TEACHER EFFECTIVENESS: EXAMINING THE RELATIONSHIP BETWEEN TEACHER GRIT AND TEACHER SELF-EFFICACY

By

DEANNA DOBBINS

Bachelor of Science in Elementary Education
Oklahoma State University
Stillwater, Oklahoma
2002

Master of Science in Educational Administration
Texas A&M Commerce
Commerce, Texas
2006

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Dissertation Approved:

Dr. Katherine Curry

Dr. Bernita Krumm

Dr. Ed Harris

Dr. Mary Jo Self

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Title of Study: TEACHER EFFECTIVENESS: EXAMINING THE RELATIONSHIP BETWEEN TEACHER GRIT AND TEACHER SELF-EFFICACY

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Abstract: The purpose of this research was to examine the relationship between teacher grit and teacher self-efficacy. Teachers in grades 3-11 in a mid-sized public school district located in a rural community containing a large research university responded to survey questions from Duckworth's (2009) Grit Scale-S questionnaire, Tschannen-Moran's (2001) Teachers' Sense of Efficacy Scale (TSES) and a Teacher Demographic Questionnaire. Two statistical techniques were used to analyze the data including correlational analysis and analysis of variance (ANOVA). The Pearson correlation between teacher self-efficacy and teacher grit (r=.306), indicating a positive relationship, is interpreted as a medium effect size (Cohen, 1988), and is statistically different from 0 ($r = .306$, $n = 194$, $p \leq .01$). Thus, the hypothesis that there is a statistically significant relationship between teacher self-efficacy and teacher grit is supported at the .01 level of significance. No statistically significant relationships where found between teacher self-efficacy or teacher grit when compared to the number of years teaching. No statistically significant relationships were found between teacher self-efficacy or teacher grit when compared to student outcomes (student growth percentiles). However, findings from this study, the relationship between self-efficacy and grit, suggests that building teacher self-efficacy may also enhance teacher grit.

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CHAPTER I

INTRODUCTION

Across the nation, educational leaders are charged with the responsibility of increasing student achievement in their districts. The enhanced emphasis on increasing student achievement is a response to perceptions that American students are underperforming as compared to students in other countries around the globe (Mullis, Martin, Foy, & Arora, 2012). As a response to demands for higher student achievement, each state in the United States has adopted some form of new standards, high-stakes testing for students, or new accreditation standards to reach educational goals (Tschannen-Moran & Barr, 2004). Studies suggest that reform efforts are somewhat successful. In international studies conducted by the International Association for the Evaluation of Educational Achievement (IEA), researchers found that the United States is improving in mathematics and eighth grade science; however, the United States is trailing other East Asian countries who are leading the world in both science and mathematics achievement (Mullis, et. al, 2012). Therefore, educators are confronted with finding just the right methods to use with students to increase student learning.

Low student achievement is a considerable problem in the United States, especially in high poverty, highly diverse communities (Mullis et. al, 2012; Reddy,

Kettler, & Kurz, 2015). Research indicates schools with high proportions of students from minority or economically disadvantaged backgrounds tend to have a more challenging time recruiting and retaining teachers (Clayton 2011; Ingersoll, 2003; Loeb, Darling-Hammond, & Luczak, 2005) and have a decrease in fiscal and human resources (Clayton, 2011). According to the Economist Intelligence Unit, (2012) the United States is ranked 17th in the world for education. IEA researchers found that higher mathematics and science achievement were associated with schools from affluent socioeconomic backgrounds (Mullis et. al, 2012) and that schools in high poverty communities showed little progress in meeting educational improvement goals. Research also indicates that schools in low-SES communities suffer from higher levels of unemployment, low educational achievement, and migration of some of the most qualified teachers (Clayton, 2011; Muijs, Harris, Chapman, Stoll, & Russ, 2009).

The Importance of Qualified Teachers

What is well understood, in response to mandates to enhance student achievement, is the importance of the classroom teacher in promoting student outcomes. Educator improvement is a priority in this country in order to increase student success. Many states have implemented new educator evaluations systems because they believe teachers are of upmost importance in students reaching outcome goals (Reddy et al., 2015). Additionally, research indicates that teachers with higher levels of self-efficacy and student grit can positively influence educational outcomes (Rojas, Reser, Usher, & Toland, 2012).Teacher quality is an important predictor in the success of students (Clayton, 2011; Mullis et al, 2012), and several teacher characteristics have been identified as important for enhancing student achievement. For example, Belson, Irvine, & Husted (2015) found the percentage of National Board certified teachers in a district is positively related to student outcomes. In

studies conducted by the IEA, researchers found that students with more experienced and more confident teachers had higher science and mathematics achievement as compared to their peers (Mullis et. al, 2012). The studies also found that teachers with higher levels of job satisfaction positively influenced student achievement (Mullis et. al, 2012). Another important teacher quality for promoting student success as identified in the literature is teacher self-efficacy (Armor, Conroy-Oseguera, Cox, King, McDonell, Pascal, Pauly & Zellman, 1976; Tschannen-Moran & Wolfolk Hoy, 2001). Tschannen-Moran and Woolfolk Hoy (2001) found higher self-efficacy of teachers "affects the effort they invest in teaching, the goals they set, and their level of aspiration" (p. 783). Research indicates that teachers with higher self-efficacy are more willing to try new ideas and use new teaching methods to meet the needs of their students (Berman, McLaughlin, Bass, Pauly, & Zellman, 1977) and to use persistence even when obstacles get in their way (Tschannen-Moran et al., 2001). An explanation for the statistically significant positive relationship between teacher self-efficacy and student achievement may be teacher persistence in pursuing educational goals. According to Tschannen-Moran and Wolfolk Hoy (2007), "A growing body of empirical evidence supports Bandura's (1977) theory that teachers' self-efficacy beliefs would be related to the effort teachers invest in teaching, the goals they set, their persistence when things do not go smoothly and their resilience in the face of setbacks" (p. 944; Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998).

Another teacher quality, teacher grit, recently was identified as a predictor of student success (Robertson-Kraft & Duckworth, 2014). Teacher grit is characterized by a teacher's willingness to persevere in working with students to achieve student outcome goals (Robertson-Kraft et al., 2014). Primarily, grit has been studied as student grit, the ability of

students to persevere in learning goals; however, teacher grit has caught the attention of researchers (Duckworth, Quinn, & Seligman, 2009b). Evidence indicates that teacher grit can enhance educational outcomes (Duckworth & Quinn, 2009a). Grit requires persistently working toward challenges, maintaining determination and interest over long periods of time despite adversity (Duckworth, Peterson, Matthews, & Kelly, 2007). Gritty individuals approach achievement with stamina, and they are willing to demonstrate sustained commitment despite obstacles that seem to hinder student learning (Duckworth et. al, 2007). Duckworth, Quinn, and Seligman (2009b) determined that (student) grit is a predictor of student achievement. Rojas et al. (2012) completed a study assessing grit, self-efficacy, and self-regulation in reading and math that indicated that grit is positively related to other motivational measures associated with enhanced student outcomes. For example, Rojas et al. (2012) surveyed 2,426 elementary and middle school students using Duckworth et al's (2007) grit scale, domain specific questionnaires to determine how confident students were in the math and reading skills to rate the student's self-efficacy for self-regulated learning skills, and students' perceptions survey. Their findings suggest a statistically significant correlation between grit scores and scores from six relative measures of effort, ability, and enjoyment in math and reading. Duckworth et al. (2009b) concluded that positive predictors of teacher effectiveness include grit and life satisfaction.

Problem Statement

Educating students is a complex task further complicated by context variables such as poverty and associated hindrances to learning, increasingly diverse student populations, and increasingly diverse learning needs (Shechtman, DeBarger, Dornsife, Rosier, & Yarnall, 2013). With these challenges, researchers seek a better understanding of teacher qualities that

can meet student needs for enhanced educational outcomes (Clayton, 2011; Rockoff, Jacob, Kane, & Staiger, 2008; Stephanou & Argyris, 2012). This understanding is an important focus for educational research. Specifically, the importance of the influence of both cognitive and noncognitive factors for teacher effectiveness is well documented (Belson et al., 2015; Clayton, 2011; Duckworth et al., 2009a; Rockoff, Jacob, Kane, & Staiger, 2008). Stephanou and Kyridis (2012) found cognitive factors had positive effects on teacher effectiveness and emotions. Cognitive factors include knowledge, memory, or reasoning skills that can be measured on a high-stakes test or an intelligence test (Duckworth, 2009a). On the other hand, Shectman et al. (2013) noted "noncognitive factors (attributes, dispositions, social skills, attitudes, and intrapersonal resources, independent of intellectual ability) that high-achieving individuals draw upon to accomplish success" (p. v). McCollum and Kajs (2009) listed self-efficacy as a non-cognitive factor found to influence educator effectiveness. Although student grit has gained attention in the literature, and a statistically significant positive relationship has been found between student grit and enhanced student outcomes, little is known about the influence of teacher grit and other non-cognitive teacher characteristics on student outcomes or whether schools can influence these characteristics to reach educational goals (Shectman, et al., 2013).

Self-efficacy is a non-cognitive factor that has been found to influence educator effectiveness (McCollum et al., 2009). However, current research contributes little information about the possible relationship between teacher self-efficacy and teacher grit or about factors that influence teacher grit. This understanding is important because it may help educational leaders in their efforts to maintain an environment that motivates teachers to persist in their educational efforts. Specifically, an understanding of the relationship between

teacher self-efficacy and teacher grit has the potential to inform educational leaders about ways to enhance teacher characteristics that have been found to influence student achievement to reach reform objectives.

Purpose of the Study

The purpose of this study is to understand the formation of teacher grit by investigating the relationship between teacher grit and teacher self-efficacy. This study examined the relationship between teacher self-efficacy and teacher grit. It also examined whether there is a difference in teacher grit and self-efficacy based on the number of years a teacher has taught as well as whether teacher grit or teacher-self efficacy has an influence on student outcomes. The variables included teacher self-efficacy, teacher-grit, number of years teaching, and student growth percentile scores. Teacher self-efficacy is defined as "the extent to which a teacher believes he or she has the capacity to affect student performance" (Berman, et al., 1977, p. 137). Teacher grit is defined as "perseverance and passion to pursue long-term goals" (Duckworth et. al., 2007, p.1087). "Student Growth Percentiles (SGPs) are a norm-referenced quantification of individual student growth derived using quantile regression techniques" (Renaissance Math Technical Manual, 2015, p. 116). An SGP is similar to that of Percentile Rank scores which compares a student's growth to that of his or her academic peers' nationwide (Renaissance Math Technical Manual, 2015). SGPs can be aggregated by teacher, class, grade or school (Renaissance Math Technical Manual, 2015).

Research Questions

The following research questions were the focus of this study:

Q1: Is there a relationship between teacher grit and teacher self-efficacy?

Q2: Are there differences in teacher grit by number of years taught?

Q3: Are there differences in teacher self-efficacy by number of years taught?

Q4: Do teacher grit and self-efficacy influence student outcomes?

Theoretical Framework

An explanation of the potential relationship between teacher self-efficacy and teacher grit is based on the framework of Bandura's (1996) Social Cognitive Theory. "Social Cognitive Theory suggests that personal factors (including self-efficacy beliefs) and individual behaviors interact with the environment to influence each other through a process of reciprocal determinism" (Tschannen-Moran & Hoy, 2006, p. 945). SCT entails the belief that individuals are engaged in their own development and their thought processes developed in relationships with others determine their actions (Pajares, 2002). In other words, "What people think, believe, and feel affect how they behave" (Bandura, 1986, p. 25). Social Cognitive Theory postulates that individuals have forethought, and their actions are guided by self-regulated, self-generated, and external sources of influence (Bandura, 1991). Therefore, prior experiences and consequences are predictors of future behavior and regulation of behavior. Thus, Social Cognitive Theory has utility for explaining a potential relationship between teacher self-efficacy and teacher grit because it explains how belief systems and environmental factors influence individual choices for behavior.

Hypotheses

Based on findings in existing research concerning the relationship between teacher self-efficacy and student outcomes (Tschannen Moran et a., 2001) and the relationship between teacher grit and student success (Robertson-Kraft et al., 2014), the following hypotheses were advanced:

H1: There is a positive, statistically significant relationship between teacher grit and teacher self-efficacy.

H2: There is a statistically significant, positive relationship between teacher grit and number of years in the classroom (ie. Teachers with higher number of years teaching will have higher levels of grit than will new teachers.)

H3: There is a statistically significant, positive relationship between teacher self-efficacy and number of years taught (ie. Teachers who have taught longer will have higher levels of self-efficacy than do new teachers).

H4: There are statistically significant differences across means of teacher grit and self-efficacy by student outcomes in reading and math (i.e. Teachers who have higher grit and self-efficacy scores will also have higher growth in student achievement in reading and math).

Definition of Terms

Adequate yearly progress

Adequate yearly progress means documenting student proficiency in reading/language arts and mathematics at each grade level, closing the achievement gap for groups of high-risk students, and, ultimately, expecting all students to receive scores of "proficient" or above on standards based assessments by the year 2014 (Redfield et al., 2004, p. X).

Collective teacher efficacy

"Collective teacher efficacy refers to the collective self-perception that teachers in a given school make an educational difference to their students over and above the educational impact of their homes and communities" (Tschannen-Moran et al., 2004, p. 190).

Grit

Grit is defined as "perseverance and passion to pursue long-term goals" (Duckworth et al., 2007, (p.1087).

Noncognitive factors

Noncognitive factors are "personality and temperament traits, interests, values, and goals," they are "patterns of behavior" that influence student learning (Duckworth, 2009a, p. 279).

Resilience

For this study, resilience is defined as "a quality that enables teachers to maintain their commitment to teaching and their teaching practices despite challenging conditions and recurring setbacks" (Brunetti, 2006, p.813), or the "capacity to overcome personal vulnerabilities and environmental stressors, to be able to 'bounce back' in the face of potential risks, and to maintain well-being" (Oswald, Johnson, & Howard, 2003, p. 50).

Self-Efficacy

Self-efficacy is defined as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 2).

SES/Socioeconomic Status/SES

Socioeconomic status indicates "the percentage of students receiving free or reduced-price lunch in the school" (Tschannen-Moran et al., 2004, p. 200).

Social Cognitive Theory (SCT)

"Social Cognitive Theory suggests that personal factors (including self-efficacy beliefs) and individual behaviors interact with the environment to influence each other through a process of reciprocal determinism" (Tschannen-Moran & Hoy, 2006, p. 945).

Student Growth Percentiles/Student Outcome Data

"Student Growth Percentiles (SGPs) are a norm-referenced quantification of individual student growth derived using quantile regression techniques" (Renaissance Math Technical Manual, 2015, p. 116). An SGP compares a student's growth to that of his or her academic peers' nationwide (Renaissance Math Technical Manual, 2015, p. 116).

Teacher Efficacy

"The extent to which a teacher believes he or she has the capacity to affect student performance" (Berman, et al., 1977, p. 137).

Teachers

For this study, "teachers" refers to individuals who hold teacher certification status in the State.

Overview of Methodology

Data were collected for this quantitative study in fall 2015. Participants included teachers teaching grades 3, 4, 5, 6, 7, 8, 9, 10, and 11 from a suburban district in a mid-western state. Teachers in grades 3, 4, 5, 6, 7, 8, 9, 10, and 11 were chosen because students are required to take state tests for both reading and mathematics at all of these grade levels. Other teachers may give competency tests; however, the focus of this study was to evaluate data for math and reading because it is the most commonly recognized student outcome data. Additionally, teachers and schools are given a report card grade based on student state test scores from students in these grades (State Department of Education, 2015). Third grade

teachers were utilized because it is the first year students are required to test and because of state legislation requiring the retention of students who are not reading at grade level at the end of the third grade year. Eleventh grade is the last year that all students are required to test, and those students in eleventh grade who plan to attend college are concentrating on college entrance and related exams. An additional consideration in gathering data from teachers across elementary, middle and high school grade levels was the potential to examine differences in teacher grit and teacher self-efficacy across grade levels in future studies.

All teachers in each of the grade levels were invited to participate in the study. Surveys were sent to teachers through their district email addresses using Qualtrics software. Teachers responded to survey questions from Duckworth's (2009a) Grit Scale-S questionnaire, Tschannen-Moran's (2001) Teachers' Sense of Efficacy Scale (TSES) and Teacher Demographic Questionnaire. Surveys were analyzed using Pearson r correlation and analysis of variance (ANOVA).

Rationale and Significance

Research indicates that teacher quality is the most important factor influencing student success (Clayton, 2011; Mullis et al, 2012). However, building and district leaders struggle to keep qualified teachers in the profession as indicated by documented understandings that 50% of teachers leave the profession within the first five years of teaching (Kopkowski, 2008; Thornton, 2004). Buchanan, Prescott, Schuck, Aubusson, Burke, and Louviere (2013) stated that there are multiple reasons why new teachers, both alternatively certified and traditionally certified, decide to leave the classroom. These reasons include difficulty with learning how to deal with full-time teaching demands, being able to handle relationships, understanding the cultural contexts of the school, having classroom

management, and feeling unsupported. For those teachers who do remain in the profession, an important responsibility of a successful educator is to encourage students and to build within them a desire to continue to grow, learn, and persevere in order to achieve their goals (Bashant, 2014). Additionally, teachers must persist in their efforts to meet educational goals in order to support student success (Duckworth et al., 2009b). Grit is an explanation of how teachers persist in their efforts to motivate students and to enhance educational outcomes (Duckworth et al., 2009b). Duckworth et al. (2009b) stated, "The rigors of teaching suggest that positive traits that buffer against adversity might contribute to teacher effectiveness," with one of these significant traits being grit (p. 540). Recent studies indicate that teacher grit is related to enhanced student outcomes (Duckworth et al., 2009b). However, little is known about the formation of teacher grit or factors that can influence a teacher's ability to persevere despite obstacles.

This study may help school administrators and teachers gain a better understanding of the relationship between non-cognitive teacher characteristics, teacher self-efficacy and teacher grit, which promote learning. This understanding may inform educational leaders and teachers in their efforts to promote learning environments that can enhance student outcomes. A statistically significant relationship between teacher self-efficacy and teacher grit may indicate that educational leaders may be able to provide support on their campuses that influence teacher confidence in their own ability to positively influence student learning. Doing so ultimately may result in greater teacher persistence in the educational process to meet educational goals. Specifically, school administrators may be able to identify strategies to enhance teacher grit by promoting teacher self-efficacy resulting in enhanced student learning. Additionally, administrators may be able to use further understandings about

teacher efficacy and teacher grit during the hiring process to identify teacher characteristics that ultimately will benefit students.

Researcher Assumptions

An assumption was that when teachers replied to the surveys, they were indicating results of their current state of being, their current beliefs, thoughts and feelings. The researcher also assumed that all participants honestly answered all questions on the Grit-S scale, on the Teachers' Sense of Efficacy Scale and on the Teacher Demographic Questionnaire.

Summary

Chapter 1 began by introducing the importance of qualified teachers for meeting student achievement goals. Specific teacher characteristics, self-efficacy and grit, were introduced as non-cognitive characteristics that can influence student learning. The statement of the problem was provided, and the need to understand the relationship between the two noncognitive factors of teacher self-efficacy and teacher grit was established. Chapter 1 also provided the purpose and significance of the research for educational leaders, research questions, and definition of terms. This paper concludes with assumptions and limitations.

Chapter 2 provides a review of the literature on teacher self-efficacy, teacher grit, and the theoretical framework identified for this study, Social Cognitive Theory (Bandura, 1997). The literature review begins with an introduction followed by an explanation of school improvement initiatives in American education. Next, the literature review provides information on teacher retention, teacher self-efficacy, growth mindset, teacher grit and Social Cognitive Theory. A summary of the literature is also provided.

Chapter 3 includes the research design and methods. This section begins with a justification of the methods that will be used for this study. Included in Chapter 3 is a discussion of the research population and sample. Descriptions of survey instruments are provided including validity and reliability of these instruments.

Chapter 4 includes findings and analysis of data. Two statistical techniques were used to analyze the data including correlational analysis and analysis of variance (ANOVA). The review of data begins with a discussion of the Pearson correlation analysis between teacher self-efficacy and teacher grit. The chapter then discusses analysis of variance to address questions two and three. These questions sought to understand differences across means of teacher grit and teacher self-efficacy by number of years taught. The chapter concludes with a discussion of the four separate one-way ANOVAs that were run in order to determine if teacher grit and self-efficacy influence student outcomes in math and reading. Results from each analysis are detailed in chapter four.

Chapter 5 provides a review and summary of the dissertation research, identifies research findings, and, conclusions, implications, and suggestions for future research. Chapter 5 begins with an introduction discussing the need for this study. It then moves to a discussion of the research findings through the lens of Bandura's (1997) Social Cognitive Theory. The chapter discusses implications from this particular study including implications for research, schools, and educational leaders. Finally, Chapter 5 ends with suggestions for future research and a summary of this study.

CHAPTER II

LITERATURE REVIEW

This literature review provides an overview of the literature on the two concepts of this study: teacher grit and teacher self-efficacy. Teachers are the focus of this study because studies indicate that teachers are the most important factor when it comes to increasing student achievement (Gibson & Dembo, 1984; Rivkin, Hanushek, & Kain, 2005; Sanders & Rivers, 1996). For example, Sanders et al. (1996) found that "teachers do have an effect on student achievement" (p. 1), and they determined that struggling students are the first to benefit when teacher effectiveness increases (Sanders et al., 1996). Given these findings concerning the importance of the teacher in the educational process, this study is important to understand teacher characteristics that can actually lead to greater student success.

The concept of teacher self-efficacy has been at the forefront of educational research for many years. For example, in 1977, Berman et al. (1977) found that teachers' sense of self-efficacy, the belief that they can help difficult and unmotivated students, was an important characteristic of a teacher for enhancing student outcomes. However, grit is a fairly new topic in educational literature; additionally, studies of grit have focused primarily on student grit. Much less is known about teacher grit and the potential

of teacher grit for enhancement of student outcomes. This chapter will provide a review of extant literature on these two important topics: teacher grit and teacher self-efficacy. The outline of the chapter is as follows: School Improvement in American Education, Teacher Retention in the United States, Self-Efficacy, and Grit. The theoretical Framework of Social Cognitive Theory is also explained.

School Improvement in American Education

School improvement is a top priority in the United States due to recent studies indicating that American students are underperforming as compared to students in other countries around the globe (Mullis et al., 2012). Because of the impression that American educational systems are falling behind educational systems across the globe, the nation's attention has shifted from "improvement" to "reform." According to Harris (2005), "reform literally means to give new form to the school" (p. 167). Because of the emphasis on reform, legislation has promoted many different types of reform in schools throughout the years. Primary examples of legislation include the Elementary and Secondary Education Act (ESEA), Improving America's Schools Act (IASA), and No Child Left Behind (NCLB). Additionally, new reforms impacting schools, teachers, parents and students recently have surfaced. These reforms include Teacher Leader Effectiveness (TLE) and Common Core Standards. These legislation and reform initiatives represent a variety of approaches to promoting success of American students. The No Child Left Behind Act of 2001, for example, was a sweeping reform that introduced mandated testing and required each state to set curriculum standards to enhance student achievement (No Child Left Behind, 2001). A better understanding of

school improvement/school reform begins with an understanding of the history of legislation regarding American education.

History of Legislation in American Education

Beginning with President Lyndon B. Johnson's *Elementary and Secondary Education Act of 1965*, teachers have been charged with the task of increasing student achievement. The National Commission on Excellence in Education (1983) began the "War on Poverty" where federal Title I funding was provided to promote increased student achievement. At that time, the United States was deemed "a nation at risk" (National Commission on Excellence in Education, 1983). As a result of Secretary T.H. Bell's concern about public education, the National Commission was created (National Commission on Excellence in Education, 1983). The Commission's charges were as follows:

> Assessing the quality of teaching and learning in our Nation's public and private schools, colleges, and universities; comparing American schools and colleges with those of other advanced nations; studying the relationship between college admissions requirements and student achievement in high school; identifying educational programs which result in notable student success in college; assessing the degree to which major social and educational changes last quarter century have affected student achievement; and defining problems which must be faced and overcome if we are successfully to pursue the course of excellence in education (p. 7).

The commission was instructed to pay particular attention to teenage youth by focusing on high schools. The commission relied on five main sources of information including:

> Papers commissioned for experts on a variety of educational issues; administrators, teachers, students, representatives of professional and public groups, parents, business leaders, public officials, and scholars who testified at eight meetings of the full Commission, six public hearings, two panel discussions, a symposium, and a series of meetings organized by the Department of Education's Regional Offices; existing analyses of problems in education; letters from concerned citizens, teachers, and administrators who volunteered extensive comments on problems and possibilities in American education; and descriptions of notable programs and promising approaches in education (National Commission on Excellence in Education, 1983, p. 7-8).

The Commission's findings indicated that the United States was being overtaken in commerce, industry, science, and technological innovation by competitors throughout the world (National Commission on Excellence in Education, 1983). Therefore, the Commission listed eight recommendations to meet these challenges. The recommendations included:

> 1. To review and synthesize the data and scholarly literature on the quality of learning and teaching in the nation's schools, colleges, and universities, both public and private, with special concern for the educational experience of teenage youth;
> 2. To examine and to compare and contrast the curricula, standards, and expectations of the educational systems of several advanced countries with those of the United States;
> 3. To study a representative sampling of university and college admission

standards and lower division course requirements with particular reference to the impact upon the enhancement of quality and the promotion of excellence such standards may have on high school curricula and on expected levels of high school academic achievement;

4. To review and to describe educational programs that are recognized as preparing students who consistently attain higher than average scores in college entrance examinations and who meet with uncommon success the demands placed on them by the nation's colleges and universities;

5. To review the major changes that have occurred in American education as well as events in society during the past quarter century that have significantly affected educational achievement;

6. To hold hearings and to receive testimony and expert advice on efforts that could and should be taken to foster higher levels of quality and academic excellence in the nation's schools, colleges, and universities;

7. To do all other things needed to define the problems of and the barriers to attaining greater levels of excellence in American education; and

8. To report and to make practical recommendations for action to be taken by educators, public officials, governing boards, parents, and others having a vital interest in American education and a capacity to influence it for the better (National Commission on Excellence in Education, 1983, p. 25).

The *Improving America's Schools* (IASA) *Act of 1994* (1994) was a reauthorization of the *Elementary and Secondary Education Act of 1965*. The IASA was the beginning of mandated increased academic standards for all students. To receive Title

I funds, IASA required all states to establish student performance standards and to set challenging academic performance goal for all students. IASA also required states to test all students on the established State standards (Redfield & Sheinker, 2004). Tests were required at least once during each of the three grade spans (third through fifth, sixth through ninth, and tenth through twelfth) for math and language arts or reading (Brooks, 2012; Redfield et al., 2004). The core goal of IASA was for the United States to regain its top global ranking for student achievement in math and reading (Redfield et al., 2004).

One of the most well-known and comprehensive pieces of legislation to impact American schools is the reauthorization of the *Elementary and Secondary Education Act*, known as *No Child Left Behind Act* of 2001 (NCLB), under President George W. Bush (Yell & Drasgow, 2005). The requirements of NCLB include a mandate for all states to create a state-wide assessment system to promote the success of all students. This legislation mandated strict accountability measures to ensure that all students were learning what was expected (Yell et al., 2005). NCLB increased testing requirements by requiring annual testing in grades three through eight and testing at least once in grades tenth through twelfth (Redfield et al., 2004). New requirements also included requiring every student to be taught by a highly qualified teacher (Redfield et al., 2004). With this new law, teachers were required to take a certification test or be able to meet certain course level and teaching requirements to be considered highly qualified (Redfield et al., 2004). Expectations of NCLB include demonstrating "adequate yearly progress" (NCLB, 2001, p. 1). Adequate yearly progress means documenting student proficiency in reading/language arts and mathematics at each grade level, closing the achievement gap for groups of high-risk students, and, ultimately, expecting all students to receive scores

of “proficient” or above on standards based assessments by the year 2014 (Redfield et al., 2004, p. X).

This legislation, since the inception of ESEA of 1965, has greatly influenced educational systems throughout the United States. Of utmost importance is an enhanced emphasis on student achievement. Teachers must know how to meet student needs in enhancing educational outcomes. Pressure from these reforms has placed teachers at the center of reform efforts as they seek to address the daunting task of promoting enhanced student performance. The result is a high stakes testing policy environment where teachers feel increased pressure and responsibility for performance outcomes.

Teacher Retention

The current “high stakes” policy environment has impacted American educational systems in unintended ways. For example, many studies show that almost 50% of teachers leave the teaching profession within the first five years (Kopkowski, 2008; Thornton, 2004) and these rates are almost a third higher in urban districts (Ingersoll, 2003). In many inner city urban districts and rural areas, the teacher shortage is so severe that, according to Maranto and Shuls (2012), principals seek “to hire whoever walks through the door” (p.1). This shortage is due to the fact that many rural and high need urban schools have great difficulty hiring and retaining qualified teachers because of the additional challenges of educating students in high poverty environments (Castro, Kelly, Shih, 2010; Maranto et al., 2012). The teacher shortage is further exacerbated by high demands placed upon beginning teachers as they enter the teaching profession. Teaching is a profession in which beginners must take on as much responsibility as their

experienced colleagues including handling a full teaching load, increased paperwork, parent interaction, and managing students (Tait, 2008).

States have responded to escalating teacher shortages. In order to address teacher shortages, states allow individuals to establish certification through alternative routes (Clark, McConnell, Constantine, & Chiang, 2013). Approximately two-fifths of new teachers enter the profession through alternative certification (Clark et al., 2013). Alternatively certified teachers help fill teacher shortages in hard-to-staff schools (Clark et al., 2013). Many times alternatively certified teachers continue taking coursework while teaching, further decreasing teacher effectiveness (Clark et al., 2013). However, according to Thornton (2004), "The primary problem is not a shortage of prepared teachers, but rather the exodus of teachers from the classroom once they get there" (p. 2).

Buchanan et al. (2013) stated that there are multiple reasons why new teachers, both alternatively certified and traditionally certified, decide to leave the classroom. These reasons include difficulty with learning how to deal with full-time teaching demands, being able to effectively handle relationships, difficulty in understanding the cultural contexts of the school, poor classroom management skills and challenges of undisciplined students, and feeling unsupported (Buchanan et al., 2013). Thorton (2004) found other reasons that even seasoned teachers leave the profession. Thorton's (2004) findings include lack of materials and resources, lack of parental support, student discipline problems, time pressures, limited input into decisions, and low salaries. According to Thorton (2004), all of these factors lead to job frustration.

Teacher frustration is not beyond the school's influence. According to Tschannen-Moran et al. (2001), people with high levels of personal efficacy possess strong

resilience. Tait (2008) added to that understanding by suggesting that teacher resilience, personal efficacy and emotional competence may be the key to help teachers become more capable, self-assured, and dedicated to teaching over longer periods of time. Efficacy beliefs influence teachers' levels of determination, resilience, effort, goal setting, and they also influence willingness to try new ideas and strategies, preparation, impartiality, enthusiasm, organization, and commitment to teaching (Tait, 2008; Tschannen-Moran et al., 2001). Teachers with emotional competence are those that have the ability to handle stress, confront failure with optimism, and persist in difficult situations (Tait, 2008).

Because teacher retention is at epidemic levels in some areas of the United States, researchers have different ideas about solutions to this growing problem. For example, Burchanan et al. (2013) found that job frustration is lessened when teachers have peer collaboration, a supportive atmosphere, and quality professional learning. Thornton (2004) suggested that developing a community of learners within the school where teachers can support each other in standards of best practice and allowing the teacher to have increased voice and power are factors that reduce teacher frustration. However, Thorton (2004) suggested that, in order for these factors to actually influence teacher morale, they must take place at the school level. Specifically, the culture of a school must change where teachers work together as a collaborative unit and where they are allowed to have a voice when it comes to student learning (Thorton, 2004).

However, some teachers choose to stay in the profession despite the increasing challenges. "Many teachers are affected by the same conditions that contribute to their colleagues leaving the profession but chose to stay" (Williams, 2003, p. 74). Castro et al.,

(2010) found that teachers that exhibit qualities of resilience (possibly hovering on high levels of grit) choose to stay in the professions. Additionally, teachers with higher levels of self-efficacy have greater commitment to teaching (Coladarci, 1992) and are more likely to stay in the profession (Burley Hal, Villeme & Brockmeirer, 1991; Tschannen-Moran et al., 2001). Teachers who possess characteristics of a resilient individual are more likely to stay in the profession and learn to adapt and implement resilience strategies despite their school context (Castro et al., 2010; Gu & Day, 2007; Mansfield, Beltman, Price, & MConney, 2012).

Because teacher retention is one of the most pressing issues currently facing educational leaders (Buchanan et al., 2013; Kopkowski, 2008), leaders must develop strategies to combat the pressure and stresses related to increased expectations of teachers that lead to the current teacher shortage. In response, the National Association of Elementary School Principals (2008) encouraged administrators and teachers to develop a collaborative culture within schools. Collaborative cultures can provide needed support to teachers and encourage them to persevere despite the challenges that are prevalent in American educational systems today. Evidence suggests that non-cognitive teacher characteristics, needed for promoting student success, are positively influenced by collaborative environments. For example, Gu et al. (2007) suggested that resilience will promote "quality retention" (p. 1314). Tait (2008) indicated teachers with characteristics including resilience, efficacy, and emotional competence will be more successful in the workplace. According to Bandura (2002), the self-efficacy beliefs that emerge from the interactive process in schools impact both participants' well-being and achievement. Therefore, since teacher retention is an important factor for success of students, and

understanding factors within schools that can promote teacher retention is an important concern for educational leaders.

Self-Efficacy

Bandura (1997) defined self-efficacy as "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 2). According to Bandura (1997), self-efficacy is an individual's belief about his/her ability to succeed in specific situations. Bandura (2006) stated, "Perceived efficacy plays a key role in human function because it affects behavior not only directly, but by its impact on other determinants such as goals and aspirations, outcome expectations, affective proclivities, and perception of impediments and opportunities in the social environment" (p. 309). According to Bandura (2006), people can cultivate their efficacy, and "self-perceptions of efficacy influence thought patterns, actions, and emotional arousal" (Bandura, 1982, p. 122).

Luszczynska, Scholz, and Schwarzer (2005) defined general self-efficacy as the belief in one's ability to cope with a broad range of stressful or challenging demands. However, specific self-efficacy is directed to the specific task at hand (Luszczynska, et al., 2005). Additionally, self-efficacy is concerned with perceived capability and is a future-oriented belief of competence in given situations (Bandura, 1977, 2006; Tschannen-Moran et al., 1998). According to Bandura (1977), self-efficacy is related to global self-images. Self-efficacy is rooted in confidence and self-concept or self-esteem and is accompanied by self-worth (Bandura, 1986). Bandura explained that self-efficacy plays a role in human functioning as it impacts behavior indirectly and directly. These influences include goal attainment, setting higher expectations for oneself, and perception

of weaknesses and external opportunities (Bandura, 1997; 2006). Self-efficacy can affect one's thinking and influence an individual's course of action. Many researchers relate motivation to self-efficacy by stating that motivation is an important component of self-efficacy needed for learning and performance to take place (McCollum et al., 2009). McCollum et al. (2009) asserted that motivation is not enough to achieve a goal; self-efficacy is also needed. Researchers have determined that when self-efficacy is included in a psychological model, the effects of self-efficacy lead to increased student academic performance as compared to other constructs (Pajares and Kranzler, 1995; Pajares, 1996; Yusuf, 2011).

Self-Efficacy and Education

Student Self-Efficacy

Self-efficacy has an influence over human behaviors in many settings including education (Bandura, 1997; Klassen, Te, Betts, & Gordon, 2011). For example, research shows that student beliefs about their own abilities are important predictors of student achievement (Bandura, 1997; Bandura, Barbaranelli, Caprara & Pastorelli, 1996; Pina-Neves, Faria, & Raty, 2013). Manthey (2006) stated that self-efficacy beliefs are predictors of achievement-related behaviors. Bandura et al. (1996) found that "childrens' beliefs in their efficacy to regulate their own learning and academic attainments, in turn, contributed to scholastic achievement both independently and by promoting high academic aspirations and prosocial behavior and reducing vulnerability to feelings of futility and depression" (p. 1206).

Other researchers have also studied student self-efficacy. Zimmerman, Bandura, and Martinez-Pons (1992) conducted a study of students' self-efficacy beliefs and academic goals with the conclusion,

> Students' beliefs in their efficacy for self-regulated learning affected their perceived self-efficacy for academic achievement, which in turn influenced the academic goals they set for themselves and their final academic achievements (p. 663).

Another study conducted by Yusuf (2011) investigated the impact of self-efficacy, motivation, and learning strategies on academic achievement. In the study, Yusuf (2011) found "self-efficacy beliefs considerably enhanced learning success" (p. 2623).

In their study, Komarraju and Nadler (2013) discovered that students with low self-efficacy tended to believe intelligence was innate and unchangeable, whereas, students with high self-efficacy pursued mastery goals and outperformed the others. Komarraju et. al, (2013) noted that the motivational component of self-efficacy is also linked to academic performance. Bandura et al. (1996) pointed out that intellectual development cannot be isolated from the social relations of children; therefore, student behavior, including performance in school, must be analyzed from a social perspective. Additionally, a study conducted by Di Giunta, Alessandri, Gerbino, Kanacri, Zuffinao and Caprara (2013) showed that student grades were influenced by both personality traits and self-esteem; these, in turn, influenced the students' perceived academic self-efficacy.

Teacher Efficacy

Not only has student self-efficacy captured the attention of educational researchers, but teacher self-efficacy is prevalent in the literature as well. Teacher

efficacy is "the extent to which a teacher believes he or she has the capacity to affect student performance" (Berman, et al., 1977, p. 137). It is also defined as "teachers' belief or conviction that he/she can influence how well students learn, even those who may be difficult or unmotivated" (Guskey & Passaro, 1994, p. 4). Many researchers have found that teacher self-efficacy affects student self-efficacy and eventually student achievement (Armor et al., 1976; Bandura, 1997; Midgley, Feldlaufer, & Eccles 1989; Tschannen-Moran & Woolfolk Hoy, 2001, 2006; Tschannen-Moran et al., 1998; Tschannen-Moran et al., 2004). Teacher efficacy has been shown to positively affect teachers' views about instructional behaviors and teaching (Ross, 1994, Klassen et al., 2011, Skaalvik & Skaalvik, 2007; Tschannen-Moran et al., 2001). Findings suggest that teacher efficacy is powerfully related to other outcomes as well including teacher persistence (Tschannen-Moran & Hoy, 2007), and enthusiasm (Guskey, 1984; Hall, Burley, Villeme & Brockmeier, 1992) resilience (Coladarci, 1992; Tschannen-Moran et al., 2007), commitment, (Coladarci, 1992) and a greater commitment to stay in teaching (Burley et al., 1991; Tschannen-Moran et al., 2001). These findings suggest that teachers who feel supported, especially if they are beginning teachers, may have stronger efficacy beliefs than those who do not feel supported. Teachers who are more efficacious invest more effort in their teaching, set higher goals, are more persistent, and have more resilience (Bandura, 1977; Tschannen-Moran et al., 2006; Tschannen-Moran, et al., 1998). Teacher efficacy has also been linked to school climate (Hoy & Wolfolk, 1993). Efficacious teachers take ownership of poor student performance by attributing failure to the teachers' own lack of adequate effort, knowledge, or skills (Bandura 1986, 1997), and they adjust their behaviors to enhance student learning. Teachers with a high teacher

efficacy approach intimidating situations with self-confidence and work hard to resolve academic issues (Bandura 1986, 1997).

Teacher efficacy is especially important in highly diverse student populations where greater understanding of how to meet student needs is important. Additionally, teacher efficacy has been shown to positively affect teachers' views about instructional behaviors and effectiveness of their own teaching (Tschannen-Moran et al., 2001). In contrast, low self-efficacy can be contagious among teachers possibly creating a culture of failure, low student achievement, and low academic achievement, which then spirals into further decline in teacher efficacy (Bandura, 1997; Tschannen-Moran, et al., 1998). Betoret (2006) found that teachers with low self-efficacy tend to experience more difficulties in teaching, higher levels of work-related stress, and less job satisfaction. Therefore, teacher self-efficacy is an important teacher quality for both teacher and student success.

According to Hoy and Spero (2005), "The first years of teaching could be critical to the long-term development of teacher efficacy" (p. 343). Hoy et al. (2005) found that teacher efficacy is related to the level of support teachers receive. Tschannen-Moran and Hoy (2006) conducted a study among 255 novice and career teachers finding "contextual factors such as the teaching resources and interpersonal support available to be much more salient in the self-efficacy beliefs of novice teachers" (p. 944). Among experienced teachers, for whom an abundance of master experiences were available, "contextual factors played a far less important role in their self-efficacy beliefs" (Tschannen-Moran et al., 2006 p. 944).

According to McCollulm et al. (2009), educational leadership students that are more efficacious are more likely to be successful in their classes, and they are more successful in their jobs as educators. Additionally, educators lacking a sense of efficacy will not pursue challenging goals, and they will not attempt to overcome obstacles that hinder the way of achieving their goals (McCollulm et al., 2009). In 1994, Ross stated that teachers with higher levels of efficacy are more likely to use and learn new teaching strategies and approaches, use management techniques to increase student autonomy, provide extra assistance to struggling students, build student confidence in academic skills, set attainable goals, and show persistence. However, Bandura (1997) later suggested that when teachers learn a new skill they "hold their efficacy beliefs in provisional status, testing their newly acquired knowledge and skills before raising their judgments about what they are able to do" (p. 83). Bandura's findings suggest that, initially, implementation of change has a negative effect on teachers' personal efficacy (Tschannen-Moran et al., 1998). Research indicates that efficacious teachers see difficult tasks as challenges rather than as threats; they continue to put forth effort even in adverse situations (Bandura 1986, 1997).

Tschannen-Moran et al. (2006) used the Ohio State Teacher Efficacy Scale, also known as the Teachers' Sense of Efficacy Scale to measure two of Bandura's four sources of teachers' self-efficacy. According to Bandura (1986, 1997), there are four sources of teacher self-efficacy: mastery experiences, vicarious experiences, verbal persuasion, and physiological arousal. Tschannen-Moran et al. (2006) tested two sources. The first source was verbal persuasion, with regard to interpersonal support from colleagues, parents, the community, and school administration. The second source tested

was mastery experiences, defined by a sense of fulfillment with one's past teaching successes (Tschannen-Moran et al., 2006). Because teachers include particular teaching tasks as part of their judgement of teacher self-efficacy, this factor was included in the study (Tschannen-Moran et al., 2001, 2006). Teaching tasks included school level and setting, teachers' assessment of the availability of teaching resources, and the quality of school facilities (Tschannen-Moran et al., 2006). Tschannen-Moran et al., (2006) found for the 255 novice and career teachers who participated, contextual factors including teacher resources and interpersonal support were more significant in predicting the self-efficacy beliefs of novice teachers compared to career teachers. They also found that, for more experienced teachers, contextual factors played a far less role in their self-efficacy beliefs as compared to novice teachers (Tschannen-Moran et al., 2006). This study displays the importance of supporting novice teachers.

According to researchers, a teacher's sense of efficacy is related to student achievement, as teachers with higher self-efficacy promote higher student achievement (Tschannen-Moran et al., 2007). Additionally, students' own sense of efficacy can also be related to the teachers' sense of efficacy (Midgley et al.,1989; Tschannen-Moran et al., 1998) in other words, studies indicate that teachers with higher self-efficacy tend to have students who are more efficacious as well. These findings indicate that teacher efficacy can be very powerful in the classroom setting. According to Tschannen-Moran et al., (2004) classroom environments are partially determined by teachers' self-efficacy beliefs. In other words, if a teacher has high efficacy he or she creates mastery instructional strategies that foster cognitive development in students; whereas, teachers with lower self-efficacy may foster classroom environments that weaken a students' self-efficacy

(Tschannen-Moran et al., 2004). In addition, the relationships between teacher attitudes and teacher behavior are critical when it comes to educational outcomes (Tschannen-Moran et al., 2004). Performance expectations set by teachers are higher for teachers with high self-efficacy and lower for teachers with low self-efficacy (Tschannen-Moran et al., 2004) Therefore, higher teacher self-efficacy may reflect on students and on their performance (Midgley et al., 1989).

Teacher's efficacy affects a teacher's attitude toward education and instructional practices (Tschannen-Moran et al., 2004). For example, teachers with strong efficacy beliefs and construct mastery instructional strategies foster cognitive development for their students, while those with low self-efficacy beliefs create classroom environments that weaken students' sense of efficacy (Bandura, 1993). Midgley et al. (1989) conducted a repeated measures study of 1,329 students and their math teachers they had before and after their transition to junior high. The study found that, for students who transitioned from a teacher's classroom that had high teacher efficacy to a teacher with low teacher efficacy, these students had the lowest self-efficacy in mathematics when compared to other students (Midgley et al., 1989). The study supported findings in the literature that suggest a relationship between teachers' personal efficacy and students' self-efficacy (Midgley et al., 1989).

Research indicates that the first few years of teaching may be the most important for the long-term development of teacher efficacy (Tschannen-Moran et al., 1998; Woolfolk Hoy et al., 2005). Woolfolk Hoy et al. (2005) reported changes in teacher efficacy from entry for the teacher preparation program through the first year of teaching. Woolfolk Hoy et al. (2005) used a variety of assessment measures including Gibson et

al.'s (1984) Teacher Efficacy Scale, Bandura's (1997) Assessment of Instructional Efficacy, and a measure specifically designed regarding specific context and goals of the preparation program, to reveal a significant decrease in teacher efficacy during the first year of teaching. Woolfolk Hoy et al.'s (2005) study included 53 prospective teachers that completed three instruments at three different times during their first year of teaching. According to results of the study, teacher efficacy was related to the level of support the teacher received (Woolfolk Hoy et al., 2005). Teachers included in the study, rated themselves higher in self-efficacy if they had more supports in place during their entry years of teaching; whereas, teachers who had less supports in place rated themselves lower on the teacher efficacy scales (Woolfolk Hoy et al., 2005).

Teachers' Collective Efficacy

Teachers do not work in a vacuum, and people form beliefs about and are influenced by the groups in which they work. Because of the need to understand the embeddedness of teachers within a school and the influence of this embeddedness on teacher efficacy, Bandura (1997) coined the term, "collective efficacy" (p. 477). Bandura defined collective efficacy as "a group's shared belief in its conjoint capabilities to organize and execute the courses of action required to produce given levels of attainments" (p. 477). "Collective teacher efficacy refers to the collective self-perception that teachers in a given school make an educational difference to their students over and above the educational impact of their homes and communities" (Tschannen-Moran et al., 2004, p. 190). Collective efficacy is often considered a cultural characteristic of a school rather than an individual teacher characteristic (Tschannen-Moran, et al., 2004).

Multiple studies have noted links between student achievement and three kinds of efficacy beliefs: self-efficacy/judgements about students (Pajares, 1994, 1997), teacher efficacy (Tachannen-Moran et al., 1998) and collective efficacy (Goddard, Hoy, & Woolfolk Hoy, 2004). For example, even when controlling for demographic characteristics and prior student achievement, teachers' collective efficacy has been found to be significantly related to student achievement (Bandura, 1993; Goddard, 2002; Klassen et al., 2011; Tschannen-Moran et al., 2004) and academic climate (Bandura, 1993; Goddard, 2002; Klassen et al., 2011). Studies find that collective teacher efficacy influences student achievement because it leads to greater effort and persistence resulting in better teacher performance (Ahston & Webb, 1986; Guskey, 1998, Tschannen-Moran et al., 2004). Findings indicate that student achievement and collective efficacy have a reciprocal relationship, meaning if one increases, the other increases, and if one decreases, the other decreases (Tschannen-Moran et al., 2004). Teacher self-efficacy and collective efficacy are counted among the most important variables that determine teachers' performance and effectiveness in schools (Calik, Sezgin, Kavgaci, & Cagatay, 2012). For example, according to Tschannen-Moran et al., (2004), students who are taught by teachers with lower self-efficacy have lower performance expectations for themselves. Collective efficacy is also closely linked to the culture and climate of a school (Gibson & Dembo, 1984; Hoy & Wolfolk, 1993; Tschannen-Moran et al., 2004). For example, teachers within a school with high collective efficacy work collectively to help students learn, develop, and achieve (Klassen, 2011).

Tschannen-Moran et al. (2004) studied the relationship between collective teacher efficacy and student achievement controlling for the SES of students. The study included

66 middle schools in the Commonwealth of Virginia using a 12-item Collective Teacher Belief scale and Standards of Learning (SOL) Test, Virginia's state test. Findings indicated statistically significant positive relationships between collective teacher efficacy and student achievement on the grade 8 SOL math, English and writing tests (Tschannen-Moran et al., 2004). Statistically significant relationships were also found between the student achievement and collective teacher efficacy instruction subscale and on all three SOL tests (*writing, math and English*) as well as between the collective teacher efficacy discipline subscale and achievement on all three SOL tests (Tschannen-Moran et al. 2004).

Schools are social organizations, arranged so that teachers, students, and administrators work together to impact instructional activities (Tschannen-Moran et al., 2004). Teachers that have a strong sense of collective efficacy promote a sense of shared responsibility (Tschannen-Moran, 2004). Because the school environment is developed both personally and collectively, each has an impact on one's efficacy beliefs (Bandura, 1993, 1997; Tschannen-Moran et al., 2004).

Grit

Researchers and educational leaders struggle to understand why some individuals with the same ability levels outperform others with similar ability levels. According to Duckworth et al., (2007) this difference may be explained by differences in "grit." Duckworth et al., (2007) define grit as "perseverance and passion for achieving long-term goals" (2007, p. 1087). Shechtman et al. (2013) defined grit as "Perseverance to accomplish long-term or higher-order goals in the face of challenges and setbacks,

engaging the student's psychological resources, such as their academic mindsets, effortful control, and strategies and tactics" (p. vii).

In explanation of why individuals with similar ability levels experience differences in outcomes, Duckworth et al. (2007) explained that grit helps drive individuals to reach their potential. Duckworth et al. (2007) suggested that individuals having higher levels of grit are less likely to deviate from their goals. For example, Robertson et al., (2014) found that grittier teachers were less likely to leave their classrooms midyear as compared to their less gritty peers. Duckworth et al., (2009a, 2009b) also found West Point cadets higher in grit were less likely to drop out as compared to their less gritty peers, even when controlling for SAT and high school rank. Research also indicates that grit can be just as important as intellectual abilities for success (Shectman, et al., 2013). In her discussion of cognitive and non-cognitive factors that can influence educational outcomes, Duckworth et al. (2009c) discussed cognitive factors, including knowledge that can be measured on high-stakes tests, and noncognitive factors, behavior patterns, personality, values, and goals. According to Duckworth et al., (2009c) noncognitive traits include tendencies or patterns of behavior which embrace personality and temperament traits, values, interests, and goals. Similarly, Shectman, et al. (2013) explored other noncognitive factors (characteristics, dispositions, intrapersonal resources, social skills, attitudes, and independent of intellectual ability) that high-achieving people draw upon in order to be successful (Shectman, et al., 2013). Shectman, et al., (2013) found that noncognitive factors including grit, tenacity, and perseverance "are essential to an individual's capacity to strive for and succeed at long-term and higher-order goals and to persist in the face of the array of challenges and obstacles

encountered throughout schooling and life" (p. v). According to Duckworth et al. (2007), grit helps to explain these differences because gritty individuals tend to work persistently toward very perplexing, long-term goals, sustaining commitment when confronted with impediments and adversity. They also suggest that most prominent leaders in every field share the quality of grit (Duckworth et al., 2007).

Duckworth et al., (2007) created a series of studies specifically involving grit. One study conducted by Duckworth et al. (2007) was a cross-sectional study in order to develop and validate a self-report measure that could be used for adults 25 years or older. During this study, researchers also wanted to determine if grit increased with age. As predicted, they found that "more educated adults were higher in grit than were less educated adults of equal age" (Duckworth et al., 2007, p. 1091). In a separate online study, Duckworth et al. (2007) added the Big Five Inventory and questions about number of career changes an individual had finding, "predictive validity of grit to education and age over and beyond conscientiousness and other Big Five traits" (p. 1093). In other words, "grit had incremental predictive validity for the number of lifetime career changes (Duckworth, et al., 2007 p.1093). The first two studies conducted by Duckworth et al., (2007) established an association between grit and educational attainment. In the third study at an elite university, researchers tested whether grit was associated with cumulative GPA (Duckworth et al., 2007). Duckworth et al. (2007) determined that, despite other students having higher SAT scores, students with higher grit scores outperformed their less gritty peers (r=.25, $p < .01$) earning higher GPAs.

Student Grit

This fairly new concept is gaining the attention of researchers (Bashant, 2014; Christensen & Knezek, 2014; Duckworth et al., 2007, Duckworth et al., 2009a, 2009b; Maddi, Matthews, Kelly, Villarreal, & White, 2012; Shechtman et al., 2013; Strayhorn, 2013; Wolters & Hussain, 2015). The U.S. Department of Education published a commissioned study entitled *Promoting grit, tenacity, and perseverance: Critical factors for success in the 21st century*. This 2013 study expanded the concept of grit to include tenacity and perseverance indicating that they, too, are non-cognitive factors critical for 21st century learners (Shechtman et al., 2013). Additionally, a recent US federal government report has been released which focuses on grit as a measure of persistence in helping students achieve success (Shechtman, et al., 2013). According to the Shechtman et al. (2013) study, researchers encompassed the meaning of grit, tenacity, and perseverance to create a multifaceted definition of grit. Shechtman et al's (2013) study combines all three concepts together as one construct which they refer to as their multifaceted definition of *grit*, "Perseverance to accomplish long-term or higher-order goals in the face of challenges and setbacks, engaging the student's psychological resources, such as their academic mindsets, effortful control, and strategies and tactics" (Shechtman et al., 2013, p.vii).

Strayhorn (2013) tested the importance of grit in predicting grades for a 140 black males attending a predominantly white institution. Strayhorn (2013) found that grit was positively associated to college grades for black males and that academic factors, background traits, and grit explained 24% of the variance in black male's college grades. In other words, grittier black males earned higher grades in college, tended to have higher grades in high school, and had higher scores on their ACTs than their less gritty same-

race peers (Strayhorn, 2013). “Participants' grades were moderately related to Grit-S scores in a positive directions, r=0.38, p,0.01. Interestingly, Grit-S scores also were positively related with Black male collegians’ high school grades and ACT scores, (r=0.35 and r=0.23; both p < 0.01), respectively” (Strayhorn, 2013, p.5).

In her groundbreaking study at West Point, Duckworth et al. (2007) set out to determine what factors predict success in the most challenging circumstances, specifically for military personnel. Researchers realized that the criteria for acceptance to the military academy were very stringent. Candidates of West Point must receive a nomination, be evaluated on physical strength and ability, have high academic ability, and show signs of strong leadership potential (Duckworth et al., 2007). However, even though all applicants faced the challenges of strict requirements, “Grit predicted completion of the rigorous summer training program better than any other predictor” (Duckworth et al., 2007, p.1095). Findings indicated,

> Cadets who were a standard deviation above average in grit were 60% more likely to complete summer training ($\beta = .48$, OR = 1.62, $p < .001$), whereas cadets who scored a standard deviation above average in self-control were only 50% more likely to complete the summer course ($\beta = .41$, OR = 1.50, $p < .01$) (p. 1095).

Extending that study, researchers wanted to investigate “whether grit had incremental predictive validity for summer attrition over and beyond Big Five Conscientiousness” (Duckworth et al., 2007, p. 1096). The study showed “grit predicted summer retention ($\beta = .39$, OR = 1.47, $p < .03$), but Conscientiousness ($\beta = -.17$, OR = 0.85, *ns*) and Whole Candidate Score ($\beta = .04$, OR = 1.04, *ns*) did not” (Duckworth et al., 2007, p. 1096).

In another innovative longitudinal study completed by Duckworth et al., (2007) researchers investigated finalists in the 2005 Scripps National Spelling Bee involving 175 national spelling bee participants. Participants for this study ranged in age from 7 to 15 years old (Duckworth et al., 2007). Using the Wechsler Intelligence Scale for Children-III, researchers were able to identify participant IQ scores which they then compared to the grit scores to answer their research questions (Duckworth et al., 2007). Duckworth et al, (2007) sought to investigate the importance of grit on extracurricular achievement and to test their hypothesis about the mechanism of grit as mediated by the time that participants spent studying (Duckworth et al., 2007). In their findings, researchers determined gritty finalists outperformed their less gritty peers (Duckworth et al., 2007). Across the six studies explained above, Duckworth et al. (2007) found "individual differences in grit accounted for significant incremental variance in success outcomes over and beyond that explained by IQ, to which it was not positively related" (Duckworth et al., 2007, p. 1098). Duckworth et al., explained that these findings were influenced by more accumulated practice in grittier individuals. In a study conducted by Duckworth et al. (2007), the importance of the non-cognitive trait of grit accounted for a 4% variance in success outcomes among students. This study is important because it "demonstrated incremental predictive validity of success measures over and beyond IQ and conscientiousness (Duckworth et. al., 2007, p. 1087). Therefore, according to Duckworth et al. (2007), grit is more important than IQ when it comes to individuals reaching their goals.

Researchers believe that if students are going to reach their full potential, they must learn and develop a rich set of non-cognitive skills to enhance educational outcomes

(Shectman, et al., 2013). Students need a supportive and rigorous environment to meet these goals knowing that students will be more successful in a learning climate that is fair, respectful, has high expectations, highlights effort above ability, and provides tangible resources as needed (Shectman, et al., 2013). Some researchers believe that placing more of an emphasis on non-cognitive factors including perseverance and grit would help students be more successful in school and in the workplace (Bashant, 2014; Christensen et al., 2014). This thought is also supported by Bashant, (2014). Also, according to a blog by Tim Elmore, grit can be taught. Elmore recommends that teachers talk to students about attitude and persistence, using pictures to engage both sides of the brain. Recommendations also include starting with smaller problems to improve success, talking about the "why" before the "what," having students work together, and rewarding hard work and promoting delayed gratification (Bashant, 2014).

Teacher Resilience

Because teacher grit is a new concept in educational literature, an understanding of teacher grit is best explained by first addressing the concept of teacher resilience. Since resilience has characteristics of grit ingrained in its meaning, especially when it comes to adversity and the ability to persevere, resilience is an important aspect of grit. Perkins-Gough (2013) states that one must be resilient and have consistent interests, over long periods of time in order to have grit. According to Perkins-Gough (2013), "Grit is not just having resilience in the face of failure, but also having deep commitments that you remain loyal to over many years" (p. 16). Resilience is a multidimensional psychological construct incorporating the study of personal factors, including self-efficacy, self-esteem, motivation, resourcefulness and health which are thought to help

with resilience when adversity strikes (Castro et al., 2010; Gu et al., 2007). Researchers have had great difficulty coming up with one common definition of resilience. Brunetti (2006) defined resilience as "a quality that enables teachers to maintain their commitment to teaching and their teaching practices despite challenging conditions and recurring setbacks" (p.813). Gu et al., (2007) defined resilience as

> the capacity to continue to "bounce back," to recover strengths or spirit quickly and efficiently in the face of adversity. Resilience is closely allied to a strong sense of vocation, self-efficacy and motivation to teach which are fundamental to a concern for promoting achievement in all aspects of students' lives (p. 1302).

There are multiple definitions for resilience. Oswald et al. (2003) states resilience is the "capacity to overcome personal vulnerabilities and environmental stressors, to be able to 'bounce back' in the face of potential risks, and to maintain well-being" (p. 50).

Multiple studies have been conducted on teacher resilience. Mansfield, et al. (2012) conducted a study involving 200 graduating and early career teachers and discovered that teacher resilience is multidimensional and may develop according to a teachers' career stage. Mansfield et al., (2012) found teachers who are resilient are more likely to persevere in adverse situations, possibly similar to perseverance of a teacher with higher grit. Henderson and Milstein (2003) concluded that it is unrealistic to expect pupils to be resilient if their teachers, who constitute a primary source of their role models, do not demonstrate resilient qualities. Findings from the literature indicate that teachers need to be able to model resilience, self-efficacy and grit (Henderson et al., 2003). According to Tait, (2008) "Resilience and personal efficacy are related topics" (p. 59). The difference between resilience and personal efficacy is that "Personal efficacy is

a future-directed human strength linked to action" (Tait, 2008, p. 59) while resilience is the ability to "bounce back" from a previous experience (Gu et al., 2007). Specifically, highly resilient individuals are reactive to stressful situations; highly efficacious individuals are proactive (Tait, 2008, p. 59).

Growth Mindset

This research study investigates the importance of grit and self-efficacy of teachers. The question remains," if grit is important, are there other factors that should be considered to help increase grit?" Therefore, having a "growth mindset" becomes important in this research study. According to Hochanadel & Finamore (2015), recently, Duckworth and Dweck have collaborated on several studies to gain a better understanding of how "having a 'growth mindset'" could develop grit (p. 49). Hochanadel et al. (2015) defines a "growth mindset" as a "student's thinking that intelligence level is not a fixed number and can change" (Hochanadel et al., 2015, p. 47). Having a growth mindset means students "believe that intelligence can be developed by various means—for example, through effort and instruction" (Dweck, 2010, p. 26). Bashant (2014) indicate children with a growth mindset tend to be grittier. Blackwell, Trzesniewski, & Dweck (2007) conducted two studies involving 373 seventh grade students. Results from the study indicated that students' mind-sets have a direct impact on student grades; teaching students to have a growth mind-set raises their grades and achievement scores significantly (Blackwell et al., 2007; Dweck, 2010). Studies indicate having a growth mindset is even more important for Black or Latino students or girls in mathematics or science classes (Blackwell et al., 2007; Dweck, 2010). Dweck (2010) stated, "Because they believed that their intellect could be developed, students with a

growth mind-set focused on learning, believed in effort, and were resilient in the face of setbacks" (p. 26). Dweck (2010) asserts, "Individuals with a fixed mindset believe that their intelligence is simply an inborn trait – they have a certain amount and that's that. In contrast, individuals with a growth mindset believe they can develop their intelligence over time" (p 16).

According to Duckworth et al., (2007) by internalizing the motivation to persist, teachers can help students develop a growth mindset and grit in order to increase students' chances of reaching long-term goals. Dweck (2010) considers, "Only in growth mind-set cultures, where teachers and administrators are encouraged to fulfill their potential, will they be able to help their students fulfill their potential in schools that are free of bias" (p. 29). Hochanadel et al. (2015) stated that when one learns "how to persist, a growth mindset develops, thus improving grit to overcome any challenges" (p. 49). Hochanadel et al. (2015) asserts the grit scale "can be used to help educators teach students to measure and reflect on their own levels of grit," (p. 49); whereas, teachers can use the grit scale to measure and reflect on their own levels of grit. According to Hochanadel et al., (2015) educators need to create learning environments to help students persist and thrive. This understanding also needs to be extended to the entire school environment to help students, as well as, teachers persist and thrive. "The growth mindset can be taught to faculty, students and parents" (Hochanadel et al., 2015, 49).

Teacher Grit

Teacher grit recently gained the attention of educational research (Bashant, 2014; Christensen et al., 2014; Strayhorn, 2013). For example, researchers investigated

explanations for why some teachers stay in education why others choose to leave the profession (Duckworth et al., 2007, 2009b, Robertson-Kraft et al., 2014). Robertson-Kraft et al. stated (2014), "Because teaching is extremely challenging work, grit may have an important salutary impact on teacher performance" (p. 2). According to Duckworth et al. (2009b), "The rigors of teaching suggest that positive traits that buffer against adversity might contribute to teachers' effectiveness" (p. 540).

Duckworth et al. (2009b) investigated teacher grit to help explain why some teachers are dramatically more effective than others. Participants for this study included Teach for America (TFA) teachers, members of the non-profit organization that recruits recent college graduates to teach for two consecutive years in under-resourced public schools across the nation (Duckworth et al., 2009b). Teachers selected to teach for TFA usually are from highly selective undergraduate institutions, and they have no teacher preparation background prior to joining the program (Duckworth et al., 2009b). For this study, 390 teachers were sampled for the final analysis, seventy-nine percent were female with a mean age of 24 years (SD=2) (Duckworth et al., 2009b). In August 2005, participants completed surveys including measures of life satisfaction on the Satisfaction With Life Scale (SWLS) developed by Diener, Emmons, Larsen, and Griffin in 1985, grit (Grit-O), and explanatory style-Attributional Style Questionnaire (Duckworth et al., 2009b). In August 2006, TFA provided teacher effectiveness rankings, demographic information, and school assignments (Duckworth et al., 2009b). Results were as follows: Second year teachers were less satisfied compared to first year teachers ($t(388)=3.72$, p ,0.001, d= 0.40), and second year teachers outperformed first-year teachers(B=0.73, $OR=2.07$, $p < 0.001$ (Duckworth et al., 2009b). Teachers who were one standard

deviation higher in grit were 31% more likely to outperform less gritty teachers (B=0.27, *OR*=1.31, $p = 0.002$) (Duckworth et al., 2009b). Teachers who were one standard deviation higher in life satisfaction were 43% more likely to outperform other teachers, (B=0.36, *OR*=1.43, $p<0.001$) (Duckworth et al., 2009b). Lastly, teachers one standard deviation higher in optimistic explanatory style were 20% more likely to outperform their peers (B=0.19, *OR*=1.20, $p=0.04$) (Duckworth et al., 2009b). According to the study, all three positive traits were significantly related, (*rs*=0.17 to 0.32, *ps*<0.05) (Duckworth et al., 2009b). According to the results, TFA teachers were especially satisfied, gritty, and optimistic compared to age-matched comparisons. The results indicated that all three positive traits individually predicted teacher performance; however, when entered simultaneously, only grit and life satisfaction remained significant predictors (Duckworth et al., 2009b). "These findings suggest that positive traits should be considered in the selection and training of teachers" (Duckworth et al., 2009b, p. 540).

Because teaching is a challenging profession, and "high stakes" accountability mandates have added to the stress experienced by teachers in the profession, research has focused on whether or not grit can be measured as a teacher characteristic during the hiring process. Robertson-Kraft et al. (2014) conducted a study to determine if grit could be measured when hiring teachers. By using a self-report questionnaire and information such as college GPA, leadership experience, and demographic information gathered from teacher resumes, grit scores were used to predict teacher retention through the academic year. Additionally, the relationship between grit scores and academic gains of the students for the teachers who stayed for the entire school year were analyzed (Robertson-Kraft et. al., 2014). Robertson-Kraft et al. (2014) stated, "Findings suggest that

biographical evidence of grit, the disposition of pursuing challenging goals with sustained passion and perseverance, predicts effectiveness and retention among novice teachers in low-income districts" (p. 4).

In addition to predicting teacher retention, grit scores also predict success in improving student educational outcomes. According to a study conducted by Robertson-Kraft, et al. (2014), grittier teachers outperform less gritty colleagues. Additionally, Farkas Johnson, Foleno, and Public (2000) found that teachers stated the most important qualities for success in the classroom include enthusiasm, effort, and energy. Despite the limited attention to teacher grit in the literature, recent attention to teacher grit has suggested that this characteristic may be an important predictor of teacher success in meeting educational goals and in teacher retention.

Developing Grit

An important finding in the research is that grit can be taught and developed (Shectman et al., 2013). Shectman et al. (2013) states grit, tenacity, and perseverance can be promoted by the following psychological resources: academic mindsets, effort control, and strategies and tactics. Academic mindsets refer to beliefs, attitudes, or the way one perceives him or herself (Shectman et al., 2013). Effort control is the ability to regulate attention during long-term tasks (Shectman, et al., 2013). Finally, strategies and tactics refer to specific strategies to deal with challenges and setbacks (Shectman, et al., 2013). According to Shectman et al., (2013) there are approximately 50 programs and/or strategies for addressing grit, tenacity, and perseverance. These programs/strategies range from preschool to adult including school readiness programs that address executive functions to digital learning environments and tools for teachers (Shectman et al., 2013)

These findings are important due to the link between grit and teacher retention/teacher outcomes that has been established in the literature. Many researchers including the U.S. State Department of Education indicate that grit is important for student success (Bashant, 2014; Christensen et al., 2014; Duckworth et al., 2007, Duckworth et al., 2009a, 2009b; Maddi et al., 2012; Shechtman, 2013; Strayhorn, 2013; Wolters et al., 2015).

According to Hochanadel et. al. (2015), "The growth mindset can be taught to faculty, students and parents" (p. 49). They further explain, "Grit in education is how one can achieve long-term goals by overcoming obstacles and challenges" (p. 49). Grit is a characteristic that can be taught and developed; educational leaders may be able to promote student success by encouraging or developing the non-cognitive factor of grit in the teachers in their buildings. As indicated, grit is important for both children and adults (Bashant, 2014; Christensen et al., 2014; Duckworth et al., 2007, Duckworth et al., 2009, 2009b; Maddi et al., 2012; Shechtman, 2013; Strayhorn, 2013; Wolters et al., 2015). Therefore, as educational leaders think about the role of the teacher, it is imperative schools begin to place a greater importance on improving teacher grit. Teacher retention continues to be major concern; therefore, increasing teacher grit could help teachers stay committed to education. If teachers are more gritty, they are more likely to work toward challenges, approach achievement with stamina, maintaining determination and interest over long periods of time despite adversity, and stay committed despite obstacles that seem to hinder student learning (Duckworth, et al., 2007; Robertson et al., 2014). These are the types of teachers that are needed in America's classrooms.

Relationship Between Teacher Efficacy and Teacher Grit

Current research supports a potential relationship between teacher self-efficacy and teacher grit. Research indicates consistency in aspects of grit and self-efficacy including an overlap in the language that is used to describe each. For example, gritty individuals approach achievement with stamina, and they are willing to demonstrate sustained commitment despite obstacles that seem to hinder student learning while staying interested over long periods of time (Duckworth, et al., 2007; Robertson et al., 2014). Similarly, teachers with higher self-efficacy invest in teaching, set goals, and have higher levels of aspiration Tschannen-Moran and Woolfolk Hoy (2001). Teachers with high grit persevere in working with students to achieve student outcome goals (Robertson-Kraft et al, 2014). When it comes to teacher self-efficacy, research indicates that efficacious teachers see difficult tasks as challenges rather than as threats; they continue to put forth effort even in adverse situations (Bandura 1986, 1997). Findings suggest that teacher efficacy is powerfully related to other outcomes as well including teacher persistence (Tschannen-Moran et al., 2007), enthusiasm (Guskey, 1984; Hall et al., 1992) resilience (Coladarci, 1992; Tschannen-Moran et al., 2007), commitment, (Coladarci, 1992) and a greater commitment to stay in teaching (Burley, et al., 1991; Tschannen-Moran et al., 2001).

Rojas et al. (2012) completed a study assessing grit, self-efficacy, and self-regulation in reading and math. Their findings indicate that grit is positively correlated with other motivational measures. According to Tschannen-Moran et al. (2006),

> A growing body of empirical evidence supports Bandura's (1977) theory that teachers' self-efficacy beliefs would be related to the effort teachers invest in

teaching, the goals they set, their persistence when things do not go smoothly and their resilience in the face of setbacks (Tschannen-Moran et al., 1998, p. 944).

Teacher efficacy appears to be related to other outcomes including teacher persistence, enthusiasm (Guskey, 1984,), resilience, commitment (Coladarci, 1992), and a greater commitment to stay in teaching (Tschannen-Moran et al., 2001).

Because of current challenges related to teaching in a high-stakes policy environment, teaching is, more than ever, a commitment for those who stay in the profession. Understanding the relationship between non-cognitive factors that can, potentially, influence student learning may help educational leaders provide an environment conducive to student learning through enhanced teacher self-efficacy and grit.

Theoretical Framework

Social Cognitive Theory

Social Cognitive Theory (SCT) (Bandura, 1996) serves as the theoretical framework for this study to explain the relationship between teacher self-efficacy and teacher grit. According to SCT, human behavior is widely motivated and regulated by self-influence (Bandura, 1991). Bandura relabeled his "social learning theory" (Bandura & Walters, 1963) as "Social Cognitive Theory" (Pajares, 1996; Pajares & Urdan, 2002) in order for individuals to understand their abilities to self-regulate, translate information and perform behaviors. With his 1977 publication, *Self-efficacy: Toward a unifying theory of behavioral change*, Albert Bandura identified self-beliefs as the key element to his Social Cognitive Theory (Bandura 1997, 2000; Pajares et al., 2002). According to SCT, individuals operate within a large network of "socio-structural and psychosocial

influences in which efficacy beliefs play an influential regulative function" (Bandura, 1996, p. 1207). In 1986, with the publication of his book, *Social Foundation of thought and action: A Social Cognitive Theory*, Bandura advanced the view of human functioning to a forceful interchange of personal, behavioral, and environmental influences (Bandura 1986; Pajares et al., 2002) (Appendix 1). Social cognitive theorists suggest that humans act "within an interdependent causal structure involving triadic reciprocal causation" (Bandura, 1997, p. 6). The major self-regulative mechanism, upon which Bandura's SCT is based, operates through three subfunctions: behavior, personal standards, and environmental circumstances (Bandura, 1986, 1991). (Figure 1) The theory states that self-regulation encompasses the self-efficacy mechanism resulting in enhanced motivation and action (Bandura, 1991).

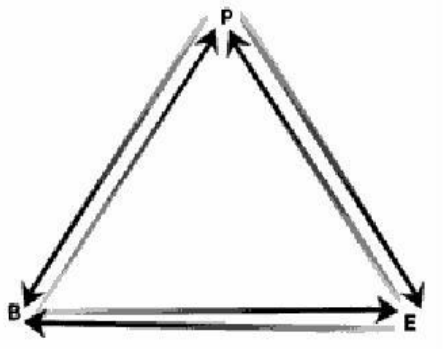

Figure 1. Bandura's model of Reciprocal Causation (Bandura, 1996) B represents behavior, P represents personal factors in the form of cognitive, affective, and biological events, and E represents the external environment
(Bandura, 1986)

SCT is entrenched in the belief that individuals are engaged in their own development and that beliefs influence their actions (Pajares et al., 2002). In other words,

"what people think, believe, and feel affects how they behave" (Bandura, 1986, p. 25). SCT postulates that individuals have forethought, and their actions are guided by self-regulated, self-generated, and external sources of influence (Bandura, 1991). Therefore, prior experiences and consequences are predictors of future behavior and regulation of behavior. According to Tschannen-Moran et al. (2006), "Social Cognitive Theory suggests that personal factors (including self-efficacy beliefs) and individual behaviors interact with the environment to influence each other through a process of reciprocal determinism" (p. 945). According to SCT teachers' perceptions of both self and organizations influence their actions (Tschannen-Moran et al., 2004).

With SCT as a framework, Pajares et al. (2002) gave an example of teachers working to improve the academic learning and confidence of students in their class. Pajares et al. (2002) suggested that teachers can improve their students' emotional states, self-beliefs, and habits of thinking (personal factors). Teachers also have the ability to improve students' academic skills and self-regulatory practices (behavior), and alter the school and classroom environment that may work to challenge student success (environmental factors) (Pajares et al., 2002). Bandura determined that thoughts people have about themselves are critical elements in the exercise of control and personal agency (Bandura 1986, 2001; Pajares et al., 2002).

Tschannen-Moran et al. (2007) indicated that, according to SCT, teachers who do not expect to be successful with particular students are less likely to put forth effort in preparation and delivery of instruction and are more willing to give up when faced with adversity even though the teacher may have strategies that could assist the student if applied. "Self-efficacy beliefs, as a foundation of Social Cognitive Theory, provide the

foundation for human motivation, well-being, and personal accomplishment" (Pajares et al., 2002, p. 2). Therefore, if people do not believe they can achieve their desired outcome, they have little reason to try or persevere when difficulties take place (Bandura, 1996; Pajares et al., 2002). The ability to achieve desired outcomes is conditioned upon having forethought. Bandura (1989) recognized the capability of forethought to guide behavior. Forethought allows an individual to anticipate consequences which can be used for setting goals and creating long-term plans to produce desired outcomes (Bandura, 1989; Curry, 2011).

Social Cognitive Theory and Grit

All efficacy belief constructs (student, teacher, and collective) are future-oriented judgements about ones' abilities to form and implement the courses of action required to produce given attainments in specific situations (Bandura, 1997). Social forethought has likely consequences for teacher grit in the educational setting as teachers take into account past successes and failures. SCT suggests that through relationships with others and self, individuals cultivate views about their own capabilities and characteristics that determine future behavior. Because SCT suggests that enhanced self-efficacy leads to motivation for persistent action, SCT has utility for explaining the relationship between teacher self-efficacy and grit.

Summary

Findings in the literature suggest that teachers are one of the most important factors, if not the most important factor, in influencing student performance (Rivkin et al., 2005; Sanders et al., 1996). Findings also suggest a statistically significant, positive relationship between teacher self-efficacy and enhanced student outcomes (Tschannen-

Moran et al., 2001). Most recently, findings in the literature support the relationship between and teacher grit and enhanced student performance (Duckworth et al., 2009b). However, little is understood about differences in teacher grit or factors that promote the development of teacher grit in an educational environment.

According to Duckworth et al. (2007), grit is even more important than IQ in helping individuals reach their potential and accomplishing their goals. Therefore, understanding the relationship between teacher self-efficacy and teacher grit can help inform educational leaders about ways to enhance these non-cognitive factors to influence student outcome goals. This understanding is especially important in a high-stakes policy environment where leaders struggle to hire and retain the most qualified teachers.

Chapter 2 began with a discussion of school improvement in the United States; this overview led to a discussion about the history of legislation in American Education. Due to the importance of teachers in education, teacher retention was addressed. Chapter 2 then continued with research about self-efficacy, specifically, student, teacher, and collective efficacy. Next, chapter 2 addressed grit starting with student grit, followed by factors that may influence grit including teacher resilience and having a growth mindset. The summary then addressed teacher grit and identified potential factors that influence grit. Chapter 2 came to a close with a discussion about the potential relationship between teacher self-efficacy and teacher grit. The theoretical framework for this study, SCT, was explained as a lens to understand the hypothesized relationship between teacher self-efficacy and teacher grit. Chapter Three explains the methods used in this study.

CHAPTER III

RESEARCH METHODS

This correlational study tested the relationship between teacher self-efficacy and teacher grit. The theoretical framework of Social Cognitive Theory (Bandura et al., 1996) is used to explain the hypothesized relationship between teacher self-efficacy and teacher grit. This chapter includes information about the schools selected for this study, the sample that was selected, and the instruments that were used. The research design, including data collection and analysis, is also explained.

The independent variable, self-efficacy, is defined as an individual's "beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1997, p. 2).The dependent variable, teacher grit, is defined as "perseverance and passion to pursue long-term goals" (Duckworth et al., 2007, (p.1087). The following questions guided this study:

Q1: Is there a relationship between teacher grit and teacher self-efficacy?

Q2: Are there differences in teacher grit by number of years taught?

Q3: Are there differences in teacher self-efficacy by number of years taught?

Q4: Do teacher grit and self-efficacy influence student outcomes?

Research Population

A teacher grit survey and a teacher self-efficacy survey were used to investigate the relationship between teacher grit and teacher self-efficacy. Two statistical techniques were used to analyze the data gathered: correlational analysis and analysis of variance (ANOVA). Data were collected in a mid-sized public school district located in a rural community containing a large research university. The district consists of six elementary schools, one middle school (6-7 grades), one junior high (8-9 grades), one high school (10-12 grades), and one alternative school (9-12 grades). Six of the schools qualify as a Title I schools, three elementary and three secondary, meaning that more than 43% of the students qualify for the federal lunch subsidy in these schools. The district had a student population of 6,081 and employed 452 certified teachers in Fall 2014 (State Department of Education, 2014).

Of the 452 certified teachers, 323 teachers taught grades 3-11 and were invited to participate in the study, and of those potential participants, 198 voluntarily completed and returned surveys. Teachers in grades 3-11 were invited to participate in the study due to state mandated testing in reading and math in these grades. Of the 198 surveys returned, 194 were usable surveys, resulting in a 60% response rate. The sample identified for this study included teachers in third grade through eleventh grade. In grades three, four, and five, the district has 22 third grade teachers, 20 fourth grade teachers, and 20 fifth grade teachers for a total of 62 core (math, science, language arts/reading, and world studies/social studies/geography) teachers. The district also employs 25 elective and 35 special education teachers and interventionists for a total of 55 additional teachers at the elementary schools. At the middle school level, 35 core teachers teach math, language

arts, world studies, or science. There are 25 additional teachers who teach electives, for a total of 60 teachers at the middle school. The Junior High has 35 teachers for eighth grade and 30 teaching ninth grade for a total of 65 teachers. For grades ten and eleven, there are 85 teachers total, 50 teaching tenth grade and 50 teaching eleventh grade with several teaching multiple grades. For the study, all participants were asked to indicate the subject(s) and grade(s) that they were teaching. Teachers were counted only one time as completing a survey.

Culture in the district has been low since spring 2013 when top-down, administrative decisions led to distrust between central administrators and teachers in the district (Muhammad, 2015). As a result of distrust, the district lost a large number of teachers in the school year 2013-2014. The district hired an outside consultant to identify the areas of distrust and to identify areas in need of improvement. This district was utilized because it serves as an opportunity to gain a better understanding of self-efficacy and grit among the teachers who chose to stay in the district. Survey data were collected in fall 2015 from 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, and 11th grade teachers in this district. Teachers in grades 3, 4, 5, 6, 7, 8, 9, 10, and 11 were utilized because students are required to take state tests for both reading and mathematics at all of these grade levels. Third grade teachers were utilized because that is the first year students are required to test and because of State legislation requiring the retention of students who are not reading at grade level at the end of the third grade year. Eleventh grade teachers were utilized because it is typically the last year that students are required to test, and those students in eleventh grade who plan to attend college are concentrating on college entrance and related exams. Third through eleventh grade teachers met the research

criteria for this study. An additional consideration in gathering data from teachers across elementary, middle and high school grade levels was the potential to examine differences in teacher grit and teacher self-efficacy across grade levels in future studies.

Surveys were distributed through teacher email addresses supplied by the district. Prior to distributing the surveys, the researcher contacted the site principals via telephone to request permission to email the teachers with the survey. Once permission was obtained the researcher then emailed each principal introductory email. The introductory email was then forwarded from the principal to his or her teachers teaching grades 3-11 to help solicit participation. After the introductory email was sent from the principals requesting teacher participation, the survey instruments were sent to the teachers via Qualtrics. Teachers returned completed surveys directly to the researcher through Qualtrics software. After the initial distribution, two additional distributions were made at one week intervals to teachers.

Measures

Instruments

Grit Scale-S. Duckworth's (2009) eight-item Short Grit Scale (Grit-S) questionnaire was used to measure Teacher Grit. The original Grit-O (original) scale identified a two-factor structure for the original 12-item self-report (Duckworth et al., 2007; Duckworth et al., 2009a). The original grit scale was consistent with the theory of grit as a compound trait comprising stamina in dimension of interest and effort; however, the differential predictive validity of these two factors for various outcomes was not discovered and needed improvement (Duckworth et al., 2009a). Therefore, Duckworth et al. (2009a) conducted separate studies that previously were completed using the Grit-O

scale. In the first study, Duckworth et al. (2009a) identified items for the Short Grit Scale (Grit-S) with the best overall predictive validity across four samples from their previous work completed in Duckworth et al., 2007. In the second study, in a novel internet sample of adults, Duckworth and her colleagues used confirmatory factor analysis to test the two factor structure of the Grit-S, then compared them to the relationships between the Grit-S and Grit-O and the Big Five personality dimensions, and examined predictive validity for educational attainment and career changes (Duckworth et al., 2009a). In the third study, Duckworth et al. (2009a) validated an informant version of the Grit-S and established consensual validity. In the fourth study, in a sample of adolescents, Duckworth et al. (2009a) measured the 1-year test-retest stability of the Grit-S. Lastly in both the fifth and sixth studies, Duckworth et al. (2009a) used samples of the West Point cadets and the National Spelling Bee finalists to further test the predictive validity of the Grit-S. The conclusion was the Grit-S questionnaire was a "more efficient measure of trait-level perseverance and passion for long-term goals" (Duckworth et al., 2009a, p. 172). Confirmatory factor analyses supported a two-factor structure of the self-report version of Grit-S in which Consistency of Interest and Perseverance of Effort both loaded on grit as second-order latent factor showing satisfactory internal consistency and strong intercorrelation (r=.59, p = .001) (Duckworth et al., 2009a). "The 8-item Grit-S is both shorter and psychometrically stronger than the 12-item Grit-O" (Duckworth et al., 2009a, 174).

The Grit-S includes 8 descriptive items that respondents rate on a five-point Likert scale, ranging from 1 (not like me at all) to 5 (very much like me) (Duckworth et al., 2009b). The score is determined by adding up all the points and dividing by 8 with a

maximum score of 5, extremely gritty, and the minimum score 1, not gritty at all (Duckworth et al., 2009b). Sample items from the Grit-S include "I am a hard worker" (Perseverance of Effort), and "I often set a goal but later choose to pursue a different one" (Consistency of Interests). The internal and external validity have been measured for this scale (Duckworth et. al. 2009). The Grit-S showed internal consistency, test-retest stability, and predictive validity (Duckworth et. al., 2009). Previous studies have confirmed high internal consistency ($\alpha = 0.85$) for the overall scale and for each factor (consistency of interest, $\alpha = 0.85$; perseverance of effort, $\alpha = 0.78$) (Duckworth et al, 2007; Duckworth & Quinn, 2009). The retest stability of the Grit-S r=.68 (Duckworth et. al., 2009). See Appendix H for the S-Grit Scale.

History of Teacher Efficacy and Scales

When discussing teacher efficacy, one must know and understand past research in regard to teacher efficacy. Armor et al. (1976), researchers from the RAND organization, conducted a study funded by the Federal Elementary and Secondary Education Act. Using Rotter's (1966) social learning theory as their theoretical base, they examined teacher characteristics, the change process, student learning, and teacher growth (Armor et al., 1976). The RAND study used a five point Likert scale on two items that were used to measure teacher efficacy, one measuring personal teaching efficacy and the other measuring general teaching efficacy. The first statement that teachers rated assessed a teacher's outcome expectation, known as, teacher efficacy, "When it comes right down to it, a teacher really can't do much because most of a student's motivation and performance depends on his or her home environment." (Armor et al., 1976, p. 159; Tschannen-Moran et al., 1998, p. 204). If teachers rated this as "agree," then the teachers were agreeing that

environmental factors overwhelmed the power of teachers (Armor et al., 1976; Tschannen-Moran et al., 1998). Item two was based on the teacher's conclusion of their personal aptitude to influence student learning or personal teaching efficacy (Woolfolk Hoy, 2004). If teachers agreed with the second item, "If I really try hard, I can get through to even the most difficult or unmotivated students" this response indicated that the teachers had confidence in their teaching abilities and could make a difference in the learning of even a difficult child (Armor et al., 1976 p. 160; Tschannen-Moran et al., 1998, p. 204). Concerns arose from only having a two-item scale; therefore, an attempt was made to develop a longer and more comprehensive measure (Tschannen-Moran et al., 1998).

Researchers desired stronger and more reliable teacher efficacy scales. In 1981, Rose and Medway developed a 28-item Teacher Locus of Control (TLC) inventory in which teachers indicated situations of student success and failure (Tschannen-Moran et al., 1998). Findings concluded that Rose and Medway's TLC inventory was a better predictor of teacher behavior than Rotter's (1966) Internal-External Scale. Guskey (1981) also developed the Responsibility for Student Achievement instrument based on Rotter's (1966) scale. Guskey (1981) concluded that greater efficacy was related to confidence in teaching and positive attitudes (Tschannen-Moran et al., 1998).

There was some controversy when it came to Bandura's self-efficacy and Rotter's locus of control. Bandura (1997) clarified the difference between self-efficacy and the locus of control. Self-efficacy is more about the belief an individual can produce certain actions; whereas, locus of control has to do with the beliefs about whether actions affect outcomes (Bandura 1997; Tschannen-Moran et al., 1998). Research shows that there is

little relationship between the two since “perceived self-efficacy is a strong predictor of behavior, whereas, locus of control is typically a weak predictor” (Tschannen-Moran et al., 1998, p. 211).

Still other researchers have based their research on Bandura’s Social Cognitive Theory. In 1984, Gibson et al. conducted a study “to develop an instrument to measure teacher efficacy, provide construct validation support for the variable, and examine the relationship between teacher efficacy and observable teacher behavior” (p. 569). In this study, elementary teachers responded to a 30-item Teacher Efficacy Scale that corresponded to Bandura’s two-factor theoretical model of self-efficacy. According to Gibson et al. (1984), “The two resulting dimensions clearly conform to Bandura’s conceptualization of self-efficacy and support Ashton and Webb’s (1982) model of teacher efficacy” (p. 574). The two scales that resulted from the phase 1 study produced reliability and internal constancy which supported Bandura’s conceptualization of self-efficacy in research on teacher efficacy. Phase 2 of the Gibson et al. study verified distinction between teacher efficacy and concepts including verbal ability and flexibility (Gibson et al., 1984). These concepts had previously been identified in research, therefore, lending support for the Teacher Efficacy Scale to measure the construct of teacher efficacy. Phase 3 included eight classroom observations in which low-efficacy teachers spent 48% more time working with small group instruction as compared to high-efficacy teachers spending 28% time working with small groups. It was also noted that high-efficacy teachers had "withitness" when it came to redirecting students who were off task. Gibson et al. (1984) confirmed, “Teacher efficacy is multidimensional, consisting of

at least two dimensions that correspond to Bandura's two-component model of self-efficacy" (p. 579).

Over the years, researchers have continued their investigation of teacher efficacy. Using Gibson and Dembo (1984) as the model, Emmer and Hickman (1990) created a 36-item measure with three efficacy subscales: efficacy for classroom management and discipline, external influences, and personal teaching efficacy. The studied yielded that pre-service teachers with higher personal teaching efficacy would be more likely to ask for assistance when dealing with student discipline (Emmer et al., 1990; Tschannen-Moran et al., 1998; Tschannen-Moran et al., 2001). Rubeck and Enochs (1991) distinguished chemistry teaching efficacy from science teaching efficacy in their study, and determined middle school science teachers personal science teaching efficacy was correlated with a preference to teach science, and chemistry teachers had a higher personal teaching efficacy for chemistry (Rubeck et. al., 1991; Tschannen-Moran et al., 1998; Tschannen-Moran et al., 2001). In 1997, Bandura constructed a 30-item instrument measured on a nine-point scale with seven subscales: efficacy to influence decision making, efficacy to influence school resources, instructional self-efficacy, disciplinary self-efficacy, efficacy to enlist parent involvement, efficacy to enlist community involvement, and efficacy to create a positive school climate (Bandura, 1997; Tschannen-Moran et al., 1998; Tschannen-Moran et al., 2001). This measure provided a multifaceted picture of teachers' efficacy beliefs (Bandura, 1997; Tschannen-Moran et al., 1998; Tschannen-Moran et al., 2001).

According to Klassen (2011), much of the more recent research is based on the troubled Gibson and Dembo (1984) Teacher Efficacy Scale. Guskey et al. (1994)

reworded items in an attempt to add clarity to the meaning of Gibson and Dembo's scale; however, the result was that internal and external factors were only moderately correlated (Guskey et al, 1994; Tschannen-Moran & Woolfolk Hoy, 2001). Researchers have warned against using this scale (Henson, 2001; Tschannen-Moran et al., 2001). Validity and reliability of previous measures were questioned; therefore, for a seminar on self-efficacy in teaching and learning in the College of Education at Ohio State University, two researchers and eight graduate students created a new teacher efficacy scale (Tschannen-Moran et al., 2001). Based on Bandura's 30-item scale, researchers were able to re-create a better and more reliable scale. They provided reliability and validity data from three studies. The new scale was created and named the Ohio State Teacher Efficacy Scale (OSTES) also known as the Teachers' Sense of Efficacy Scale (TSES). This instrument had two forms: a long form containing 24 items and a short form with 12 items (Tschannen-Moran et al., 2001). Klassen (2011) advised the use of this scale for future quantitative research. This study follows Klassen's suggestion and uses the TSES short 12-item survey.

Teacher Efficacy

Teacher efficacy was measured using Tschannen-Moran's (2001) Teachers' Sense of Efficacy Scale (TSES), also called the Ohio State Teacher Efficacy Scale. The scale includes 12 descriptive items that respondent's rate on a nine-point Likert scale, ranging from 1 (nothing) to 9 (a great deal). The 12-item scale included three dimensions of efficacy for instructional strategies, student engagement and classroom management in order to represent the requirements of good teaching and the vast work lives of teachers (Tschannen-Moran et al., 2001). Internal and external validity have been established for

this scale (Tschannen-Moran et al., 2001). The reliability for the 12-item Grit-S was 0.90 (Tschannen-Moran et al., 2001). The validity for personal teacher efficacy on the Grit-S was 0.61. The scale includes 12 descriptive items that respondents rate on a nine-point Likert scale, ranging from 1 (nothing me at all) to 9 (a great deal like me). Sample items include, "How much can you do to motivate low performing student in the classroom?" and "How much can you do to help your students' value learning?" With the short teacher efficacy form, teachers answer four questions about student engagement, four questions about instructional strategies, and four questions about classroom management. See Appendix I for the TSES Scale

Demographic Information

Collection of demographic data were also included in this study (Appendix C). This study investigated teacher grit and teacher self-efficacy by analyzing survey results from teachers across a school district including six elementary schools, one middle school, one junior high, one high school, and one alternative center. Teachers from grades three through eleven were invited to participate in the study. A total of 323 teachers were invited to participate in the study, and of those potential participants, 198 voluntarily completed and returned surveys. Of the 198 surveys that were returned, 194 were usable surveys resulting in a 60% response rate. Participants included 47 males (24%) and 147 females (76%). This study included surveys from 79 elementary teachers (grades 3-5), 47 middle school teachers (grades 6-7), 31 junior high teachers (grades 8-9), and 37 high school teachers (grades 10-12). For this research study, student outcome data were available for math and reading teachers that elected to participate in the study. Therefore, a total of 48 teachers had corresponding usable reading outcome data, and 42

math teachers had usable corresponding student outcome data. The Teacher Demographic Questionnaire is included in Appendix J.

Student Growth Percentile Reports by Teacher

Using Renaissance Learning software, the researcher collected student growth percentile (SGP) information by teacher was collected from the participating district. "Student Growth Percentiles (SGPs) are a norm-referenced quantification of individual student growth derived using quantile regression techniques" (Renaissance Math Technical Manual, 2015, p. 116). The reason for choosing this measure was that it is utilized by the district to gain a better understanding of individual teacher influence on student growth. This measure is utilized by educational leaders in the district as a way to make sure that teachers are effective within their classrooms and students are on target to meet the state performance objectives. An SGP compares a student's growth to that of his or her academic peers nationwide (Renaissance Math Technical Manual, 2015, p. 116), therefore, reflecting a student's growth under the instruction of an individual teacher. Each teacher who teaches math or reading receives a SGP score showing the median growth score of his/her students. The SGP report collected provided a measure of change from one STAR testing window, fall 2015, to a later testing window, Winter/Spring 2016. The results are relative to other students and teachers with similar starting STAR Math or Reading scores.

> SGPs can be aggregated to describe typical growth for groups of students—for example, a class, grade, or school as a whole—by calculating the group's median, or middle, growth percentile no matter how SGPs are aggregated, whether at the class, grade, or school level, the statistic and its interpretation remain the same.

> For example, if the students in one class have a median SGP of 62, that particular group of students, on average, achieved higher growth than their academic peers (Renaissance Math Technical Manual, 2015, p. 118).

Separate analyses were run (ANOVA) for SGP reports by teacher and the teacher grit and teacher self-efficacy survey scores of the math and language arts/reading teachers to answer Q4: Do teacher grit and self-efficacy influence student outcomes? Because scores for SGP are percentiles, and percentiles are contrived values, teacher scores were converted into categorical variables (high, medium, and low), and analysis of variance was used to understand if there were differences across SGP means for self-efficacy and grit.

According to Renaissance Learning, the within-grade average concurrent validity coefficients for STAR math for grades 1-6 varied from 0.64-0.74 with an overall average of 0.69 and grades 7-12 ranged from 0.56-0.75 with an overall average 0.69 (Renaissance Math Technical Manual, 2015). The predictive validity coefficients for 1-6 grades ranged from 0.55-0.72 with an average of 0.55 and for grades 7-12 it ranged 0.72-0.80 with an average of 0.76 (Renaissance Math Technical Manual, 2015). Correlation coefficients were run at the 0.05 alpha level (Renaissance Math Technical Manual, 2015). For reading, Renaissance Learning found for grades 1-6 the within-grade average concurrent validity coefficients varied from 0.72–0.80, with an overall average of 0.74 and for grades 7-12 it ranged from 0.65–0.76, with an overall average of 0.72 (Renaissance Reading Technical Manual, 2015). For grades 1-6 the predictive validity coefficients ranged from 0.69–0.72, averaging 0.71, whereas in grades 7–12 the predictive validity coefficients ranged from 0.72–0.87 with an average of 0.80 (Renaissance Reading

Technical Manual, 2015). The other validity coefficient within-grade averages varied from 0.60–0.77; the overall average was 0.72 (Renaissance Reading Technical Manual, 2015). Correlation coefficients were run at the 0.05 alpha level (Renaissance Reading Technical Manual, 2015).

Analysis of Data

Survey data were electronically collected utilizing Qualtrics software. RQ1 was analyzed using the Pearson r correlation. According to Gay, Mills, and Airasian (2012) this statistical procedure is used to determine the relationship between two or more variables belonging to the same individuals to determine the presence and strength of the relationship between variables. An analysis of variance (ANOVA) was conducted to examine if differences exist across teacher efficacy and number of years taught and grit and number of years taught (RQ2 & RQ3). Finally, four separate ANOVAs were run to determine if teacher grit and self-efficacy influence student outcomes in reading and math (RQ4). Running each analysis separately allowed the researcher to determine if statistically significant differences existed across means of teacher grit and teacher self-efficacy by student outcome scores in reading and math. Because teachers in the district teach either math or reading (and not both), and student outcomes were treated as the dependent variable in the study, running separate ANOVAs provided the most appropriate initial means of analyzing the data. If statistically significant differences were noted across means of both grit and self-efficacy for individual teachers, further analysis could be conducted to understand combined effects of grit and self-efficacy on student outcomes.

Trustworthiness

The procedure for this study began by the researcher going through the IRB process, ensuring that all criteria are met. The researcher met with the district representative to discuss the study and the proper steps that the district required prior to the beginning on the study. Permission was obtained prior to talking with site principals. Once district level permission was obtained, the researcher obtained permission from the building principals at each site. The Teachers' Sense of Efficacy Scale Short Form took approximately three minutes to complete, and the Grit-S survey took approximately three minutes to complete and the demographic portion took approximately four minutes to complete for a total of 10 minutes. Teachers took the surveys at their own convenience by utilizing a link to Qualtrics sent to their district email addresses. Prior to participation in the study, the teachers were informed about purpose of the study and their rights as participants; contact information was provided for future communication. Teachers had the opportunity to "opt out" of the survey if they did not wish to participate. The choice of "opt out" prevented them from receiving any additional invitations for participation. As indicated previously, data were collected through Qualtrics on three separate occasions, one week apart, and analyzed through SPSS software after all participants completed the survey.

Summary

Valid and reliable measures were used for teacher self-efficacy and teacher grit. Chapter IV provides the discussion of data, analysis, and findings. School leaders across the nation struggle to have more effective teachers in the classroom to more effectively meet the needs of increasingly diverse student populations. Research indicates that both teacher self-efficacy and teacher grit are noncognitive characteristics that can have a

positive impact in education. Research indicates that these characteristics can change and be developed. Therefore, it is important for educational leaders to understand the potential relationship between teacher grit and teacher self-efficacy to understand how these non-cognitive teacher characteristics may interact to influence student achievement.

CHAPTER IV

FINDINGS

The purpose of this research was to examine the relationship between teacher grit and teacher self-efficacy. A teacher grit survey and a teacher self-efficacy survey were used to investigate the relationship between teacher grit and teacher self-efficacy. Two statistical techniques were used to analyze the data including correlational analysis and analysis of variance (ANOVA). The first hypothesis was tested using the Pearson r correlation. For this study, it was hypothesized that findings would indicate a positive, statistically significant relationship between teacher grit and teacher self-efficacy. The second and third questions were tested using ANOVA. For question two, it was hypothesized that findings would indicate statistically significant differences across means of teacher grit by number of years in the classroom (i.e. Teachers with higher number of years teaching will have higher levels of grit than will new teachers.) For question three, it was hypothesized that findings would indicate statistically significant differences across means of self-efficacy by number of years taught (i.e. Teachers who have taught longer will have higher levels of self-efficacy). Lastly, for question four, four separate ANOVAs were run to test the hypothesis that there would be statistically significant differences in teacher grit and self-efficacy by student outcomes. It was hypothesized that teachers who have higher grit and self-efficacy scores will have

higher growth in student achievement. Results from each analysis are detailed in this chapter.

Descriptive Statistics

This study was conducted to investigate teacher grit and teacher self-efficacy by using survey results from teachers across a school district including six elementary schools, one middle school, one junior high, one high school, and one alternative center. Teachers from grades three through eleven were invited to participate in the study. A total of 323 teachers were invited to participate in the study and, of those potential participants, 198 voluntarily completed and returned surveys. Of the 198 surveys returned, 194 were usable surveys, resulting in a 60% response rate. Participants included 47 males or 24% and 147 females or 76%. This study included surveys from 79 elementary teachers (grades 3-5), 47 middle school teachers (grades 6-7), 31 junior high teachers (grades 8-9), and 37 high school teachers (grades 10-12). For this research study, student outcome data was available for only math and reading teachers that elected to participate in the study; therefore, a total of 48 or 25% of teachers had corresponding usable reading outcome data and 42 or 22% of math teachers had usable corresponding student outcome data.

Descriptive Statistics: Teacher Self-Efficacy and Teacher Grit

Descriptive statistics were first calculated to describe the teachers within the school district that participated in the study. Using the survey results of 194 teachers, these data guided later analyses of the relationship between teacher self-efficacy and teacher grit. Table 5.1 shows the mean score and standard deviation for teacher self-

efficacy and teacher grit. The mean score for self-efficacy was 7.10 with a standard deviation of .87 and a range of 4.58 to 9.0. The mean for teacher grit was 3.74 with a standard deviation of .51 and a range of 2.38 to 5.0. Table 5.1 displays descriptive data for teacher grit and teacher self-efficacy.

Table 5.1

Descriptive Statistics: Teacher Grit Mean by Teacher Self-Efficacy Mean

Variable Name	N	Minimum	Maximum	Mean	SD
Grit Mean	194	2.375	5.000	3.738	.506
Self-Efficacy Mean	194	4.583	9.000	7.100	.870

Pearson Correlation: Question One

Pearson correlation coefficients were computed to analyze the relationship between variables in this study. The Pearson correlation was utilized to determine if there was a relationship between teacher self-efficacy and teacher grit. The test was conducted using an alpha of .05. The hypothesis proposed for the study was that findings would indicate a statistically significant, positive relationship between self-efficacy and teacher grit. The assumption of linearity was reasonable given a review of a scatterplot of the variables. The scatterplot (Appendix G) illustrates the weak positive relationship between teacher grit and teacher self-efficacy.

Correlation Results

The Pearson correlation between teacher self-efficacy and teacher grit (r=.306), indicating a positive relationship is interpreted as a medium effect size (Cohen, 1988), and is statistically different from 0 ($r = .306$, $n = 194$, $p \leq .01$). Thus, the hypothesis that there is a statistically significant relationship between teacher self-efficacy and teacher grit is supported at the .01 level of significance. Findings indicate a medium, positive correlation between teacher self-efficacy and teacher grit as measured by the Duckworth and Quinn Grit Scale (Duckworth et al., 2009) and teacher self-efficacy as measured by Tschannen-Moran's Teacher Self-Efficacy Scale (2001). Findings indicate that teacher self-efficacy accounts for approximately 10% of variance in grit ($R^2 = .094$). Therefore, based upon results of this study, for this group of teachers, as self-efficacy increases, an accompanying increase in teacher grit is observed. Table 5.2 displays the correlational data regarding the relationship between teacher grit and teacher self-efficacy.

Table 5.2

Pearson Correlation Test Results for Teacher Grit and Teacher Self Efficacy

		Grit Mean	SE Mean
Grit Mean	Pearson Correlation	1	.306**
	Sig. (2-tailed)		.000
	N	194	194
SE Mean	Pearson Correlation	.306**	1
	Sig. (2-tailed)	.000	
	N	194	194

**Correlation is significant at the 0.01 level (2-tailed). ($R^2 = .094$)

One-Factor Analysis of Variance Results: Research Questions Two and Three

An analysis of variance was used to address questions two and three because the questions sought to understand differences across means of teacher grit and teacher self-efficacy by number of years taught. Question two stated, "Are there differences in teacher grit by number of years taught?" Question three stated," Are there differences in teacher self-efficacy and the number of years taught?"

Teacher Grit by Number of Years Taught

To answer this question, the number of years a teacher taught was converted into a categorical variable. Levene test for homogeneity of variance was calculated to ensure equal distribution of variance across categories. Data fell neatly into four categories. The first category identified by the researcher was one to five years of teaching experience. This decision to use this time frame was made due to documentation in the literature that over 50% of new teachers leave the teaching profession within the first five years of teaching (Kopkowski, 2008; Thornton, 2004). The second category identified through descriptive data analysis was 6 to 12 years of teaching experience. The third category included teachers who taught 13 to 15 years. Lastly, the fourth category included any teacher who had taught 16 years or more. Surprisingly, approximately 40% of the participants who participated the in this study had been teaching 16 or more years.

Descriptive Statistics. Descriptive statistics were first calculated to describe grit mean by number of years teaching. Because not every teacher who responded to the survey answered the question about number of years teaching, the sample size was

reduced to 189. Using the survey results of 189 teachers, Table 5.3 shows the mean score and standard deviation for teacher grit and years of teaching. The mean of category 1 (one to five years of teaching) was 3.63 with a standard deviation of .54. The mean of category 2 (6 to 12 years of teaching) was 3.79 with a standard deviation of .48. The mean of category 3 (13 to 15 years of teaching) was 3.68 with a standard deviation of .51. The mean of category 4 (16 or more years of teaching) was 3.79 with a standard deviation of .49.

Table 5.3

Descriptive Statistics: Grit Mean by Number Years Teaching (Categorical)

Grit Mean					95% CI			
YT	N	Mean	SD	Std. Error	LB	UB	Min	Max
1	44	3.631	.543	.082	3.466	3.796	2.375	4.625
2	50	3.790	.478	.067	3.654	3.926	2.875	5.000
3	20	3.675	.509	.114	3.437	3.913	2.500	4.500
4	75	3.785	.493	.057	3.671	3.900	2.625	4.750
Total	189	3.739	.504	.037	3.667	3.811	2.375	5.000

Note. YT = years teaching by category; CI= confidence interval; LB = lower bound; UB = upper bound; Min = minimum; Max = maximum

Analysis of Variance. A one-way ANOVA was conducted to determine if there differences in teacher grit by number of years taught. The assumption of normality was tested and met via examination of the residuals. Review of the S-W test for normality

(*SW* = .986, df = 189, p = .049) and skewness (-.186) and kurtosis (-.566) statistics suggested that normality was a reasonable assumption. The boxplot suggested a relatively normal distributional shape with no outliers of the residual (Appendix A.1). The Q-Q plot and histogram suggested normality was reasonable (Appendix A.2). The histogram was skewed a little to the right (Appendix A.3). According to the Levene test, the homogeneity of variance assumption was satisfied [F(3, 185) = .690, p = .559]. Additionally, a scatterplot of residuals against the levels of the independent variable was reviewed. A random display of points around 0 provided further evidence that the assumption of independence was met (Appendix A.4).

Results from the one-way ANOVA indicate that difference across means is not statistically significant (F = 1.168, df 3, 185, p = .323) (Table 5.4). The means and the profile plot (Appendix A.5) suggest that for participants in this study, grit increases after the first five years of teaching (category 2). Teacher grit then drops between years 12 and 15 (category 3). Teacher grit then begins to increase from year 16 and above (category 4).

Table 5.4

One-way ANOVA Test of Between-Subject Effects: Teacher Grit by Years Taught (Categorical)

Dependent Variable: Teacher Grit Mean

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power

Cr	.887α	3	.296	1.168	.323	.019	.311
Inter	2087.813	1	2087.813	8248.950	.000	.978	1.000
YT	.887	3	.296	1.168	.323	.019	.311
Error	46.824	185	.253				
Total	2689.609	189					
CrTt	47.710	188					

α. R Squared = .019 (Adjusted R Squared = .003) b. Computed using alpha = .05; *Note.* Cr = corrected, Inter = Intercept, CrTt = corrected total, YT = years teaching by category

Teacher Self-Efficacy and Years Taught

Descriptive Statistics: Teacher Self-Efficacy and Years Taught

Descriptive statistics were calculated to describe teacher self-efficacy by number years teaching. Using the survey results of 189 teachers, Table 5.5 shows the mean score and standard deviation for teacher self-efficacy and years of teaching. The mean of category 1 (one to five years of teaching) was 6.82 with a standard deviation of .78. The mean of category 2 (6 to 12 years of teaching) was 7.16 with a standard deviation of .75. The mean of category 3 (13 to 15 years of teaching) was 7.12 with a standard deviation of .80. The mean of category 4 (16 or more years of teaching) was 7.20 with a standard deviation of .94.

Table 5.5

Descriptive Statistics: Teacher Self-Efficacy by Years Taught (Categorical)

Self-Efficacy Mean	95% CI

YT	N	Mean	SD	Std. Error	LB	UB	Min	Max
1	44	6.818	.776	.117	6.582	7.054	5.000	9.000
2	50	7.162	.752	.106	6.948	7.375	5.167	8.833
3	20	7.121	.802	.179	6.746	7.500	5.42	8.833
4	75	7.202	.9340	.108	6.996	7.418	4.667	8.833
Total	189	7.093	.849	.0618	6.972	7.212	4.667	9.000

Note. YT = years teaching by category; CI= confidence interval; LB = lower bound; UB = upper bound; Min = minimum; Max = maximum

One-way ANOVA: Teacher Self-Efficacy by Years Taught

A one-way ANOVA was conducted to determine if there are differences in teacher self-efficacy by number of years taught. The assumption of normality was tested and met via examination of the residuals. Review of the S-W test for normality (*SW* = .992, df = 189, p = .359) and skewness (-.223) and kurtosis (.252) statistics suggested that normality was a reasonable assumption. The boxplot suggested a relatively normal distributional shape with two outliers of the residual (Appendix B.1). The Q-Q plot and histogram suggested normality was reasonable (Appendix B.2). The histogram was skewed a little on the left (Appendix B.3). According to the Levene test, the homogeneity of variance assumption was satisfied [F(3, 185) = 2.205, p = .089]. Additionally, a scatterplot of residuals against the levels of the independent variable was reviewed. A random display of points around 0 provided further evidence that the assumption of independence was met (Appendix B.4).

Results from the one-way ANOVA indicate that the difference across means of teacher self-efficacy according to years taught is not statistically significant (F = 2.102, df 3, 185, p = .102) (Table 5.6). The means and the profile plot (Appendix B.5) suggest teacher self-efficacy increases after the first five years of teaching (category 2). Like teacher grit, teacher self-efficacy then drops from year 12 to 15 (category 3). Teacher self-efficacy then increases from year 16 and above (category 4).

Table 5.6

One-way ANOVA Test of Between-Subject Effects: Teacher Self-Efficacy by Years Taught

Dependent Variable: Teacher Self-Efficacy Mean

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power
Cr	4.469α	3	1.490	2.102	.102	.033	.531
Inter	7552.798	1	7552.798	10656.753	.000	.983	1.000
YT	.887	3	.296	1.168	.323	.019	.531
Error	131.116	185	.709				
Total	9645.569	189					
CrTt	135.585	188					

α. R Squared = .033 (Adjusted R Squared = .017) b. Computed using alpha = .05; *Note.* YT = years taught by category, Cr = corrected, Inter = Intercept, CrTt = corrected total

Differences in Teacher Grit and Self-Efficacy by Student Outcomes

In order to answer question number four, four separate one-way ANOVAs were conducted to determine if teacher grit and self-efficacy influence student outcomes in

math and reading. Most teachers do not teach both math and reading; therefore, a two-way ANOVA was not an appropriate test. Each teacher who teaches math or reading receives a Student Growth Percentiles (SGP) score showing the median growth score of their students. Since the SGP scores are reported as percentages, and percentages are contrived numbers, the scores were converted for both math and reading into categorical variables (low, middle, and high). Based upon analysis of the data for both math and reading, data fell neatly into three categories for each variable. Separate one-way ANOVAs were run to test differences across means of teacher grit and self-efficacy for math and reading student outcome data using SGP scores from STAR test by Renaissance Learning.

Descriptive Statistics: Teacher Grit and Math SGP Scores

Descriptive statistics were calculated to describe teacher grit by math SGP scores. Using the results of 42 teachers' SGP scores, Table 5.7 shows the mean score and standard deviation for teacher grit by math SGP scores.

Table 5.7

Descriptive Statistics: Teacher Grit Mean by Math SGP Scores

	N	Min	Max	Mean	SD
Grit Mean	194	2.375	5.000	3.738	.506
M-SGP	42	1.00	3.000	1.976	.811
Valid N	42				

Note. M-SGP = Math Student Percentile Growth; CI= confidence interval; LB = lower bound; UB = upper bound; Min = minimum; Max = maximum

The math SGP scores were entered into three categories. The category of 1 (0-56) was 3.62 with a standard deviation of .50. The category of 2 (57-65) was 3.65 with a standard deviation of .59. The category of 3 (66 or more) was 3.73 with a standard deviation of .52. Descriptive statistics were calculated to describe the teacher grit by math SGP scores as shown in Table 5.8. Teachers submitted a total of 194 usable surveys with a minimum grit mean score of 2.38 and a minimum mean grit score of 5.000. The math SGP scores included 42 usable scores. The scores were broken down into three categories with a minimum of 1.00, a maximum 3.00, a mean of 1.98, and a standard of .82.

Table 5.8

Descriptive Statistics: Teacher Grit by Math SGP Scores (Categorical)

Dependent Variable: Grit Mean					95% CI			
M-SGP	N	Mean	SD	Std. Error	LB	UB	Min	Max
1	14	3.616	.499	.133	3.328	3.904	2.875	4.375
2	15	3.650	.589	.152	3.324	3.976	2.500	4.500
3	13	3.730	.523	.145	3.415	4.047	2.875	4.500
Total	42	3.660	.529	.082	3.499	3.828	2.500	4.500

Note. M-SGP = Math Student Percentile Growth; CI= confidence interval; LB = lower bound; UB = upper bound; Min = minimum; Max = maximum, Cr = corrected, Inter = Intercept, CrTt = corrected total

One-way ANOVA: Teacher Grit and Math SGP Scores

The Math (M) SGP categories include: category 1 M-SGP scores 0-56, category 2 M-SGP scores 57-65, and category 3 M-SGP scores 66 or more. The assumption of normality was tested and met via examination of the residuals. Review of the S-W test for normality (*SW* = .964, df = 42, p = .207) and skewness (-.256) and kurtosis (-.926) statistics suggested that normality was a reasonable assumption. The boxplot suggested a relatively normal distributional shape with no outliers of the residual (Appendix C.1). The Q-Q plot suggested normality was reasonable (Appendix C.2). The histogram was skewed a little to the right (Appendix C.3). According to the Levene test, the homogeneity of variance assumption was satisfied [F(2, 39) = .324, p = .725]. Additionally, a scatterplot of residuals against the levels of the independent variable was reviewed. A random display of points around 0 provided further evidence that the assumption of independence was met (Appendix C.4).

Table 5.9 indicates that the one-way ANOVA is not statistically significant (F = .160, df 2, 39, p = .853). The means and the profile plot (Appendix C.5) suggests that there is an increase in teacher grit from category 1, to category 2, to category 3 with a larger increase from category 2 to category 3. Although the finding was not significant, this could be because the sample size was not large enough.

Table 5.9

One-way ANOVA Test of Between-Subject Effects: Teacher Grit by Math SGP

Dependent Variable: Grit Mean

	Type III Sum				Partial Eta	Observed

Source	of Squares	df	Mean Square	F	Sig.	Squared	Power
Cr	.093ɑ	2	.047	.160	.853	.008	.073
Inter	562.420	1	562.420	1930.893	.000	.980	1.000
M-SGP	.093	2	.047	.160	.008	.319	.073
Error	11.360	39	.291				
Total	575.203	42					
CrTt	11.453	41					

ɑ. R Squared = .008 (Adjusted R Squared = -.043) b. Computed using alpha = .05

Note. Cr = corrected, Inter = Intercept, CrTt = corrected total, M-SGP = Math growth percentile

Teacher Grit and Reading SGP

Descriptive Statistics: Teacher Grit and Reading SGP Scores

Descriptive statistics were calculated to describe the teacher grit by reading SGP scores. Using the results of 48 teachers' SGP scores, Table 5.10 shows the mean score and standard deviation for teacher grit by category of reading SGP scores.

Table 5.10

Descriptive Statistics: Teacher Grit Mean by Reading SGP Scores

	N	Min	Max	Mean	SD
Grit Mean	194	2.375	5.000	3.738	.506
R-SGP	482	1.00	3.000	2.042	.798
Valid N	48				

Note. R-SGP = Reading Student Percentile Growth; CI= confidence interval; LB = lower bound

The category of 1 (0-55) was 3.77 with a standard deviation of .60. The category of 2 (56-67) was 3.83 with a standard deviation of .46. The category of 3 (68 or more) was 3.78 with a standard deviation of .41. Descriptive statistics were calculated to describe the teacher grit by reading SGP scores as shown in Table 5.11. Teachers submitted a total of 194 usable surveys with a minimum grit mean score of 2.38 and a maximum mean grit score of 5.000. The reading SGP scores included 48 usable scores. The scores were broken down into three categories with a minimum of 1.00, a maximum 3.00, a mean of 2.04 and a standard deviation of .80.

Table 5.11

Descriptive Statistics: Teacher Grit by Reading SGP Scores (Categorical)

Grit Mean					95% CI			
R-SGP	N	Mean	SD	Std. Error	LB	UB	Min	Max
1	14	3.768	.602	.160	3.420	4.116	3.000	5.000
2	18	3.833	.464	.109	3.603	4.064	2.875	4.500
3	16	3.781	.412	.103	3.562	4.001	2.875	4.250
Total	48	3.800	.482	.070	3.657	3.937	2.875	5.000

Note. R-SGP = Reading Student Percentile Growth; CI= confidence interval; LB = lower bound; UB = upper bound; Min = minimum; Max = maximum

One-way ANOVA: Teacher Grit and Reading SGP Scores

The Reading (R) SGP categories include: category 1 R-SGP scores 0-55, category 2 R-SGP scores 56-67, and category 3 R-SGP scores 68 or more. The assumption of normality was tested and met via examination of the residuals. Review of the S-W test for normality (*SW* = .981, df = 48, p = .636) and skewness (-.030) and kurtosis (-.287) statistics suggested that normality was a reasonable assumption. The boxplot suggested a relatively normal distributional shape with no outliers of the residual (Appendix D.1). The Q-Q plot suggested normality was reasonable (Appendix D.2). The histogram was skewed a little to the left (Appendix D.3). According to the Levene test, the homogeneity of variance assumption was satisfied [F(2, 45) = .819, p = .447]. Additionally, a scatterplot of residuals against the levels of the independent variable was reviewed. A random display of points around 0 provided further evidence that the assumption of independence was met (Appendix D.4).

Table 5.12 indicates that the one-way ANOVA is not statistically significant (F = .082, df 2, 45, p = .922). The means and the profile plot (Appendix D.5) suggests that there is a large increase in teacher grit scores from category 1 to 2, then a large drop in teacher grit from category 2 to category 3. According to this chart, teachers with the highest grit do not have the highest test scores in reading. The teachers with the highest grit were category 2 teachers. Although the finding was not significant, these results could be due to a small sample size.

Table 5.12

One-way ANOVA Test of Between-Subject Effects: Teacher Grit by Reading SGP Scores

Dependent Variable: Grit Mean

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power
Cr	.040α	2	.020	.082	.922	.004	.062
Inter	683.751	1	683.751	2818.323	.000	.984	1.000
R-SGP	.040	2	.020	.082	.922	.004	.062
Error	10.917	45	.243				
Total	702.938	48					
CrTt	10.957	47					

α. R Squared = .004 (Adjusted R Squared = -.041) b. Computed using alpha = .05 *Note.* Cr = corrected, Inter = Intercept, CrTt = corrected total, R-SGP = Reading growth percentile

Teacher Self-Efficacy and Math SGP

Descriptive statistics were calculated to describe teacher self-efficacy by math SGP scores. Using the results of 42 teachers' math-SGP scores, Table 5.13 shows the mean score and standard deviation for teacher self-efficacy by math SGP scores.

Table 5.13

Descriptive Statistics: Teacher Self-Efficacy Mean by Math SGP Scores

	N	Min	Max	Mean	SD
SE Mean	194	4.53	9.000	7.100	.870
M-SGP	42	1.00	3.000	1.976	.811
Valid N	42				

Note. M-SGP = Math Student Percentile Growth; CI= confidence interval; LB = lower bound; UB = upper bound; Min = minimum; Max = maximum

The math SGP scores were entered into three categories. The category of 1 (0-56) had a mean of 7.11with a standard deviation of .89. The category of 2 (57-65) had a mean of 7.18 with a standard deviation of 1.09. The category of 3 (66 or more) had a mean of 7.22 and a standard deviation of .94. Descriptive statistics were calculated to describe the teacher self-efficacy by math SGP scores as shown in Table 5.14. Teachers submitted a total of 194 usable surveys with a minimum self-efficacy mean score of 4.58 and a maximum mean self-efficacy score of 9.000. The math SGP scores included 42 usable scores since not all teachers included in this study teach math. The scores were broken down into three categories with a minimum of 1.00, a maximum 3.00, a mean of 1.98, and a standard of .81.

Table 5.14

Descriptive Statistics: Teacher Self-Efficacy by Math SGP Scores (Categorical)

Self-Efficacy Mean					95% CI	
M-SGP	N	Mean	SD	Std. Error	LB	UB
1	14	7.107	.889	.626	6.578	7.636
2	15	7.178	1.088	.253	6.667	7.689
3	13	7.224	.935	.271	6.67	7.773
Total	13	7.169	.956			

Note. R-SGP = Reading Student Percentile Growth; CI= confidence interval; LB = lower bound; UB = upper bound; Min = minimum; Max = maximum

One-way ANOVA: Teacher Self-Efficacy and Math SGP Scores

The Math (M) SGP categories include: category 1 M-SGP scores 0-56, category 2 M-SGP scores 57-65, and category 3 M-SGP scores 66 or more. The assumption of normality was tested and met via examination of the residuals. Review of the S-W test for normality (*SW* = .983, df = 42, p = .767) and skewness (-.048) and kurtosis (-.591) statistics suggested that normality was a reasonable assumption. The boxplot suggested a relatively normal distributional shape with no outliers of the residual (Appendix E.1). The Q-Q plot suggested normality was reasonable (Appendix E.2). The histogram was reasonable (Appendix E.3). According to the Levene test, the homogeneity of variance assumption was satisfied [F(2, 39) = .377, p = .689]. Additionally, a scatterplot of residuals against the levels of the independent variable was reviewed. A random display of points around 0 provided further evidence that the assumption of independence was met (Appendix E.4).

Table 5.15 indicates that the one-way ANOVA is not statistically significant (F = .047, df 2, 39, p = .952). The means and the profile plot (Appendix E.5) suggest that there is a consistent increase of math SGP scores as teacher self-efficacy increases. However, the findings from this analysis were not significant; these results could result from a small sample size.

Table 5.15

One-way ANOVA Test of Between-Subject Effects: Teacher Self-Efficacy by Math SGP Scores

Dependent Variable: Self-Efficacy Mean

	Type III Sum				Partial Eta	Observed

Source	of Squares	df	Mean Square	F	Sig.	Squared	Power
Cr	.095ɑ	2	.047	.049	.952	.003	.057
Inter	2151.673	1	2151.673	2247.162	.000	.983	1.000
M-SGP	.095	2	.047	.049	.952	.003	.057
Error	37.343	39	.958				
Total	2195.799	42					
CrTt	37.437	41					

ɑ. R Squared = .003 (Adjusted R Squared = -.049) b. Computed using alpha = .05 *Note.* Cr = corrected, Inter = Intercept, CrTt = corrected total, M-SGP = Math growth percentile

Teacher Self-Efficacy and Reading SGP

Descriptive statistics were calculated to describe the teacher self-efficacy by reading SGP scores. Using the results of 48 teachers' reading-SGP scores, Table 5.16 shows the mean score and standard deviation for teacher self-efficacy by reading SGP scores.

Table 5.16

Descriptive Statistics: Teacher Self-Efficacy Mean by Reading SGP Scores

	N	Min	Max	Mean	SD
SE Mean	194	4.53	9.000	7.100	.870
R-SGP	48	1.00	3.000	2.042	.798
Valid N	48				

Note. R-SGP = Reading Student Percentile Growth; CI= confidence interval; LB = lower bound; UB = upper bound; Min = minimum; Max = maximum

The reading SGP scores were separated into three categories. The category of 1 (0-55) had a mean of 7.18 with a standard deviation of .87. The category of 2 (56-67) had a mean of 7.34 with a standard deviation of .82. The category of 3 (68 or more) had a mean of 7.18 and a standard deviation of .84. Descriptive statistics were calculated to describe the teacher self-efficacy by reading SGP scores as shown in Table 5.17. Teachers submitted a total of 194 usable surveys with a minimum self-efficacy mean score of 4.58 and a maximum mean self-efficacy score of 9.000. The reading SGP scores included 48 usable scores. The scores were broken down into three categories with a minimum of 1.00, a maximum 3.00, a mean of 2.04, and a standard of .80.

Table 5.17

Descriptive Statistics: Teacher Self-Efficacy by Reading SGP Scores (Categorical)

Self-Efficacy Mean					95% CI	
R-SGP	N	Mean	SD	Std. Error	LB	UB
1	14	7.184	.869	.225	6.732	7.637
2	18	7.337	.818	.198	6.939	7.737
3	16	7.188	.839	.210	6.764	7.611
Total	48	7.243	.825			

Note. R-SGP = Reading Student Percentile Growth; CI= confidence interval; LB = lower bound; UB = upper bound; Min = minimum; Max = maximum

One-way ANOVA: Teacher Self-Efficacy and Reading SGP Scores

The Reading (R) SGP categories include: category 1 R-SGP scores 0-55, category 2 R-SGP scores 56-67, and category 3 R-SGP scores 68 or more. The assumption of normality was tested and met via examination of the residuals. Review of the S-W test for normality (*SW* = .990, df = 48, p = .947) and skewness (.127) and kurtosis (-.248) statistics suggested that normality was a reasonable assumption. The boxplot suggested a relatively normal distributional shape with no outliers of the residual (Appendix F.1). The Q-Q plot suggested normality was reasonable (Appendix F.2). The histogram was reasonable (Appendix F.3). According to the Levene test, the homogeneity of variance assumption was satisfied [F(2, 45) = .137, p = .872]. Additionally, a scatterplot of residuals against the levels of the independent variable was reviewed. A random display of points around 0 provided further evidence that the assumption of independence was met (Appendix F.4).

Table 5.18 indicates that results from the one-way ANOVA were not statistically significant (F = .184, df 2, 45, p = .833). The means and the profile plot (Appendix F.5) suggests that there is an increase in self-efficacy scores for teachers between category 1 to category 2 and a decline in self-efficacy scores between category 2 to category 3. According to this chart, teachers with lower R-SGP scores have self-efficacy scores that are consistent with teachers that have high SGP scores. The teachers with the highest self-efficacy are those with medium R-SGP scores. Findings from the one-way ANOVA were not statistically significant; these results could be caused by a small sample size.

Table 5.18

One-way ANOVA Test of Between-Subject Effects: Teacher Self-Efficacy by Reading SGP Scores

Dependent Variable: Self-Efficacy Mean

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power
Cr	.259α	2	.130	.184	.833	.008	.077
Inter	2487.404	1	248.404	3523.680	.000	.987	1.000
R-SGP	.259	2	.130	.184	.833	.008	.077
Error	31.766	45	.706				
Total	212550.194	48					
CrTt	32.025	47					

α. R Squared = .008 (Adjusted R Squared = -.036) b. Computed using alpha = .05 *Note.* Cr = corrected, Inter = Intercept, CrTt = corrected total, M-SGP = Reading growth percentile

Separate one-way ANOVAs were run to test differences across means of teacher grit and self-efficacy for math and reading student outcome data using SGP scores from STAR test by Renaissance Learning. Because results from each ANOVA resulted in findings that were not statistically significant, no bivariate analysis was run.

Summary

This study investigated teacher grit and teacher self-efficacy by using survey results from teachers across a school district. Two statistical techniques were used to analyze the data including correlational analysis and analysis of variance (ANOVA). The

Pearson correlation between teacher self-efficacy and teacher grit (r=.306), indicating a positive relationship, is interpreted as a medium effect size (Cohen, 1988), and is statistically different from 0 ($r = .306$, $n = 194$, $p \leq .01$). Thus, the hypothesis for research question one, that there is a statistically significant, positive relationship between teacher self-efficacy and teacher grit, is supported at the .01 level of significance. No other statistically significant findings were noted in this study, indicating that the hypotheses for research questions two, three and four were unsupported. Chapter V provides a discussion of these findings.

CHAPTER V

DISCUSSION

Introduction

Educational leaders today face unprecedented challenges in meeting building and district goals. Federal legislation puts responsibility for educating students, and ultimately enhancing student outcomes, squarely on educators while factors such as increased incidence of poverty, lower family involvement in education, extreme budget shortfalls, and severe teacher shortages threaten the very sustainability of public education (Clayton 2011; Ingersoll, 2003; Jacob, 2007; Loeb et al., 2005; Mullis et. al, 2012; Reddy et al., 2015). Principals are often at a loss concerning how to retain qualified teachers in the profession and, ultimately, to build perseverance in their teachers to help them successfully navigate the challenges of educating students in the 21st century (Castro et al., 2010; Maranto et al., 2012). Grit is a teacher characteristic that appears to be a characteristic needed in the current educational climate where obstacles abound and interfere with achieving long term educational goals. This chapter will review and summarize the dissertation research, identify research findings, and discuss conclusions, implications, and suggestions for future research.

This study investigated the relationship between teacher self-efficacy and teacher grit. Grit is a newer concept in the literature and is defined as "perseverance and passion to pursue long-term goals" (Duckworth et al., 2007, p. 1087). Findings in previous studies indicate that individuals with grit stay interested, committed, and work toward challenges (Duckworth et al., 2007; Maddi et al., 2012). Individuals with high grit approach achievement with determination and a willingness to demonstrate sustained commitment despite obstacles that may hinder student learning (Duckworth et al., 2007; Shectman et al., 2013). Although studies on grit typically seek to understand student grit to reach educational goals, a recent development in the literature by Robertson-Kraft et al. (2014) has been in the investigation of teacher grit.

Although teacher grit has been identified as a factor that influences teacher success in meeting educational goals, before this study was conducted, little was known about any of the factors that actually influence teacher grit. There may be other factors that influence teacher grit not investigated in this study. This study provides insight into the relationship between the teacher grit and teacher self-efficacy in terms of number of years teaching, as a factor that may affect grit.

Research Questions

The following research questions were the focus of this study:

Q1: Is there a relationship between teacher grit and teacher self-efficacy?

Q2: Are there differences in teacher grit by number of years taught?

Q3: Are there differences in teacher self-efficacy by number of years taught?

Q4: Do teacher grit and self-efficacy influence student outcomes?

Discussion of Findings

Descriptive Data

Descriptive data on teacher grit and teacher self-efficacy provide insight into the sample of teachers who participated in the study. Even though descriptive evidence does not address the hypotheses, the information does have implications for understanding the interaction patterns for this study.

The mean for teacher grit was 3.74 with a standard deviation of .51 and a range of 2.38 to 5.0. For teacher grit, teachers could rate themselves on a five point scale ("very much like me" to "not like me at all"). The mean score for grit was 3.74. The findings for this study were consistent with the Duckworth et al. (2009b) study where researchers found a grit mean of 3.89. In the Duckworth study, researchers surveyed only first and second year Teach for America teachers (Duckworth et al., 2009b). These findings support Duckworth et al.'s (2009b) contention that the profession of teaching lends to attracting gritty, satisfied, and optimistic individuals.

The mean for self-efficacy was 7.10 with a standard deviation of .87 and a range of 4.58 to 9.0. Teachers could rate themselves on a nine-point scale from 1-Nothing like me to 9-A Great Deal like me. For this scale, teachers rated themselves on items including efficacy for instructional strategies, efficacy for classroom management, and efficacy for student engagement. With a mean of 7.10 for efficacy, most teachers had a fairly high self-efficacy rating with the lowest score at a 4.58. Tschannen-Moran et al. (2007) conducted a study using only two categories, beginning teachers (one to three years of experience) and career teachers (four or more years of experience). In their

study, they found in a mean of 6.87 for teachers with three or less years of teaching and a mean of 7.29 for four or more years of teaching (Tschannen-Moran et al., 2007). These results for teacher self-efficacy are consistent with what was found in this study which used four categories for teachers beginning one to five years, 6 to 12 years of teaching, 13 to 15 years of teaching, and 16 years or more. Findings from this study indicate that this group of teachers has fairly strong self-efficacy for reaching educational outcomes with their students.

Pearson Correlation for Teacher Grit and Teacher Self-Efficacy

Results from the correlation analysis supports the first hypothesis by indicating a statistically significant, positive relationship between teacher grit and teacher self-efficacy. These findings suggest that as self-efficacy increases, teacher grit also increases. This study is the first known study to identify a relationship between teacher grit and teacher self-efficacy. These findings are important because individuals with higher grit tend to work harder than corresponding peers, and remain dedicated to their chosen pursuits longer (Duckworth et. al., 2007; Duckworth et al., 2009b). The Pearson correlation between teacher self-efficacy and teacher grit of .306, indicating a positive correlation, is interpreted as a medium effect size (Cohen, 1988), and is statistically different from 0 ($r = .306$, $n = 194$, $p \leq .01$). Findings from this study indicate that self-efficacy accounts for approximately 10 percent of the variance in teacher grit. This finding is important, and it was the primary focus of this research. According to Social Cognitive Theory (SCT) (Bandura, 1997), teachers with higher self-efficacy are more likely to stay committed when faced with a challenge and stay committed to teaching. Teaching is a challenging profession, and understanding ways to increase teacher grit is

important for educational leaders as they seek to encourage teachers to remain in the profession. According to SCT, teachers who do not anticipate being successful with certain students are less likely to put forth effort in preparing and delivering instruction. The relationship between teacher self-efficacy and teacher grit in this study suggests that self-efficacy provides a foundation of motivation to teachers to persist in their efforts to reach educational outcomes. Therefore, findings from this study offer suggestions for promoting teacher grit and potentially, suggestions for promoting teacher retention in the profession. A statistically significant relationship between teacher self-efficacy and teacher grit indicates that educational leaders may be able to establish school environments that enhance teacher grit. For example, Bandura (1989) explained that mastery experiences and vicarious learning influence self-efficacy as individuals gain confidence in their efforts and witness the success of others. This understanding suggests that educational leaders ultimately may be able to influence teacher grit by enhancing teacher self- efficacy. For example, if professional development efforts are designed to enhance efficacy through mastery experiences, and teachers are given opportunities to witness the success of others, enhanced teacher grit may result. Because results from this analysis are correlational, causation cannot be assumed. However, self-efficacy is a non-cognitive factor that is influenced by social factors (Bandura, 1989). It stands to reason that providing environments that enhance teacher self-efficacy may result in enhanced teacher grit as well. This understanding provides valuable direction to educational leaders as they seek to retain qualified teachers in the workforce.

One-Factor Analysis of Variance Results for Number of Years Teaching: Q2 and Q3

Research Question Two. Findings for question two, "Are there differences in teacher grit by number of years taught?" were not statistically significant ($F = 1.168$, df 3, 185, $p = .323$). Closer inspection of the means and the profile plot (Appendix A.5) suggested that grit increases after the first five years of teaching (category 2). What is interesting about this finding is that given the research on teachers leaving the profession at alarming rates in the first five years of teaching (Kopkowski, 2008; Thornton, 2004), this study may have identified that the teachers who choose to remain in the profession may actually be the grittier teachers. Analyzing these findings through Bandura's (1977) Social Cognitive Theory suggests that teachers with less self-efficacy are less likely to stay in the teaching profession. Findings from this study also suggest that teachers with less grit are most likely the teachers who leave within the first five years of teaching. This finding offers important implications for the importance of building grit in teachers early in their careers. The increase in teacher grit from category 1 (one to five years of teaching) to category 2 (6 to 12 years of teaching) may represent the grittiest teachers choosing to stay after five years of teaching. Additionally, the grit mean for category 2 (3.790) is a bit higher than the grit mean for teachers who have remained in the profession the longest, category 4 (3.785). The finding from this study that suggests that teacher grit then drops from year 13 to 15 (category 3) is a finding that warrants further investigation. This finding is difficult to interpret with data gathered from this study. A qualitative study that investigates changes in teacher grit through years of teaching may help to further explain this finding. Additionally, replicating this study with a larger sample size and multiple districts could provide additional clarity regarding this finding. The finding that teacher grit then begins to increase from year 16 and above (category 4)

is not surprising. It is expected that teachers who choose teaching as a career and who stay in the profession extended periods of time would have high levels of grit according to SCT. What was surprising was that teachers with 6 to 12 years of teaching experience scored slightly higher in grit than teachers with 16 or more years of experience. Additional research could provide additional understandings and could, potentially, highlight the importance of identifying factors that influence the formation of teacher grit to encourage teachers to remain in the profession.

Research Question Three. Findings for question three, "are there differences in teacher self-efficacy by number of years taught," were conducted using a one-way ANOVA. These findings were not statistically significant ($F = 2.102$, df 3, 185, $p = .102$). The means and the profile plot (Appendix B.5) suggested teacher self-efficacy increases after the first five years of teaching (category 2). Like teacher grit, teacher self-efficacy then drops slightly in category 3 (13-15 years of teaching). Teacher self-efficacy then begins to increase from year 16 and above (category 4). This finding is important because these findings suggest that teachers with the fewest years of teaching experience have the lowest self-efficacy scores. This finding highlights the importance for schools to provide support for teachers during their first five years of teaching. As SCT indicates, self-efficacy is a socially constructed non-cognitive characteristic. Individuals with higher self-efficacy tend to preserve in goal attainment, and they tend to attempt challenges that those with lower self-efficacy may not attempt (Bandura, 1989). These findings suggest that motivation, encouragement, and mastery experiences need to be provided during the early years of teaching in order that teachers may work diligently with students to meet learning goals and in order to encourage teachers to stay in the profession. Additionally,

if self-efficacy dips after 12 years of teaching as indicated in this study, motivation, encouragement, and mastery experiences need to be provided throughout the middle stages of a teacher's career to help teachers maintain the desire to stay in the classroom. It is important to remember that the categories used in this study were based on decisions made through analysis of data for this study; teachers do not experience practical categorical differences between years twelve and thirteen, for example. However, what this study reveals is that self-efficacy may fluctuate during a teacher's career. This may perhaps indicate relevance of multiple factors (life experiences) that play into teacher self-efficacy. Therefore, it is important for educational leaders to maintain a consistent focus of efficacy development for all of their teachers, regardless of number of years of teaching experience. Research indicates that mastery experiences are the most important factor for building self-efficacy (Tschannen-Moran et al., 2007). Mastery experiences encourage teachers to perceive their teaching performance to be a success (Tschannen-Moran et al., 2007). Additionally, the relationship found in this study (research question one) between teacher self-efficacy and teacher grit suggests that mastery experiences and vicarious learning may be important for not only the development of self-efficacy but also the development of grit. Therefore, this study highlights the importance of continual opportunities throughout a teacher's career for vicarious learning, mastery experiences and development of self-efficacy through social interactions.

Student Outcomes: Q4

In order to answer question four, "Do teacher grit and self-efficacy influence student outcomes?" four separate one-way ANOVAs were run to understand differences across means of teacher grit and teacher self-efficacy for math and reading outcome data.

The outcome data used for this study included Student Growth Percentiles (SGP) given to teachers who taught math and/or reading. SGP scores indicated the median growth score for students by teacher. Since the SGP scores are reported as percentages, and percentages are contrived numbers, the scores were converted into categorical variables. Analysis of the data gathered for this study indicated the need to divide the scores into three categories: low (1.0), medium (2.0), and high (3.0). Question four was posed to gain a better understanding of teacher self-efficacy and teacher grit on student performance. This question serves as a post hoc analysis of the data since the primary focus of this study was to understand the formation of teacher grit by examining the relationship between teacher grit and teacher self-efficacy.

Differences in Teacher Grit by Math and Reading Scores

Teacher Grit and Math SGP Scores

Statistics were calculated to describe the teacher grit by math SGP scores. The category of 1-low (0-56) was 3.62 with a standard deviation of .50. The category of 2-medium (57-65) was 3.65 with a standard deviation of .59. The category of 3-high (66 or more) was 3.73 with a standard deviation of .52. Results from the one-way ANOVA are not statistically significant ($F = .160$, df 2, 39, $p = .853$). However, using the results of 42 teachers' SGP scores, The means and the profile plot (Appendix C.5) suggests that there is an increase in teacher grit from category 1, to category 2, to category 3 with a larger increase from category 2 to category 3. Therefore, data from this study indicate that teachers with higher grit scores also have higher math SGP scores. This finding was not significant; however, this result could be caused by a small sample size. According to

Bandura's social cognitive theory, an individual's beliefs about actions, outcomes of those actions, and motivation are directly related to the individual's personal experiences (Bandura, 1977, 1986, 1997; Schaefer, 2010). Based on the finding that teacher grit across student outcome categories increases, a logical assumption is that as a teacher works toward challenges with his or her students and is able to see positive results, the teacher will continue to strive toward meeting educational goals. However, additional research with a larger sample is needed to gain a better understanding of the influence of teacher grit on Math SGP scores.

Teacher Grit and Reading SGP Scores

Statistics were calculated to describe teacher grit by reading SGP scores. Using the results of 48 teachers' SGP scores, the mean score and standard deviation were calculated for teacher grit by category of reading SGP scores. The category of 1 (0-55) was 3.77 with a standard deviation of .60. The category of 2 (56-67) was 3.83 with a standard deviation of .46. The category of 3 (68 or more) was 3.78 with a standard deviation of .41. The one-way ANOVA indicated that teacher grit across means is not statistically significant ($F = .082$, df 2, 45, $p = .922$). The means and the profile plot (Appendix D.5) suggests that there is an increase in teacher grit from category 1 to 2, then a large drop in teacher grit between categories two and three. According to these findings, teachers with the highest grit do not have the highest test scores in reading. However, the finding was not statistically significant. This finding could be caused by a small sample size. Future research, therefore, is warranted.

Teacher Self-Efficacy and Math and Reading SGP Scores

Teacher Self-Efficacy and Math SGP Scores. Statistics were calculated to describe the teacher self-efficacy by math SGP scores. Using the results of 42 teachers' math-SGP scores, the mean score and standard deviation for teacher self-efficacy by math SGP scores were calculated. The category of 1 (0-56) had a mean of 7.11with a standard deviation of .89. The category of 2 (57-65) had a mean of 7.18 with a standard deviation of 1.09. The category of 3 (66 or more) had a mean of 7.22 and a standard deviation of .94. Results from the one-way ANOVA were not statistically significant ($F = .047$, df 2, 39, $p = .952$). The means and the profile plot (Appendix E.5) suggest that there is a consistent increase of math SGP scores as teacher self-efficacy increases. According to Social Cognitive Theory, teacher efficacy is linked to instructional commitment, willingness to try new teaching methods, and one's ability to reach students (Schaefer, 2010). However, findings from this analysis were not statistically significant. Therefore, further interpretation of these findings is limited. A replication of this study with a larger sample size could provide additional understandings of the influence of teacher self-efficacy on student math performance.

Teacher Self-Efficacy and Reading SGP Scores

Statistics were calculated to describe teacher self-efficacy by reading SGP scores. Using the results of 48 teachers' reading-SGP scores, the mean score and standard deviation for teacher self-efficacy by reading SGP scores were calculated. The category of 1 (0-55) had a mean of 7.18 with a standard deviation of .87. The category of 2 (56-67) had a mean of 7.34 with a standard deviation of .82. The category of 3 (68 or more) had a mean of 7.18 and a standard deviation of .84. Results from the one-way ANOVA were not statistically significant ($F = .184$, df 2, 45, $p = .833$). The means and the profile plot

suggest that there is an increase in teacher self-efficacy from category 1 to category 2 and a decline in teacher self-efficacy from category 2 to category 3. According to findings from this study, teachers with the lowest reading results and those with the highest reading results have similar self-efficacy scores. The teachers with the highest self-efficacy scores are those with medium reading SGP scores. Findings from the one-way ANOVA were not statistically significant; these results could be caused by a small sample size.

Conclusions

Although several of the analyses yielded results that were not statistically significant, findings from the correlational analysis (question one) are important. With findings indicating a statistically significant relationship between teacher self-efficacy and teacher grit, this study provides insight into the relationship between the two in terms of number of years teaching, as a factor that may affect grit. There may be additional cognitive and non-cognitive factors that are not considered in this study that may influence teacher grit and self-efficacy. However, the importance of the influence of both cognitive and noncognitive factors of teacher effectiveness with well documented (Belson et al., 2015; Clayton, 2011; Duckworth et al., 2009a; Rockoff et al., 2008) It is unknown if teachers come to the profession with a fixed level of "grittiness" or ability to persevere despite obstacles that they face, findings from this study indicate that schools may be able to influence teacher grit through building teacher self-efficacy. Findings in the literature support the fact that schools and teachers can, indeed, influence teacher self-efficacy (Tschannen-Moran et al., 2007). For example, when schools provide teachers with opportunities for success, mastery experiences, when they celebrate those successes,

and when they provide opportunities for teachers to witness the success of other teachers through vicarious experiences, self-efficacy is enhanced (Tschannen-Moran et al., 2007). Duckworth et al. (2009b) suggested that considering positive traits, noncognitive factors, such as grit, in the selection and hiring of teachers can lead to enhanced teacher retention and enhanced student performance. Additionally, determining ways to enhance teacher grit may be an important consideration in retaining quality teachers in the profession. Teacher quality is an important factor, and there are many factors of teacher quality that are outside of the school's control. However, schools may be able to influence teacher grit and teacher efficacy. By providing supportive environments and quality professional development to teachers, schools may be able to enhance teacher grit and teacher-efficacy, therefore leading to increases in student achievement. Findings from this study, a statistically significant relationship between teacher self-efficacy and teacher grit, suggests that efforts made to build teacher self-efficacy may also result in enhanced teacher grit.

Research indicates that a school culture that emphasizes character and student grit results in higher levels of student grit (Dean, 2014). Dean's (2014) study specifically addressed building grit and character in students; however, findings from this study emphasize the possibility of developing a school culture that enhances teacher grit as well. This finding has important implications for school administrators and teacher leaders. For example, these findings indicate that professional development offered by educational leaders, such as mentoring or capacity building in specific targeted skills (primarily those identified by teachers as "needs"), may also influence teacher grit through the building of teacher self-efficacy. Also, teachers can take professional

development into their own hands and work to build teacher self-efficacy, collective efficacy, and eventually teacher grit within themselves and their colleagues. According to Woolfolk-Hoy et al. (2005), external factors, including resources and support offered to teachers, can have a significant effect on teacher self-efficacy. Teacher resources such as colleague and administrative support can provide the necessary "professional development" through vicarious learning experiences (Tschannen-Moran et al., 2007) which, according to SCT, can increase teacher self-efficacy (Bandura, 1997). Specifically, mastery experiences and vicarious learning through watching other successful teachers accomplish their learning goals may influence teacher grit through the development of enhanced self-efficacy (Tschannen-Moran et al., 2007). These findings may also help improve the educational environment through teacher retention, and possibly inform potential personnel decisions. Ultimately, when quality teachers are retained, students benefit. Promoting student success is the most important reason for understanding factors that influence teacher grit.

Implications for Future Research

Research question are often guided from "gaps" found in existing literature. Questions generated from findings in this study include: "What other student outcome data could provide further understandings of the influence of teacher grit on student outcomes?", "If self-efficacy accounts for approximately 10 percent of the variance in teacher grit, what other factors influence teacher grit?", "Do teachers with alternative certification have higher grit as compared to teachers who attended school for teaching?", "Does the age of the teacher impact his or her level of grit or self-efficacy?", and "Do

school that have active Professional Learning Communities have higher grit and self-efficacy?"

The results from the correlational analysis supported the hypotheses of the current study, signifying the statistically significant, positive correlation between teacher grit and teacher self-efficacy. However, it was somewhat surprising that there were no significant findings for differences in teacher self-efficacy and teacher grit and student outcome data in reading and math. Because other research findings have indicated a relationship between self-efficacy and student success (Bandura, 1997; Bandura et al., 1996; Di Giunta et al., 2013; Pina-Neves et al, 2013; Yusuf, 2011; Zimmerman et al., 1992), it was hypothesized for this study that significant differences across means of teacher self-efficacy and teacher grit would be found. Additional research is needed to gain a better understanding of the influence of teacher grit on student reading and math outcomes. Another implication for research includes examining the relationship between teacher grit and the three sub-categories of teacher self-efficacy. The research question guiding a potential study would include: "Is there a relationship between teacher grit and the three subcategories of self-efficacy (engagement, instructional, classroom management)?" An additional question for further research would be to investigate differences in teacher grit and self-efficacy based on grade level taught. Because teacher grit is a new concept in the educational literature, it is anticipated that further research will provide important understandings of teacher grit.

It is also recommended that a mixed methods approach be used for a similar study. Using qualitative methods would allow researchers to dig deeper into the constructs that result in teacher grit. This underlying phenomenon can better be

understood through teachers' lived experiences. The quantitative pieces will then provide additional explanations to add to current understandings of the formation of teacher grit and the influence of teacher grit on student outcomes.

Summary

Teacher expectations and duties continue to increase; therefore, it is said that only those with a "true calling" should become teachers (Duckworth et al., 2009). This comment by Duckworth et al., (2009) further emphasizes the importance of this study. The purpose of this study was to understand the teacher grit by investigating the relationship between teacher grit and teacher self-efficacy. Students desperately need teachers in the profession that have high grit and self-efficacy and will stay committed to the teaching profession. Schools and students need teachers that will continue to work with students despite challenges that they may face.

Teacher grit is characterized by a teacher's willingness to persevere in working with students to achieve student outcome goals (Robertson-Kraft et al., 2014). Grit requires persistently working toward challenges, maintaining determination and interest over long periods of time despite adversity (Duckworth, et al., 2007). Gritty individuals approach achievement with stamina, and they are willing to demonstrate sustained commitment despite obstacles that seem to hinder student learning (Duckworth et. al, 2007). Schools also need teachers that have a higher self-efficacy since studies indicate they are more willing to try new ideas and use new teaching methods to meet the needs of their students (Berman et al., 1977). Research indicates that a higher sense of self-efficacy "affects the effort teachers invest in teaching, the goals they set, and their level of aspiration" (Tschannen-Moran et al., 2001, p. 783). These findings suggest that there

will be times when discouragement, disappointment, and the real demands of teaching set in. These results suggest that it is important for school leaders to work to provide teachers with the needed professional development to build teacher grit and teacher self-efficacy and to create school environments that support teacher grit and self-efficacy.

Research indicates that teacher self-efficacy can influence student outcomes (Tschannen-Moran et al., 2007). "Teachers' judgment of their capability to impact student outcomes has been consistently related to teacher behavior, student attitudes and student achievement" (Tschannen-Moran et al., 2007, p. 954). Findings from this study, the relationship between self-efficacy and grit, suggests that building teacher self-efficacy may also enhance teacher grit. Research indicates that developing a school culture that emphasizes character and grit will result in enhanced student grit (Dean, 2014). Findings from this study indicate that professional development offered by educational leaders, such as mentoring or capacity building in specific targeted skills (primarily those identified by teachers as "needs"), may influence teacher grit through the building of teacher self-efficacy. Teacher resources, such as colleague and administrative support can proved the necessary "professional development" through vicarious learning experiences (Tschannen-Moran et al., 2007) which, according to SCT, can increase teacher self-efficacy (Bandura, 1997). Further understandings about the development of teacher grit may work in tandem with current understandings about teacher self-efficacy to enhance student outcomes. Student outcomes will increase as teacher efficacy is combined with strong collective beliefs, and when staff development aligns with the vision of the school (Bandura. 1997; Tschannen-Moran, 2004). Specifically, mastery experiences and vicarious learning through watching other successful teachers may influence teacher grit

through building self-efficacy. These findings may also help improve the educational environment in schools through higher teacher retention rates, and they may possibly inform potential personnel decisions. Ultimately, when quality teachers are retained, students benefit, Benefitting students is the most important reason for understanding factors, such as teacher grit, that can lead to enhanced educational outcomes.

Limitations

There are several limitations present in this study. Although care was taken to receive responses from all 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th grade teachers in the district, those teachers who actually completed the survey may have similar teacher characteristics, including higher levels of teacher grit and self-efficacy. If so, findings about the relationship between teacher self-efficacy and teacher grit may be under estimated. It was understood, before collection of data, that low response rates could potentially influence results from the study. In other words, results from this study would actually underestimate the strength of the relationship that may actually exist in the general teacher population due to lower variability in teacher responses. However, a 60% response rate minimized the effect of response rate on the findings of this study. A second limitation to this study is that this district is located in a town with a large research university. Because of this location, teachers in the district may have higher levels of self- efficacy and grit because of other unknown factors—such as higher levels of education, better support systems and/or resources available to them. Therefore, this study will not be representative of all schools and teachers in the state and could be generalized only to districts with similar demographics. A third limitation of this study is based on the subjectivity of survey research. Survey responses can be susceptible to

misunderstanding or misinterpretation by the respondent. Finally, because this study is correlational, causality cannot be inferred.

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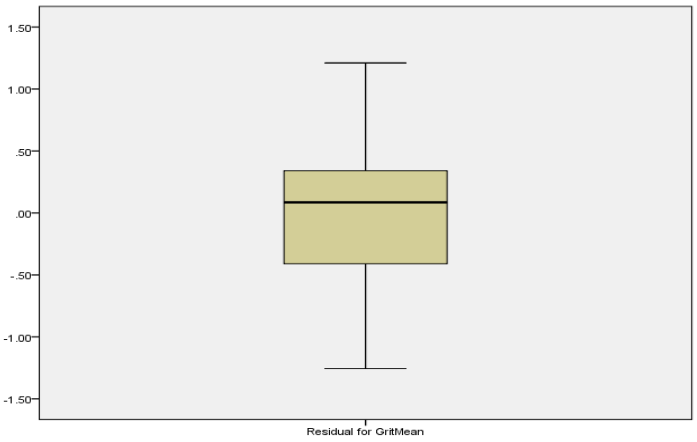
APPENDICES

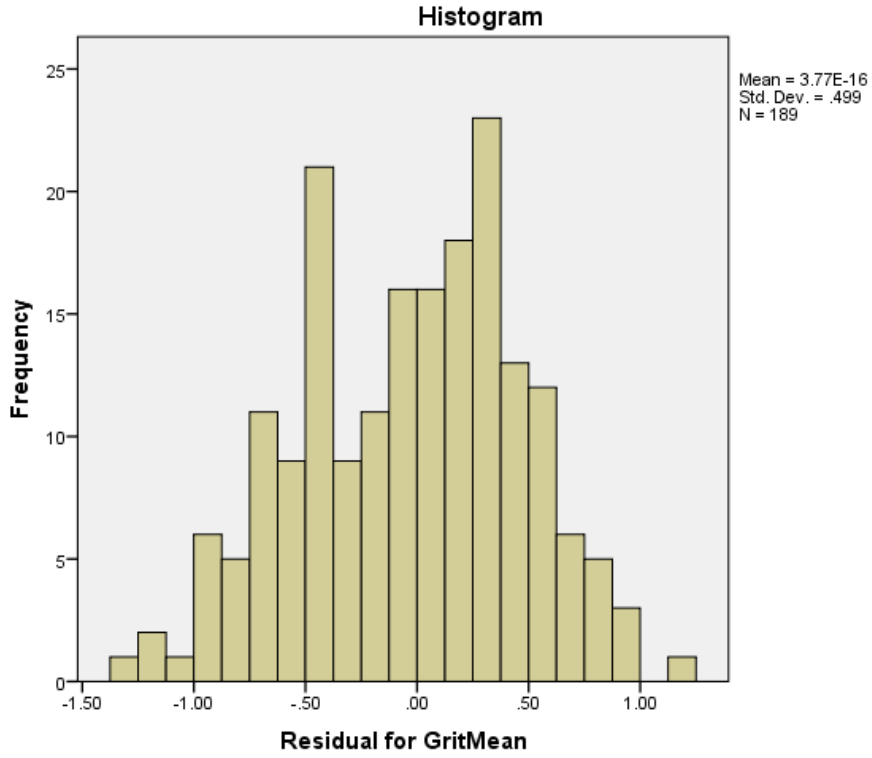
Appendix A: Teacher Grit by Number of Years Taught

A.1 Boxplot: Teacher Grit by Number of Years Taught

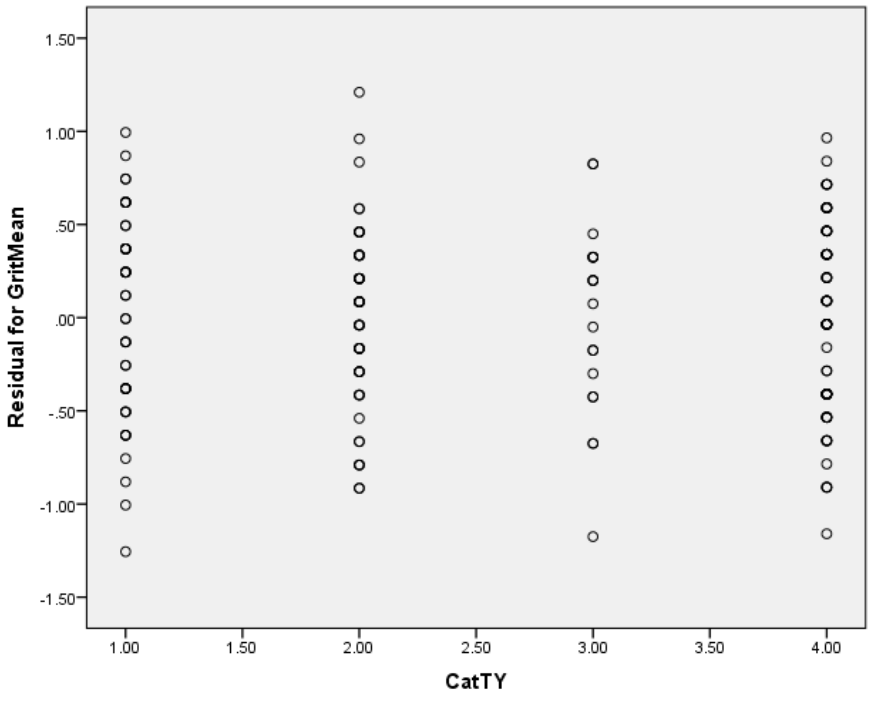


A.2 Q-Q Plot: Teacher Grit by Number of Years Taught

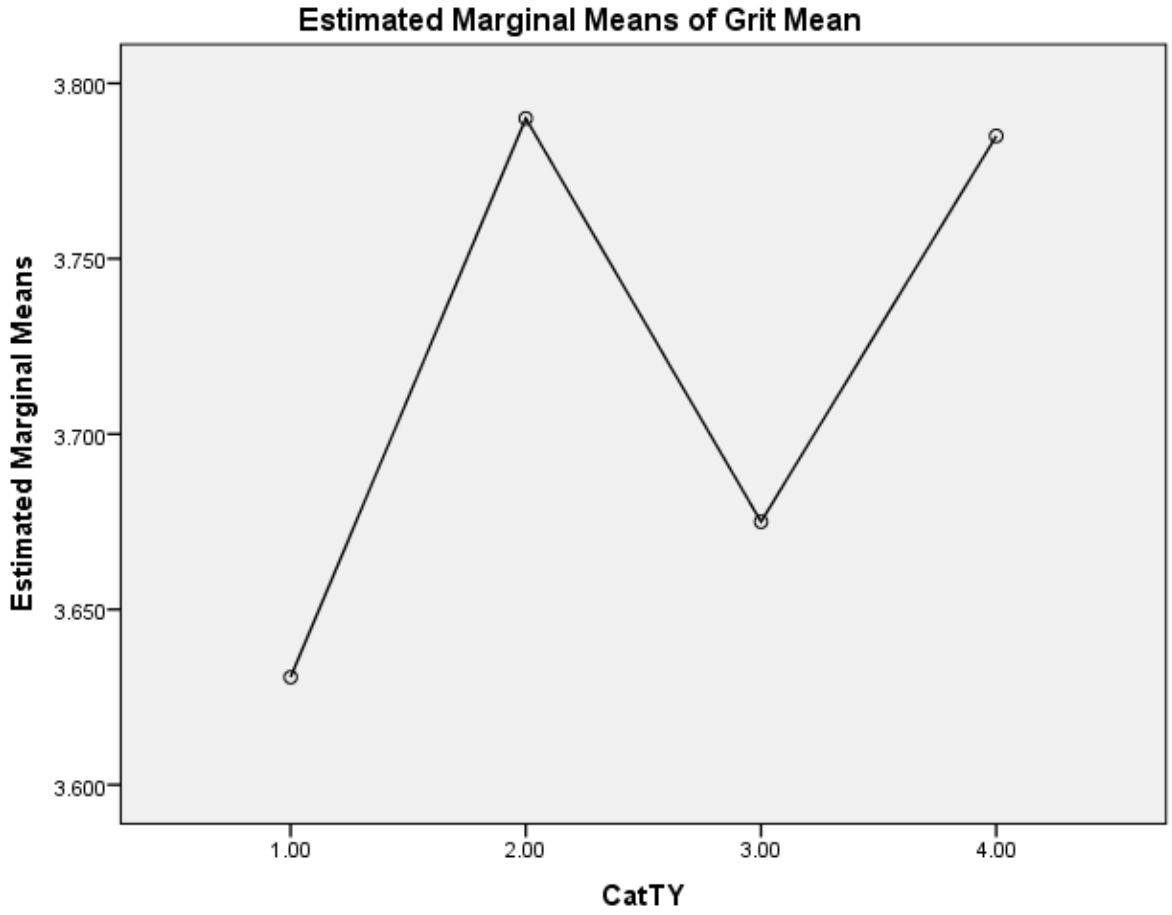
A.3 Histogram: Teacher Grit by Number of Years Taught



A.4 Scatterplot of Residuals: Teacher Grit by Number of Years Taught

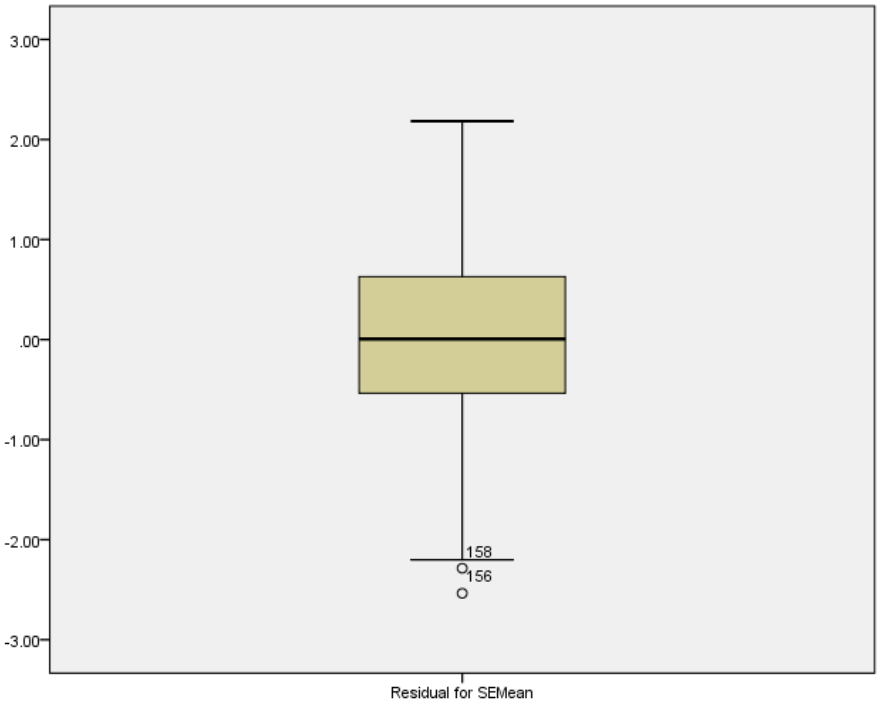


A.5 Estimated Means and Profile Plot: Teacher Grit by Number of Years Taught

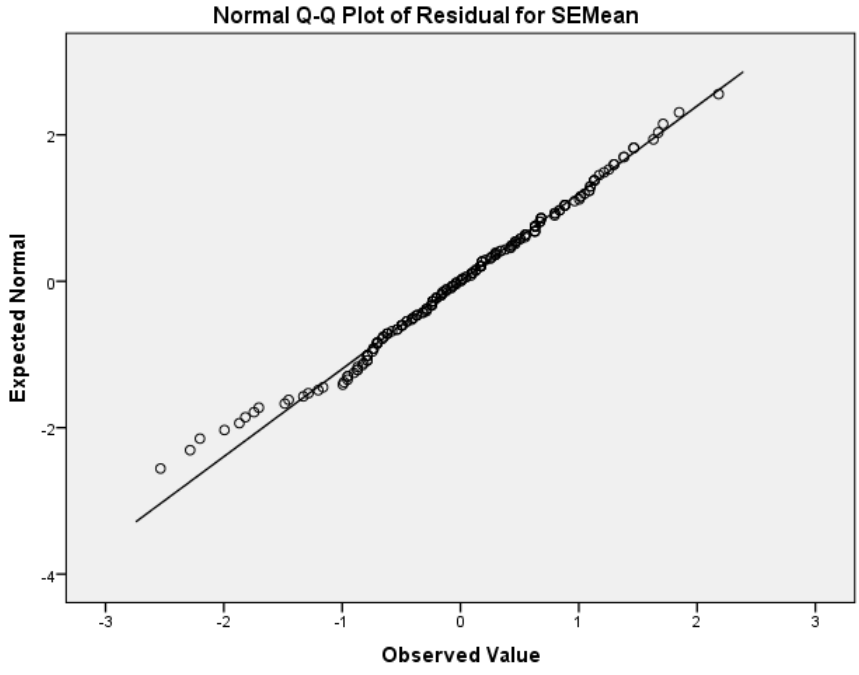


Appendix B: Teacher Self-Efficacy by Years Taught

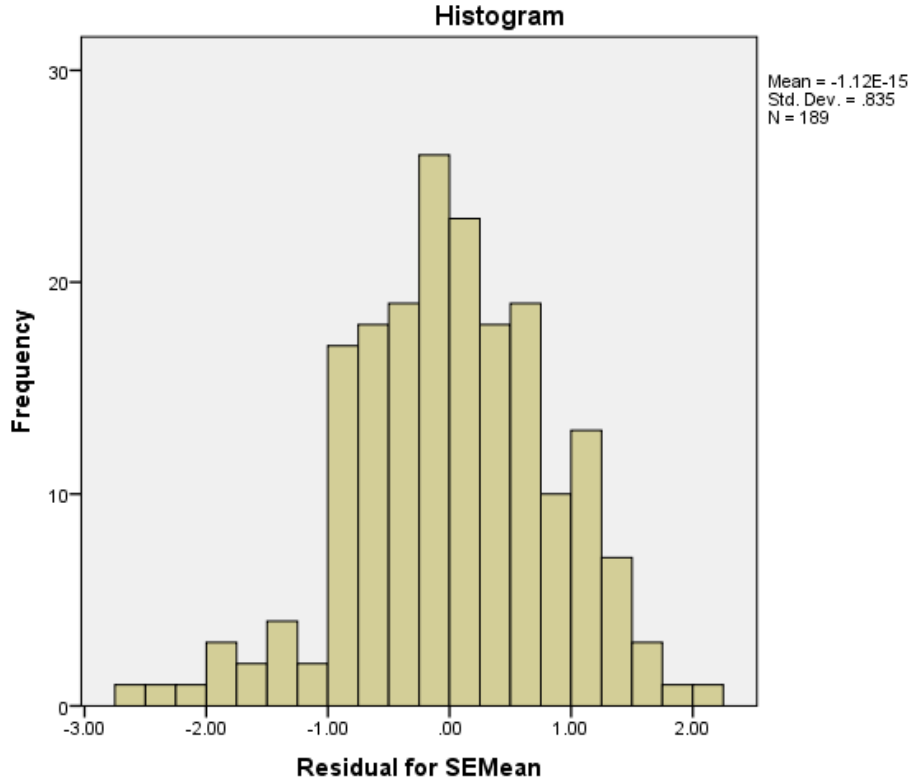
B.1 Boxplot: Teacher Self-Efficacy by Years Taught



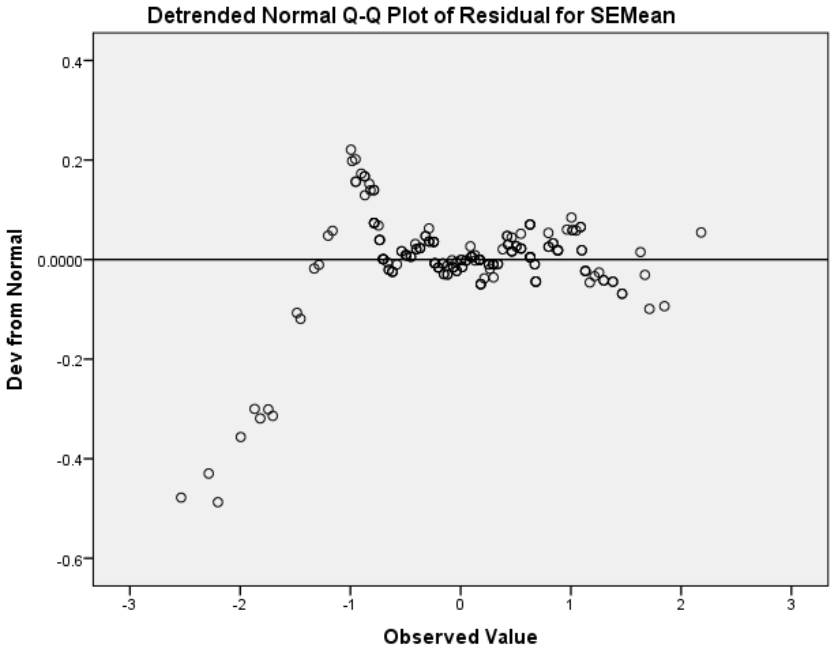
B.2 Q-Q Plot: Teacher Self-Efficacy by Years Taught



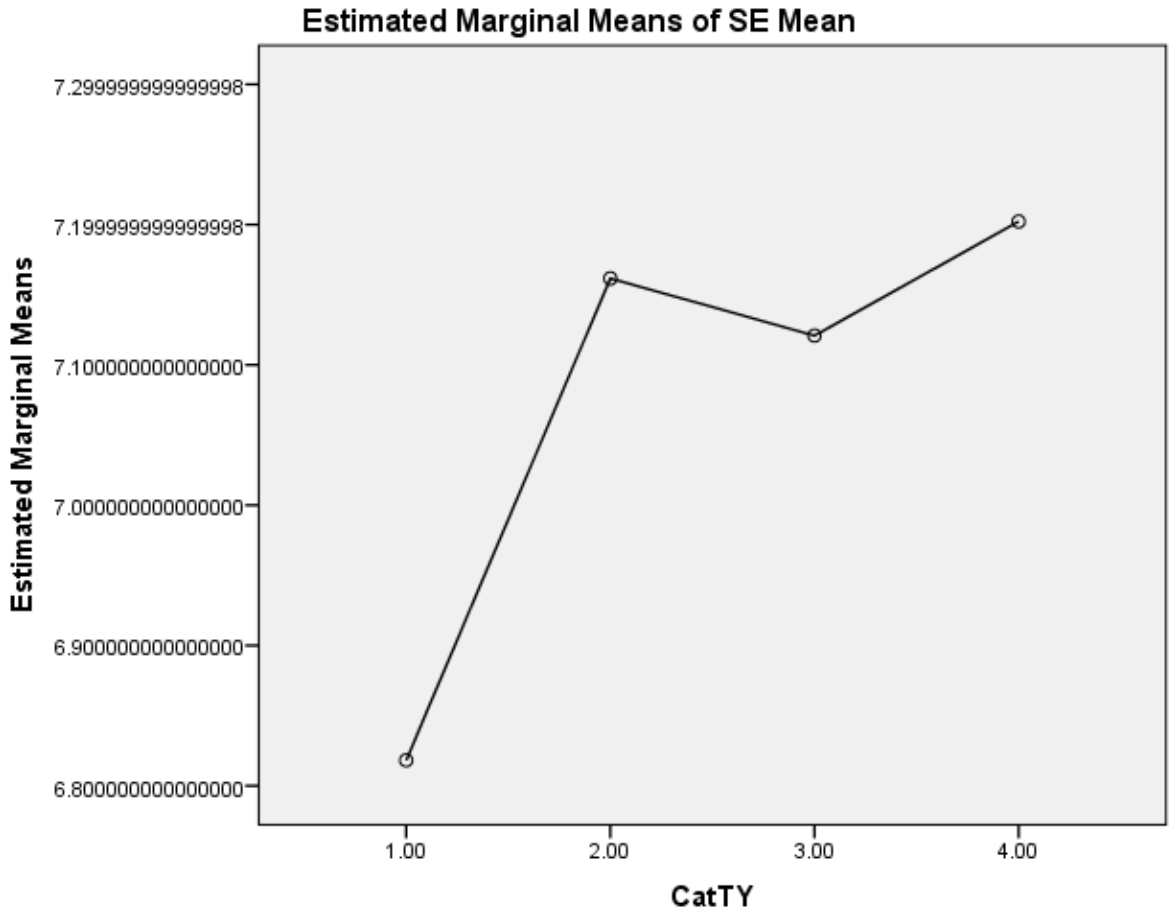
B.3 Histogram: Teacher Self-Efficacy by Years Taught



B.4 Scatterplot: Teacher Self-Efficacy by Years Taught

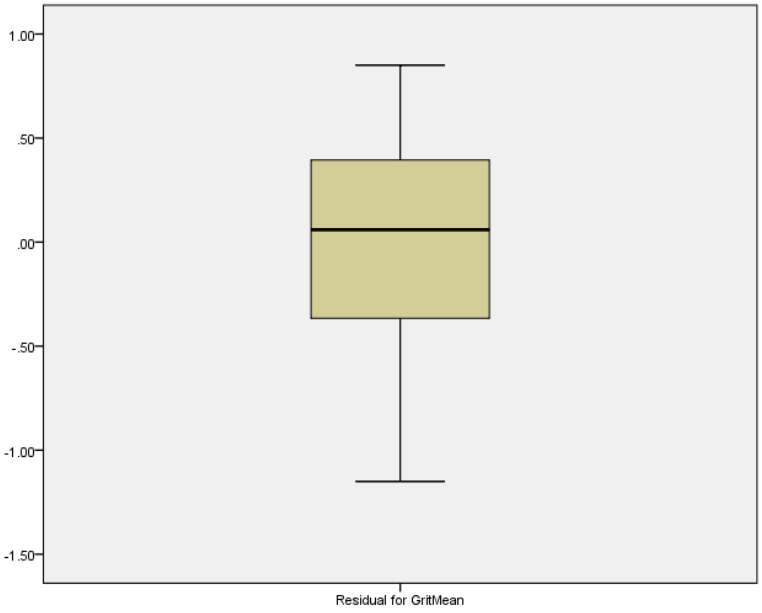


B. 5 Estimated Means and Profile Plot: Teacher Self-Efficacy by Years Taught

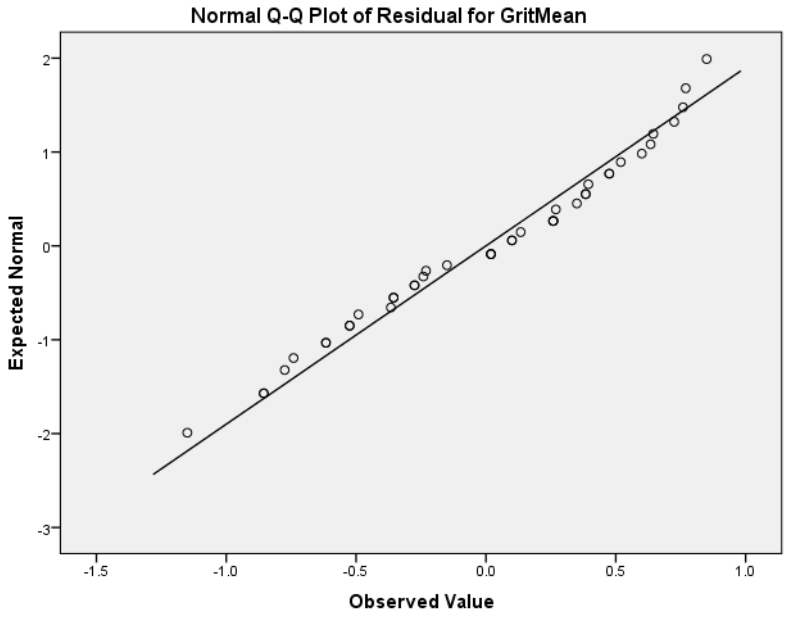


Appendix C: Teacher Grit and Math SGP Scores

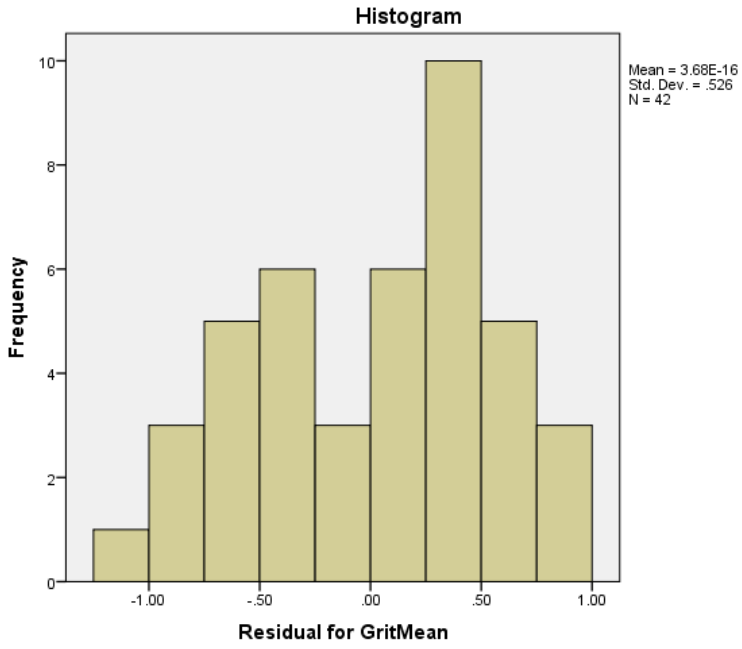
C.1 Boxplot: Teacher Grit and Math SGP Scores



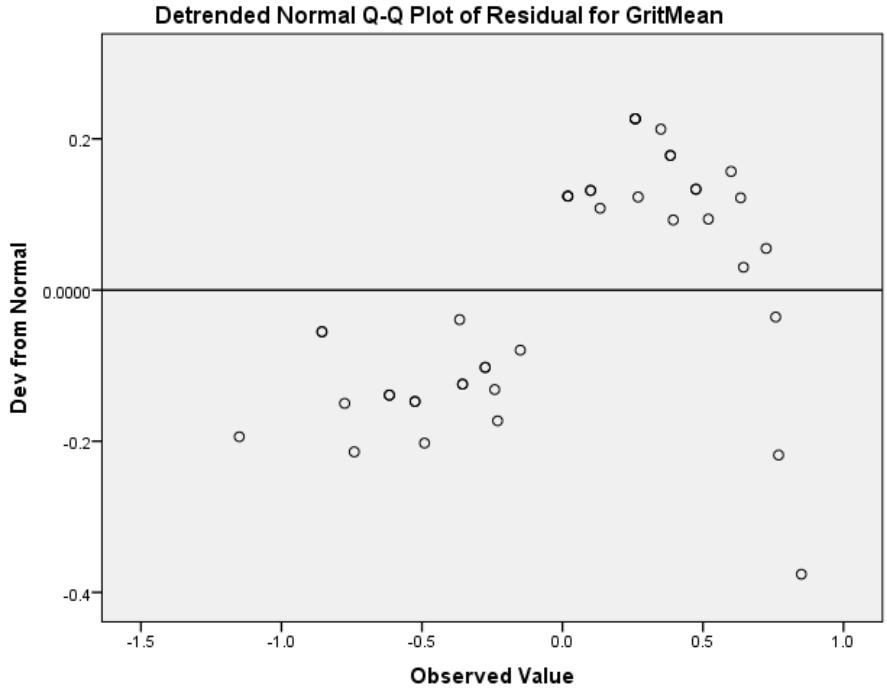
C.2 Q-Q Plot: Teacher Grit and Math SGP Scores



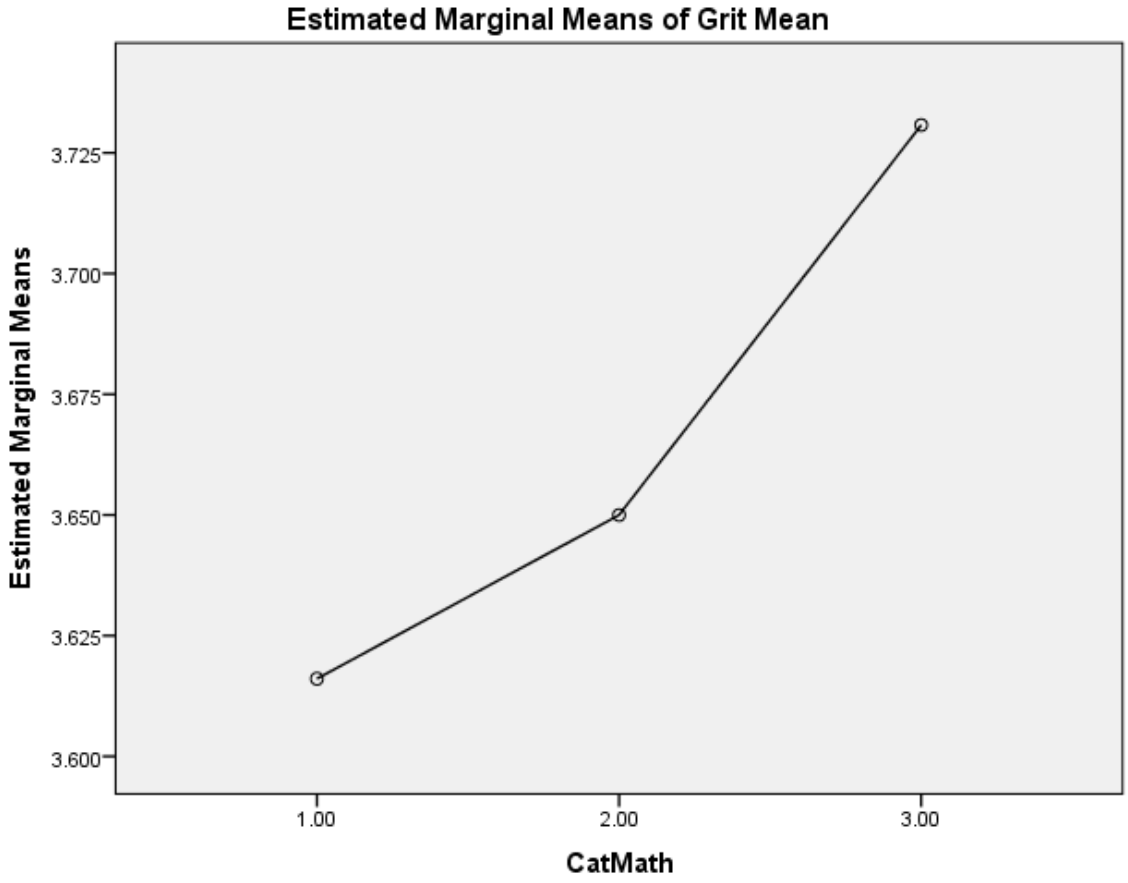
C.3 Histogram: Teacher Grit and Math SGP Scores



C.4 Scatterplot of Residuals: Teacher Grit and Math SGP Scores

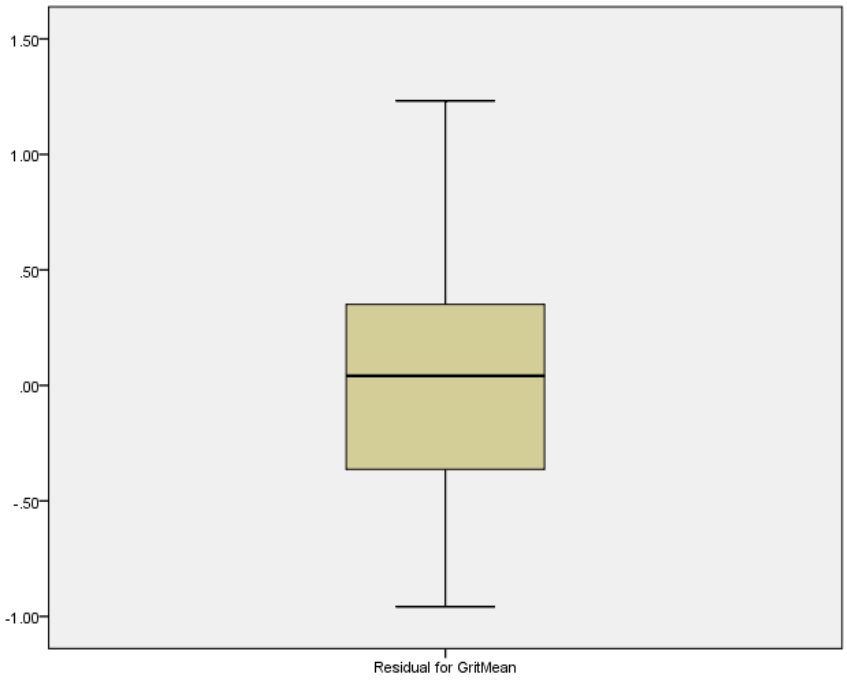


C.5 Estimated Mean and Profile Plot: Teacher Grit and Math SGP Scores

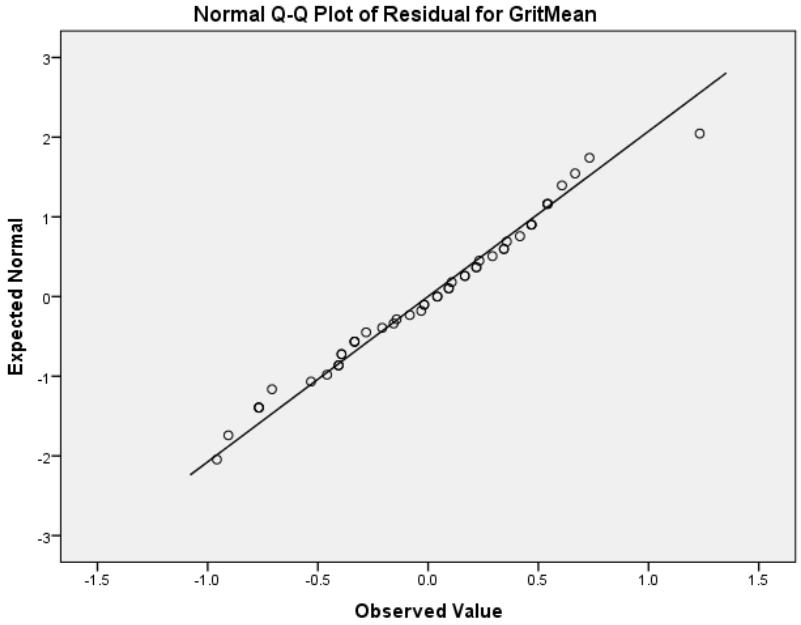


Appendix: Teacher Grit and Reading SGP Scores

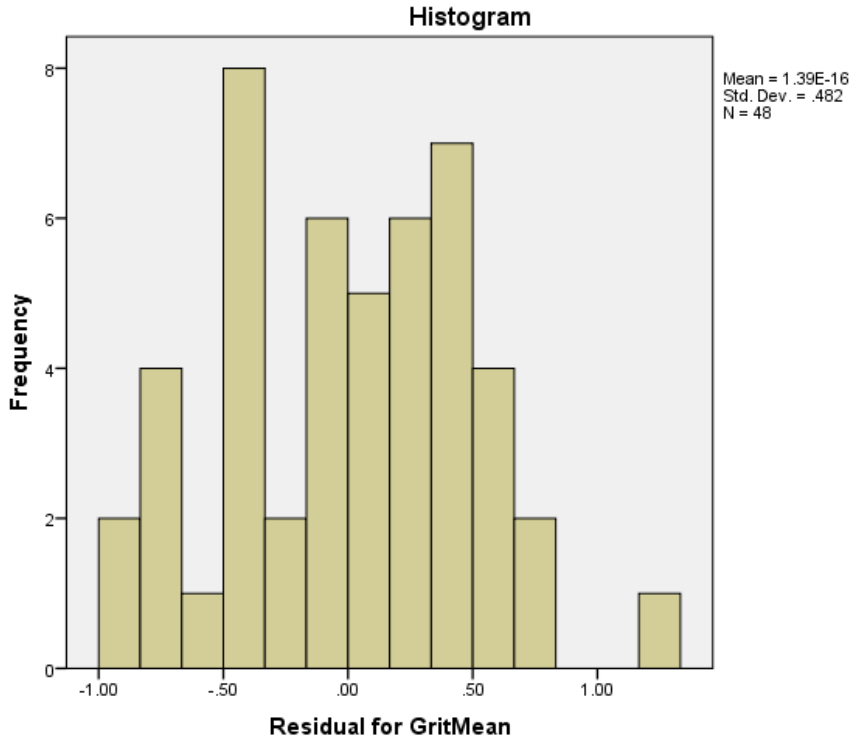
D.1 Boxplot: Teacher Grit and Reading SGP Scores



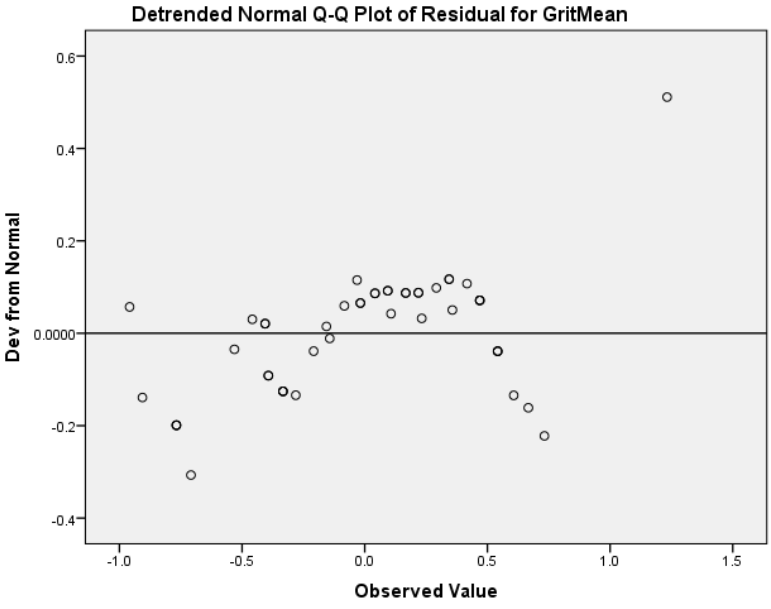
D.2 Q-Q: Teacher Grit and Reading SGP Scores



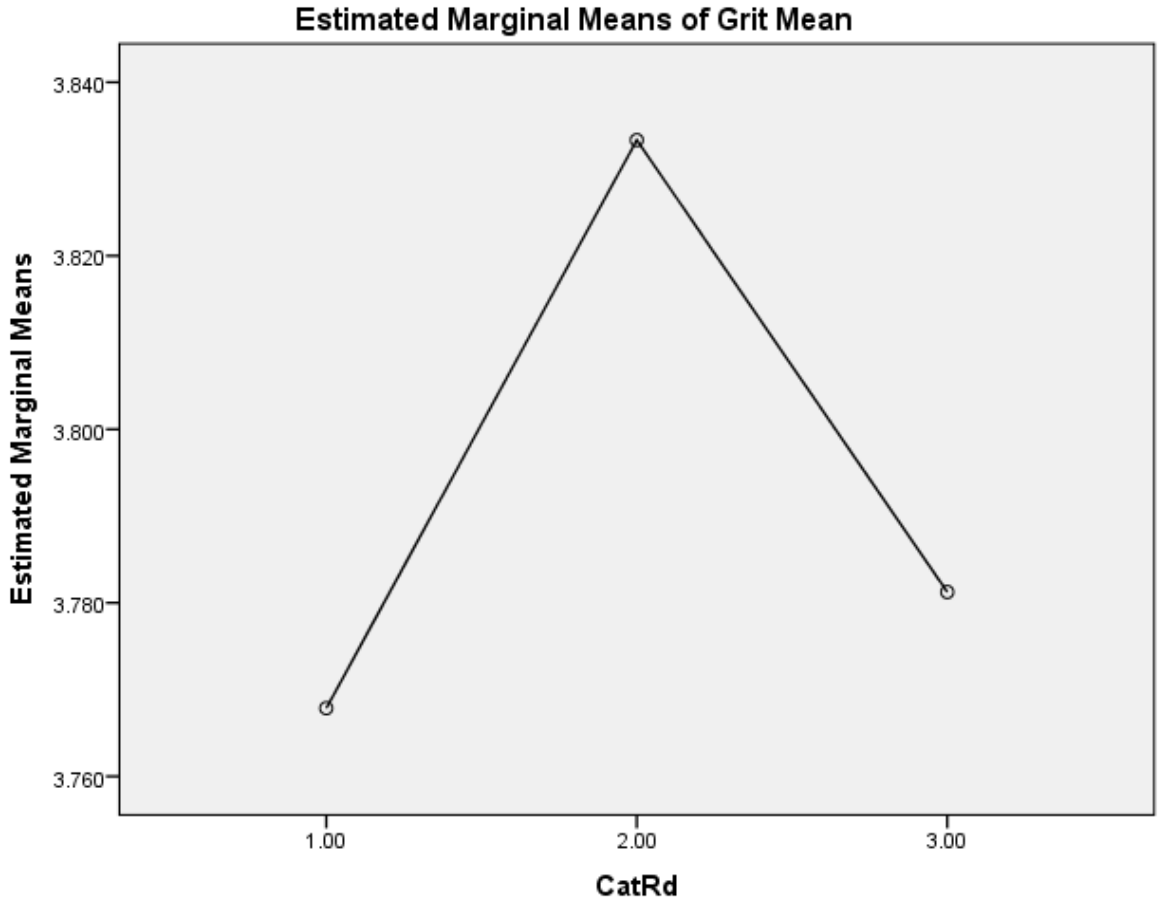
D.3 Histogram: Teacher Grit and Reading SGP Scores



D.4 Scatterplot of Residuals: Teacher Grit and Reading SGP Scores

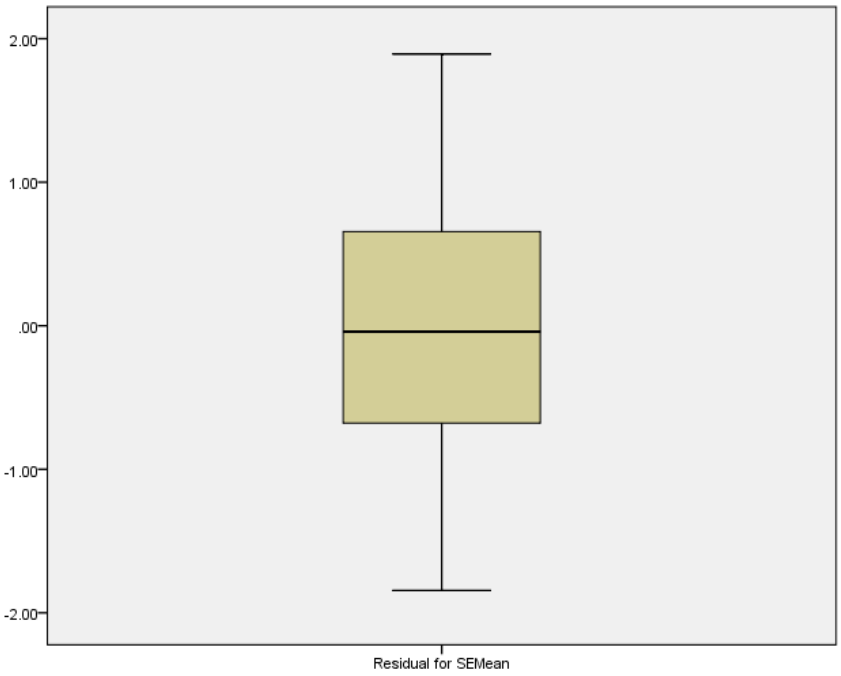


D.5 Estimated Mean and Profile Plot: Teacher Grit and Reading SGP Scores

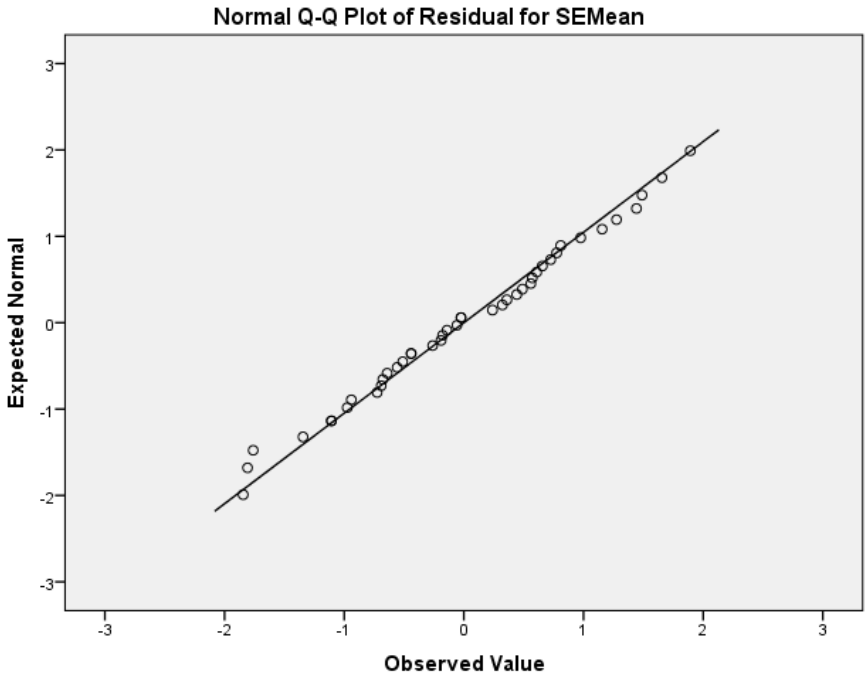


Appendix E: Teacher Self-Efficacy and Math SGP

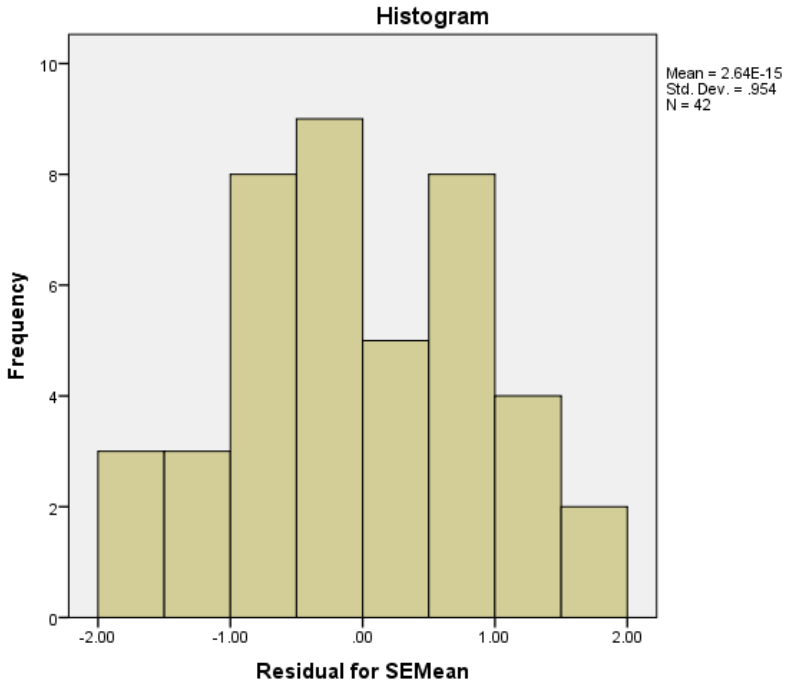
E.1 Boxplot: Teacher Self-Efficacy and Math SGP



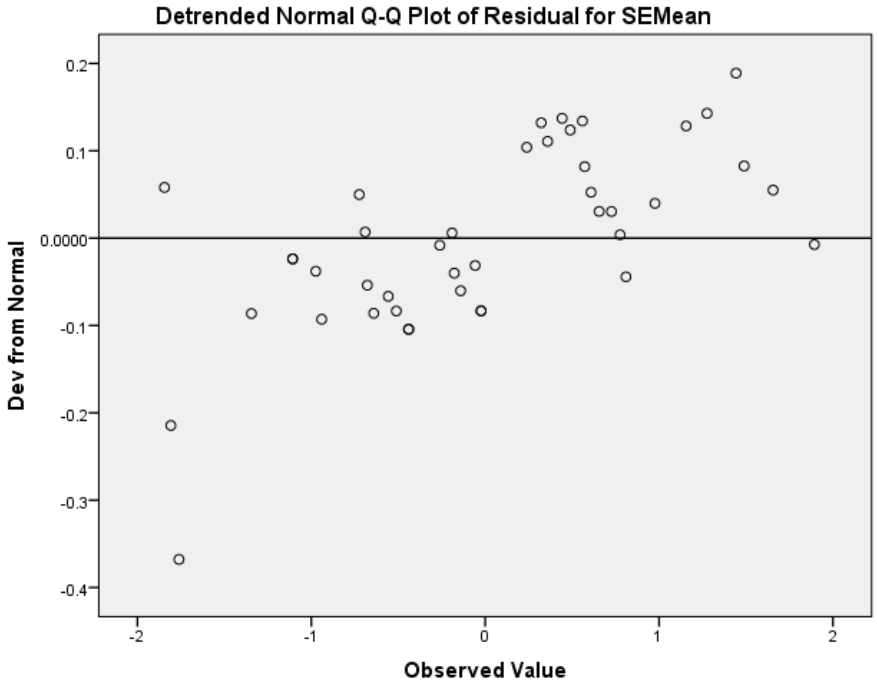
E.2 Q-Q: Teacher Self-Efficacy and Math SGP



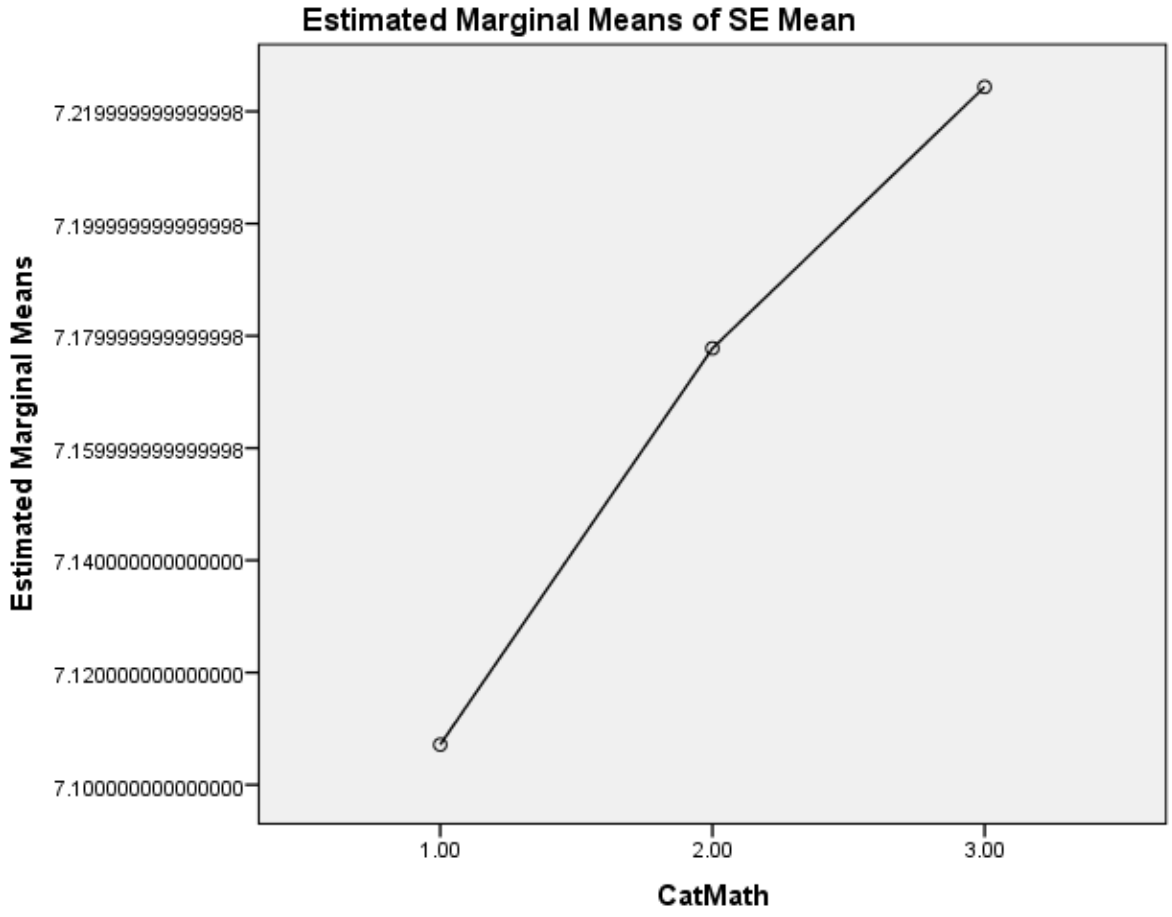
E.3 Histogram: Teacher Self-Efficacy and Math SGP



E.4 Scatterplot of Residuals: Teacher Self-Efficacy and Math SGP

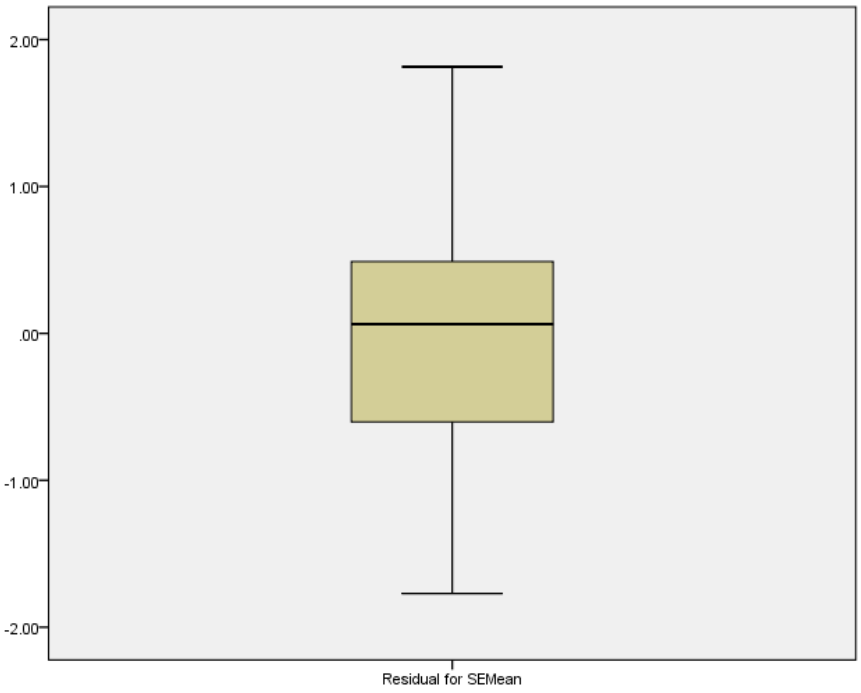


E.5 Estimated Mean and Profile Plot: Teacher Self-Efficacy and Math SGP

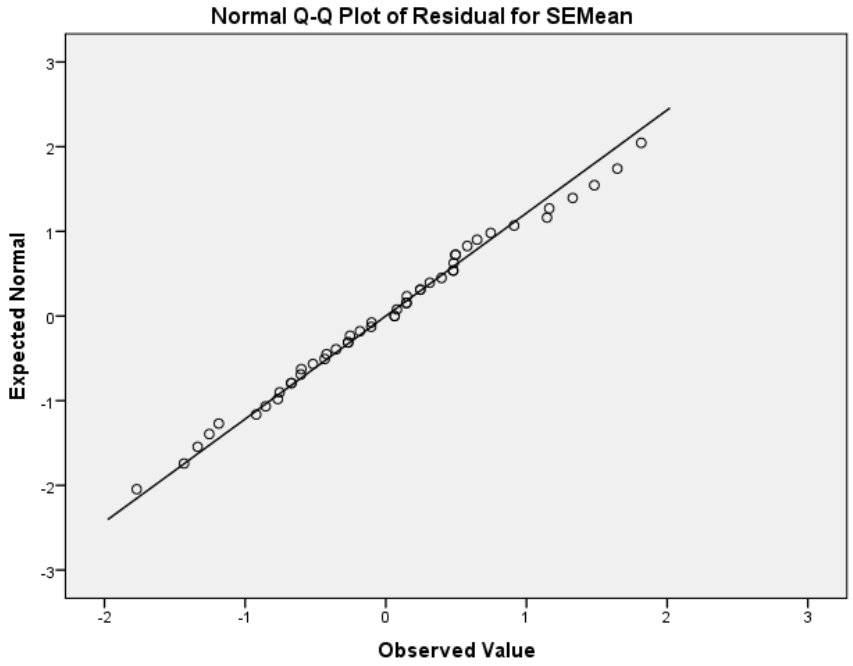


Appendix F: Teacher Self-Efficacy and Reading SGP

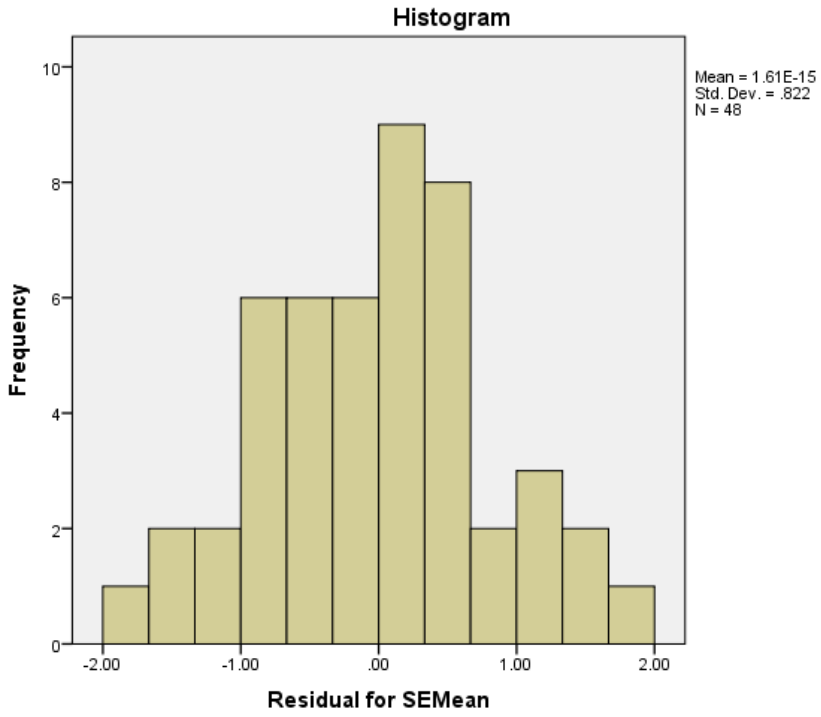
F.1 Boxplot: Teacher Self-Efficacy and Reading SGP



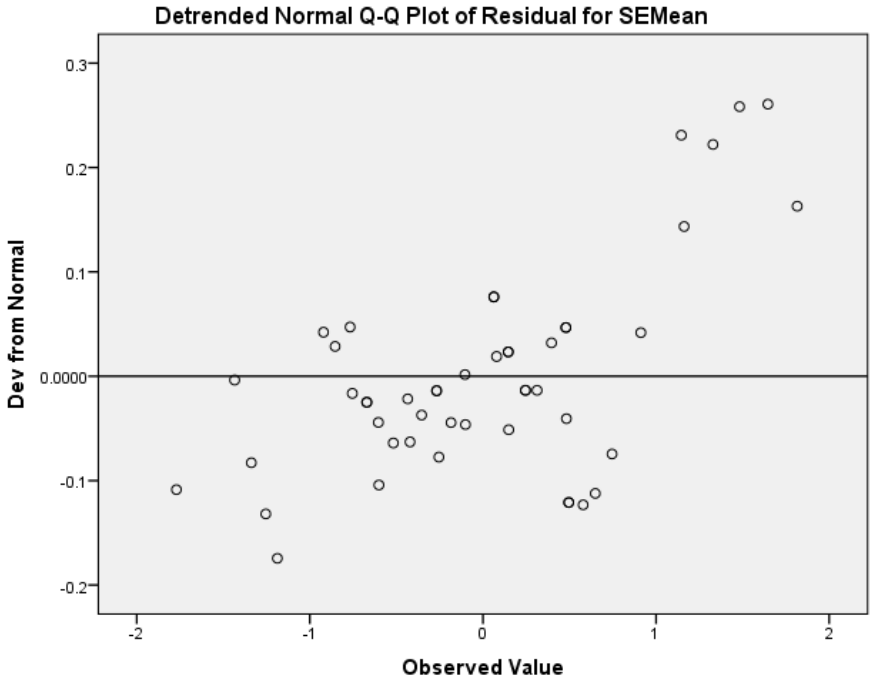
F.2 Q-Q: Teacher Self-Efficacy and Reading SGP



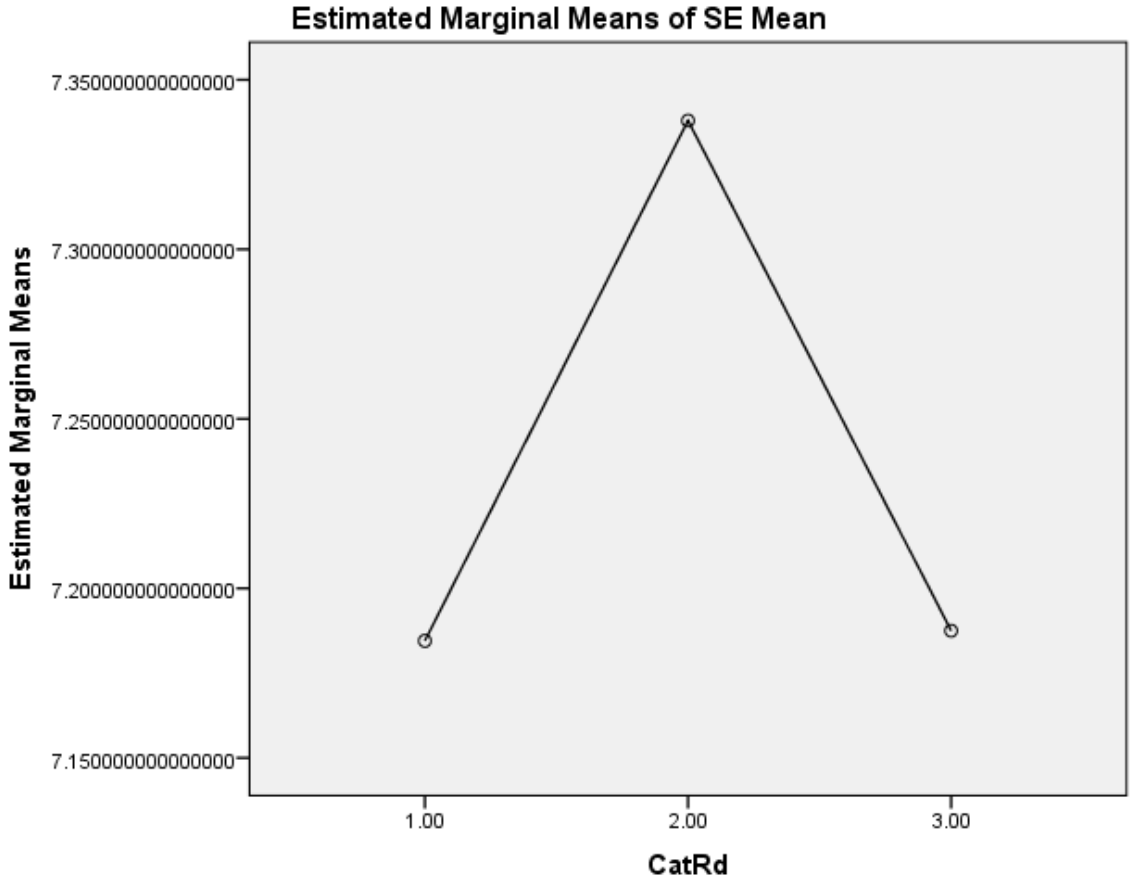
F.3 Histogram: Teacher Self-Efficacy and Reading SGP



F.4 Scatterplot of Residuals: Teacher Self-Efficacy and Reading SGP

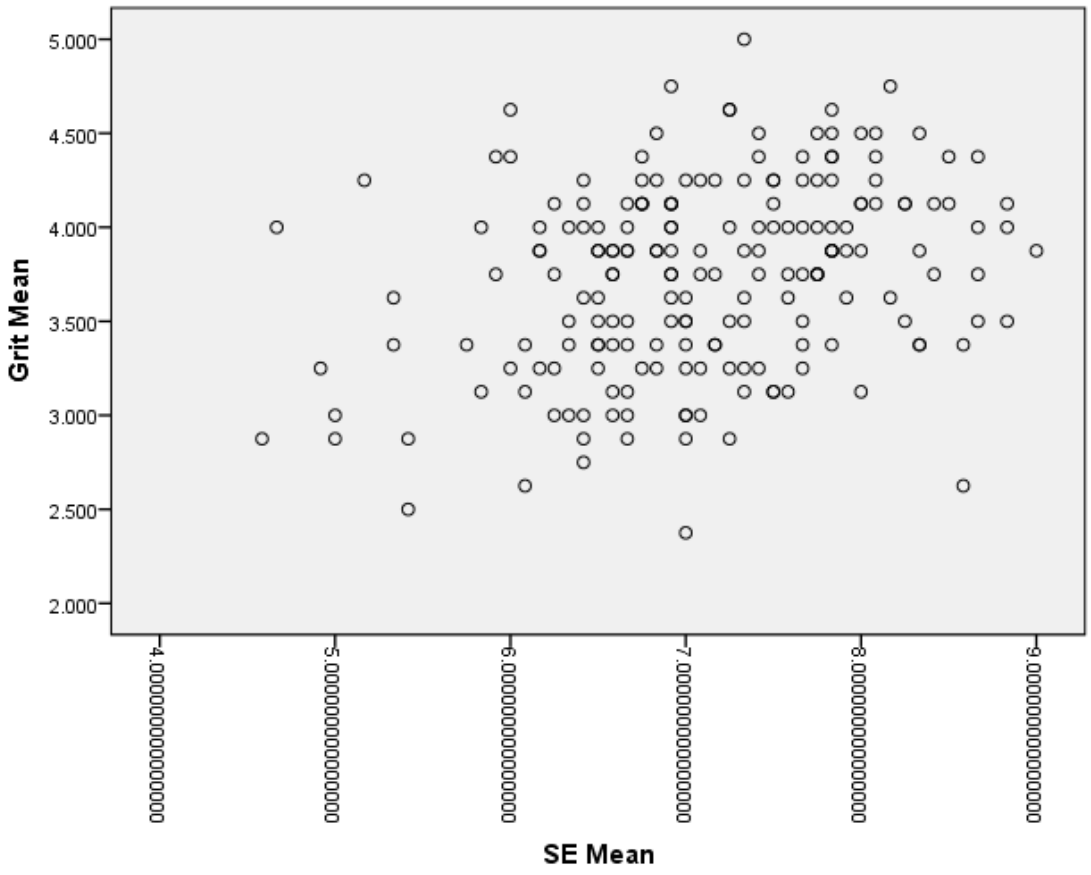


F.5 Estimated Mean and Profile Plot: Teacher Self-Efficacy and Reading SGP



Appendix G Correlation: Teacher Grit & Teacher Self Efficacy

Correlation: Scatterplot



Appendix H: Short Grit Scale

Short Grit Scale

Directions for taking the Grit Scale: Please respond to the following 8 items. Be honest – there are no right or wrong answers!

1. New ideas and projects sometimes distract me from previous ones.*

- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

2. Setbacks don't discourage me.

- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

3. I have been obsessed with a certain idea or project for a short time but later lost interest.*

- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

4. I am a hard worker.

- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me

- ❑ Not much like me
- ❑ Not like me at all

5. I often set a goal but later choose to pursue a different one.*

- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

6. I have difficulty maintaining my focus on projects that take more than a few months to complete.*

- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

7. I finish whatever I begin.

- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

8. I am diligent.

- ❑ Very much like me
- ❑ Mostly like me
- ❑ Somewhat like me
- ❑ Not much like me
- ❑ Not like me at all

Scoring:

1. For questions 2, 4, 7 and 8 assign the following points:

5 = Very much like me

4 = Mostly like me

3 = Somewhat like me

2 = Not much like me

1 = Not like me at all

2. For questions 1, 3, 5 and 6 assign the following points:

1 = Very much like me

2 = Mostly like me

3 = Somewhat like me

4 = Not much like me

5 = Not like me at all

Add up all the points and divide by 8. The maximum score on this scale is 5 (extremely gritty), and the lowest score on this scale is 1 (not at all gritty).

Grit Scale citation

Duckworth, A.L, & Quinn, P.D. (2009). Development and validation of the Short Grit Scale (Grit-S). *Journal of Personality Assessment, 91*, 166-174.

http://www.sas.upenn.edu/~duckwort/images/Duckworth%20and%20Quinn.pdf

Duckworth, A.L., Peterson, C., Matthews, M.D., & Kelly, D.R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 9*, 1087-1101.

http://www.sas.upenn.edu/~duckwort/images/Grit%20JPSP.pdf

Appendix I: Teachers' Sense of Efficacy Scale (SHORT FORM)

From Teacher efficacy: Capturing an elusive construct, by Tschannen-Moran & Woolfolk Hoy,

2001. *Teaching and Teacher Education*, 17, 783-805. Copyright by Tschannen-Moran &

Woolfolk Hoy. Reprinted with Permission.

Teacher Beliefs	**How much can you do?**								
Directions: This questionnaire is designed to help us gain a better understanding of the kinds of things that create difficulties for teachers in their school activities. Please indicate you opinion about each of the statements below. Your answers are confidential.	**Nothing**		**Very Little**		**Some Influence**		**Quite a Bit**		**A Great Deal**
1. How much can you do to control disruptive behavior in the classroom?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2. How much can you do to motivate students who show low interest in school work?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3. 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)
4. How much can you do to help your student's value learning?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
5. To what extent can you craft good questions for your students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
6. How much can you do to get children to follow classroom rules?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
7. How much can you do to calm a student who is disruptive or noisy?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
8. How well can you establish a classroom management system with each group of students?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
9. How much can you use a variety of assessment strategies?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
10. To what extent can you provide an alternative explanation or example when students are confused?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
11. How much can you assist families in helping their children do well in school?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
12. How well can you implement alternative strategies in your classroom?	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

Appendix J: Teacher Demographic Questionnaire

Teacher Demographic Questionnaire

1. What is your gender? Male _____ Female _____

2. In which school do you teach (Choose all that apply)?

3. How long have you taught in the district? (including this year) _____

4. What is your total number of years of teaching experience? (including this year) _____

5. How many years of teaching experience do you have at the grade level you are teaching? (including this year) _____

6. What grade do you teach (choose all that apply)? 3, 4, 5, 6, 7, 8, 9, 10, 11

7. What subject(s) do you teach? (Please choose all that apply) math, language arts/reading, science, social studies, special education, music/band/orchestra, art, physical education, speech/drama, foreign language, other _____

8. Are you certified in the subject area that you currently teach? ___yes ____ no

9. Did you go through an alternative certification program to become a teacher? ____yes ___no

10. What type of teaching certificate do you hold?
    Standard _____
    Provisional ____
    Emergency _____
    Other _____

11. What degrees do you currently hold? (please check all that apply)

    B.S./B.A._____
    Masters_____
    Educational Specialist (Ed.S.) _____
    Ph.D/Ed.D_____
    Other_____

Appendix K: IRB Approval

Oklahoma State University Institutional Review Board

Date:	Thursday, October 15, 2015
IRB Application No	ED15134
Proposal Title:	Teacher effectiveness: Examining the relationship between teacher grit and teacher self-efficacy
Reviewed and Processed as:	Expedited

Status Recommended by Reviewer(s): Approved Protocol Expires: 10/14/2016

Principal Investigator(s):

Deanna Dobbins
Stillwater, OK 74078

Katherine Curry
306 Willard
Stillwater, OK 74078

The IRB application referenced above has been approved. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

☒ The final versions of any printed recruitment, consent and assent documents bearing the IRB approval stamp are attached to this letter. These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1.Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval. Protocol modifications requiring approval may include changes to the title, PI advisor, funding status or sponsor, subject population composition or size, recruitment, inclusion/exclusion criteria, research site, research procedures and consent/assent process or forms
2.Submit a request for continuation if the study extends beyond the approval period. This continuation must receive IRB review and approval before the research can continue.
3.Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of the research; and
4.Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the authority to inspect research records associated with this protocol at any time. If you have questions about the IRB procedures or need any assistance from the Board, please contact Dawnett Watkins 219 Scott Hall (phone 405-744-5700, dawnett.watkins@okstate.edu).

Sincerely,

Hugh Crethar, Chair
Institutional Review Board

VITA

Deanna Michelle Dobbins

Candidate for the Degree of

Doctor of Education

Dissertation: TEACHER EFFECTIVENESS: EXAMINING THE RELATIONSHIP BETWEEN TEACHER GRIT AND TEACHER SELF-EFFICACY

Major Field: School Administration

Biographical:

Education:

Completed the requirements for the Doctor of Education in School Administration at Oklahoma State University, Stillwater, Oklahoma in May, 2016.

Completed the requirements for the Master of Science in Educational Administration at Texas A&M University, Commerce, Texas in 2006.

Completed the requirements for the Bachelor of Science in Elementary Education at Oklahoma State University, Stillwater, Oklahoma in 2002.

Experience:
Assistant Principal/Instructional Coach, Stillwater Middle School
Stillwater, OK 2010 – 2016

Elementary Support Specialist-Title I, Garland ISD,
Garland, Texas 2008 – 2010

Teacher 3rd Math & 5th Science, Hillside Academy for Excellence,
Garland, Texas 2003 – 2008

Professional Memberships:
Cooperative Council for Oklahoma School Administrators
Golden Key National Honors Society
National Association of Secondary School Principals
Phi Kappa Phi
Young Professionals of Stillwater