of efficacy data in this research. A nine point Likert type scale was used for each item with 1= meaning nothing, 3= very little, 5 = some influence, 7 = quite a bit, and 9 = a great deal. The TSES was scored by adding the value of each question. Higher scores indicate a stronger sense of efficacy and low scores indicated little or no sense of efficacy. The 24 items were summed up to derive a score ranging from a minimum score of 24 to a maximum score of 216 for an overall efficacy score.

The Teacher Sense of Efficacy Scale has eight questions that measure efficacy of instructional strategies, eight that measure efficacy of classroom management, and eight that measure efficacy of student engagement. Efficacy in instructional practices was made up of questions 7, 10, 11, 17, 18, 20, 23, and 24. The dimension concerning efficacy in student engagement was made up of questions 1, 2, 4, 6, 9, 12, 14, and 22. Lastly, efficacy in classroom management was made up of questions 3, 5, 8, 13, 15, 16, 19, and 21. The eight items related to instructional strategies, eight items related to student engagement, and the eight items related to classroom management were added separately to arrive at sub-scores for each dimension. A score could have ranged from a minimum of eight to a maximum of 72 for all three dimensions.

Efficacy for Instructional Strategies

The mean scores to the questions on the efficacy for instructional strategies by Title I and Non-Title I teachers were summarized separately and are presented in table 9.

The mean scores for all teachers are also summarized in this table. The results indicated there were questions pertaining to instructional strategies that all teachers appeared less efficacious. These items concerned their ability to differentiate instruction. The first area was addressed in question number seventeen. This question asked teachers to gauge their ability to adjust lessons. Thirty-six percent reported that they only have some influence to very little influence in their ability to adjust their lessons to the proper instructional level for each student. Only 18% reported that they felt extremely efficacious concerning making adjustments to their lessons based on the needs of their students.

Question 23 also received a response rating that was not consistent with the other lofty ratings in this dimension. This question assessed a teacher's perceived ability to implement alternative strategies in the classroom. Only 12.8 % of the teachers felt highly efficacious with their ability to implement alternative strategies. Thirty-three percent felt that their ability to implement alternative strategies was adequate to slightly inadequate. Ironically, the two items that received the lowest scores both dealt with differentiating instruction.

When disaggregating the data based on groups, Non-title I teachers efficacy mean scores were higher on all eight questions. Title I teachers highest mean score (7.29) came from question 7. The question evaluated the teacher's ability to respond to difficult questions. Non-title I teachers highest mean score in their responses pertained to question 11. This question evaluated the teacher's ability to craft good questions.

Table 9

Mean Score of TSES Instrument Questions Related to Efficacy of Instructional Strategies

		Title I Schools (N=52)			Non-Title I Schools (N=57)			All Schools (N=109)		
Item	Question	Mean	Percent		Mean	Percent		Mean	Percent	
7	Respond to difficult questions?	7.29	1 0%	6 11%	7.37	1 0%	6 9%	7.33	1 0%	6 10%
			2 0%	7 25%		2 0%	7 32%		2 0%	7 28%
			3 0%	8 40%		3 0%	8 32%		3 0%	8 36%
			4 0%	9 12%		4 0%	9 18%		4 0%	9 15%
			5 11.5%			5 11%			5 11%	
10	Gauge student comprehension?	6.90	1 0%	6 13%	7.31	1 0%	6 9%	7.12	1 0%	6 18%
			2 0%	7 21%		2 0%	7 45%		2 0%	7 34%
			3 0%	8 29%		3 0%	8 21%		3 .9%	8 25%
			4 5.8%	9 9.6%		4 1.8%	9 18%		4 1.8%	9 14%
			5 11.5%			5 5.3%			5 6.4%	
11	Craft good questions?	7.04	1 0%	6 13.5%	7.47	1 0%	6 10%	7.27	1 0%	6 12%
			2 0%	7 25%		2 0%	7 30%		2 0%	7 28%
			3 0%	8 31%		3 0%	8 32%		3 0%	8 31%
			4 5.8%	9 13.5%		4 1.8%	9 21%		4 4%	9 17%
			5 11.5%			5 5.3%			5 8%	
17	Adjust lessons?	6.56	1 0%	6 23%	7.37	1 0%	6 11%	6.98	1 0%	6 16%
			2 0%	7 21%		2 0%	7 26%		2 0%	7 24%
			3 5.8%	8 27%		3 3.5%	8 24%		3 4.6%	8 26%
			4 9.6%	9 8%		4 5.3%	9 28%		4 7.3%	9 18.3%
			5 5.8%			5 1.8%			5 3.7%	

Table 9 Continued

Mean Score of TSES Instrument Questions Related to Efficacy of Instructional Strategies

		Title I Schools (N=52)			Non-Title I Schools (N=57)			All Schools (N=109)		
Item	Question	Mean	Percent		Mean	Percent		Mean	Percent	
18	Use variety of assessment strategies?	6.89	1 0% 2 0% 3 2% 4 6% 5 4%	6 15% 7 29% 8 25% 9 15%	7.35	1 0.0% 2 0.0% 3 0.0% 4 1.8% 5 8.8%	6 18% 7 16% 8 37% 9 19%	7.1284	1 0% 2 0.9% 3 3% 4 3% 5 6%	6 17% 7 22% 8 31% 9 17%
20	Provide an alternative explanation?	7.29	1 0% 2 0% 3 0% 4 6% 5 2%	6 15% 7 31% 8 27% 9 19%	7.38	1 0% 2 0% 3 0% 4 4% 5 4%	6 12% 7 28% 8 37% 9 16%	7.3394	1 0% 2 0% 3 0% 4 5% 5 3%	6 14% 7 29% 8 32% 9 17%
23	Implement alternative strategies?	6.63	1 0% 2 0% 3 2% 4 10% 5 12%	6 15% 7 33% 8 19% 9 10%	7.02	1 0% 2 0% 3 2% 4 9% 5 2%	6 16% 7 33% 8 23% 9 16%	6.8349	1 0% 2 0% 3 2% 4 9% 5 6%	6 16% 7 33% 8 21% 9 13%
24	Provide appropriate challenges?	7.13	1 0% 2 0% 3 2% 4 4% 5 6%	6 21% 7 23% 8 23% 9 21%	7.25	1 0% 2 0% 3 0% 4 2% 5 12%	6 16% 7 21% 8 28% 9 21%	7.1927	1 0% 2 0% 3 0.9% 4 3% 5 9%	6 18% 7 22% 8 26% 9 21%

Efficacy for Student Engagement

The mean scores to the questions on the efficacy for student engagement by Title I and non-Title I teachers were summarized separately and are presented in Table 10. The mean scores for all teachers are also summarized in these tables. Results indicated that there was one question in the area of student engagement that all teachers appeared to be challenged by. Question number 4 received an overall mean score of 6.1 which indicates these teachers believe that they have less than "quite a bit" of influence on student achievement concerning this question. This question asked teachers to assess their ability to motivate students who show low interest in school. Unlike other items in this dimension this question scored in the low to average range.

As indicated early in this study, efficacy of student engagement was the dimension that received the lowest mean scores for all teachers. While overall, Non-Title I teachers received higher mean scores in this dimension, Title I teachers, ironically scored higher on question 6. This question assessed the teacher's perceived ability to convince students of their ability to achieve academically in school. This was the only question that received a mean score over the above average range or "quite a bit of influence" range (7.25). However, Title I teachers did not feel as efficacious in their ability to motivate their most difficult students. Their mean score to this question was 5.88. Teachers also reported feeling in adequately prepared with respect to their ability to assist students' families in helping their children "do well" in school. The mean score to this question was 5.83. The ability to assist families with helping their children

Table 10

Mean Scores for TSES Instrument Questions Related to Efficacy for Student Engagement

		Title I Schools (N=52)			Non-Title I Schools (N=57)			All Schools (N=109)		
Item	Question	Mean	Percent		Mean	Percent		Mean	Percent	
1	Get through to most difficult student?	5.88	1 0% 2 0% 3 6% 4 14% 5 31%	6 12% 7 23% 8 5.8% 9 9.6%	6.42	1 0% 2 0% 3 5% 4 4% 5 23%	6 14% 7 25% 8 14% 9 14%	6.17	1 0% 2 0.9% 3 5% 4 8% 5 27%	6 13% 7 24% 8 10% 9 12%
2	Help your students think critically?	6.42	1 0% 2 0% 3 6% 4 10% 5 13%	6 15% 7 29% 8 17% 9 10%	6.67	1 0% 2 0% 3 2% 4 5% 5 21%	6 9% 7 33% 8 19% 9 11%	6.55	1 0% 2 0% 3 4% 4 7% 5 17%	6 12% 7 31% 8 18% 9 10%
4	Motivate students who show low interest in school?	5.90	1 0% 2 0% 3 14% 4 12% 5 15%	6 17% 7 23% 8 12% 9 8%	6.26	1 0% 2 2% 3 4% 4 11% 5 19%	6 10% 7 33% 8 12% 9 9%	6.09	1 0.0% 2 0.9% 3 8% 4 11% 5 17%	6 14% 7 28% 8 12% 9 8%
6	Motivate students to believe that they can do well?	7.25	1 0% 2 0% 3 0% 4 2% 5 2%	6 14% 7 14% 8 33% 9 23%	6.80	1 0% 2 0% 3 5% 4 7% 5 9%	6 14% 7 25% 8 26% 9 14%	7.01	1 0% 2 0% 3 3.7% 4 5% 5 11%	6 14% 7 19% 8 29% 9 18%

Table 10 Continued

Mean Scores for TSES Instrument Questions Related to Efficacy for Student Engagement

		Title I Schools (N=52)			Non-Title I Schools (N=57)			All Schools (N=109)		
Item	Question	Mean	Percent		Mean	Percent		Mean	Percent	
9	Help your students value learning?	6.65	1 0% 2 2% 3 2% 4 6% 5 12%	6 23% 7 27% 8 12% 9 17%	6.56	1 0% 2 2% 3 7% 4 2% 5 16%	6 16% 7 26% 8 18% 9 14%	6.61	1 0% 2 0% 3 2% 4 4% 5 14%	6 19% 7 26% 8 15% 9 16%
12	Foster student creativity?	6.40	1 0% 2 0% 3 6% 4 6% 5 21%	6 6% 7 21% 8 23% 9 8%	6.42	1 0% 2 0% 3 7% 4 9% 5 12%	6 25% 7 14% 8 21% 9 12%	6.41	1 0% 2 0% 3 6% 4 7% 5 17%	6 20% 7 17% 8 22% 9 10%
14	Improve the understanding of a student who is failing?	6.25	1 0% 2 0% 3 4% 4 2% 5 27%	6 23% 7 23% 8 19% 9 2%	6.75	1 0% 2 0% 3 2% 4 4% 5 12%	6 12% 7 47% 8 16% 9 7%	6.51	1 0% 2 0% 3 3% 4 3% 5 19%	6 17% 7 36% 8 17% 9 5%
22	Assist families in helping their children do well in school?	5.83	1 2% 2 8% 3 4% 4 15% 5 14%	6 7% 7 27% 8 17% 9 5.8%	6.44	1 0% 2 1% 3 9% 4 4% 5 10%	6 25% 7 18% 8 23% 9 11%	6.15	1 0.9% 2 4.6% 3 6% 4 95 5 12%	6 17% 7 22% 8 20% 9 8%

was an item where Non-Title I teachers scored the lowest (6.4) along with fostering creativity and getting through to their most difficult students.

Efficacy for Classroom Management

As in the two other dimensions Non-title I teachers' mean score was higher in this dimension. All teachers perceived themselves as having some difficulty in their ability to calm disruptive or noisy students, prevent a few problem students from ruining an entire lesson and the ability to respond to defiant, controlling and disruptive behaviors. The mean scores in these areas are 6.5, 6.8, 6.7 and 6.7 respectively. Question 15 gathered information on a teacher's perceived ability to calm a student who is disruptive or noisy. Only 8% of the respondents gave themselves a nine rating of "a great deal", while 47% gave themselves a rating of six or lower.

Although there were some pockets of low scores in this dimension, the respondents in this research study tended to score at higher levels concerning efficacy for classroom management. The teachers for the most part felt that although they had a difficult time getting students to comply with the rules, as indicated above, they did not have a problem establishing rules and routines for their classrooms. Title I and Non-Title I received high mean scores in similar areas. Teachers for the most part felt very comfortable establishing routines to keep activities running smoothly, establishing classroom management systems with each group of students, making expectations clear for student behavior, and getting students to follow classroom rules. The mean scores for these questions are 7.4, 7.3, 7.9, and 7.1 respectively. The frequency data for question five indicates that 71% of the respondents rated themselves at a level eight or higher on this particular question. This question received the highest mean score (7.9). Table 11

Table 11

Mean Scores for TSES Instrument Questions Related to Efficacy for Classroom Management

		Title I Schools (N=52)			Non-Title I Schools (N=57)			All Schools (N=109)		
Item	Question	Mean	Percent		Mean	Percent		Mean	Percent	
3	Control disruptive behavior in the classroom?	6.46	1 0% 2 0% 3 8% 4 8% 5 19%	6 12% 7 21% 8 15% 9 17%	6.98	1 0% 2 0% 3 7% 4 7% 5 11%	6 7% 7 21% 8 19% 9 28%	6.73	1 0% 2 0% 3 75 4 7% 5 15%	6 9% 7 21% 8 17% 9 23%
5	Make your expectations clear about student behavior?	7.77	1 0% 2 0% 3 0% 4 4% 5 6%	6 12% 7 12% 8 23% 9 44%	7.95	1 0% 2 0% 3 0% 4 0% 5 4%	6 5% 7 12% 8 26% 9 47%	7.86	1 0% 2 0% 3 0% 4 4% 5 6%	6 8% 7 12% 8 25% 9 46%
8	Establish routines to keep activities running smoothly?	7.38	1 0% 2 0% 3 0% 4 4% 5 6%	6 17% 7 21% 8 21% 9 31%	7.35	1 0% 2 0% 3 4% 4 2% 5 14%	6 9% 7 14% 8 21% 9 37%	7.37	1 2% 2 2% 3 2% 4 0.9% 5 10%	6 13% 7 17% 8 21% 9 34%
13	Get children to follow classroom rules?	6.77	1 0% 2 2% 3 6% 4 2% 5 8%	6 33% 7 4% 8 29% 9 17%	7.35	1 0% 2 0% 3 0% 4 2% 5 16%	6 9% 7 19% 8 28% 9 26%	7.07	1 0% 2 0.9% 3 3% 4 25 5 12%	6 20% 7 12% 8 28% 9 22%

Table 11 Continued

Mean Scores for TSES Instrument Questions Related to Efficacy for Classroom Management

		Title I Schools (N=52)			Non-Title I Schools (N=57)			All Schools (N=109)		
Item	Question	Mean	Percent		Mean	Percent		Mean	Percent	
15	Calm a student who is disruptive?	6.50	1 0% 2 2% 3 4% 4 8% 5 14%	6 17% 7 21% 8 27% 9 8%	6.60	1 0% 2 0% 3 5% 4 9% 5 16%	6 11% 7 19% 8 32% 9 9%	6.55	1 0% 2 0.9% 3 5% 4 8% 5 15%	6 14% 7 20% 8 29% 9 8%
16	Establish a classroom management system with each group of students?	7.04	1 0% 2 0% 3 6% 4 10% 5 6%	6 23% 7 21% 8 31% 9 17%	7.46	1 0% 2 0% 3 0% 4 7% 5 5%	6 9% 7 21% 8 30% 9 28%	7.26	1 0% 2 0% 3 0.9% 4 7.3% 5 6%	6 11% 7 21% 8 30% 9 23%
19	Keep a few problem students from ruining an entire lesson?	6.65	1 0% 2 0% 3 2% 4 10% 5 10%	6 27% 7 19% 8 17% 9 15%	6.88	1 4% 2 4% 3 4% 4 4% 5 11%	6 11% 7 25% 8 26% 9 18%	6.77	1 0% 2 0% 3 0% 4 5% 5 3%	6 14% 7 29% 8 32% 9 17%
21	Respond to defiant students?	6.48	1 0% 2 0% 3 6% 4 8% 5 14%	6 15% 7 33% 8 14% 9 12%	6.88	1 0% 2 2% 3 2% 4 7% 5 4%	6 19% 7 30% 8 23% 9 14%	6.69	1 0% 2 0.9% 3 4% 4 7% 5 8%	6 17% 7 31% 8 18% 9 13%

summarizes the mean scores for this dimension.

Grouping Title I and Non-Title I Schools in to Quartiles

For analytical purposes Title I and Non-Title I schools were divided into four groups or quartiles. The researcher grouped the schools based on the Title I status and the school's overall sum score on the efficacy survey. This created a top quartile Title I group, a bottom quartile Title I group, and top quartile Non-Title I group and a bottom quartile Non-Title I group. There were sixteen schools that were grouped in the top and bottom quartile; eight Title I (4 top and 4 bottom) and eight Non-Title I (4 top and 4 bottom). The researcher's purpose for grouping the schools into quartiles was to take a closer examination at the impact of efficacy on student achievement in at-risk students. This was accomplished by taking an even closer look at the difference between schools that scored lower on the efficacy survey but had similar populations. For Non-Title I schools, a school was in the top quartile if its sum score on the efficacy survey was between 213 and 181. Title I schools were in the top quartile if their sum score on the efficacy survey was between 195-175. Non-Title I schools were in the bottom quartile if their sum score on the efficacy survey was between 163 and 122. Title I schools were in the bottom quartile if their sum score on the efficacy survey was between 147 and 135. There were no comparisons made for schools that fell in the middle two quartiles.

Data Analysis

In order to analyze the data and answer the research questions, descriptive statistics were run to determine the distribution and detect outliers. The research questions were examined at the .05 level of significance using Pearson's product moment correlation, ANOVA, t-test, and descriptive statistics.

Research Question #1: What is the relationship between teacher personal efficacy as measured by the TSES and student achievement as measured by the fourth grade Standards of Learning Assessments in math and reading?

Four main correlation analyses were conducted to determine the relationship between the overall teacher efficacy scores, efficacy for student engagement, efficacy for instructional strategies, efficacy for classroom management, and student achievement. The percentage of students passing the Standards of Learning Assessment in reading and math were used to measure student achievement.

In a comparison of the total group of schools there was a statistically significant positive relationship between teacher efficacy and student achievement in the area of mathematics at the .05 level. There was a statistically significant positive relationship between efficacy for instructional strategies and student achievement in the area of mathematics at the .01 level (see Table 12).

The correlation between teacher efficacy and student achievement in Title I schools indicated a statistically significant positive relationship between the two variables in mathematics. Additionally, there was a statistically significant positive relationship between the efficacy of student engagement and efficacy for instructional strategies and mathematics at the .05 level (see Table 13).

One interesting result is that Tables 12 and 13 indicate no relationship between the student achievement and efficacy scores in Non-Title I schools.

Table 12

Summary of Correlation of Reading Achievement and Efficacy Scores

	Reading Achievement			
School Type	Overall Efficacy	Student Engagement	Instructional Strategies	Classroom Management
All Schools N=109	.122	.116	.154	.081
Title I N=52	.230	.233	.223	.192
Non-Title I N=57	-.094	-.059	.062	.132

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Table 13

Summary of Correlation of Math Achievement and Efficacy Scores

	Math Achievement			
School Type	Overall Efficacy	Student Engagement	Instructional Strategies	Classroom Management
All Schools N=109	.197*	.163	.260**	.143
Title I N=52	.319*	.293*	.346*	.266
Non-Title I N=57	-.003	-.012	.078	-.054

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Research Question #2: Does the relationship between teacher personal efficacy scores and student achievement differ in Title I and Non-Title I students?

Two statistical analyses were used to answer this question. First, a two-way factorial ANOVA was used to examine whether there was a statistically significant main effect of the efficacy levels on student achievement. The main effect of teacher efficacy on student achievement was examined by comparing student achievement - reading and math scores. The scores were compared between the top and bottom quartile of the schools to determine if there was a significant difference in means between these two groups.

Second, a t-test was used as a follow-up test of simple significant main effect and interaction effect. This was done in order to probe the significance of the main effect of efficacy on student achievement in the subject areas of reading and math. This follow-up test also helped to evaluate the significant interaction effect of efficacy and school type on student achievement. An analysis of the simple main effects was conducted for efficacy levels (difference in means between the top quartile and the bottom quartile) within Title I and Non-Title I schools. This study did not examine the differences in means between Title I schools and Non-Title I schools within the top and bottom quartiles of schools. The t-test was conducted for the primary purpose of examining whether or not there was a difference in means between the top and bottom quartile group for each condition within Title I and Non-Title I schools separately.

Two-way ANOVA – Reading Achievement

A 2 (Efficacy Level-Top Quartile of Schools/Bottom Quartile of Schools) X 2 (School Type – Title I/Non-Title I) analysis of variance of student achievement,

identified as the dependent variable, yielded a significant main effect for efficacy level in the area of reading. The ANOVA indicated no significant interaction between efficacy level and school type, [F (1,12)=1.836, p < .05], but a significant main effect for efficacy level, [F(1,12)=17.421, p<.05], and school type, [F(1,12)=6.49, p<.05] (see Table 14). Figure 10 demonstrates the importance of the main effect, teacher efficacy, on reading achievement. It shows that as efficacy levels go up so does reading achievement.

The t-test test was conducted as a follow-up for the simple main effect of efficacy level on student achievement in the area of reading for Title I and Non-Title I schools separately. Although the reading achievement in Title I and Non-Title I school were comparable, when looking at the differences between the top and bottom quartile, the t-test indicated that there were significant differences only in Title I schools (see figure 11). Table 15 shows that the top quartile of Title I schools scored significantly higher than the bottom quartile.

Two-Way ANOVA – Math Achievement

A 2 (Efficacy Level-Top Quartile of Schools/Bottom Quartile of Schools) X 2 (School Type – Title I/Non-Title I) analysis of variance of student achievement, identified as the dependent variable, yielded a significant main effect for efficacy level but not school type in the area of math. The ANOVA indicated no significant interaction between efficacy level and school type, [F(1,12)=2.609, p < .05], but significant main effect for efficacy level, [F(1,12)=18.081, p<.05], and a non significant main effect for school type, [F(1,12)=.914, p<.05] (see Table 16). Figure 12 demonstrates the importance of the main effect, teacher efficacy, on math achievement. It shows that as efficacy levels go up so does reading achievement.

The t-test test was conducted as a follow-up for the simple main effect of efficacy level on student achievement in the area of math for Title I and Non –Title I schools separately. The t-test indicated that there was a significant difference between the top and bottom quartile schools in both Title I and Non-Title I schools (see figure 13). Table 17 shows that the top quartiles of Title I and Non-Title I schools scored significantly higher than the bottom quartiles.

Table 14

Two-way ANOVA – School Type * Quartile Student Achievement (Reading)

	Top Quartile (N=8)		**Bottom Quartile (N=8)**		**Interaction**	
	M	SD	M	SD	F	P
Title I	88.5	6.25	75.75	3.304		
	91.25	3.40	84.75	4.86		
Non-Title I						
					6.49	0.26
School Type						
					17.421	.001
Quartile						
					1.836	.200
School Type*Quartile						

df=1,12

4.75 significance

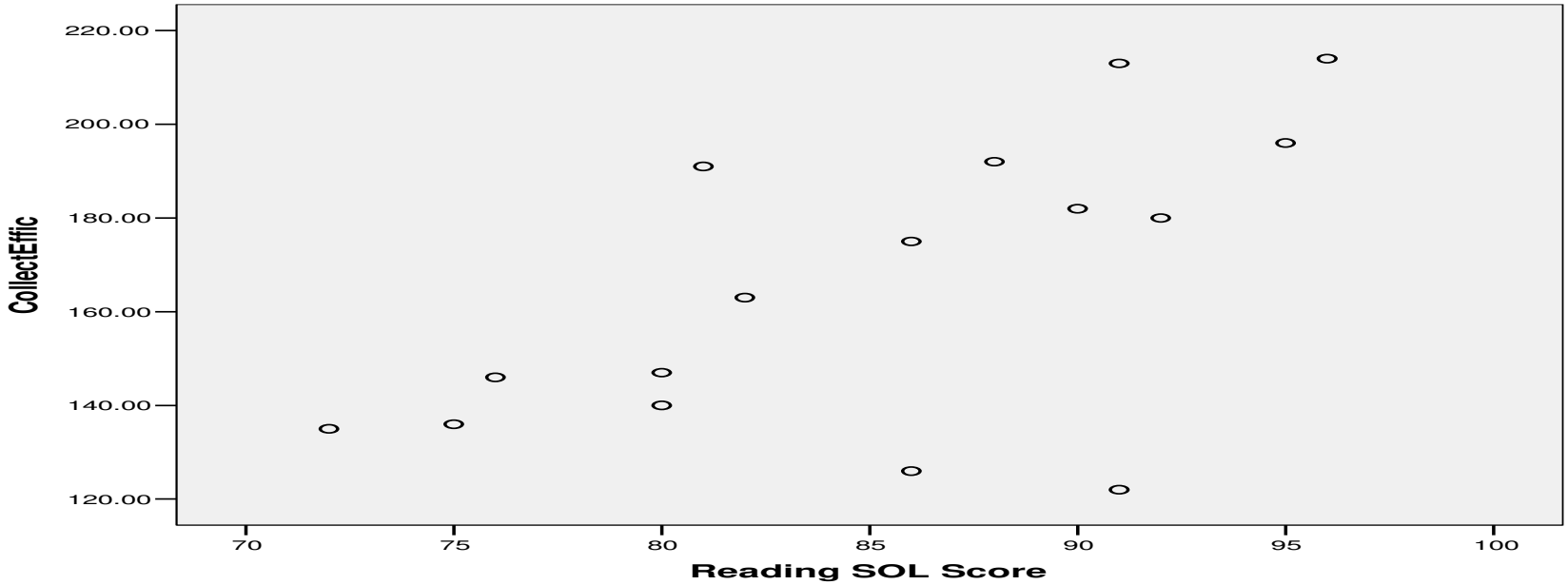

Figure 10

Graph of Efficacy Mean Score by Reading Scores Demonstrating the Effect of Efficacy on Reading Scores

Table 15

T-Test (Reading)

School Type	Quartile	Mean	Standard Deviation	T	P
Title I	Top (n=4)	88.5	6.25	3.609	.011
	Bottom (n=4)	75.75	3.304		
Non-Title I	Top (n=4)	91.25	3.40	2.192	.071
	Bottom (n=4)	84.75	4.856		

(Significance 2.447)

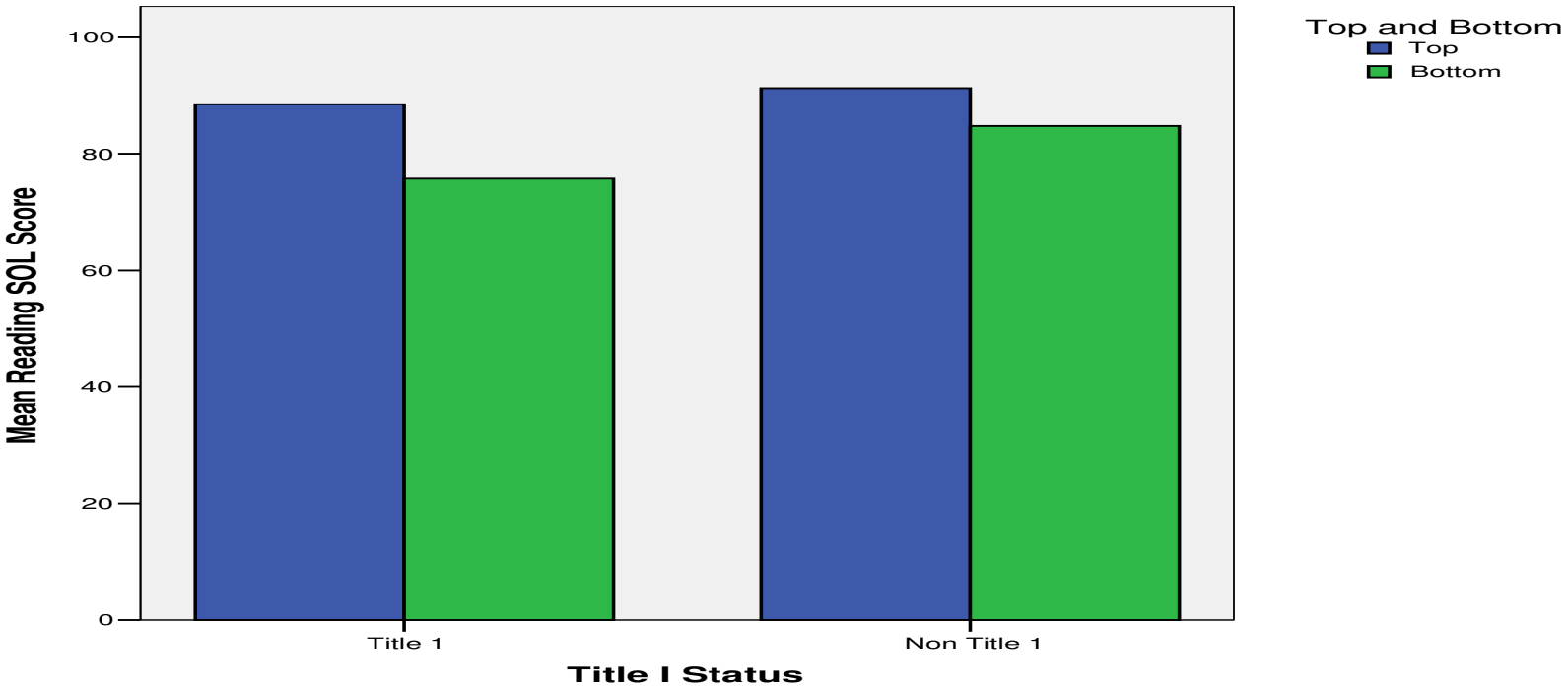

Figure 11

Graph of Reading Score for Top and Bottom Quartile by School Type

Table 16

Two-way ANOVA – School Type * Quartile Student Achievement (Math) 4.75 sig .05

	Top Quartile (N=8)		Bottom Quartile (N=8)		Interaction	
	M	**SD**	**M**	**SD**	**f**	**p**
Title I	92.25	7.14	70.00	10.96		
Non Title I	89.75	5.32	79.75	5.56		
School Type					.914	.358
Quartile					18.081	.001
School Type * Quartile					2.609	.132

df= 1,12

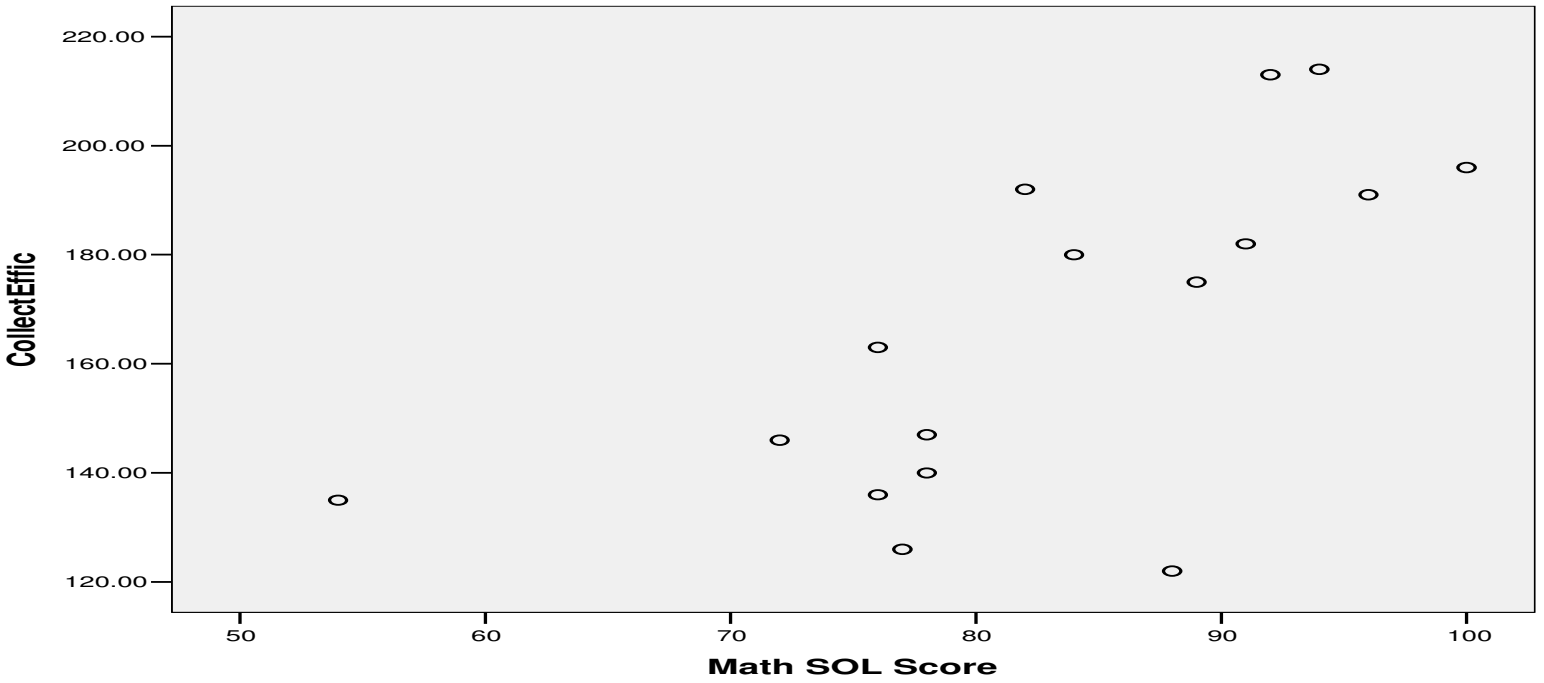

Figure 12

Graph of Efficacy Mean Score by Math Scores Demonstrating the Effect of Efficacy on Reading Scores

Table 17

T-Test (Math)

School Type	Quartile	Mean	Standard Deviation	T	P
Title I	Top (n=4)	92.25	7.14	3.404	.014
	Bottom (n=4)	70.00	10.954		
Non-Title I	Top (n=4)	89.75	5.315	2.60	.041
	Bottom (n=4)	79.75	5.560		

(Significance 2.447)

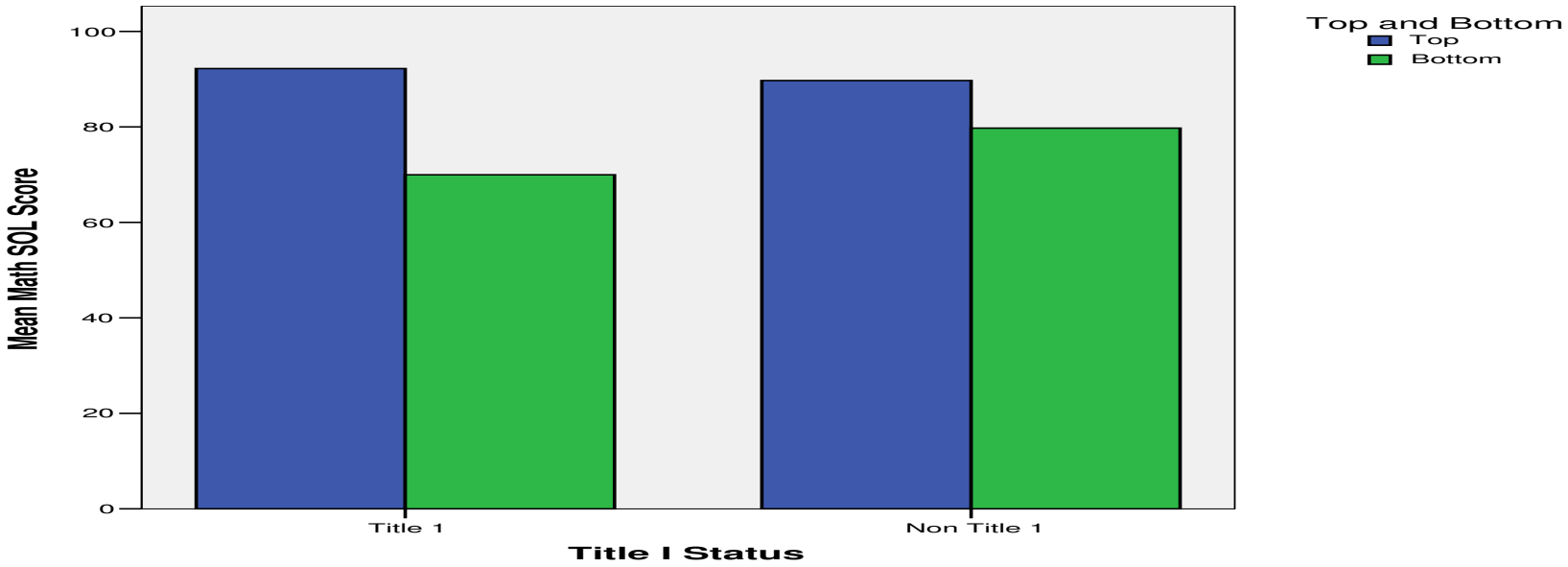

Figure 13

Graph of Math Score for Top and Bottom Quartile by School Type

Research Question #3: Is there a significant difference in the personal efficacy levels of teachers in Title I schools and Non-Title I schools?

An independent sample t-test using the .05 level of significance was used in order to determine whether or not there was a significant difference between the efficacy levels of teachers in Title I schools and Non-Title I schools. The researchers also conducted three additional independent sample t-tests using the .05 level of significance. This was done to determine if there was a significant difference between the efficacy for student engagement scores, efficacy for instructional strategies, and efficacy for classroom management scores in Title I and Non-Title I teachers. The findings are presented in table 18.

The independent-samples t test analysis indicates that the 52 Title I teachers had a mean of 161.4 on the efficacy scale, the 57 Non-Title I teachers for Title I teachers had a mean of 168.3. This is determined to be a statistically insignificant difference in the means. In the investigation of the difference in the other three dimensions, no statistical difference could be found between the mean score of 50.6 and 52.3 in the area of efficacy for student engagement. There was no significant difference between the mean scores 55.7 and 58.5 in the dimension of efficacy of instructional strategies. There was also no significant difference between the mean score of 55.06 and 57.4 in the dimension of efficacy of classroom management.

Table 18

Independent Sample T-Test

	Title I (N=52)		Non-Title I (N=57)			
	M	**SD**	**M**	**SD**	**t**	**p**
Overall Efficacy	161.38	26.97	168.3	27.88	-1.316	.191
Efficacy of Engagement	50.60	9.82	52.33	9.82	-.879	.381
Efficacy of Instructional	55.73	8.43	58.53	8.31	-1.74	.084
Efficacy of Classroom Management	55.06	10.53	57.44	11.01	1.15	.252

df= 107 $p < .05$

Research Question #4: What dimension of teacher efficacy do teachers in Title I schools score higher and is there a statistical significant difference in the mean scores between dimensions?

In order to answer this question the researcher first looked at the overall mean scores for the three dimensions using descriptive statistics. Of the three dimensions, it was discovered that Title I teachers scored highest on the dimension labeled efficacy of instructional strategies. The mean score in this area was 55.73. Next the researcher ran three paired sample t-test utilizing efficacy of student engagement/efficacy of instructional strategies, efficacy of classroom management/efficacy of student engagement, and efficacy for instructional strategies/efficacy for classroom management.

The first paired t-test examined efficacy for student engagement and efficacy for instructional strategies. The mean difference was -5.1 as indicated on Table 19. The researcher found that there was a statistical significant difference in the mean scores at a .05 level of significance. The t-test also indicated zero probability that chance had anything to do with the differences in these mean scores.

The second paired t-test examined efficacy of student engagement and efficacy of classroom management. The mean difference between these two variables was -4.5. The researcher found that there was a statistically significant difference in the mean score at a .05 and a .01 level of significance. This t-test also indicated that there was zero probability that chance had anything to do with the differences in the mean scores.

The last and final paired test examined efficacy of instructional strategies and classroom management. The mean difference between these two variables was .67. The

Table 19

Paired Sample T-Test - Title I

	M	SD	t	p
Efficacy of Engagement/ Efficacy of Classroom Management	-4.46	6.60	-4.88	.000
Efficacy of Instructional/ Efficacy of Engagement	-5.13	5.89	-6.29	.000
Efficacy of Instructional/ Efficacy of Classroom Management	.670	5.40	.898	.373

df= 51 $p < .05$

test indicated there was not a statistically significant difference between the mean scores.

Research Question #5: What dimension of teacher efficacy do teachers in Non-Title I schools score higher and is there a statistical significant difference in the mean scores between dimensions?

In order to answer this question, the researcher followed the same procedure used in research question four. The overall mean scores for the three dimensions were examined utilizing descriptive statistics. Non-Title I teachers scored higher in the dimension labeled efficacy for Instructional Strategies. The mean score in this area was 58.5. Next the researcher ran a three paired sample t-test utilizing efficacy of student engagement/efficacy of instructional strategies, efficacy of classroom management/efficacy of student engagement, and efficacy of instructional strategies/ efficacy of classroom management.

The first paired t-test examined efficacy for student engagement and instructional strategies. The mean difference was -6.2 as indicated in table 20. The researcher found a statistical difference in the mean scores at a .05 level of significance. The t-test also indicated a zero probability that chance had anything to do with the differences in these mean scores.

The second paired t-test examined efficacy of student engagement and efficacy of classroom management. The mean difference between these two variables was -5.1. The researcher found there was a statistically significant difference in the mean score at a .05 and a .01 level of significance. This t-test also indicated there was zero probability that chance had anything to do with the differences in the mean scores.

Table 20

Paired Sample T-Test - Non-Title I

	M	SD	t	p
Efficacy of Engagement/ Efficacy of Classroom Management	-5.11	6.56	-5.88	.000
Efficacy of Instructional/ Efficacy of Engagement	-6.19	7.27	-6.44	.000
Efficacy of Instructional/ Efficacy of Classroom Management	1.09	6.92	1.187	.240

df= 56 $p < .05$

The last and final paired test examined efficacy of instructional strategies and classroom management. The mean difference between these two variables was 1.09. The test indicated there was not a statistically significant difference between the mean scores.

Summary

The results of the statistical analyses including descriptive statistics and inferential statistics are included in this chapter. The descriptive statistics summarized the responses of the teachers to the TSES instrument used in this study, while, inferential statistics included the results of Pearson's product moment correlation analysis, two-way factorial ANOVA, t-tests as a follow-up test of the main effects on student achievement, independent sample t-tests, and paired sample t-tests.

The correlation between all school and overall teacher efficacy indicated a positive relationship between teacher efficacy and math scores and efficacy of instructional strategies and math scores. Moreover, the results indicated a positive relationship between overall teacher efficacy, efficacy of student engagement, and efficacy of instructional strategies and math scores in Title I schools. There was no relationship between efficacy levels and student achievement in Non-title I schools

Two analyses of two-way factorial ANOVA were performed and followed by the t-test analysis to determine the impact of teacher efficacy on reading achievement. The first ANOVA indicated no statistically significant interaction between efficacy level and school type, but significant main effects for efficacy level, and school type. The t-test was conducted as a follow-up for the simple main effect. This test indicated the presence of significant differences in reading achievement in Title I schools. The second ANOVA

indicated no significant interaction between efficacy level and school type, but significant main effect for efficacy level, and no significant main effect for school type. The t-test was conducted as a follow-up for the simple main effect. This revealed no significant differences in top quartile and bottom quartile schools in math achievement for Title I and Non-Title I schools.

An independent sample t-test was used in order to determine whether there was a significant difference between the overall efficacy levels and efficacy levels in the three dimensions of teachers in Title I schools and Non-Title I schools. The test indicated there was no significant difference in the mean scores of Title I and Non-Title I teachers on the overall efficacy scale, nor in the three dimensions.

Descriptive statistics and pair sample t-test were used to answer questions four and five. Of the three dimensions, the test indicated Title I and Non-title I teachers scored highest in the dimensions labeled efficacy for instructional strategies. There was a statistical significant difference in the mean scores of student engagement / instructional strategies and student engagement / classroom management in both Title I and Non-Title I teachers.

Chapter 5

CONCLUSION, DISSCUSION, IMPLICATIONS FOR PRACTICE, AND RECOMMENDATIONS FOR FUTURE STUDENTS

Teacher efficacy research is roughly a quarter of a century old. Early works suggest that a teacher's beliefs in his or her ability to positively impact student learning are critical to the actual success or failure in a teacher's behavior. These beliefs, called teacher self-efficacy, are explained in Bandura's (1977) social cognitive theory, which emphasizes human agency within a multi-directional model that influences our thoughts and behaviors. This important construct has suffered from inadequate validity issues and the lack of well-developed instruments to provide measurable results. Teacher efficacy has endured remarkable scrutiny. Recently however, there have been several important advances in the field. New research models have materialized and several promising instruments have been developed.

The purpose of this study was to examine the differences in the relationship between teacher efficacy and student achievement in an urban school district. Specifically, the research sought to identify any possible differences in the relationships between a teacher's level of efficacy and student achievement scores on the Fourth Grade Virginia Standards of Learning Reading and Mathematic Assessments.

The researcher examined teachers' efficacy levels in Title I and Non-Title I schools utilizing the Teacher Sense of Efficacy Scale. This scale, created by Tschannen-Moran and Woolfolk-Hoy, not only measured the teacher's sense of overall efficacy, but also their perceived efficacy in three distinct aspects of teaching: efficacy for instructional strategies, efficacy for classroom management, and efficacy for student

engagement (Tschannen-Moran & Hoy, 2001). This study highlights factors that will assist in understanding teacher efficacy in relation to improving or eliminating achievement gaps. The following are the research questions which guide this investigation:

a. What is the relationship between teacher personal efficacy and student achievement as measured by the TSES and the fourth grade Standard of Learning Assessments in math and reading?
b. Does the relationship between teacher personal efficacy scores and student achievement differ in Title I and Non-Title I students?
c. Is there a significant difference in the personal efficacy levels of teachers in Title I schools and Non-Title I schools?
d. What dimensions of efficacy do teachers in Title I schools score consistently higher as measured by the TSES and is there a statistical difference in the mean scores between dimensions?
e. What dimensions of teacher efficacy do teachers in Non-Title I schools score consistently higher as measured by the TSES and is there a statistical difference in the mean scores between dimensions?

This chapter provides a summary of the findings resulting from analyzing the data collected from the Teacher Sense of Efficacy Scale and student achievement scores as reported in Chapter Four. Conclusions drawn from the findings are also discussed and correlations of the findings to other studies are summarized. Recommendations based on the study are presented. The chapter is organized into the following sections: Summary

of Findings, Recommendations, Limitations, Implications for Further Study, and Conclusions.

Summary of Findings

Discussion of Teachers Responses

A careful analysis of the teacher's responses to instrument questions has provided a clear picture of these teachers' efficacy levels. The responses from both Title I and Non-Title I teachers were very similar. Both groups had identical highs and lows. Efficacy for student engagement was the weakest area for both groups of teachers. This indicates a need for staff development in this area for teachers in this district and possibly in other similar urban districts.

This study revealed that a greater population of African-American students attend Title I schools and a greater population of Caucasian students attend Non-Title I schools. Even more interesting, the majority of teachers in Title I schools are African-American and the majority of teachers in Non-Title I Schools are Caucasian.

Efficacy for Instructional Strategies

The results indicated that there were areas of instructional strategies that all teachers appeared to feel were a bit more challenging than others. Teachers felt less efficacious with differentiating instruction and implementing alternative strategies in the classroom. Based on the results of this study, teachers were more skilled at teaching to one group of students at similar achievement levels, but found it difficult to design lessons for students at various achievement levels. The responses from this study indicated that teachers were more comfortable with their ability to design good questions than their ability to respond to difficult questions posed by students.

Efficacy for Student Engagement

As indicated early in the text, efficacy of student engagement was the dimension that received the lowest mean score averages for Title I and Non-Title I teachers. These teachers did not feel that this was an area of strength for them. They were not comfortable in their ability to motivate an extremely difficult student, nor were they comfortable with assisting their families in helping their children "do well" in school.

Efficacy for Classroom Management

The participants in this study felt most efficacious concerning classroom management. For the most part, teachers felt that although they encountered difficulties in making students obey the rules, they did not have a problem with establishing rules and routines for their classrooms. Teachers also felt very comfortable with their ability to 1) establish routines to keep activities running smoothly, 2) maintain classroom management systems with each group of students, 3) give clear expectations about proper student behavior, and 4) enforce classroom rules.

Findings from Analysis Results and Conclusions from Findings

The overarching question that drove this research was:

- Are students who are enrolled in classes where the teacher has a high sense of efficacy outperforming students who are enrolled in classes where the teacher has a lower sense of efficacy? Further, does a teacher's efficacy level have a greater impact on students who have been identified as at-risk?

This research found that teacher efficacy, in general, does have an effect on student achievement. The results of this study support what previous studies (Tschannen-Moran and Hoy, 2001; Brown, Anfara, and Roney, 2004; and Tucker et al., 2005) have

found regarding the relationship between teacher efficacy and student achievement. The results of these studies and this current study have shown that a relationship does exist between these two variables.

Research suggests that high efficacy teachers believe that it is up to them to provide a wealth of strategies to reach students. They view success in the classroom as a dual responsibility. They expect their students to take a measure of responsibility for their success and they also accept responsibility to ensure positive outcomes for their students (Allington, 2002). They believe that intelligence is malleable; that all children can learn and that they can help them learn (Deemer, 2004). These teachers believe that they must know their students, their subject, and themselves, while they continue to account for the fact that students learn differently.

The difference in the relationship of teacher efficacy was not addressed in previous studies as it was in this study. This study probed the differences in the significance and the relationship of teacher efficacy between teachers in Title I and Non-Title I schools in order to determine if there were any ambiguities. This study's examination of the significance of the effect of teacher efficacy on student achievement has helped to provide more evidence to speak about the role and importance of teacher efficacy.

An analysis of this study shows numerous results regarding the relationship between teacher efficacy and student achievement. The disaggregated results are summarized below.

a. What is the relationship between teacher personal efficacy as measured by TSES and student achievement as measured by the fourth grade Standard of Learning Assessments in math and reading?

There is a correlation between teacher efficacy and student achievement. However, the results of this study indicate that a relationship was found in mathematics only. Even more important, the relationship was only found when examining the total population and when examining the Title I population. There was no relationship between efficacy and student achievement in Non-Title I schools. The data in this study revealed that at a .05 significant level, there was a .122, .230, and a -.094 correlation between reading achievement and efficacy levels in the total population of Title I, and Non-Title I schools respectively. These data indicate, in all actuality, that high teacher efficacy has an adverse effect on reading achievement in Non-Title I schools. This phenomenon was examined in Wheatley's research on the adverse effects of high teacher efficacy. Wheatley postulates that teacher confidence in their current efficacy can sometimes do more harm than good (2005).

In contrast, the results indicate that at a .05 significant level, there was a .197, .319, and a -.003 correlation between math achievement and efficacy levels in the total population, Title I, and Non-Title I schools respectively. Therefore, there is a significant relationship between teacher efficacy and math achievement when examining the total population of students and Title I schools. Though not significant, the relationship was negative when examining Non-Title I schools.

The results are congruent with the works of many other researchers who found that teachers' efficacy scores could be used to predict student achievement on the Iowa

Test of Basic Skills (Moore & Essleman, 1992; Love & Kruger, 2005), the Canadian Achievement Test (Anderson, Greene, & Loewen, 1988), and theq Ontario Assessment Instrument Pool (Ross, 1992).

b. Does the relationship between teacher personal efficacy scores and student achievement differ in Title I and Non-Title I students?

The two-way factorial ANOVA helped to examine the main effect of teacher efficacy and school type (Title I and Non-Title I) on student achievement (reading and math). This analysis also helped determine if there was an interaction between these two variables.

The results revealed that the combination of efficacy level and school type did not have an effect on reading achievement. Therefore, the researcher cannot say that efficacy levels had more of an effect on student achievement in the area of reading in Title I schools than in Non-Title I schools. A teacher's efficacy level, however, did affect the reading achievement when examining top and bottom quartile Title I schools. Students whose teachers had higher efficacy levels, scored significantly higher than students whose teachers did not. Although this was not a research question, the results of the two-way ANOVA indicated that school type also had an effect on reading achievement. Students who were in Title I schools had a significantly lower mean score on the reading assessment than students in Non-Title I schools. Many policies have been put in place, aimed at improving the academic results of ethnic minorities. The policies have become necessary because too many groups of students from similar backgrounds are still not exiting K through 12 programs with a quality education. The findings of this study

indicate that these policies have not resulted in a closed achievement gap, and focus must continue to be placed on these policies.

The data collected in this study supports the findings mentioned above. The interaction score was 1.86 and the main effect for efficacy level and school type were 17.421 and 6.49, both being statistically significant.

The results revealed that the combination of efficacy level and school type did not have an effect on mathematics achievement. The researcher cannot say that efficacy levels are a stronger predictor of student achievement in the area of math in Title I schools than Non-Title I schools. However, a teacher's efficacy level did have a significant affect on math achievement when examining top and bottom quartile schools; therefore, students whose teachers had higher efficacy levels scored significantly higher than students whose teachers did not. Although this was not a research question the results of the two-way ANOVA indicated that school type did not have an effect on math achievement. Students who were in Title I schools had comparable mean scores in the area of math as did students in Non-Title I schools.

The data collected in this study support the findings mentioned above. The interaction score was 2.609, and the main effect for efficacy level and school type were 18.081 and .914. These data reveal that the only significant main effect was efficacy level (18.081).

These results found are similar in Tournaki and Podell 2005 research. These researchers found that teacher efficacy had a major affect on how teachers made academic predictions about certain students. Teachers with low efficacy demonstrated a bleak outlook on students reading two years below grade level. Moreover, lower efficacy

teachers predict poorer academic outcomes based on student characteristics (Tournaki & Podell, 2005).

c. Is there a significant difference in the personal efficacy levels of teachers in Title I schools and Non-Title I schools?

Efficacy levels are not contingent upon school type. This study revealed that there is no significant difference between Title I schools and Non-Title schools on the mean scores for overall efficacy, nor in the mean score for the three dimensions. Although Non-Title I teachers efficacy scores were higher, their efficacy scores were still comparable to Title I teachers.

The independent-samples t-test analysis indicates that the 52 Title I teachers had a mean of 161.4 on the efficacy scale; the 57 Non-Title I teachers had a mean of 168.3. Statistically, these scores are not significantly different. This same trend was seen in the areas of the three dimensions: efficacy for instruction, efficacy for student engagement, and efficacy for classroom management.

According to Tschannen-Moran and Hoy (2001), teacher efficacy can be both contextual and subject-matter specific. While it can be agreed that efficacy is situation specific it is not clear what level of specificity is applicable, or how this difference in teacher efficacy affects teacher performance. Other studies have found that about 75% of teachers in low income schools have low teaching efficacy (Warren, 2002). However, this was not the case in this study.

d. What dimension of efficacy do teachers in Title I schools score consistently higher and is there a statistical difference in the mean scores between dimensions?

e. What dimension of efficacy do teachers in Non Title I schools score consistently higher and is there a statistical difference in the mean scores between dimensions?

Both Title I and Non-Title I teachers in this sample felt most comfortable with their ability to implement instructional strategies. This is probably because of the number of staff development opportunities offered in this area. They felt least comfortable with their ability to maintain student engagement. The mean scores were considerably lower in this area. The scores were so much lower that the statistical analysis found a significant difference in the scores.

The data found that there was a statistically significant difference between the mean score of student engagement and instructional strategies with both Title I and Non-Title I teachers. Further the data revealed that there was a zero probability that chance had anything to do with the differences in these mean scores. Both Title I and Non-Title I teachers had a statistically significant difference in the mean score for student engagement and classroom management at a.05 and a .01 level of significance. This t-test also indicated that there was zero probability that chance had anything to do with the differences in the mean scores. Neither Title I nor Non-Title I teachers had a statistical difference between the mean scores of instructional strategies and classroom management.

Most teachers in this study had above average teacher efficacy levels and ironically felt most confident with their ability to deliver sound instruction. This finding is consistent with the research concerning characteristics of high efficacy teachers. Specific instructional behaviors are related to teachers with high efficacy. These

behaviors include: 1) maintaining on-task behaviors in students, 2) focusing on academic instruction, 3) direct instruction, 4) hands-on learning, 5) simulations, 6) inquiry, and 7) other strategies that require higher order skills (Henson, 2002; Zahorik et al., 2003; Deemer, 2004; Swars, 2005). These strategies foster academic achievement (Langer, 2000).

Teachers in this study, however, felt less confident in their ability to engage all students. Even more significant, the question with lowest response score dealt with their ability to engage all families.

Maton and Hrabowski (2004) described a successful program in the United States aimed at increasing the numbers of graduating African-American science, mathematic and engineering students. One of their findings was the important role that parents played earlier on in facilitating their children's success in primary and high school. This finding was the result of parent's emphasis on the role of education in society, focusing on high levels of achievement for their children, involvement in school activities, engagement with teachers, and being advocates for their children. Not all parents from low economic status and/or minority ethnic groups have the strength or the knowledge to become so intimately involved in their children's school life. Schools have an important role in supporting all parents in their hopes for their children's futures.

Implication for Practices

Although this study did not find a significant relationship in reading student achievement, it did however, find a relationship in mathematical student achievement. Therefore, efficacy plays a greater role in closing the achievement gap in math than frequently mentioned by school districts. High levels of teaching efficacy may serve as a

necessary component for teaching students who are difficult 'to reach'. It is imperative that teacher efficacy levels be considered before placing teachers in schools. It may become increasingly important for Human Resource personnel to gauge a teacher's efficacy level during the hiring process and the placement of new teachers.

Principals must be dedicated to finding ways to increase efficacy levels in their teachers. They must know the "pulse" of their teachers. This means, they must know the subjects that teachers feel more confident teaching and subjects they are less confident teaching. Further, districts must make a conscious effort to determine if teachers with lower efficacy are more likely to be employed at schools where the population of low SES students is higher. If this is the case, they must make every attempt to change this approach.

According to Tschannen-Moran and Hoy (2001), teacher efficacy can be both contextual and subject-matter specific. For example, Non-Title I teachers' scores indicated they felt more efficacious than Title I teachers. Other studies have found that about 75% of the teachers in low income schools have low teaching efficacy (Warren, 2002). This was not the case in this study. The difference between the two mean scores of Title I and Non-Title I teachers was not significant. Although not significantly higher, Non-Title I teachers had a higher efficacy mean score than Title I teachers. Deductions from this study and other studies imply that there are possible intervening variables influencing teachers' sense of efficacy.

Educational leaders must have difficult conversations with teachers concerning working with students from diverse populations, and teachers must be honest with themselves concerning any biases that they may have concerning student groups such as

boys, girls, low income, wealthy, Christian, Muslim, Black, White, etc. With the increasing diversity in classrooms today and a larger number of students being included in regular education classes, it is even more important that we pay closer attention to teacher efficacy since we know that efficacy plays a key role in the reactions of teachers to students from diverse backgrounds.

Another implication from this study is that universities and teacher preparation programs must ensure that that all students have a well-rounded practicum/student teaching experience. Preservice teachers sometimes enter the profession never having been exposed to a variety of cultural backgrounds either low SES, high SES, Hispanic, African American, etc. Their student teaching experience occurs in a setting similar to the school they attended. Once they receive a job, the job is in a district with students they have had no practical experience with. New teachers often arrive with a sense of hope for the future potential of their career and their students. It often takes only a few months or weeks for that positive attitude to become negative. Bandura states that mastery experience is the most powerful source of efficacy. Preservice teachers need an opportunity to work with diverse students prior to accepting a teaching position.

Colleges and universities may need to include examinations of beliefs related to knowledge, race and culture, teaching practices, teaching as a profession, expectations of students, and social relations within and beyond the classroom. In her research, Ennis (1998) noted that in settings where teachers are increasingly asked to teach at-risk (low income or African-American) students, some teachers will lower their expectations. These teachers may resent teaching a large number of students in varying stages of low-

level learning which are accompanied by behaviors that do not focus on successful learning practices.

The goal of colleges and universities should be to produce beginning teachers who feel efficacious in all facets of teaching. While this is a vigorous goal, this researcher recognizes that the ability to achieve this in two short semesters may be an unrealistic expectation. A more reasonable goal is to help beginning teachers develop the skills and knowledge that are instrumental in accomplishing the obvious responsibilities of teaching. Although there is no one way to accomplish this goal, essential features of preparation should include specific courses and experiences in classroom management, dealing with students from diverse backgrounds, providing opportunities to use data in order to make academic decisions concerning students' achievement, and most importantly supervision that allows continuous development towards improvement in the "Art and Science" of teaching (Woolfolk and Hoy, 1990). Vicarious experiences (coaching and modeling) should be offered to teachers even after student teaching. There should also be attempts to regularly have an experienced teacher in the classroom throughout their first year of teaching.

Lastly and most importantly, additional staff development is needed in all aspects of teaching. Studies have revealed that training directly influenced teachers' attitudes (Burke & Sutherland, 2004; Ross & Bruce, 2007; Woolfolk Hoy & Spero, 2005). Burke and Sutherland (2004) found in their study that teachers can have experience, but lack current knowledge and strategies needed to enhance student achievement. Professional development can give teachers the skills they need in order to increase student achievement. Professional development engages teachers in a process where teachers

gain information to enhance teaching practices and improve student learning, where they are encouraged to collaborate with peers, who provide feedback and offer support. Teachers need to work collaboratively and share concerns, issues, and best practices. The professional development must fit the needs of individual teachers as well as their years of experience and their level of efficacy.

Special attention must be shown to ensure that professional development is offered in the area of student engagement. While the school district appears to have done a sufficient job in training their teachers to implement instructional best practices, the results of this study indicate that a barrier still remains in the form of student engagement. Teachers in this study did not feel as confident in their ability to engage all students and families in the educational process. Therefore, the professional development offered to teachers in this area must also address connecting the home and school since this was the question that teachers scored the lowest.

Teachers must understand that they are ultimately responsible for what happens in their classrooms. If we believe in accountability in education, teachers must realize that professional development provides opportunities to improve teaching practices, gain confidence in changing teaching methodologies, and gain access to resources which assist in curricular implementation.

Educators must figure out how to engage parents and families to assist them in helping their children at home. It is becoming increasingly more necessary for teachers to reach out to people who are from diverse backgrounds. These few actions could change a magnitude of things. Schools could make more effort to work with their

communities to enhance student achievement and to find out how parents might best be supported.

Maton and Hrabowski (2004) described a successful program in the United States aimed at increasing the numbers of graduating African-American science, mathematic and engineering students. One of their finding was the important role that parents had played earlier in facilitating their children's success in primary and high school.

Limitations

The TSES instrument included items related to teacher efficacy. In addition these items were separated and categorized into three dimensions; instructional strategies, student engagement, and classroom management for further analysis. The beauty of the TSES instrument is that all its items are directly related to student achievement. However, the TSES has limitations and cannot be considered as a comprehensive assessment tool of teacher efficacy. Although the TSES helps in the evaluation of efficacy, the range of this assessment tool is extremely broad and causes uncertainty about highs and lows.

It is possible to question the validity and the limitations of the findings of this study because of methodological concerns such as the research design, data collection methods, or data analysis. For example, in the data collection process, participants were at varying stages of their education. Some had master's degrees while others were working on their doctorates. This raises questions as to levels of confidence and experience in teaching, which could possibly have a direct impact on efficacy scores. Another question that was not sufficiently documented in this study was whether or not participants were exposed to essentially similar requirements in their respective

classroom environments. The researcher worked on the assumption that similar requirements existed, but there is room for a considerable amount of discretion in classroom practices. Further, the researcher did not have access to students individual test scores, instead schools overall pass rates were used to assess student achievement.

Research studies conducted on intact classrooms in natural school settings contain inherent limitations within the research design that hinder the researcher's ability to generalize results about teacher and student populations other than those who were studied. This study made the assumption that teachers were honest when completing the survey. There are always limitations to survey research that is self reported. Respondents sometimes answer the questions in the manner that they think the researcher would expect them to answer. This sometimes leads to answers that are not truly indicative of how they feel or how they would act. This often occurs primarily when they feel that their livelihood could be at stake.

Other mitigating factors from this study that may contribute to the validity and reliability is the percentage of SES students in Title I and Non-Title I schools. There are Non-Title I schools whose SES population is comparable to the population in some Title I schools. This is due to the percentage of students needed to qualify for Title I. Some Title I schools barely qualify and some Non-Title I schools are on the verge of qualifying based on their population.

Recommendations for Future Research

There is a need to examine the correlation between teacher efficacy and the adoption of learning/tasks goals (Marat, 2007). We know that teachers with positive teacher efficacy are willing to try various strategies and curriculum ideas in the classroom

(Podell & Soodak, 1993; Tschannen-Moran and Hoy, 1998) and teachers who are high in teacher efficacy have students who achieve in the area of mathematics. It has also been demonstrated that teachers with high teacher efficacy scores have a greater number of students demonstrate an overall interest in school.

The question that follows is: How could a greater understanding of teachers' efficacy beliefs contribute to fostering greater equity in schools? It is important for practical and theoretical reasons, that we understand the sources teachers tap into when predicting their capabilities for teaching (Tschannen-Moran and Hoy, 2001). Teachers' sense of efficacy is a "little idea" with a "big impact". Teachers' judgment of their capabilities to impact student outcomes is consistently related to their behaviors, student attitudes and student achievement. Research must be conducted in order to determine how these beliefs are framed and sustained throughout a teacher's career.

While this study reveals that teacher efficacy has been and continues to be a contributor to positive educational outcomes, we must also recognize the gaps in this research. Specifically, the majority of this work has been descriptive in nature, relying heavily on self-reporting measures and correlational analysis. In consideration of the model proposed by Tschannen-Moran (and colleagues) of teacher efficacy as a cyclical construct, there is a need to investigate the ways in which efficacy in teachers can be enhanced so that important educational outcomes can occur.

It would behoove current day educational systems to conduct practical research that makes an examination between the art and science of teaching. Currently, most of the research looks at the 'science' of teaching but does not examine the 'art'. We now have data that indicates the value of the 'art' of teaching (Marzano, 2007). Teachers

should be aware of principles of teaching pedagogy. They need to strive towards innovate learning opportunities that assist in connecting students with course content as well as recognize that teacher-student relationships need to be equitable and fair. Teachers should acknowledge the importance of cultural meanings of teacher efficacy in relation to teacher roles, expectations, and social relations. If investigation of the construct of teacher efficacy is to continue, there is an essential need for studies to examine teachers from diverse cultural backgrounds and teachers who teach a wide range of students (Sorrells, Schaller, & Yang, 2004). We know how to help teachers who are proficient in the art but do not have the science. Are we skilled enough to help teachers who are proficient with the science of teaching but lack the art of teaching? Research should also examine the ramifications of having teachers who do not focus on being caring and compassionate instructors.

Qualitative studies about the effect of vicarious experiences on pre-service and novice teachers would be useful. Teachers entering the field have typically experienced "apprenticeships" of at least 17 years as students. We should examine the qualities of the teachers they remember and the impact of these memories on the pre-service teachers developing a sense of efficacy. We should also examine the impact of the modeling by university professors and by cooperating teachers during student teaching. Another consideration is the impact of images of teachers in movies and the news media and the ramifications of an unsuccessful first year on efficacy level. There are also the effects of having a part time coach in the classrooms with first-year teachers. Studies that focus on these issues would be helpful as we seek to learn about the source of self-efficacy beliefs among pre-service and novice teachers.

Longitudinal designs that would allow researchers to observe the periods of fluctuation and stability of self-efficacy beliefs at different career stages (pre-service, novice, early, mid and late career) would be of value. Some longitudinal designs are appearing in research journals (cf., Woolfolk Hoy & Burke-Spero, 2005). Also, longitudinal studies that examine teacher efficacy levels in various teaching environments such as urban, suburban, rural, high SES, low SES, and other similar classifications would be useful. While it can be agreed that efficacy is situation specific, it is not clear what level of specificity is applicable or how this difference in teacher efficacy affects teacher performance.

In addition, studies that examine teachers' "calibration" of their efficacy as teachers - the match between their self-assessment of their capability as teachers with other more objective measures would be useful. This is especially the case, given that we have newer measures of efficacy beliefs available that have overcome some of the psychometric difficulties of earlier measures (Tschannen-Moran & Woolfolk Hoy, 2001).

A major barrier to accomplishing research that will be of assistance to teachers is that teachers, researchers, administrators, and politicians view the ails of education in diverse ways (Wheatley, 2005). In order for research to by useful in the schoolhouse, the key players must be allowed to "come to the table". Researchers must seek information from teachers as to their concerns and what they see as major issues in education. After all, these are the people who will truly be implementing the recommendations from the research. This also applies to further research on teacher efficacy beliefs and how it might provide support in meeting the daily demands of teachers. Collaboration across

roles and disciplines is crucial in order for research to truly be influential (Wheatley, 2005).

Reflections

So much more needs to happen along the path – from implementing structural reform initiatives to creating a 'growth-inducing environment' to increasing student performance. We must connect reform efforts to organizational health, and then organizational health to student outcomes. School culture and climate, teacher efficacy, student support and stressors, and the nature of the curriculum (teaching and learning), are all key issues for future investigations (Brown, Anfara, Roney, 2004).

We know that one year with an ineffective teacher can affect a child academically for more than two years. Because of this knowledge, we must deal with how to break the cycle of low student achievement in sub group populations. We also need to address how long we have to reverse underperformance in groups of students. Although the achievement gap that deals with race is beginning to close, we still need to address the achievement gap between SES groups and how to break generational curses. Educators must figure out how to engage parents and families to assist them with helping their children at home. It is becoming increasingly more important for teachers to reach out to people who are not from similar backgrounds. If this 'elusive' construct is to move forward, we must include "all teachers" and "all students" in this most important research.

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APPENDIX A
Permission to Use Teacher Sense of Efficacy Scale (TSES)

Dwana P. White
1348 Monarch Reach
Chesapeake Virginia 23320

May 1, 2008

The Ohio State University

Dear Dr. Woolfolk Hoy,

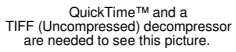
I am requesting a letter of permission to use the Ohio State Teacher Efficacy Scale for scholarly research. I will not charge money or make a profit from the use of the research instrument. For my dissertation, I am examining the effect of teacher efficacy on elementary fourth graders in Title I Schools and would like to use the scale that and Dr. Tschannen-Moran have developed

Thank you in advance for your time and assistance.

Sincerely

Dwana P. White

Dwana P. White
Ph.D. Candidate
Virginia Polytechnic University



Anita Woolfolk Hoy, Ph.D.

Professor
Psychological Studies in Education

August 13, 2008

Dear Dwana P. White,

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, Ph.D.
Professor

APPENDIX B
The Teacher Sense of Efficacy Scale (TSES)

Teacher Beliefs - TSES

This questionnaire is designed to help us gain a better understanding of the kinds of things that create challenges for teachers. Your answers are confidential.

Directions: Please indicate your opinion about each of the questions below by marking any one of the nine responses in the columns on the right side, ranging from (1) "None at all" to (9) "A Great Deal" as each represents a degree on the continuum.

Please respond to each of the questions by considering the combination of your *current* ability, resources, and opportunity to do each of the following in your present position.

	None at all		Very Little		Some Degree		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
Teacher Participation Letter

February 10, 2009

Dear Fourth Grade Chair,

My name is Dwana White and I am a Doctoral student at Virginia Tech University. Your district has given me permission to collect research data from your grade level. If you would, please distribute the attached surveys to members of your fourth grade team. Each member will complete a survey and place it in the plain white envelope. This sealed envelope should be returned to you. Once you have collected all surveys please place all white envelopes in the pony envelope (also attached) and mail via NPS pony mail system. The pony envelope has already been addressed to me. Teachers should not put their name on the surveys or the envelopes.

Thank you in advance for your time and significant contribution to this study. Please feel free to contact me at 675-6474 if you have additional questions or concerns.

You will find a Chick-fil-a gift card for your trouble. Again, thank you for your assistance.

Respectfully,

Dwana P. White

Dwana P. White
Doctoral Student
Virginia Polytechnic University

February 10, 2009

Dear Teacher:

My name is Dwana P. White and I am a Doctoral student at Virginia Tech University. I am conducting a research study regarding teacher efficacy. The purpose of this study is to develop an understanding of teacher efficacy and student achievement as perceived by teachers.

Your professional opinion is indeed valued. It is the front line teacher who is the gateway to change and student learning. To provide your perspective, could you please complete the attached survey? This task should not take more the 5-10 minutes and will greatly help to enhance teaching and learning. Your participation is anonymous. Reporting of results in this study will not identify individual participants, schools or jurisdiction.

Thank you in advance for your time and significant contribution to this study. Please feel free to contact me at 757-675-6474 if you have additional questions or concerns.

Respectfully,

Dwana P. White

Dwana P. White
Doctoral Student
Virginia Polytechnic University

APPENDIX D
Demographic Survey

Demographic Survey

Please answer each of the following questions as they apply to you. There are no right or wrong answers, and all responses will be confidential.

Gender	**Age**	**Educational Level**
○ Male	Under 25	Bachelors
○ Female	26-30	Masters
	31-40	Masters +30
	41-50	Ed. Specialist
	51-60	Doctorate
	Over 60	Other_____

1. Is your present teaching assignment in an area for which you are certified?

   Yes
   No (please explain _____)
   Other (please explain _____)

2. Type of teaching license:
   National Board Certification
   Professional
   Provisional (Please Explain _____)

3. Number of years in education _____

4. Number of years in present school district _____

5. Number of years in present school _____

6. Number of years in present position _____

7. Using the scale provided, please indicate by circling the scale number how likely is it that you will remain in the teaching profession for the duration of your professional career? 1 2 3 4 5

   < ---------->
   Unlikely Likely

8. Did you teach fourth grade during the 2007-2008 school year?

   Yes or No

APPENDIX E
Permission to Conduct Study

[redacted]

April 3, 2009

Dwana P. White
[redacted]
Doctoral candidate, Virginia Tech University

Dear Ms. White,

Your doctoral Study, "Teacher Efficacy and At-Risk Students," was approved from 4th grade teachers in [redacted], and effect starting February 5, 2009. The research proposal meets the [redacted] criteria, including:

- Voluntary participation allows each school-per principal, teacher, or staff to individually decide whether to participate, and may withdraw at any time without question or consequence.
- Participant and school names will remain anonymous in data collect, and aggregated results will be reported. Identifiable characteristics or linkage to the identity of any individual or school in the report is prohibited.
- Approval does not constitute commitment of resources, endorsement of the study, or its findings by the school district or the School Board.
- Data collected and results will not become part of any student, teacher, principal, school, or district record. All research records must be locked in a secured location

We look forward to your findings and contribution to instructional practice, program services and achievement for ALL students.

Sincerely,
[redacted], Ph.D.
Senior Coordinator [redacted]

[redacted]

APPENDIX F
IBR Approval

Office of Research Compliance
Carmen T. Green, IRB Administrator
2000 Kraft Drive, Suite 2000 (0497)
Blacksburg, Virginia 24061
540/231-4358 Fax 540/231-0959
email ctgreen@vt.edu
www.irb.vt.edu
FWA00000572 (expires 1/20/2010)
IRB # is IRB00000667

Date: September 24, 2008

MEMORANDUM

TO: Travis Twiford

Dwana P. White

FROM: Carmen Green

SUBJECT: IRB Exempt Approval: "Teacher Efficacy and At-Risk Students", IRB # 08-328

I have reviewed your request to IRB for exemption for the above reference project. The research falls within the exempt status. Approval is granted effective as of September 24, 2008.

As an investigator of human subjects, your responsibilities include the following:

1. Report promptly proposed changes in the research protocol, the proposed changes must not be initiated with out IRB review and approval, except when necessary to eliminate apparent immediate hazards to the subjects.

2. Report promptly to the IRB any injuries or other unanticipated or adverse events involving risks or harms to human research subject or others.

cc: File