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The Connection to Improved Student Performance for Teacher Experience and Advanced Degree Completion above Bachelor's Level

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by

Jared Flay Terry

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A Dissertation submitted to the Education Faculty of Lindenwood University in partial fulfillment of the requirements for the degree of

Doctor of Education

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Cherita Graber — Dr. Cherita Graber, Dissertation Chair — May 28, 2014 — Date

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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

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Abstract

Educational leaders and experts claim that teachers are the number one classroom factor in the educational success of students (Marzano, 2007; Wong, 2009). This study determined there was not a significant correlation between the two teacher characteristics of advanced degree completion and years of experience. These are two of the more quantifiable and highly regarded teacher characteristics in the profession. The typical teacher salary is a major component of education that places high value on these two characteristics. There are many other policies and legislation, such as the No Child Left Behind Act, teacher tenure, hiring practices, and staff reduction policies that place the focus primarily on experience, degree completion, or a combination of the two. Data for the study were requested from rural school superintendents and elementary principals. These data were degree level completion and experience for third and fifth grade teachers, as well as the class mean scores for the Missouri Assessment Program (MAP) tests in communication arts and mathematics for those teachers. These numbers were analyzed using the Pearson *r* and multiple regression to determine whether the two teacher characteristics had a statistically significant effect on student scores. The study found no significant correlation between the two characteristics, advanced degree completion and years of experience, and the scores on the class standardized tests. These results question the effectiveness of using these two characteristics to distinguish teacher quality, and the high priority given to these characteristics.

Table of Contents

List of Tables

Chapter One: Introduction

Typically, when people think of a good teacher, they picture a professional who is both knowledgeable and experienced and uses these attributes to help students in the classroom achieve academic success. There are a number of programs and procedures that lend credence to the idea that the more experience a teacher has, the better teacher that person may be (Rice, 2010). Rice (2010) indicated teacher tenure, a higher pay scale, mentoring programs, and seniority assignments have been some of the ways that schools compensate experienced teachers. There is also a tendency to give preference and to push teachers to advance their education in the form of advanced degrees (Drury & Baer, 2011). Yet, there are some educational professionals who both question and debate the notion that experienced teachers are better educators (Miller & Roza, 2012). Furthermore, there is controversy surrounding the notion that experienced teachers are better able to raise test scores for students in the classroom (Clotfelter, Ladd, & Vigdor, 2007). In fact, it is debatable whether these characteristics affect test scores at all, and there has been much deliberation on whether quantifying student success by scores on a standardized test is even a competent measure for analysis (Rockoff & Speroni, 2010).

In Chapter One, there is discussion of the history and background of this study and what it means to be an effective teacher. The study was guided by questions pertaining to two characteristics of effective teachers: years of teacher experience and completion of an advanced degree program. There is also discussion of legislation that has guided the debate surrounding teacher effectiveness. Other studies concerning this and related topics are also discussed in this chapter.

Background of the Study

Teacher effectiveness is a hot topic in the world of education. Reeves (2009) said, "Of all the variables that influence student achievement, the two that have the most profound influence are teacher quality and leadership quality" (p. 67). Wong (2009) alleged, "The single greatest effect on student achievement is the effectiveness of the teacher" (p. 2). These are just two opinions of leaders in the field of education who advocate the notion that effective teachers are the key to student success.

If teacher effectiveness truly is the principal component to student success, then it is vital that the educational field examine the specific characteristics inherent in effective teachers. This has been a primary goal in education, especially since passage of the No Child Left Behind (NCLB) Act, a controversial piece of legislation which focuses on making schools accountable to both the state and federal government (U.S. Department of Education, 2002). As part of the U.S. Department of Education (2002) NCLB guidelines, schools must hire and retain highly qualified teachers. In fact, school districts across the nation were required to have all teachers highly qualified by the end of the 2006 school year, and were expected to ensure that rate remained static thereafter (U.S. Department of Education, 2002).

The NCLB "highly qualified" designation has remained the only standard requirement for teacher accountability in education. In order to be designated highly qualified, a teacher must be appropriately certified, hold a minimum of a bachelor's degree, and demonstrate subject matter competency (U.S. Department of Education, 2002). Teachers who have not been appropriately certified, or have not shown subject area competency via the Praxis test, may also use the Highly Objective Uniform State

Standard of Evaluation (HOUSSE) to become highly qualified (U.S. Department of Education, 2002). According to guidance from the U.S. Department of Education (2002), the HOUSSE option was designed for teachers who have at least one year of experience, and gives points based on applicable teaching characteristics, professional development, and other attributes that demonstrate highly qualified status according to the NCLB. A teacher must have accumulated 50 points to be considered highly qualified according to HOUSSE qualifications (U.S. Department of Education, 2002). The HOUSSE certification was typically sought by those possessing a master's degree in their content field, which in itself scores the 50 points required, or by those who have accumulated years of teaching experience (U.S. Department of Education, 2002). Experienced teachers can earn five points for every year taught, up to 25 points (Missouri Department of Education [MODESE], 2013). Ultimately, a teacher can completely bypass the content knowledge test by having an advanced degree and the appropriate teaching experience.

In addition to the NCLB definition of a highly qualified teacher, there are a myriad of factors to consider when evaluating an effective educator. Individual teaching experience, background, advanced education, and demographics are some of the more widely used factors for evaluating the quality of a teacher (Harris & Sass, 2009). For this study, teacher experience and the procurement of an advanced degree took center stage. These typically have been the major attributes the educational world connects to effective teachers. Furthermore, these have remained the two factors that most school districts rely upon when designing steps on district pay scales (Grissom & Strunk, 2012). As a result, teacher salary tends to increase with years of experience and/or when a teacher returns to

school to further his or her education. There are several experts who push for teacher pay based on student test scores, while others argue for merit pay schedules as alternatives to the traditional salary schedule (Baker et al., 2010). These experts believe that teacher experience and degree level have very little bearing on the quality of a teacher (Baker et al., 2010).

For this study, data from Missouri Assessment Program (MAP) were used to determine student academic success. Missouri Assessment Program (MAP) student scale score data were obtained for each classroom from school building administrators, and the mean classroom score was compared with each teacher's experience and degree level. The *MAP Grade Level Assessments Guide to Interpreting Results* explained the use of scale score:

> The scale score describes achievement on a continuum that in most cases spans the complete range of Grades 3–8. These scores range in value from 455 to 875 for Communication Arts, 450 to 885 for Mathematics, and 470 to 895 for Science. Within a content area, scores from adjacent grades may be compared. Scale scores cannot be compared across content areas. For example, it is appropriate to compare a student's Grade 5 Mathematics scale score with his or her Grade 6 Mathematics scale score. The MAP scale score determines the student's achievement level. (MODESE, 2012a, p. 4)

Data points for teachers were obtained from the data provided by school districts. Teacher data were presented as the individual teacher's years of experience in the classroom and whether or not that teacher had received an advanced degree (master's degree or higher).

Conceptual Framework

This study considered the theory that student achievement is affected by teacher quality (Marzano, 2007). It is imperative in education to be able to discuss and narrow down the characteristics that make excellent teachers. It is also important to examine whether or not characteristics that the education field currently prioritizes truly result in student academic success. In order to improve quality in education, there would need to be improvements in the pool of available teachers (Drury & Baer, 2011). As stated previously, the two primary characteristics that have been typically aligned with teacher quality are teacher experience and advanced degree completion (Harris & Sass, 2008). If a positive correlation is to be found connecting the two, research should conclude that teachers with more experience and higher degree levels are better able to provide their students with higher academic achievement.

According to Missouri statutes (2012d), a teacher's pay is required to be determined by a salary schedule adopted by the local board of education. In Missouri, there is not a state-defined salary schedule; however, the statute does set a minimum standard for base pay (Mo. Rev. Stat., 2012d; Mo. Rev. Stat., 2012g). This statute requires a minimum base salary of $33,000 for teachers with 10 years of experience and a master's degree (Mo. Rev. Stat., 2012d; Mo. Rev. Stat., 2012g). For teachers with less than 10 years of teaching experience, and who do not hold an advanced degree, the minimum base salary is $25,000 (Mo. Rev. Stat., 2012d; Mo. Rev. Stat., 2012g). The manner in which these requirements are written make it easy for school boards and administrations across the state to have flexibility in creating their own salary schedules. As a result, most districts align their pay schedules using the two aforementioned teacher

characteristics: experience and advanced degree completion. This highlights the fact that the Missouri legislature supports the notion that the completion of advanced degrees and experience make teachers better able to educate students.

A number of educational experts have studied teacher quality in order to determine what qualities and characteristics exemplary teachers share. Marzano is one of those experts. Marzano (2007) stated that with the vast amount of new research being conducted in the area of education, characteristics of effective schools have been defined "among elements such as a well-articulated curriculum and a safe and orderly environment, the one factor that surfaced as the single most influential component of an effective school is the individual teachers within that school" (p. 1). Marzano (2007) described three general characteristics of effective teaching uncovered in his research. The three characteristics of effective teachers Marzano (2007) discovered were use of effective instructional strategies, use of effective classroom management strategies, and use of effective classroom curriculum design.

Another expert on teacher quality, Professor James H. Stronge of the Educational Policy Department at William and Mary, summarized his definition of quality teaching using four characteristics, or statements. The effective teacher, according to Stronge (2007), cares deeply, recognizes complexity, communicates clearly, and serves conscientiously. Both of these researchers discuss extensively the roles that teacher education and experience play in improving the quality of individual teachers. Stronge (2007) believed experienced teachers:

> Have attained expertise through real-life experiences, classroom practice, and time. Teachers who are both experienced and effective are experts who know the

> content and the students they teach, use efficient planning strategies, practice interactive decision making, and embody effective classroom management skills. (p. 11)

A challenge facing the education community is matching the pre-service requirements for entering the profession with the qualities of an effective teacher. The federal government, through the NCLB, has mandated that highly qualified teachers achieve at least a bachelor's degree, state certification, and show content knowledge (U.S. Department of Education, 2002). By obtaining a four-year degree in a qualifying subject area, a teacher has demonstrated the required general content knowledge to teach others (U.S. Department of Education, 2002). Teachers may also count teaching experience as a measure of subject area competency through HOUSSE (U.S. Department of Education, 2002). Loeb and Miller (2009) wrote, "The HOUSSE option was intended to give states flexibility in deeming their veteran teachers highly qualified" (p. 201). The federal government, like the state of Missouri, adheres to the premise that both teacher degree level attainment and teacher experience are two of the most important characteristics of teacher quality (U.S. Department of Education, 2002).

The issue of teacher pay and how it relates to student performance has been a highly scrutinized area of education. Unfortunately, the majority of studies have been based on the notion of merit or performance pay, and not on current salary schedules and their effect on student achievement (Grissom & Strunk, 2012). This fact illustrates the importance of a study such as this – one that takes into account the current salary schedule and unmasks if the qualifiers of the salary schedule do affect student learning.

In 2009, the Bill and Melinda Gates Foundation funded a study led by Steve Cantrell and Thomas Kane to determine what qualities make an effective teacher. The stated goal was to enable school leaders and districts to come up with a more reliable way to evaluate their teachers (Cantrell & Kane, 2010). The study, called the Measures of Effective Teaching (MET) Project, relied upon over 3,000 teacher volunteers, mainly from urban school districts (Cantrell & Kane, 2010).

Cantrell and Kane (2010) evaluated the teachers using five different measures: student achievement gains on assessments, classroom observations, content knowledge, student perceptions, and teacher perceptions of school. In the MET study, Cantrell and Kane (2010) observed that teacher experience and advanced degree completion were undoubtedly characteristics that helped define quality teachers. However, Cantrell and Kane (2010) also alluded to the fact that these attributes were only part of the overall equation in determining a quality teacher. In the end, the researchers from the Gates Foundation concluded that this determination could not be based on these two criteria alone (Cantrell & Kane, 2010).

Previous studies on this topic offer mixed results on the correlation between teacher experience/degree attainment and student achievement (Cantrell & Kane, 2010; Harris & Sass, 2008). In a study by Harris and Sass (2008), researchers created a student performance output function to determine the value of individual teacher experience and education to student performance. The functions accounted for student fixed characteristics and teacher pre-service education in service education (Harris & Sass, 2008).

The data acquired by Harris and Sass (2008) originated from the state of Florida test scores obtained from the 2000 to 2005 school years. Harris and Sass (2008) were able to identify student scores with individual teachers to further specify the data. Harris and Sass (2008) uncovered a positive correlation between teacher experience and student achievement; however, the greatest effects were only after the first year. Also, it seemed that elementary school students received the greatest impact from teacher experience (Harris & Sass, 2008). For teachers with advanced degrees, the only area of positive correlation was in middle school mathematics (Harris & Sass, 2008).

Statement of the Problem

As teacher accountability gains precedence for school districts in terms of teacher accountability, it is important to have clear definitions for what characteristics an effective teacher possesses. Specific factors and teacher traits that affect student performance need to be defined, so that teacher preparation programs and state licensure and evaluation guidelines can be more focused and impactful. Also, traditional educational pay scales have two variables for teacher advancement through the pay scale, teacher experience and progress toward advanced degrees. This fact has brought teacher experience and the achievement of advanced degrees into the discussion of what makes an effective teacher. If these two factors have any correlation to student achievement, then teacher pay scales may have the correct emphasis. If not, school districts may need to determine where that money can be spent in order to have a greater impact on the success of students.

If teacher experience and advanced degrees really do improve the skills of a teacher, it could be putting smaller school districts at a disadvantage. Beesley, Atwill,

Blair, and Barley (2010) explained small schools, such as those in rural and economically depressed districts, have pay scales and salaries typically lower than schools in more populated districts with a greater tax base. Also, because budgets are usually tighter in small school districts, it places an unjust strain on these districts that must not only hire highly qualified teachers, but may also be forced to raise their pay schedule in order to compete with nearby, larger school districts (Beesley et al., 2010).

It is not uncommon to find higher turnover rates in smaller schools, with quality teachers moving to larger schools for a higher salary (Beesley et al., 2010). Teachers in rural districts are often responsible for an entire discipline, not just a specific subject, increasing the difficulty of finding qualified and experienced teachers (Beesley, et al., 2010). This makes the search for better and more qualified teachers more difficult for all districts, but especially smaller school districts.

NCLB guidelines are constructed from the idea that more experienced and better educated teachers lead to better teacher quality (U.S. Department of Education, 2002). Loeb and Miller (2009) highlighted there has been some disapproval of the measures contained in the act, "Significant criticism has been directed at NCLB's definition of quality teachers, attacking it as too focused on inputs at the expense of what really defines a good teacher – their actions within the classroom" (p. 201). The same could be said for both statutes and salary schedule, or any other measure of teacher characteristics pertaining to quality teachers; teacher characteristics may be part of the high quality equation, but there are also other factors that can make a significant difference for the performance of the students in that classroom as well (Loeb & Miller, 2009).

Missouri statutes and school board policies adopted from the Missouri School Boards Association (MSBA) and the Missouri Consultants for Education (MCE) also seem inclined to give preference to teachers with higher degrees and experience. Missouri statutes also set the parameters and minimum salaries for teachers in Missouri (Mo. Rev. Stat., 2012d). There are two minimums referenced in the statutes: a minimum salary for all teachers and a minimum salary for teachers with a master's degree and 10 years of experience (Mo. Rev. Stat., 2012d).

The minimum salary for teacher with a master's degree and 10 years of experience was $33,000, an $8,000 increase from the overall minimum of $25,000 (Mo. Rev. Stat., 2012d). Both the MSBA (2013d) and the MCE (2013e) policies require school districts to adopt salary schedules that follow the Missouri statute. Specifically, these policies mention experience and educational background among other variables used to determine salary steps and increases (MCE, 2013e; MSBA, 2013d).

There are multiple other state and school board policies that incorporate experience and educational background. Teacher tenure is an area defined in state and local statutes that helps to protect or give advantage to teachers with experience (Mo. Rev. Stat., 2012e; Mo. Rev. Stat., 2012i). A probationary status was meant to give time for a teacher to show competence in the teaching field (MCE, 2013b).

Missouri statutes declare a teacher on probationary status until the teacher has completed his or her fifth year of teaching (Mo. Rev. Stat., 2012e; Mo. Rev. Stat., 2012i). After the contract begins on the sixth year, the teacher is now considered permanent (Mo. Rev. Stat., 2012e). Probationary teachers must receive a summative evaluation every year, whereas permanent teachers must be evaluated every other year (MCE, 2013a;

MSBA, 2013a). The MCE Policy 4610 (2013a) also advises that administrators and other evaluators "focus their attention, non-exclusively, on probationary teachers and on tenured teachers whose practices adversely affect student learning" (p. 2). Once a teacher has received tenure, that teacher has an indefinite contract, which includes specific protections making dismissal a more involved process (MCE, 2013c).

A probationary teacher may receive a nonrenewal of his or her contract (MCE, 2013c; MSBA, 2013b). In contrast, a tenured teacher must have his or her contract terminated (MCE, 2013c; Mo. Rev. Stat, 2012b; Mo. Rev. Stat, 2012c; Mo. Rev. Stat, 2012j; Mo. Rev. Stat, 2012k; MSBA, 2013b; MSBA, 2013c). Before the contract is to be terminated, a notice of deficiency must have been given to the teacher with adequate time to correct the issues, unless there was a statutory cause for removal (MCE, 2013f; Mo. Rev. Stat., 2012b; Mo. Rev. Stat, 2012f; Mo. Rev. Stat, 2012j; Mo. Rev. Stat, 2012k; MSBA, 2013b; MSBA, 2013f). However, both teachers do have the option of appeal to the county circuit court over board decisions (Mo. Rev. Stat., 2012a).

When a school district has been forced to reduce staff numbers due to financial hardship or low enrollment numbers, tenured teachers in a district have some protection (MCE, 2013d; MSBA, 2013e). MCE (2013d) and MSBA (2013e) policies both clearly state that when a school has to cut back on the number of staff, a situation more commonly called a "reduction in force," probationary teachers must be removed before tenured teachers. If there is a permanent teacher in the grade level or department where the cuts occur and he or she is certified for another area in which there was a probationary teacher, the probationary teacher must be released and the tenured teacher moved to that position (MCE, 2013d; MSBA, 2013e).

Purpose of the Study

In this study, teacher experience and advanced degree completion were analyzed to determine the connection to teacher quality and effectiveness. These two characteristics have been consistently connected with teacher quality and remain the focus due to the fact that the majority of teacher pay scales throughout the state and country are based upon these attributes (Podgursky & Springer, 2011). It must also be noted that not only are these two the most definable, but each can be inspected and analyzed by educators and researchers alike. Results, either way, will necessitate adjustments to district salary schedules, professional development opportunities, and the hiring practices of schools across the nation.

Research Questions

In order to guide the research forward through data collection, it was important to develop questions that would bolster and clarify the study's findings. These questions give parameters and a focus to the study. The following research questions guided this study:

1. What relationship exists, if any, between the years of teaching experience of a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Communication Arts test?

2. What relationship exists, if any, between the years of teaching experience of a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Communication Arts test?

3. What relationship exists, if any, between the years of teaching experience of a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Math test?

4. What relationship exists, if any, between the years of teaching experience of a fifth grade teacher and the performance of that teacher's students on the fifth Grade Missouri Assessment Program Math test?

5. What relationship exists, if any, between the academic degree held by a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Communication Arts test?

6. What relationship exists, if any, between the academic degree held by a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Communication Arts test?

7. What relationship exists, if any, between the academic degree held by a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Math test?

8. What relationship exists, if any, between the academic degree held by a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Math test?

Null Hypotheses and Alternate Hypotheses

The null and alternate hypotheses used in this study were as follows:

$H1_0$: There is no relationship between years of teaching experience and student performance on the third grade Missouri Assessment Program Communication Arts test.

$H1_a$: There is a relationship between years of teaching experience and student performance on the third grade Missouri Assessment Program Communication Arts test.

$H2_0$: There is no relationship between years of teaching experience and student performance on the fifth grade Missouri Assessment Program Communication Arts test.

$H2_a$: There is a relationship between years of teaching experience and student performance on the fifth grade Missouri Assessment Program Communication Arts test.

$H3_0$: There is no relationship between years of teaching experience and student performance on the third grade Missouri Assessment Program Math test.

$H3_a$: There is a relationship between years of teaching experience and student performance on the third grade Missouri Assessment Program Math test.

$H4_0$: There is no relationship between years of teaching experience and student performance on the fifth grade Missouri Assessment Program Math test.

$H4_a$: There is a relationship between years of teaching experience and student performance on the fifth grade Missouri Assessment Program Math test.

$H5_0$: There is no relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the third grade Missouri Assessment Program Communication Arts test.

$H5_a$: There is a relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the third grade Missouri Assessment Program Communication Arts test.

$H6_0$: There is no relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the fifth grade Missouri Assessment Program Communication Arts test.

$H6_a$: There is a relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the fifth grade Missouri Assessment Program Communication Arts test.

$H7_0$: There is no relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the third grade Missouri Assessment Program Math test.

$H7_a$: There is a relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the third grade Missouri Assessment Program Math test.

$H8_0$: There is no relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the fifth grade Missouri Assessment Program Math test.

$H8_a$: There is a relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the fifth grade Missouri Assessment Program Math test.

Definition of Key Terms

For the purposes of this study, the following terms are defined:

Full time equivalent (FTE). For school data, one FTE is equal to the minimum number of hours required by a district to be a full time employee, or in other words, one full time teacher on staff (MODESE, 2008). FTE is used for school district staff counts reported to the MODESE (2008).

Highly qualified teacher. The No Child Left Behind Act defines a highly qualified teacher as a teacher who was appropriately certified, held at least a bachelor's

degree, and could demonstrate content knowledge via the Praxis test or by other means (MODESE, 2012b; U.S. Department of Education, 2002).

Missouri Assessment Program (MAP). The MAP is the state defined program of assessment for schools in Missouri. For the purpose of this study, MAP Grade Level Assessments results were used to represent student achievement score data. These tests are performed annually each spring in elementary schools in grades three through five (MODESE, 2012a). Students in grades three and four take the MAP tests in communication arts and mathematics (MODESE, 2012a). Students in grade five take the tests in communication arts, mathematics, and science (MODESE, 2012a). These tests are designed to evaluate students' mastery of the Missouri Show-Me Standards, which are the standards set forth by the MODESE (2012a). The test is made up of three different types of questions: multiple choice, constructed response, and performance events (MODESE, 2012a). Students are scored and ranked into four possible levels: below basic, basic, proficient, and advanced (MODESE, 2012a). Student and school data are compiled by the state for use in comparison with all Missouri school districts, as well as schools throughout the nation (MODESE, 2012a).

Missouri Comprehensive Data System (MCDS). This is the MODESE system of data collection and publishing that allows education professionals, as well as the general public, to access education related data from Missouri schools (MODESE, 2012c).

Missouri School Improvement Program (MSIP). The Missouri School Improvement Program is the process that the MODESE uses to evaluate and assess the performance of school districts in Missouri. State law and school board policies

mandated the evaluation by MSIP Standards. The MSIP standards determine the accreditation status for Missouri school districts (MODESE, 2012d).

No Child Left Behind (NCLB). Federal legislation signed into law by President George W. Bush. NCLB created new standards for states and school districts (U.S. Department of Education, 2002). There are four basic tenets of the NCLB legislation; flexibility in local control, parental choice, disadvantaged students, and a national system of accountability for school districts (U.S. Department of Education, 2002). NCLB also created standards for highly qualified teachers, which initiated debate on what constitutes a high quality teacher (U.S. Department of Education, 2002).

Race to the Top (RTT). Race to the Top is a competitive grant program to encourage and reward states that implement significant reforms in the four education areas described in the American Reinvestment and Recovery Act: Enhancing standards and assessments, improving the collection and use of data, increasing teacher effectiveness and achieving equity in teacher distribution, and turning around struggling schools (U.S. Deptartment of Education, 2010).

Salary schedule. Salary schedules determine teachers' salary. Typically the schedules are in chart form with each column representing a stated level of degree completion and each row representing a year of experience (Podgursky & Springer, 2011). Teachers take "steps" on the salary schedule as they increase experience and achieve credit hours toward and completed advanced degrees (Podgursky & Springer, 2011).

Small schools. Small schools are defined as any school district with a total student enrollment of fewer than 600 students. According to the U.S. Department of

Education Rural Education Achievement Program (REAP), schools are eligible for the Small, Rural School Achievement (SRSA) program if they have an Average Daily Attendance (ADA) of less than 600 (U.S. Department of Education, 2003).

Teacher experience. This is the number of years that a teacher has accumulated in his or her teaching profession. For this study, teacher experience was reported as the total number of years of experience for each individual teacher.

Teachers with advanced degrees. Teachers with advanced degrees are defined as a teacher who has achieved a master's degree or higher.

Teacher tenure. In Missouri, any teacher who has been employed as a teacher in the same school district for five successive years, and who has continued or who thereafter continues to be employed as a teacher by the school district, receives tenure status (Mo. Rev. Stat., 2012e). Under Missouri law, these teachers are labeled permanent teachers (Mo. Rev. Stat., 2012e).

Limitations

The following limitations were identified in this study:

The sample demographics could be one limitation of the study. The school data evaluated in this study were very specific, only examining public elementary school data from small districts in the state of Missouri. There were no private or charter school data included in this study. The MAP grade level assessments are only offered to students in grades three through eight in math and communication arts; therefore, data from high schools (grades 9-12) were not considered. Data from the science MAP grade level test were not incorporated in the study because students in grades three and four did not take the test. Also, there was no grade level test for other subjects or classes, such as art and

physical education; therefore, these subjects were not included in the study. Consequently, it may not be prudent to apply the data found in the study to other subjects and grade levels, nor to entire school districts. Data obtained from private schools or high schools may lead to alternative conclusions.

Student performance calculation methods could be another limitation found in the study. Student achievement and performance can be defined in multiple ways. Student scores from the MAP test may not be completely indicative of the success or achievement levels of the student. This study only analyzed the relationship between teacher factors and the performance of the students on statewide tests.

The differences in the quality and rigor of collegiate degree programs and the identification of teacher quality are additional limitations. Not all teacher preparation and college degree programs are equal (Harris & Sass, 2008). Harris and Sass (2008) explained some have higher entrance requirements for students; whereas, others may have a more rigorous curriculum. Furthermore, a college degree signifies only so much, innate ability, prior education and training, and personal teaching and other career experiences apart from an advanced degree may have had an effect on the quality of an individual teacher (Harris & Sass, 2008). This study did not take into account any of these variables.

Another limitation in this study was the lack of distinction between content areas of a master's degree. The data from school districts only revealed whether or not the teacher had an advanced degree, not the content area the degree encompassed. While school districts move teachers up the salary scale according to degree completion, the schools did not register the actual content of the degree. A teacher's master's degree may

have been in his or her content area, educational administration, or it may have been unrelated to a teacher's grade level or content area.

School size may be another limitation to the study. The data analyzed in this study came from small school districts. These districts had an average daily attendance of 600 students or less, according the definition of a small rural school for REAP (U.S. Department of Education, 2003). The conclusions gathered from this study may or may not apply to larger or urban school districts.

Summary

Teacher quality and effectiveness are a crucial components of school success. If teacher effectiveness is one of the major factors in raising student achievement, it is vital to pinpoint the exact characteristics that constitute an effective educator. Once this is completed, states and school districts can then focus exclusively on improving teacher quality and effectiveness. Teacher experience and advanced education have been consistent areas that experts and leaders in the field of education have suggested make teachers more efficient (Harris & Sass, 2008; Stronge, 2007). This study was designed to examine the relationship between these two factors and student achievement. If it can be determined there was a relationship, the educational community needs to implement strategies to encourage teachers to stay in the field and to seek opportunities for advanced degrees. If there was no relationship, there needs to be a change in focus and an adjustment to salary scales.

In Chapter Two, educational practices that are based almost solely upon experience and degree completion are examined. There is also an in-depth review of the salary schedule and its components, including how these components relate to student

achievement. Hiring, retention, teacher layoff, and tenure practices are other practices in school districts that hinge on experience and degree completion. A discussion of these topics is contained in this chapter. There is also a review of teacher characteristics and characteristics of the pool of prospective teachers for schools to hire. Research and studies on the correlation between teacher experience and qualifications to student achievement are explored.

Chapter Two: Review of Literature

This study sought to uncover whether teacher experience or pursuit of advanced degrees improve teacher quality, thus leading to an improvement in student test scores on the Missouri Assessment Program (MAP) communication arts and mathematics tests. The review of literature examined background and previous studies completed on the major topics involved with these questions. These topics included teacher experience, teacher advanced degree completion, student achievement, teacher quality, current forms of salary schedules, and teacher tenure. Examining the background and previous studies gives an understanding of the topics discussed and allows a deeper, more qualified viewpoint of the topic being studied.

Missouri and National Teacher Characteristics

According to the MODESE (2012e), there were 67,600 public school teachers in Missouri in 2012. There has been a consistent decline in the number of teachers since 2008, which was the high water mark of the last 10 years (MODESE, 2012e). In that year, there were a total of 70,624 teachers in Missouri (MODESE, 2012e). These trends could be associated with a declining economy and a drop in the amount of funds available to schools from the state government. The MODESE (2012e) report also revealed the majority (30.3%) of Missouri teachers were in the 30-39 age bracket as compared to 26.6% for the 40-49 age group, 20.6% for ages 50-59, and 16.6% for ages 20-29. In terms of experience, the MODESE (2012e) reported 48.9% of Missouri teachers had 10 years or less of teaching experience, and of those with 10 or less years, 26.7% had five years or fewer, and 22.2% had 6-10 years of experience. The percentages for teachers with 10 or more years of experience were 33.2% for those with 11-20 years

at the helm, 15.1% for 21-30, and 4.2% for those with 30 or more years of experience (MODESE, 2012e). Within the last decade, the highest percentage of Missouri teachers with 10 or less years of experience was reached in 2008 with 52.1%, which indicates the average experience for Missouri teachers was increasing (MODESE, 2012e). In 2012, the MODESE (2012e) reported Missouri school districts hired 7,209 teachers who were new to the district in which they were hired. Of those teachers, 65.9% were new first year teachers (MODESE, 2012e).

The National Center for Education Statistics (NCES) (2012) published an annual report titled the *Digest of Education Statistics*. Inside this report were teacher and school data for the entire country. The most recent data, published in the 2011 report, were from the 2009 school year. In that year, NCES (2012) reported there were 3.2 million public school teachers in the United States. Of those teachers, 13.4% had taught less than three years, 33.6% had 3-9 years of experience, 29.3% had 10-20 years, and 23.7% had 20 or more years of experience (NCES, 2012). The NCES (2012) also published data on degree completion for teachers across the country; the highest category of degree completion was a bachelor's degree at 47.4%. Master's degree completion had the next highest percentage with 44.5%, specialist at 6.4%, and doctorate at 0.9% (NCES, 2012). Drury and Baer (2011) compared these data and indicated their findings on the significance of the teaching profession to the American workforce:

> Public school teachers constitute the largest college-educated occupational group in the United States. The number of public school teachers is greater than the number of postsecondary teachers, social workers, doctors, and lawyers

> combined. Put another way, in a country of approximately 310 million people, more than one in every 100 Americans is a public school teacher. (p. 25)

Missouri and National Salary Schedule Information

According to the NCES (2012) statistics for 2011, the average salary for teachers with one year of experience or less was $38,210. As experience level rises, so does average salary. The NCES (2012) reported at five years of experience, the average salary jumped to $45,590; at 10 years the average grew to $50,470; and at 20 years the average salary became $57,830. The average salaries, according to degree completion as reported to the NCES (2012), were $43,650 for teachers with a bachelor's degree, and for teachers with a master's degree, that average salary jumped to $54,810. The average salary for teachers with a specialist's degree was $58,420 (NCES, 2012). According to the NCES (2012), the national average for a teacher with a bachelor's degree and one year of experience or less was $36,700. In contrast, the national average for a teacher with 10 years of experience and a master's degree soared to $53,400 (NCES, 2012).

According to the MODESE (2012c) statistics, the average teacher salary in Missouri in 2011 was $45,712. The Missouri National Education Association (MNEA) (2012) published the *Salary Benchmarks and Rankings Report 2011-2012* to analyze Missouri salary data from school districts and provide groupings and rankings. For the southwest region of Missouri, the lowest starting base salary for school districts was $25,000 (MNEA, 2012). The MNEA (2012) reported the highest base salary for the same region was $36,230, a difference of $11,230. The greatest maximum step on the salary schedule for teachers was $75,100, and the lowest maximum step on the salary

schedule was $35,000 (MNEA, 2012). This was a difference of $40,100, a much greater discrepancy.

The Missouri State Teachers Association (MSTA) also published a salary report. The MSTA *Salary Schedule & Benefits Report* (2010) gave state averages for the information on district salary schedules. The state average in 2010 for base salary with no experience and a bachelor's degree was $29,315 (MSTA, 2010).

Student Achievement

When the NCLB Act was passed in 2001, it brought with it an added program of accountability for school districts throughout the nation. NCLB held schools accountable for Adequate Yearly Progress (AYP), which was based on student scores from consistent state tests (U.S. Department of Education, 2002). NCLB required these tests be administered annually to students in grades three through eight in reading and math (U.S. Department of Education, 2002). The student scores for each school district were then compared to school districts throughout the state and nation (U.S. Department of Education, 2002). These tests were designed to show progress and to allow teachers, parents, and other parties to determine the effectiveness of a school district or building (U.S. Department of Education, 2002). They were also designed to be used as data points to show school buildings and educators where to focus improvement strategies (U.S. Department of Education, 2002).

Federal school funding through the new Race to the Top program continued the focus on teacher quality and effectiveness, as well as determining teacher effectiveness through test scores (U.S. Department of Education, 2009). One of the four main goals of the Race to the Top program was "recruiting, developing, rewarding, and retaining

effective teachers and principals, especially where they are needed most" (U.S. Department of Education, 2009, p. 2). In Race to the Top, the U.S. Department of Education (2009) measured teacher and principal effectiveness based on performance; this performance measure was based upon evaluation performance and student data. It also gave the opportunity for states to create financial incentives for teachers who perform well (U.S. Department of Education, 2009).

In Missouri, student achievement assessments are administered through MAP tests (MODESE, 2012a). In elementary schools, these are grade level assessments given in grades three through five (MODESE, 2012a). The MODESE (2012a) stipulated the test be administered in math and communication arts for all three grades in elementary, as well as a science version given to fifth grade.

There are three different question formats on the MAP test: multiple choice questions in which the students must choose the best answer from multiple options, constructed response questions in which students must answer a question in their own words, and performance events in which students create longer answers after going through a variety of problems, such as experiments, essays, or multiple resources (MODESE, 2012a). These grade level assessments are given to each and every student, and individual performance is ranked according to four categories: below basic, basic, proficient, and advanced (MODESE, 2012a). The tests are based on the Missouri Show Me Standards for education and state defined Grade Level Expectations (MODESE, 2012a).

Student achievement results on standardized tests are becoming more of an emphasis in evaluating schools and teachers (Rockoff & Speroni, 2010). There seems to

be a divide on whether these results should be involved in these evaluations. Stronge, Ward, Tucker, and Hindman (2008) declared, "given the clear and undeniable link that exists between teacher effectiveness and student learning, the use of student achievement information, when it is curriculum based, can provide an invaluable tool" (p. 181). Stronge et al. (2008) continued by asserting, "student achievement can be, indeed, should be, an important source of feedback on the effectiveness of schools, administrators, and teachers" (p. 181). Rockoff and Speroni (2010), however, revealed a flaw in that assertion when their study revealed "value-added' measures of effectiveness are noisy and can be biased if some teachers are persistently given students that are difficult to teach in ways that are hard to observe" (p. 261).

Teacher Quality

Missouri statutes require standards for quality teaching (Mo. Rev. Stat, 2012h). NCLB required all teachers in core subjects to be Highly Qualified (U.S. Department of Education, 2002). The determination must be made as to whether highly qualified teachers are also highly effective teachers when it comes to student achievement. It is generally considered common knowledge that high quality teachers can make a big difference in the classroom (Marzano, 2007). There have been multiple studies and reports that confirm this fact (Aaronson, Barrow, & Sander, 2007). Additional studies have indicated teacher quality is the number one classroom factor in student achievement (Harris & Sass, 2009; Marzano, 2007; Reeves, 2009; Wong, 2009).

Marzano (2007) stated, "students who have a teacher at the 75th percentile in terms of pedagogical competence will outgain students who have a teacher at the 25th percentile by 14 percentile points in reading and 18 percentile points in mathematics"

(p. 2). Also, "students who have a 90th percentile teacher will outgain students who have a 50th percentile teacher by 13 percentile points in reading and 18 percentile points in mathematics" (Marzano, 2007, p. 2). A high quality teacher can also make a substantial difference on the educational outcomes for the students in his or her classroom, not only for that year, but for the student's long-term educational future (Marzano, 2007).

The definition of a quality teacher has evolved throughout the years. Arnold Shober (2012), associate professor of government at Lawrence University, stated, "Through the late 1990s, policymakers and district personnel trusted teacher credentials as a marker of quality in the education system, and they paid little attention to the variation in classroom effects despite the common credential" (p. 3). Shober (2012) continued, "Since then, the combination of a renewed public emphasis on improving academic achievement and new research on teacher effectiveness has prompted policymakers to question the trustworthiness of linking certification to quality" (p. 3). This shift in thinking, Shober (2012) said, came about in the late 1990s:

> It was abundantly clear that this definition was fiction. Teacher qualifications did not guarantee teacher quality. Thirty years of data showed that students systematically learned more in some classrooms than others and that disparities in learning could be tied to disparities in teacher quality. Certified teachers were not, as it turned out, interchangeable; they were individuals with strengths and weaknesses. (p. 3)

In his book, *Qualities of Effective Teachers,* Stronge (2007) examined six major categories that he believes are part of effective teaching. Teaching prerequisites, the person, classroom management, planning, instruction, and monitoring are the six

categories defined by Stronge. Stronge (2007) discussed the fact that effective teachers typically combine all of these categories and traits instead of relying on just one tool in order to educate students. Stronge (2007) stated, "Teaching occurs at a crossroads of complex disciplines and involves interacting with diverse and complex student learners. The effective teacher must have sufficient knowledge of subject matter and of teaching and learning to appreciate those complexities" (pp. 74-75).

Stronge (2007) also maintained it is important for teachers to realize that each student is an individual and each class is different; therefore, short and long-term plans and adaptations for each class are unique and unalike. Marzano (2007) described effective teaching this way: "Individual classroom teachers must determine which strategies to employ with the right students at the right time. In effect, a good part of effective teaching is an art" (p. 5). Furthermore, the level at which students learn and retain knowledge and material is also a byproduct of effective teaching (Marzano, 2007; Stronge, 2007). Stronge (2007) claimed, "The ultimate proof of teacher effectiveness is student results. Simply put, teacher success = student success" (p. 105).

Administrators and educational leaders have begun to try and qualify teacher quality by observable and quantifiable methods (Harris & Sass, 2009). This has led teacher quality to be tied to students' performance on tests (Stronge et al., 2008). Stronge et al. (2008) declared, "Given the central role that teachers have always played in successful schools, connecting teacher performance and student performance is a natural extension of the educational reform agenda" (p. 181). Along with the attempt to quantify quality, educational leaders have been focusing on defining the characteristics of teachers that can provide an increase in student achievement (Harris & Sass, 2009; Marzano,

2007; Stronge, 2007). Previous studies have provided varying results when exploring the effect of teacher quality (Munoz & Chang, 2008). Munoz and Chang (2008) claimed, "Although common sense and experience suggest that teachers make a difference for student achievement (positively and negatively), the available empirical evidence shows mixed findings when it comes to certain teacher characteristics" (p. 156).

The "widget effect" is one of the reasons that some reformers are pushing for student scores to be involved in teacher evaluation. According to Weisberg, Sexton, Mulhuern, and Keeling (2009), the widget effect was rooted in the failure of teacher evaluation systems to produce meaningful information about teacher effectiveness. In theory, an evaluation system should identify and measure an individual teacher's strengths and weaknesses accurately and consistently, so the teacher can receive the feedback needed to improve, and so his or her school can determine how best to allocate resources and provide support (Weisberg et al., 2009). According to a 2009 study conducted by Weisberg et al. (2009), "teacher evaluation systems do little more than devalue instructional effectiveness by generating performance information that reflects virtually no variation among teachers at all" (p. 10). Weisberg et al. (2009) also stated:

> The disconnect between teacher evaluation systems and actual teacher performance is most strikingly illustrated by the wide gap between student outcomes and teacher ratings in many districts. Though thousands of teachers included in this report teach in schools where high percentages of students fail year after year to meet basic academic standards, less than one percent of surveyed teachers received a negative rating on their most recent evaluation. (p. 10)

Weisberg et al. (2009) claimed proponents of the push to make student achievement a major part of teacher evaluation have used these facts to bolster their agenda. Proponents asserted it was impossible to have that many great teachers, due to the fact there were some schools that had a high number of highly rated teachers, but the school rating was poor along with low test scores (Weisberg et al., 2009). Also, statistically speaking, it was also highly improbable that 99% of teachers were highly effective (Weisberg et al., 2009).

Rockoff and Speroni (2010) performed a comparative study of subjective and objective methods of teacher evaluation. The study was completed in the New York City School District and focused on teachers and student achivement in elementary and middle schools, grades three through eight (Rockoff & Speroni, 2010). Rockoff and Speroni (2010) examined the link between evaluations of teachers in their first year and the student test scores for that same year. Rockoff and Speroni (2010) then considered whether those student test results in the first year correlated to a similar range of scores in the second year. Rockoff and Speroni (2010) revealed that teachers with high evaluation scores also produced higher student test scores in the first year. The study also showed that teachers with high first-year test scores also produced high second-year test scores (Rockoff & Speroni, 2010).

A study by Baker et al. (2010) outlined the dangers of attaching student performance to the teacher evaluation process, cautioning educational leaders to not omit the evaluation of practice. Baker et al. (2010) stated:

> These systems for observing teachers' classroom practice are based on professional teaching standards grounded in research on teaching and learning.

> They use systematic observation protocols with well-developed, research-based criteria to examine teaching, including observations or videotapes of classroom practice, teacher interviews, and artifacts such as lesson plans, assignments, and samples of student work. Quite often, these approaches incorporate several ways of looking at student learning over time in relation to the teacher's instruction. (p. 21)

Darling-Hammond (2011) also warned against the sole use of student scores or other value added measures, because teachers often have limited control over students in their classroom. These educators also have virtually no control over outside issues that students may face on a daily basis – factors that undoubtedly affect test scores (Darling-Hammond, 2011). These factors include class size, school resources, home/community support or adversity, individual needs, peer grouping, and prior educational experiences (Darling-Hammond, 2011).

Substantial research has shown that despite efforts to begin basing teacher evaluations on student test scores alone, the best approach may be to include both student scores and teacher evaluations (Darling-Hammond, 2011). Including both measures of teacher competency may paint a better overall picture of the quality of a teacher. Rockoff and Speroni (2010) stated:

> Our results suggest that evaluation systems which incorporate both subjective measures made by trained professionals and objective job performance data have significant potential to help address the problem of low teacher quality. However, we also find that the application of standards can vary significantly across

> individuals responsible for making evaluations, and the implementation of any evaluation system should address this issue. (p. 264)

Stronge et al. (2008) also supported this hypothesis, adding:

> Teacher effectiveness to a school districts's accountability system would provide a critical empiricial perspective to the multifaceted process of teacher evaluation. Secondly, when the data from teacher effectiveness are associated with professional development opportunities that are structured on the instructional characteristics and behaviors of effective teachers, the ultimate outcome may be increased educational success of more students. (p. 179)

Teacher Candidate Quality

There often is a substantial variation between the quality of teacher candidates that schools have to choose from when seeking to hire new personnel (Drury & Baer, 2011). Drury and Baer (2011) concluded teachers hold more college degrees than any other profession in the United States. However, there is a difference between a collection of teacher candidates and a collection of *quality* teaching candidates (Drury & Baer, 2011). The pool of quality teaching candidates available to a school district is often dictated by that district's teacher salary, entrance requirements, and university programs and requirements, among other things (Drury & Baer, 2011).

Finding quality teaching candidates can be a tough job for school administrators and leaders (Drury & Baer, 2011). Drury and Baer (2011) outlined the marked increase in teaching candidates entering the workforce from the years 1960 through 2010. Drury and Baer (2011) claimed:

> [The increase in education degree graduates] reveals an uneven rise in the number of U.S. school-age children, from approximately 50 million in 1960 to just over 60 million in 2010. Over the same period of time, the teacher workforce expanded at an almost linear pace, from under 1.5 million to approximately 3.25 million. (p. 26)

In other words, though the student to teacher ratio was lower, there was also a lower percentage of high quality teachers. This left more students in classrooms led by lower quality teachers.

Hanushek (2011) believed teacher salary schedules were robbing the profession of quality candidates. Hanushek (2011) stated the current salary structure "acts to turn policy makers away from any substantial increases in teacher pay. As a result, any efforts to improve our schools through attracting and retaining effective teachers are handicapped by eliminating use of monetary incentives" (p. 110).

Gratz (2009) reported that new teachers are coming out of college better educated than their predecessors. Gratz's research conflicted with current information "that new teachers tend to come from the bottom third of college graduates" (p. 132). In fact, Gratz (2009) exhibited data from a 2007 Educational Testing Service survey that found the opposite: "The study looked at 153,000 prospective teachers who took the Praxis exams between 2002 and 2005, and found that both their SAT scores and college grades were significantly higher than those of similar candidates a decade ago" (p. 132).

There is some concern that the low base pay in education is leading some of the better candidates to turn away from the teaching profession altogether (Goldhaber, Gross, & Player, 2010). Furthermore, even when high quality candidates enter the field of

education, a large number of those teachers left the profession in the first five years of their career. (Goldhaber et al., 2010) Some experts believe that a higher base salary will entice new teaching candidates and retain qualified teachers in the field (National Council for Teacher Quality [NCTQ], 2010). A report by the NCTQ (2010) discussed this very issue:

> In districts that reserve significant raises for teachers with the most experience, earnings growth is nearly nonexistent during the early part of a teacher's career. This strategy does not serve the profession well. It directs a disproportionate share of the resources to veteran teachers who have the promise of a pension in their near future to keep them in the classroom. Meanwhile, novice teachers have little incentive to stay in a system that makes them wait years before earning a viable salary. And even if they stay in the profession, they have little incentive to stay in their current district as there will be no significant financial loss by transferring elsewhere. (p. 6)

The NCTQ (2010) gathered data from school districts that gave higher salary increases in the first few years of teachers' careers and compared the data to schools in which teacher salary increases were higher near the end of the teachers' careers. In school districts with higher early increases, teachers earned 8-20% more income in their careers, even with comparable beginning and retirement salaries (NCTQ, 2010).

Teacher Experience and Student Achievement

One area consistently paired with teacher quality is experience. There are a number of policies in education that hold the idea that a teacher with experience is a superior teacher over a novice teacher (Mo. Rev. Stat., 2012e; Mo. Rev. Stat., 2012i).

Many assume this jump in effectiveness is due to on-the-job training, professional development, and/or gains from working within a professional community (Marzano, 2007; Stronge, 2007). Stronge (2007) stated, "experienced teachers differ from rookie teachers in that they have attained expertise through real-life experiences, classroom practice, and time" (p.11).

The majority of research connecting teacher experience and student achievement revealed a minor correlation in the first few years of teaching, with beginning teachers less effective than experienced teachers in influencing student test scores (Clotfelter et al., 2007; Harris & Sass, 2008; Kane & Staiger, 2008; Kane, Taylor, Tyler, & Wooten, 2010). However, in most studies, the effect of experience seemed to level off after four or five years of teaching experience (Clotfelter et al., 2007; Harris & Sass, 2008; Kane & Staiger, 2008; Kane et al., 2010). The most recent of these studies conducted by Kane et al. (2010) used data from the Cincinnati Public School District Teacher Evaluation System (TES). Kane et al. (2010) explained the Cincinnati TES system was based on Danielson's *Framework for Teaching*. The research showed:

> [The] average TES score increases more from zero to three years of experience than after the third year. The difference between the mean rating at year three (3.21) was roughly three-quarters of a standard deviation higher than it was in year one (2.86). (Kane et al., 2010, p. 25)

Also, "the correlation between years of experience and TES scores was 0.34 in years zero to three and 0.12 in years four plus" (Kane et al., 2010, p. 25).

Although the majority of findings showed a plateau after the first four years, there have been studies that suggest a continued correlation between teacher experience and

student achievement that continued throughout a teacher's career (Papay & Kraft, 2011). Using data obtained from a large, urban school district with over 9,000 teachers and 100,000 students, Papay and Kraft (2011) established that experienced teachers often had higher test scores than their more inexperienced counterparts. Papay and Kraft (2011), however, like previous research, also discovered the majority of that improvement occurred in the first few years. Papay and Kraft (2011) observed:

> Over the first five years of their career, teachers improve in their ability to raise student achievement by approximately 0.05 standard deviations in reading and 0.08 standard deviations in mathematics. This represents about half of a teacher's eventual career growth in any of the models. (p. 21)

Atteberry, Loeb, and Wyckoff (2013) obtained similar results in their study using data from New York City schools. Atteberry et al. (2013) included their results with other researchers who found similar conclusions:

> Each study shows increases in student achievement as teachers accumulate experience such that by a teacher's fifth year her or his students are performing, on average, from 5 to 15 percent of a standard deviation of student achievement higher than when he or she was a first year teacher. This effect is substantial, given that a one standard deviation increase in teacher effectiveness is typically about 15 percent of standard deviation of student achievement; thus, the average development over the first few years of teaching is from one-third to a full standard deviation in overall teacher effectiveness. (p. 14)

According to Rice (2010), "teacher experience is probably the key factor in personnel policies that affect current employees" (p. 1). Salary schedules, tenure laws,

seniority based promotions, and seniority based layoff policies all give preference to teachers with experience (Harris & Sass, 2008). Harris and Sass (2008) wrote, "requiring and rewarding these teacher credentials remains the nation's dominant teacher quality strategy" (p. 2).

The generally accepted principle that teachers get better from year to year because of classroom experiences during those first years was one reason for this thinking (Rice, 2010). There were some who believed the reason experienced teachers performed better than novice teachers is because poorer performing teachers often leave the profession early in their careers (Henry, Bastian, & Fortner, 2012). Some researchers argued that the opposite is true: higher quality teachers, or those with better credentials, are the ones who leave the education field early to pursue other avenues (Goldhaber et al., 2010). However, a number of those who left the classroom did so to take positions in school or district administration, and not to other fields (NCTQ, 2004).

A study by Ost (2009) revealed that teacher experience does help teachers improve student performance on standardized tests. Ost (2009) used student test scores in grades three through eight and teacher data from North Carolina from 1995-2007. Ost (2009) examined specific grade level experiences, as well as general experiences, as possible influences on teacher improvement and student test scores. The report established a small correlation between grade level experience and test scores in math and little to no correlation between the experience and reading scores (Ost, 2009).

A study completed at Harvard University using data retrieved from the Tennessee STAR Project determined that teacher experience did matter in kindergarten (Chetty et al., 2011). Chetty et al. (2011) discovered that students in classes with experienced

teachers did have higher test scores than those with novice teachers. The data established a linear correlation between teacher years of experience and higher scores (Chetty et al., 2011). Henry, Fortner, and Bastian (2012) ascertained similar findings in high school math and science classes. Henry et al. (2012) analyzed the correlation between teacher experience and student scores on high school end-of-course exams. The study revealed increases in student achievement in classrooms with teachers with four years of experience or less (Henry et al., 2012). After the fourth year, the gains in scores seemed to level off (Henry et al., 2012).

Chargois and Irons (2011) conducted research examining the role of experienced teachers within certain student populations. Chargois and Irons (2011) revealed inconclusive results between experience and higher test scores in African-American ninth graders. Within the study, highest test scores were associated with teachers who had 6-10 years of experience and over 21 years of experience, respectively (Chargois & Irons, 2011). Most puzzling was the fact that the study's results actually showed a drop in student test scores for students who had teachers with 11-15 years of experience (Chargois & Irons, 2011).

Staiger and Rockoff (2010) used economic examples to demonstrate the difference between teachers with three or more years in the field and teachers who have less than three years experience:

> Based on the gains that teachers make in their first few years of experience, every time a school district loses an experienced teacher with two or more years of experience and is forced to hire a novice teacher, the students assigned to the novice teacher over the first two years of their career lose roughly .10 standard

> deviations in student achievement. As discussed above, estimates suggest a .10 standard deviation gain in math scores has a value of roughly $10,000 to $25,000 per student. (p. 103)

Stronge (2007) believed that one of the main reasons experienced educators seem to be more effective was because they have learned to be more efficient. Stronge (2007) stated, "these experienced and effective teachers are efficient – they can do more in less time than novice educators can" (p. 11). Stronge (2007) also believed that the ability to adapt in the classroom was an edge that experienced teachers often have:

> Flexibility and adaptability are sometimes more desirable than a well-written lesson plan, because classrooms are dynamic. Novice teachers often hesitate to deviate from a plan, but effective teachers can do it with ease, capitalizing on a teachable moment or accommodating a schedule change. The ability to improvise is a characteristic more common to experienced educators. (pp. 11-12)

The majority of research on this topic asserted teacher experience makes a difference in the classroom, but only to a certain degree (Clotfelter et al., 2007; Harris & Sass, 2008; Kane & Staiger, 2008; Kane et al., 2010). Huang and Moon (2009) determined teacher experience made no difference in student test scores. Stronge (2007) believed an experienced teacher is typically well-versed in handling individual and group situations, as well as differences in student personality and behavior. Likewise, experience has taught them what works and what does not work as far as providing quality instruction to their students (Stronge, 2007). Studies showed that a teacher's skill level tends to level off after the first five years, except for a few cases in which the year-

to-year experience does continue to make a difference (Clotfelter et al., 2007; Harris & Sass, 2008; Kane & Staiger, 2008; Kane et al., 2010.

Advanced Degree Completion

Another teacher characteristic that has been under the microscope recently is the importance of completing an advanced degree. While the MODESE (2012) requires all teachers must hold a bachelor's degree to become certified, there are some states that have begun to require a master's degree to receive an initial teaching certificate or to renew an existing certificate (Miller & Roza, 2012). Drury and Bauer (2011) reported teachers with master's degrees now are relatively commonplace and, the number of teachers with a master's degree or higher actually was higher than the number holding bachelor's degrees in 2007.

Though some districts require a master's degree, most teachers who pursue master's degrees do so because it raises them a step on the salary schedule (Miller & Roza, 2012). Typically, in both salary schedules and credit cost reimbursement plans, there is no discrimination in the degree program a teacher completes (Miller & Roza, 2012). This means a teacher could, theoretically, work toward completing a degree in a field of study that has nothing to do with his or her subject area (Miller & Roza, 2012). According to Miller and Roza (2012), the majority of master's degree programs completed by teachers are general education master's degrees or master's degrees in administration. Still, there is continued debate on whether these programs actually improve the effectiveness of teachers (Miller & Roza, 2012).

Perhaps it is not *if* a teacher pursues a higher degree, but *when*. According to Grossman and Brown (2011), teachers who receive a master's degree during the first few

years of teaching may not have the necessary background and on-the-job experience in the profession to actually gain skill from the college experience:

> The NEA data show that many teachers have earned master's degrees within the first few years of teaching. Since these teachers are still relatively new to the field, graduate study is not serving as an opportunity to refine an already solid skill set but is instead being undertaken while teachers are still "getting their sea legs." (p. 102)

The practice of paying for degrees has come under scrutiny due to the current economic crisis in education and the high amount of money that school districts put into the so-called "master's bump" (Roza & Miller, 2009). Roza and Miller (2009) analyzed data from state salaries and determined there were states, such as New York, in which 78% of all teachers had a master's degree or higher. Roza and Miller (2009) indicated in some states, the difference in salary between a teacher with a master's degree and one without, with the same level of experience, was as much as $10,000. These costs, along with the added benefits, can add up quickly for school districts (Roza & Miller, 2009).

Throughout the nation, the added cost accrued in supplying funds for master's degrees for teachers ranged from $27 per pupil in Texas to $319 per pupil in Washington State (Roza & Miller, 2009). In Missouri, according to Roza and Miller (2009), the numbers hover somewhere between those two numbers; 51% of Missouri teachers had a master's degree or higher, and the average salary increase for a teacher with a master's degree was $4,283, a total of $146,603,923 extra dollars spent by Missouri school districts. This added an additional $163 per student in the state (Roza & Miller, 2009).

Advanced Degree Completion and Student Achievement

Recent research revealed that having a master's degree does not improve the academic achievement of students in that teacher's classroom (Campbell & Lopez, 2008; Clotfelter et al., 2007; Dobbie & Fryer Jr., 2011; Hanushek & Rivkin, 2012; Harris & Sass, 2009; Huang & Moon, 2009). It did not seem to matter whether the master's degree was obtained before or after the initial teaching experience; research has shown there was no difference in student achievement between teachers with a master's degree or those without (Campbell & Lopez, 2008; Clotfelter et al., 2007; Dobbie & Fryer Jr., 2011; Harris & Sass, 2009).

Clotfelter et al. (2007) studied data from North Carolina teachers and students to determine the relationship between teacher characteristics and student achievement. Clotfelter et al. (2007) determined, despite rewarding teachers for advanced degrees, schools may not be seeing benefits from the practice. Clotfelter et al. (2007) found "the variable denoting having a graduate degree exerts no statistically significant effect on student achievement and in some cases the coefficient is negative" (pp. 27-28). Clotfelter et al. (2007) continued by asserting:

> If the goal of the salary structure was to provide incentives for teachers to improve their teaching, the higher pay for master's degrees would appear to be money that was not well spent, except to the extent that the option of getting a master's degree keeps effective experienced teachers in the profession. (p. 33)

For those teachers who received a master's degree after beginning their teaching career, the data showed they may actually be less effective in raising student test scores when compared to those who do not have a master's degree (Clotfelter et al., 2007).

Other research has shown, as a whole, districts that have a majority of teachers with advanced degrees have lower test scores than other districts (Dobbie & Fryer, Jr., 2011). Campbell and Lopez (2008) studied "the relationship between advanced degrees for teachers and student performance on the Georgia High School Graduation Test (GHSGT)" (p. 34). Campbell and Lopez (2008) found, "after controlling for student population, area population density, area income, school revenue, and ethnic make-up, school systems with more master's qualified teachers fail[ed] to perform better on the Georgia High School Graduation Tests" (p. 44). Campbell and Lopez (2008) also found there may actually be a negative effect on student performance.

A study by Harris and Sass (2008) showed a positive correlation between advanced degree completion and student achievement for middle school math classes; yet did not find any correlation for elementary teachers in both reading and math. In high school math and reading, as well as middle school reading, there actually seemed to be a negative correlation (Harris & Sass, 2008). Harris and Sass (2008) continued, "This may be because graduate degrees include a combination of pedagogy and content and our other evidence suggests that only the latter has a positive influence on teacher productivity" (p. 27).

Buddin and Zamarro (2008) analyzed data from the Los Angeles School District from 2000 to 2004. Buddin and Zamarro (2008) observed teacher characteristics and students' scores for grades two through five. Each student was in a self-contained classroom with one teacher (Buddin & Zamarro, 2008). Buddin and Zamarro (2008) determined there was no difference between student scores when the students had teachers with a master's degree or higher and when the students had a teacher who did

not have an advanced degree. The attainment of a higher degree showed no improvement to teacher quality or student scores (Buddin & Zamarro, 2008).

In a study of Chicago school districts and teachers, Aaronson et al. (2007) provided similar conclusions. Aaronson et al. (2007) found that advanced degrees accounted for less than 1% of the variation in teacher quality and student test scores. Aaronson et al. (2007) discovered advanced degree completion for teachers did not have a statistically significant effect on the achievement status and test scores of the students in those districts.

It is quite obvious, then, why the use of school funds to provide funds for master's degrees has become a target of research and question. The push for master's degree completion by teachers could be due to the fact that in Finland, whose schools are some of the highest performing in the world, all teachers are required to receive a master's degree (Sahlberg, 2010). However, according to Sahlberg (2010), in Finland, only the top 10% of graduating classes are pushed to become educators. Furthermore, teachers enter a master's degree program that aligns specifically with his or her instructional area, such as history, math, or biology (Sahlberg, 2010). This is in broad contrast to the United States, where the majority of master's degrees obtained by teachers are in general education, which is a broad, non-differentiated degree (Miller & Roza, 2012).

Teacher Salary Schedule

The current teacher salary schedule is at the center of the ongoing debate on teacher effectiveness and student achievement. Podgursky and Springer (2011) found, "During the 2003-04 school year, approximately 96% of public school districts accounting for nearly 100% of all public school teachers reported use of a salary

schedule" (pp. 2-3). In the majority of states and districts, teachers were paid based on years of experience and degree level (Podgursky & Springer, 2011). Teachers advanced across these steps and lane schedules as years of experience were gained and as the teacher made progress towards advanced degrees (Podgursky & Springer, 2011). As defined by Podgursky and Springer (2011), this salary schedule is often termed the "single salary schedule" (p. 2). According to Johnson and Papay (2009):

> That scale [salary schedule] is composed of a set of steps that provide every teacher with an annual raise until he or she reaches the top of the scale, which generally takes eight to 20 years. In addition to the steps, the salary schedule typically includes four to six lanes. A teacher is entitled to enter a higher paying lane after completing certain academic requirements or degrees. All lanes have the same longevity steps, so a fourth year teacher who holds a master's degree in the third lane earns more than a fourth year teacher who has no master's degree and thus remains in the first lane. (p. 49)

Podgursky (2010) claimed the single salary schedule was created in the 1920s and continued to evolve until the 1950s, with the majority of public school districts adopting the salary schedule by 1951. During this time, there was typically a marked discrepancy between the teaching salaries of men and women (Podgursky, 2010). Feminists and other reformers began calling for a single salary schedule for all teachers, regardless of gender (Podgursky, 2010).

According to Podgursky (2010), the single salary schedule is unique to the field of education; in most other professional fields, there is no set schedule for pay. Podgursky (2010) claimed pay is determined by qualifications, field or specialty, supply and

demand, or any other number of factors, and that "starting pay is usually market-driven, and institutions will often match counter-offers for more senior faculty whom they wish to retain. Merit or performance-based pay is commonplace" (p. 21). Johnson and Papay (2009) explained that critics of the salary schedule find fault with "paying all teachers the same wages without regard to performance and for being 'lock-step.' There was no way for teachers to earn more by exercising initiative or achieving success in their day-to-day work" (p. 49).

Previous research called into question the use of teacher experience and advanced degree completion as the basis of teacher pay (Podgursky & Springer, 2011; Vigdor, 2008). Most of the studies have shown a minimal, if any, correlation to student achievement (Vigdor, 2008). Podgursky and Springer (2011) determined that the current salary schedule is completely off-base with the goals its developers were trying to achieve. According to Podgursky and Springer (2011), the goals of the salary schedule should be to attract and keep the best teachers, as well as motivate teacher improvement. Podgursky and Springer (2011) claimed, "however, the current teacher compensation 'system' is best characterized as a mix of policies reflecting divergent stakeholder preferences, legislative tinkering, and legacies from earlier vintages of employment contracts" (p. 2). Podgursky and Springer (2011) continued:

> There is an old adage in economics: 'You can't repeal the law of supply and demand.' By this, economists mean that if governments or regulatory agencies do not allow prices to clear a market then some other mechanism will. School district salary schedules are a case in point. Salaries set by the schedules take no recognition of market or performance factors. Thus, non-price factors act to clear

> the market. We briefly consider three consequences of these rigid schedules: teacher shortages by field, the concentration of novice teachers in high-poverty schools, and the incentives (or lack thereof) for more effective teachers to stay in classrooms or enter the profession. (p. 4)

In a single salary schedule, elementary education teachers make the same salary, according to step, as a specialized teacher in a high school classroom (Podgursky & Springer, 2011). Podgursky (2010) claimed while both teachers may be of equal importance, there is a stark difference in the available pool of quality teachers in both. Podgursky (2010) also claimed a high school science teacher may have many more non-education opportunities than an elementary teacher, because of the background and in-depth subject matter knowledge. Podgursky (2010) referenced a teacher recruitment survey in which administrators were asked to rank the difficulty of hiring staff in individual fields:

> In 2003-04, 75% of school administrators reported that it was “easy” to fill vacancies in elementary education, with fewer than four percent reporting it “very difficult” or that they could not fill the position. The situation changes dramatically when we turn to math, science, and special education, where a large share of districts reported it was “very difficult” or they were unable to fill a vacancy. (p. 22)

A study by Hanushek and Rivkin (2012) revealed:

> Easily quantifiable characteristics explain little of the variation in teacher effectiveness, and this has important implications for the development of policies designed to raise the quality of instruction and to reduce unequal access to high

> quality teachers. First, neither a graduate degree nor additional years of experience past the initial year or two translate into significantly higher instructional effectiveness, bringing into question a salary structure based almost entirely on these two variables. (p. 132)

In addition to the salary schedule, Hanushek and Rivkin (2012) added three other avenues in which teacher characteristics were utilized. Those avenues were to use characteristics to compare members of a teaching staff for quality and equal access, using these characteristics to add requirements to initial certification, and focusing on student outcomes related to characteristics to legislate better teachers (Hanushek & Rivkin, 2012).

Aaronson et al. (2007) reported, "the vast majority of the variation in teacher effects is unexplained by easily observable teacher characteristics, including those used for compensation" (p. 97). Aaronson et al. (2007) utilized research with the Chicago Public Schools System and showed that observable teacher characteristics, such as experience, degrees, and certifications, accounted for less than 1% of the total variation in teacher quality:

> These results highlight the lack of a close relationship between teacher pay and productivity and the difficulty in developing compensation schedules that reward teachers for good work based solely on certifications, degrees, and other standard administrative data. That was not to say such schemes were not viable. Here, the economically and statistically important persistence of teacher quality over time should be underscored. By using past performance, administrators can predict teacher quality. Of course, such a history might not exist when recruiting,

> especially for rookie teachers, or may be overwhelmed by sampling variation for new hires, a key hurdle in prescribing recruitment, retention, and compensation strategies at the beginning of the work cycle. (p. 98)

There were some advantages for teachers and districts that utilize the single salary schedule as it is currently constituted. Johnson and Papay (2009) claimed the schedule provides confidence and stability to teachers; teachers can look at the salary schedule and easily determine their current salary and future salary. The salary schedule also benefits the districts' budget process by forecasting future costs (Johnson & Papay, 2009). Johnson and Papay (2009) described the benefit this way:

> Given that certainty some consciously trade the chance to earn more in the short run at another job for the assurance of a steady paycheck as a teacher. Teachers know that the steps of the salary scale reward loyalty and longevity, and once they have spent seven or eight years in a district, they tend to remain in their position. In a field that is perpetually hampered by the shortage of able teachers, a pay system that brings stability to the teacher force has its advantages. (p. 50)

Goldhaber, Dearmond, and Deburgomaster (2011) discussed the benefits of the single salary schedule previously suggested by earlier researchers, "By rewarding teachers' years in the classroom, salary schedules reflect the fact that teachers learn from experience; by rewarding all teachers equally, salary schedules mitigate competition between teachers that might inhibit collaboration or knowledge exchanges" (p. 443).

Recent research has focused on how to modify the current salary schedule to incorporate research findings, rather than just scrapping the entire system altogether (Grissom & Strunk, 2012). Some of these methods could be front-loading or back-

loading the salary schedule, or adjusting the salary schedule based on subject area or the socio-economic status of the school district (Grissom & Strunk, 2012). Grissom and Strunk (2012) asserted there could be benefits to a front-loaded salary schedule, and those pay schedules would have a higher base salary as compared to other salary schedules. Grissom and Strunk (2012) believed the higher base salaries would attract higher quality teachers to the profession and would make teaching more comparable, in terms of salary, to other professional tracks.

Also, this type of salary schedule would give higher increases in the first years of teaching, which is the period of time many teachers voluntarily exit the profession and this would give quality, young teachers another incentive to stay with teaching, rather than switching to another profession (Grissom & Strunk, 2012). Grissom and Strunk (2012) analyzed salary schedules in a study comparing teacher salary schedules to student performance. The study included almost 800 students across 15 states and Grissom and Strunk (2012) concluded:

> Across the board, no matter the grade, more students achieve and pass the proficiency cut point and fewer students fail to pass the basic cut point as districts frontload their salary schedules to a greater extent. Although the results for the advanced level are less precise, the consistent direction of the relative experience premium coefficient suggests that the more frontloaded the salary schedule, the greater proportion of students achieve 'advanced' status on state assessment tests, holding school and district characteristics constant. (p. 683)

Harris and Sass (2008) mentioned that since "advanced degrees [that] are uncorrelated with the productivity of elementary school teachers suggests that current

salary schedules, which are based in part on educational attainment, may not be an efficient way to compensate teachers" (p. 31). Harris and Sass (2008) did, however, see benefits in building the salary schedule, or at least at the base, to retain quality teachers early in their career, which could benefit students.

Teacher Pay and Student Achievement

When studies were analyzed comparing teacher pay and student performance, Podgursky (2010) found very little to suggest a correlation between higher teacher salaries and student performance. Podgursky (2010) stated, "Surveys of the early education production function literature found little evidence of a strong positive effect of teacher pay on student achievement" (p. 17). Podgursky (2010) also cited earlier research from Hanushek and Rivkin, Jacobs and Lefgren, and others, in which there had been no connection found between how well teachers were paid and the performance of their students.

Teacher Tenure and Last-In-First-Out Policies

Another area in which this research could be very impactful is in examining teacher tenure and teacher layoff last-in-first-out (LIFO) policies. Both of these policies were based on the belief that experienced teachers were better teachers (Boyd, Lankford, Loeb, & Wyckoff, 2011). There are educational experts who support the idea that seniority-based layoffs are not the best strategy for cutting costs, and the practice may actually harm student performance (Boyd et al., 2011).

Boyd et al. (2011) expressed, in reality, a higher number of teachers must be released to achieve the desired effects of the layoffs. This is due to the fact that senior teachers earn more, according to the salary schedule, than novice teachers (Boyd et al.,

2011). The sheer removal of so many teachers at one time could be detrimental to student performance, because it compromises such variables as stability, comfort, and regularity (Boyd et al., 2011).

Boyd et al. (2011) completed a study in New York City to analyze the effect of teacher layoffs brought about by the recent economic crisis. Boyd et al. (2011) compared teachers who would be laid off due to the existing policy, which was based on seniority, with the teachers who would be released based on teacher effectiveness. The study was implemented as a result of a 5% shortfall in the budget for teacher salaries (Boyd et al., 2011). Boyd et al. (2011) determined that 25% fewer teachers would need to be dismissed if the policy, which was based on teacher effectiveness rather than seniority, was allowed. Boyd et al. (2011) also found the group of teachers who would be dismissed because of performance differed greatly from the group who would be dismissed because of experience. In fact, only about 13% of the teachers fell into both systems (Boyd et al., 2011). Results of the study by Boyd et al. (2011) determined:

> The typical teacher who was laid off under a value-added system was 26% of a standard deviation in student achievement less effective than the typical seniority-based layoff. This was a large effect, corresponding to the difference more than twice the difference between a first and fifth-year teacher and equivalent to the difference between having teacher who was 1.3 standard deviations below the effectiveness of the average teacher. (p. 11)

A similar study of layoffs in Washington State school districts, by Goldhaber and Theodbald (2010), during the 2008-2009 school year, uncovered comparable results. Goldhaber and Theodbald (2010) found that only 23% of the teachers who would be

dismissed based on seniority would still be dismissed if the criteria for layoffs was teacher effectiveness. According to Goldhaber and Theodbald (2010), the difference in teacher effectiveness was also significant. Goldhaber and Theodbald (2010) observed a 20% standard deviation in math and 19% in reading, which is the difference between having a teacher who was in the 16th percentile of effectiveness and a teacher in the 50th percentile of effectiveness. The separation was also described as two to three months of an average student's learning (Goldhaber & Theodbald, 2010).

Goldhaber and Theodbald (2010) asserted that if the teachers who were removed had salaries at the average district salary, instead of near the base, "it is estimated that it would only be necessary to lay off 1,349 teachers in order to attain the same (or greater) budgetary savings; this is approximately 20% less than the actual number of teachers (1,717) who received layoff notices" (pp. 12-13).

The results of these studies showed that current practices for teacher layoffs could potentially hurt students and school districts (Boyd et al., 2011). The greater number of teachers released resulted in larger class sizes and a loss of quality teachers (Boyd et al., 2011). Boyd et al. (2011) claimed, despite all of these concerns, the majority of states and districts have layoff policies that give precedence to teachers with more years of experience.

Hiring Process

When hiring new teachers, most administrators pursue teachers with teaching experience and a higher degree (Rockoff, Jacob, Kane, & Staiger, 2011). Rockoff et al. (2011) estimated experience and degree completion are two of the most studied characteristics in research projects due to legal and salary requirements. However, the

use of experience and degree completion to separate candidates for a position has since become a questionable practice (Rockoff et al., 2011).

Though it may remain the most efficient way to determine the legitimacy of a candidate, Rockoff et al. (2011) likened the use of these characteristics to the "story of the man looking for his keys under a street light – not because he dropped them nearby, but because that is where he can see" (p. 19). Staiger and Rockoff (2010) also stated, "with the exception of teaching experience, there is little to suggest that the credentials commonly used to determine teacher certification and pay are related to teachers' impacts on student outcomes" (p. 104). Staiger and Rockoff (2010) suggested a more open policy of hiring teachers and improvements to the current teacher evaluation process. One of the most prevalent thoughts is the idea that schools must adhere to a more aggressive dismissal program (Staiger & Rockoff, 2010). Staiger and Rockoff (2010) recommended setting a base cutoff score on annual standardized tests, and if the teacher does not reach this goal in his or her first year, then that teacher would be terminated and replaced.

In multiple studies, researchers have found that additional teacher characteristics, not just teacher experience and an advanced degree, should be used to recruit and hire teachers (Rockoff, et al., 2011; Staiger & Rockoff, 2010). Rockoff et al. (2011) claimed "recruiting teachers with a number of attractive credentials while avoiding teachers whose credentials are unatractive has the potential power to improve the effectiveness of their teacher workforce" (p. 38). Rockoff et al. (2011) implied finding quality recruits is dependent "on a broad set of credentials, all of which are fairly traditional indicators of teacher quality but some (e.g., SAT scores) are not currently collected by many school districts" (p. 38). A few of these traits include the prospective teacher's SAT/ACT

scores, his or her personality, college selectivity and quality, area of certification, and area of advanced degrees (Rockoff, et al., 2011; Staiger & Rockoff, 2010).

Early Retirement Incentives

One avenue that school districts have used in an attempt to lower costs during years of tight budgets is to offer early retirement incentives. Fitzpatrick and Lovenheim (2012) suggested the teachers who are eligible to retire, yet remain at the helm, be offered early retirement incentives. Teachers who are more experienced or are at retirement age typically cost more to employ for districts than their less-experienced counterparts (Fitzpatrick & Lovenheim, 2012). Fitzpatrick and Lovenheim (2012) believed if a district was to choose to replace multiple high-cost experienced teachers with less-experienced teachers, it could provide substantial savings to that district.

Fitzpatrick and Lovenheim (2012) studied the effects of early retirement programs in Illinois on student achievement. In this study, Fitzpatrick and Lovenheim (2012) found that teachers leaving their posts had an average of 29 years of experience, while incoming teachers averaged less than three. These findings revealed no decline in student achievement scores, in fact, student test scores actually improved in the years following the exodus of the experienced teachers (Fitzpatrick & Lovenheim, 2012).

Summary

School districts continue to use on-the-job experience and advanced degree attainment in their recruitment, retention, and compensation policies (Rockoff et al., 2011). The value of these two factors continues to be hashed and rehashed as they pertain to teacher quality and student achievement. It should be assumed that when looking at the hiring and compensation practices of school districts, consideration should

be given to the money spent in a manner that positively affects students' test scores within that district. Previous research has shown an inconclusive correlation between these characteristics and the ultimate success of teachers to bolster test scores (Campbell & Lopez, 2008; Clotfelter et al., 2007; Dobbie & Fryer Jr., 2011; Hanushek & Rivkin, 2012; Harris & Sass, 2009). Nevertheless, these two characteristics remain the focal point during salary schedule and hiring/retention discussion.

In Chapter Three, the methodology of the research project is discussed. This includes the research design and statistical procedures employed. The details of each school district, their populations, and their teachers are revealed. The research will endeavor to determine if a significant correlation exists between teacher experience and advanced degrees in relationship to student achievement in Missouri school districts.

Chapter Three: Methodology

There are a variety of characteristics an effective teacher should possess. Most researchers and educational leaders, including Wong (2009), Marzano (2007), and Stronge (2007), believe the teacher has the greatest influence on the achievement of students. The issue currently facing educational leaders and researchers is to narrow down which characteristics are invaluable, and which are supplemental. If the characteristics that determine teacher effectiveness could be separated and defined, educational institutions would be able to pinpoint these characteristics in their personnel.

Furthermore, depending on the degree in which these characteristics were defined, teacher standards and preparations could be adjusted to maximize effectiveness. School policies and programs could also be aligned to provide incentives for teachers who utilize these characteristics and were successful in improving student achievement in the classroom. While it has been a challenge for researchers to describe and measure many of the characteristics that define an effective teacher, at least two of these variables – years of experience and educational attainments – are readily measurable and can be applied to student performance.

This study sought to reveal the relationship between teacher experience and advanced degrees attainment with student achievement on the Missouri Assessment Program (MAP). These two teacher attributes were chosen mainly because of their continued use in crafting teacher policies and salary schedules. The study provided insight into two easily quantifiable teacher characteristics and the potential impact on student achievement.

In this study, data from the MODESE and school districts were analyzed to determine if teacher experience and advanced degrees equal higher student scores on the MAP assessments in grades three and five in math and communication arts. The focus of the study was on small school districts in Missouri. Small schools were defined as any school district with a total student average daily attendance (ADA) of fewer than 600 students. According to the U.S. Department of Education Rural Education Achievement Program (REAP), schools were eligible for the Small, Rural School Achievement (SRSA) incentives with an ADA of less than 600 (U.S. Department of Education, 2003).

This was a quantitative study in which the data were examined to determine if there was a statistical relationship between the variables. The methodology included descriptive, correlational, and inferential statistics. In this chapter, the methods used to collect data, evaluate the data, and summarize the findings are discussed.

Problem and Purpose Overview

Educational experts and school and district administrators have traditionally assumed that teachers gain additional skills as they continue in the profession, enabling them to continuously improve upon their skill set (Stronge, 2007). It is also believed that teachers will hone these skills and learn how to use them with more efficiency as they spend more time in the classroom (Boyd et al., 2011; Henry et al., 2012). The thought is that an increase in the number of tools and methods a teacher possesses will, in turn, lead to higher student scores and improved student achievement. Educational system components, such as teacher pay scales, teacher tenure, and mentoring programs seem to lend themselves to the fact that more experience means a better teacher. The same can be said of teachers obtaining advanced degrees. District and building leaders tend to push

teachers to continue their education by way of a master's, specialist, and/or doctorate degree (Miller & Roza, 2012).

There are many school districts that continue to offer tuition reimbursement for teachers taking these classes, and almost all districts have steps on the pay scale rewarding teachers for continuing their education (Miller & Roza, 2012). When building administrators hire educators for positions within the district, most often, they look for those teachers who have had greater experience and attained higher degree levels (Rockoff et al., 2011). In terms of teachers already working in the district, those with more experience and education tend to be teacher-leaders in their buildings (Rockoff et al., 2011). Again, it is assumed that the higher a teacher moves up the degree ladder, the quality and effectiveness of the teacher increases.

This way of thinking has spawned a culture of sorts within the public education system, especially elementary and secondary education. As a result, a number of studies now question whether school districts assume correctly these two characteristics alone define quality teachers. If it is discovered they do not, in fact, correctly predict teacher quality, then school leaders will need to determine how the school's resources would be better served by concentrating on factors influencing test scores. This study analyzed these two characteristics and sought to determine whether there was a relationship between these teacher attributes and student achievement.

Because teachers with more experience and advanced degrees are higher on the pay scale than new teachers, rural and small school districts, due to budget restraints, typically cannot afford to recruit experienced teachers. The salary offered by rural districts cannot compete with more populated districts. Furthermore, this makes it

increasingly difficult for smaller schools to retain teachers with experience and/or advanced levels of degree completion. Hefty gaps between the salaries offered by larger school districts can put smaller schools – and the students who attend them – at a distinct disadvantage. This study was designed to determine if teacher effectiveness and student achievement on MAP communication arts and mathematics assessments directly correlates with teacher experience and the procurement of an advanced degree.

Legislation, such as No Child Left Behind (NCLB), has increased the emphasis on quality teachers by using student test scores as marks of achievement, thereby holding teachers and schools accountable for the results (U.S. Department of Education, 2002). The NCLB legislation used the term "highly qualified teacher" to define the type of teacher school districts should seek to hire and retain (U.S. Department of Education, 2002). The legislation put forth its own definition of a highly qualified teacher. Highly qualified teachers will "have state certification (which may be alternative state certification), hold a bachelor's degree, and have demonstrated subject area competency" (U.S. Department of Education, 2002, p. 19).

Individual states and school districts within those states may have completely different ideas on what specific characteristics make a successful or high quality teacher. In this study, data were compiled to determine whether there was a statistically significant relationship between teacher attributes, specifically years of experience and advanced degree completion, and student achievement. Grade level data from grades three through five from the MAP test were analyzed. These particular data were compiled from school districts in southwest Missouri.

Research Questions

In order to guide the research forward through data collection, it was important to develop questions that would bolster and clarify the study's findings. These questions give parameters and a focus to the study of teacher experience/advanced degrees and student achievement. The following research questions guided the study:

1. What relationship exists, if any, between the years of teaching experience of a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Communication Arts test?

2. What relationship exists, if any, between the years of teaching experience of a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Communication Arts test?

3. What relationship exists, if any, between the years of teaching experience of a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Math test?

4. What relationship exists, if any, between the years of teaching experience of a fifth grade teacher and the performance of that teacher's students on the fifth Grade Missouri Assessment Program Math test?

5. What relationship exists, if any, between the academic degree held by a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Communication Arts test?

6. What relationship exists, if any, between the academic degree held by a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Communication Arts test?

7. What relationship exists, if any, between the academic degree held by a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Math test?

8. What relationship exists, if any, between the academic degree held by a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Math test?

Null Hypotheses and Alternate Hypotheses

The null and alternate hypotheses used in this study were as follows:

$H1_0$: There is no relationship between years of teaching experience and student performance on the third grade Missouri Assessment Program Communication Arts test.

$H1_a$: There is a relationship between years of teaching experience and student performance on the third grade Missouri Assessment Program Communication Arts test.

$H2_0$: There is no relationship between years of teaching experience and student performance on the fifth grade Missouri Assessment Program Communication Arts test.

$H2_a$: There is a relationship between years of teaching experience and student performance on the fifth grade Missouri Assessment Program Communication Arts test.

$H3_0$: There is no relationship between years of teaching experience and student performance on the third grade Missouri Assessment Program Math test.

$H3_a$: There is a relationship between years of teaching experience and student performance on the third grade Missouri Assessment Program Math test.

$H4_0$: There is no relationship between years of teaching experience and student performance on the fifth grade Missouri Assessment Program Math test.

$H4_a$: There is a relationship between years of teaching experience and student performance on the fifth grade Missouri Assessment Program Math test.

$H5_0$: There is no relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the third grade Missouri Assessment Program Communication Arts test.

$H5_a$: There is a relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the third grade Missouri Assessment Program Communication Arts test.

$H6_0$: There is no relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the fifth grade Missouri Assessment Program Communication Arts test.

$H6_a$: There is a relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the fifth grade Missouri Assessment Program Communication Arts test.

$H7_0$: There is no relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the third grade Missouri Assessment Program Math test.

$H7_a$: There is a relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the third grade Missouri Assessment Program Math test.

$H8_0$: There is no relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the fifth grade Missouri Assessment Program Math test.

$H8_a$: There is a relationship between a teacher with a master's degree or higher and a teacher without a master's degree and student performance on the fifth grade Missouri Assessment Program Math test.

Research Design

For this study a quantitative research design was used, specifically a correlational quantitative design. The study attempted to determine whether there was a correlation between the teacher characteristics, such as experience and degree completion, and student achievement. Also, it was necessary for the hypotheses listed in the study to be testable, since "quantitative research strives for testable and confirmable theories that explain phenomena by showing how they are derived from theoretical assumptions" (Ary, Jacobs, Razavieh, & Sorensen, 2006, p. 449). Fraenkel, Wallen, and Hyun (2012) stated, "When it comes to the purpose of research, quantitative researchers seek to establish relationships between variables and look for and sometimes explain the causes of such relationships" (p. 10). It was appropriate to use quantitative methods, since data and facts compiled from staff information and student performance on state achievement tests were presented in numerical form. Quantitative studies specialize in generalizing findings, testing hypotheses, and predicting behavior (Ary et al., 2006).

This research attempted to determine a relationship, if any, between teacher characteristics and student achievement on the MAP test. Therefore, a correlational study design was used. Creswell (2012) defined correlational research as "procedures in quantitative research in which investigators measure the degree of association between two or more variables using the statistical procedure of correlational analysis" (p. 21). Fraenkel et al. (2012) believed researchers should use correlational research to

"determine relationships among two or more variables and to explore their implications for cause and effect" (p. 12). The use of correlational research was employed to allow the determination of the extent to which teacher characteristics, such as degree completion and experience, correlate to student success on the MAP test. Creswell (2012) found, "this degree of association, expressed as a number, indicates whether the two variables are related or whether one can predict another" (p. 21).

The independent variables in the study were the attributes of each of the teachers in the classrooms from which data were obtained. These characteristics included the total number of years these teachers have taught and the academic degree each has achieved. The dependent variables were the mean achievement scores on the MAP for all their students in the third and fifth grade classes. Mean scores for each classroom in mathematics and communication arts were gathered for the purpose of the study.

The study focused on quantity and numbers, including classroom mean student achievement scores and teacher characteristics. The data were subsequently employed to generalize those findings to other schools in the state in order to predict whether teacher characteristics, such as experience and advanced degrees, make a difference in student achievement. Ideally, the data from this study will be used to predict whether the teacher variables produce higher student achievement scores. According to Fraenkel et al. (2012), "If a relationship of sufficient magnitude exists between two variables, it becomes possible to predict a score on one variable if a score on the other variable is known" (p. 333).

There was also discussion involving the relationship between the three variables in an effort to understand if there was an effect on student achievement; moreover, "in

correlational research, we do not influence any variables but only measure them and look for relations (correlations) between some set of variables" (StatSoft, 2012, para. 3). According to Ary et al. (2006), "Correlational research methods are used to determine relationships and patterns of relationship among variables in a single group of subjects" (p. 378). Therefore, since the study's purpose was to determine relationships between and among teacher experience, teachers with advanced degrees, and student achievement on the MAP tests, a correlational study was the best analysis for this study.

Population and Sample

The setting for this study was school districts in southwest Missouri. This region encompasses 24 counties and over 100 school districts (MODESE, 2012c). In total, there were over 13,000 certified teachers and 145,000 students in these districts (MODESE, 2012c) at the time of this study. The target teacher population was third and fifth grade teachers. There were approximately 500-2,000 third and fifth grade teachers in the population (MODESE, 2012c). The sample was narrowed down to school districts with an average daily attendance of less than 600 students. As a result, 69 school districts fell into this category (MODESE, 2012c). These school districts housed over 20,000 students and over 1,300 teachers (MODESE, 2012c). There were approximately 140-200 third and fifth grade teachers in the population (MODESE, 2012c). It is possible that the research findings can be applied in schools not just in this region, but across the state. The MAP scores were acquired from the 2011-2012 school year during the spring of 2012; therefore, the students were taking the MAP near the end of their third and fifth grade years.

The sample sizes for this study ranged from 30 to 200 teachers. A sample size of 30 can give a result that provides a more accurate degree of relationship and is likewise less prone to error than a smaller or larger sampling (Creswell, 2012; Fraenkel et al., 2012; Israel, 2012; Watson, 2001). However, Fraenkel et al. (2012) stated, "samples larger than 30 are much more likely to provide meaningful results" (p. 339). In the end, these varying sample sizes allow researchers to generalize their findings to the entire population.

Due to the fact that permission was needed from school superintendents to gather the individual school's data, a convenience sampling method was used. Creswell (2012) determined, "in convenience sampling the researcher selects participants because they are willing and available to be studied" (p. 145). Southwest Missouri superintendents and principals were contacted with requests to gather enough data to meet the needs for statistical analysis. These school districts varied in size and demographics but constituted a good sample representation of all the schools in the area.

Instrumentation

Research data were obtained from the MODESE's Missouri Comprehensive Data System (MCDS) Portal, as well as from administrators at each individual school district. Superintendents and principals used electronic mail (e-mail or fax) to send the data for the research to the researchers. The MCDS portal is a "resource provided by the MODESE that allows school personnel and the public to access education-related data" (MODESE, 2012c, para 1). Student and classroom achievement level data were obtained from the MAP test via school administrators and the state assessment section of the

MCDS portal. For the purpose of this study, MAP scale scores were used for classroom data:

> The scale score describes achievement on a continuum that in most cases spans the complete range of Grades 3–8. These scores range in value from 455 to 875 for Communication Arts, 450 to 885 for Mathematics, and 470 to 895 for Science. (MODESE, 2012a, p. 4)

The MAP scale scores were used to determine student achievement levels and provided a scaled, normalized score that was used across all districts. This allowed a class average to be determined with because "within a content area, scale scores can be added, subtracted, and averaged" (MODESE, 2012a, p. 4).

Faculty information data were acquired from school faculty information databases. All schools keep records on teachers in the district, and this teacher information includes the years of experience a teacher has completed, as well as whether or not that teacher has achieved a degree higher than the bachelor's degree required to obtain initial certification. The only data obtained from these files for this study were the teachers' experience and degree level obtained.

There were a few possible threats to internal validity with this study that need to be discussed. Trochim (2012) defined internal validity as "the approximate truth about inferences regarding cause-effect or causal relationships" (para. 1). Some of these threats included student performance characteristics. According to Harris and Sass (2008), "it is difficult to isolate productivity, especially in teaching where a student's own ability, the influences of students' peers, and other characteristics of school also affect measured outcomes" (p. 2). Experts in education, such as Marzano (2007) and Stronge (2007)

agreed that teachers have a considerable influence on student scores, but it can be hard to generalize that teachers were the only influence on student achievement. There were certainly other factors, even outside the school district, that affect students' achievement (Marzano, 2007).

Another threat to internal validity could be the measure of teacher quality, as it pertains to teacher effectiveness. Harris and Sass (2008) believed there may be factors that affect the quality of a teacher other than on-the-job experience and the completion of an advanced degree. Furthermore, "unobserved teacher characteristics, such as 'innate' ability, may affect the amount and types of education and training they choose to obtain as well as subsequent performance of teachers in the classroom" (Harris & Sass, 2008, p. 3). These outside factors could affect the validity of the findings of this study.

Though there may be some concerns over validity, the data from this study were specific and should clarify whether teacher experience and advanced degrees make a difference with student achievement. Not only was there a substantial data pool for this study, but the data for the study was specific to the qualities that were being examined for the study. These facts helped minimize the possibility of an internal validity threat.

Data Collection

Once the Institutional Review Board (IRB) at Lindenwood University approved the project (see Appendix A), the data collection process began. The first step was to determine the participating school districts. School district superintendents were contacted to determine the district's interest in providing data and being part of the study. School superintendents who agreed to participate in the study signed a consent agreement (see Appendix B).

Once approval from the superintendent was obtained, contact was made with the proper staff responsible for student and teacher data. In most cases, this was the school principal; in other cases it was the school superintendent. The data requested were a list of third and fifth grade teachers for the school district. Years of teaching experience and level of degree achievement were requested for each of the third and fifth grade teachers in the district. Degree level attainment was also collected in three different categories: teachers with a bachelor's degree, those with a master's degree, and those with a specialist or doctorate degree. Individual teacher names were not used in the data collection; all teachers were assigned a random identification number. This helped maintain the anonymity of these educators.

Mean MAP scale scores for each third and fifth grade classroom were also gathered for each school district. These data were matched to the class list of student scale scores for each teacher. The school administrator either calculated the mean for each classroom, or the lists of scores were provided. Either way, once a classroom's mean score was obtained, the individual student scores were discarded. The classroom mean scale scores were paired with the level of teaching experience and highest degree level obtained for the individual teachers. All student and teacher information remained confidential.

Data Analysis

There was a statistical analysis of the data, using various descriptive and inferential statistical measures. These measures included the Pearson *r* correlation coefficient and multiple regression. The descriptive statistics provided a clear picture of the school districts and test scores that were to be evaluated for the study. The

correlational statistics determined if there was a correlation between the variables and whether that correlation was statistically significant. The statistical analysis was performed on all the variables, including teacher experience, teachers with advanced degrees, and student achievement on the MAP test. From the data analysis, the null hypotheses of the study were rejected or not rejected, and the alternate hypotheses were supported or not supported.

Descriptive statistics were appropriate for this study, since the data were evaluated using a significant amount of numbers. Trochim (2006) found:

> Descriptive statistics were used to present quantitative descriptions in a manageable form. In a research study we may have lots of measures. Or we may measure a large number of people on any measure. Descriptive statistics help us to simplify large amounts of data in a sensible way. (para. 3)

Tables were created to show the descriptive data and view a summary of the data as a whole. Tables also allowed the data to be examined with mean, median, mode, percentiles, ranges, standard deviation, and the correlation between variables. The tables included comparisons for teacher experience, teachers with advanced degrees, and classroom MAP scale scores. This provided the data needed to respond to the research questions stated earlier in this chapter.

Correlational statistical analysis was also very important to evaluate the results of this study. Bluman (2010) related, "in simple correlation and regression studies, the researcher collects data on two numerical or quantitative variables to see whether a relationship exists between the variables" (p. 531). Since the research compared two variables to determine whether there was a relationship, correlation analysis was utilized

to make that determination. Ary et al. (2006) determined, "correlations indicate the relationship between paired scores. The correlation indicates whether the relationship between paired scores is positive or negative and how strong this relationship is" (p. 147).

In order to compute the correlation coefficient, the Pearson product moment correlation coefficient was employed. The Pearson *r* was used to show this correlation in positive or negative terms. Trochim (2006) explained:

> We use the symbol *r* to stand for the correlation. Through the magic of mathematics it turns out that *r* will always be between -1.0 and +1.0. If the correlation is negative, we have a negative relationship; if it's positive, the relationship is positive. (para. 5)

According to Bluman (2010), "A positive relationship exists when both variables increase or decrease at the same time" (p. 531). Bluman (2010) described a negative relationship this way: "in a negative relationship, as one variable increases, the other variable decreases, and vice-versa" (p. 531). The further from zero (and closer to one or negative one) the correlation coefficient, the stronger the linear relationship of the variables (Bluman, 2010). Once the linear relationship between the variables is determined, there are two possibilities: "Either the value of *r* is high enough to conclude that there is a significant linear relationship between the variables, or the value of *r* is due to chance" (Bluman, 2010, p. 536). Therefore, in order to determine if the correlation was statistically significant, the data were analyzed to test the hypotheses and compute the test values for the data. Bluman (2010) described the determination of statistical significance from hypothesis testing:

> When the null hypothesis is rejected at a specific level, it means that there is a significant difference between the value of *r* and 0. When the null hypothesis is not rejected, it means that the value of *r* is not significantly different from 0 (zero) and is probably due to chance. (p. 537)

In order to determine whether the results indicated to reject or not reject the null hypothesis, a level of significance or alpha (α) level was set. According to Creswell (2012), "a significance level (or alpha level) is a probability level that reflects the maximum risk you are willing to take that any observed differences are due to chance" (p. 188). Creswell (2012) also stated that typically α is set at .01 or .05. This means that "1 out of 100 times (or 5 out of 100 times) an extremely low probability value will actually be observed if the null hypothesis is true" (p. 189). For this research study, $\alpha = .05$ was used. Furthermore, "It is customary in educational research to view as unlikely any outcome that has a probability of .05 ($p = .05$) or less" (Fraenkel et al., 2012, p. 253).

Once the data had been analyzed, a determination of the relationship between teacher experience and/or advanced degrees and student results on the communication arts and math MAP tests was made.

A multiple regression test was a correlational statistical tool applied to examine data from this study. According to Ary et al. (2006), "multiple regression is a correlational procedure that looks at the relationships among several variables" (p. 387). Since there was more than one variable in the study, it was important to examine all the variables and discover which variable had the greatest correlation to student achievement. It was also essential to determine whether teacher experience or teachers with advanced

degrees made a difference in student achievement and which had a greater effect, if any. In the online version of the *Electronic Statistics Textbook*, the authors explained the use of multiple regression analysis in research studies: "In the social and natural sciences, multiple regression procedures are very widely used in research. In general, multiple regression allows the researcher to ask (and hopefully answer) the general question 'what is the best predictor of ...'" (StatSoft, 2012, para. 3).

Summary

With a renewed focus on teacher quality and effectiveness due to legislation, such as NCLB, it is important for educators to determine precisely what makes an effective teacher. The educational community tends to hold on to the belief that experienced teachers are better teachers. Thus, hiring and compensation practices have had a tendency to reflect that belief. The purpose of this study was to determine whether or not there was a significant correlation between teacher experience and the possession of an advanced degree, and student achievement on the MAP communication arts and math tests.

The study was a correlative quantitative study, in which data were obtained from school district faculty information by way of district administrators and from MAP test scores. Data analysis procedures employed descriptive statistics, as well as correlational statistics, such as the Pearson *r* and multiple regression analysis. From these analyses, data were evaluated to respond to the research questions.

In Chapter Four, the data received from school districts are analyzed using the methodology described in Chapter Three. This analysis includes descriptive statistics, defining the sample, demographics, and student achievement results. Results from the statistical analysis, including correlation, regression, and hypotheses testing are provided in Chapter Four. The subsequent data analyses are used to draw conclusions regarding the null and alternate hypotheses.

Chapter Four: Analysis of Data

Education experts hold on to the assertion that teacher quality is the number one factor in student success in a classroom (Marzano, 2007; Wong, 2009). This study was designed to determine whether the two driving factors of the currently used teacher salary schedule (on-the-job experience and advanced degree completion) were the primary indicators of the quality of a teacher. Teacher quality in this study was defined by analyzing student test scores for classroom teachers in the study. This study was completed using data from small rural school districts in southwest Missouri.

Background of the Study

Teacher quality and effectiveness are hard to define in education. NCLB legislation holds school districts accountable for hiring and keeping highly qualified teachers (U.S. Department of Education, 2002). Two pieces of the evaluation process for highly qualified teachers are experience and degree completion (U.S. Department of Education, 2002). There are a myriad of state statutes and local school board policies that favor teachers with experience and/or advanced degree over those who do not (MCE, 2013f; Mo. Rev. Stat., 2012i). The most obvious example of this discrepancy is the salary schedule that most schools employ.

According to the current salary schedule, teachers obtain pay raises when steps on the scale are completed. These steps include years of experience and coursework above a bachelor's degree. The purpose of this study was to determine whether or not these two teacher characteristics play a role in how well the teachers' students performed on the MAP test.

Research Questions

In order to guide the research forward through data collection, it was important to develop questions that would bolster and clarify the study's findings. The following research questions guided this study:

1. What relationship exists, if any, between the years of teaching experience of a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Communication Arts test?

2. What relationship exists, if any, between the years of teaching experience of a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Communication Arts test?

3. What relationship exists, if any, between the years of teaching experience of a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Math test?

4. What relationship exists, if any, between the years of teaching experience of a fifth grade teacher and the performance of that teacher's students on the fifth Grade Missouri Assessment Program Math test?

5. What relationship exists, if any, between the academic degree held by a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Communication Arts test?

6. What relationship exists, if any, between the academic degree held by a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Communication Arts test?

7. What relationship exists, if any, between the academic degree held by a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Math test?

8. What relationship exists, if any, between the academic degree held by a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Math test?

Descriptive Statistics

Twenty-three school districts returned teacher data for the study. In total, the 23 districts accounted for 65 third and fifth grade teachers. The data included 32 third grade teachers and 33 fifth grade teachers. Thirteen of the 23 school districts had only one teacher per grade level with 10 having at least two teachers per grade level. The mean ADA for the school districts was 328.61, with a range of 462.83. Details on the school districts' building ADA, enrollment, and total staff counts are shown in Table 1.

Table 1

Participating School Attendance, Enrollment, & Staff Count

	M	*Mdn*	*SD*	Range
District ADA	328.61	343.40	141.43	462.83
District Enrollment	327.78	312.00	151.73	539.00
District Staff	41.26	41.00	14.86	59.00
Elementary Enrollment	190.39	192.00	80.05	277.00
Elementary Staff	22.00	22.00	6.43	26.00

Note. $n = 23$

The classification of the school district enrollments for the schools participating in this study is provided in Table 2. The number of school districts in each category is listed as well as the corresponding percentage of total school district respondents. Cumulative numbers are also included in Table 2.

Table 2

School District Average Daily Attendance

ADA	*n*	% of Respondents	Cumulative #	Cumulative %
0 - 99	0	0	0	0
100 -199	6	26	6	26
200 - 299	4	17	10	43
300 - 399	7	30	17	74
400 - 499	3	13	20	87
500 - 599	3	13	23	100

There were a total of 32 third grade teachers in the sample used for this study. The teachers held a broad range of experience, ranging from one year of experience to 18 years of experience. There were no teachers with 20 or more years of experience. The classification of teachers, according to years of experience, is shown in Table 3. The largest percentage of teacher experience level in the study was four to six years of experience with 37.5% of the total number third grade teachers falling within this category.

Table 3

Experience Level of Third Grade Teachers

Years of Experience	*n*	% of Teachers	Cumulative #	Cumulative %
0 to 3	4	12.50	4	12.50
4 to 6	12	37.50	16	50.00
7 to 10	3	9.38	19	59.38
11 to 15	9	28.13	18	56.25
16 to 20	4	12.50	32	100.00
21 to 30	0	0.00	32	100.00

The degree level held by the third grade teachers in the study is presented in Table 4. The group was split with 17 teachers having earned bachelor's degrees and 15 holding a master's or higher. One of the third grade teachers involved in the study had a specialist degree; the remaining teachers held master's degrees.

Table 4

Degree Level of Third Grade Teachers

Degree Held	*n*	% of Teachers
Bachelor's Degree	17	53.13
Master's Degree or Higher	15	46.88

In the school districts studied, there were 33 teachers at the fifth grade level. In most school districts, one teacher taught all of the subjects for his or her class in a self-

contained classroom. However, at the fifth grade level, not all teachers taught in self-contained classrooms. There were 31 teachers who taught communication arts and 31 teachers who taught math. There were two school districts in which two teachers taught the fifth grade level, but one teacher taught math for both classes, and one taught communication arts for both groups. The fifth grade classes switched between the two teachers for those subjects. In Table 5 is the classification of teachers and classroom experience for the fifth grade teachers.

Table 5

Experience Level of Fifth Grade Teachers

Years of Experience	*n* of Math Teachers	% of Math Teachers	*n* of CA Teachers	% of CA Teachers	*n* of Fifth Grade Total	% of Total Fifth Grade Teachers
0 to 3	7	22.58	6	19.35	7	21.21
4 to 6	5	16.13	4	12.90	5	15.15
7 to 10	8	25.81	9	29.03	9	27.27
11 to 15	6	19.35	6	19.35	6	18.18
16 to 20	3	9.68	3	9.68	3	9.09
21 to 30	2	6.45	3	9.68	3	9.09

The degree level held for all of the fifth grade teachers in the study is shown in Table 6. There was a similar number of teachers with a bachelor's degree and master's

degree or higher. Of the fifth grade teachers, all teachers with advanced degrees had completed a master's degree. There were no higher degrees than a master's completed.

Table 6

Degree Level of Fifth Grade Teachers

Degree Held	*n* of Math Teachers	% of Math Teachers	*n* of CA Teachers	% of CA Teachers	*n* of Fifth Grade Total	% of Total Fifth Grade Teachers
Bachelor's Degree	17	54.84	17	54.84	18	54.55
Master's Degree or Higher	14	45.16	14	45.16	15	45.45

For this study, student MAP score data were given for each teacher, as well as the degree level completed and experience level. Descriptive statistics were used to describe the MAP score data. The MAP data for all teachers of third and fifth grades were summarized as shown in Table 7.

Table 7

MAP Data Analysis

Grade & Subject	*n*	*M*	*Mdn*	*SD*	Range
Third Grade					
Communication Arts	32	640.42	640.40	13.54	57.59
Math	32	628.96	625.60	16.73	83.24
Fifth Grade					
Communication Arts	31	673.51	673.40	15.77	89.48
Math	31	666.03	666.10	13.38	57.00

Results of Pearson *r* Correlation

In order to determine the correlation between the variables, the Pearson *r* test was employed for this study. The Pearson *r* "measures the strength and direction of a linear relationship between the two variables" (Bluman, 2010, p. 533). Bluman (2010) continued:

> The range of the correlation coefficient is from -1 to +1. If there is a strong positive linear relationship between the variables, the value of *r* will be close to +1. If there is a strong negative linear relationship between the variables the value of *r* will be close to -1. (p. 533)

The guidelines for interpreting the strength of a relationship in the study were as follows: 0.00 to .3 constituted a negligible correlation, 0.3 to 0.5 was a low correlation,

0.5 to 0.7 demonstrated a moderate correlation, 0.7 to 0.9 was a high correlation, and 0.9 or higher indicated a very high correlation (Hinkle, Wiersma, & Jurs, 2003).

The results of the Pearson *r* correlation test revealed no relationship between the years of teaching experience for the third grade teachers and communication arts scale scores for the classes ($r = -0.03$, $p < 0.05$). There was a negligible relationship between the years of teaching experience for the third grade teachers in the sample and math scale scores for the classes ($r = 0.13$, $p < 0.05$).

The Pearson *r* results presented no relationship between the third grade teachers' degree level and communication arts scale scores for the classes ($r = 0.09$, $p < 0.05$). The test results showed there was not a significant relationship between the third grade teacher's degree level achieved and math scale scores for the classes ($r = 0.15$, $p < 0.05$).

The results of the Pearson *r* correlation test indicated a negligible relationship between the years of teaching experience for the fifth grade teachers and communication arts scale scores for the classes ($r = 0.21$, $p < 0.05$). The results also showed no relationship between the years of teaching experience for the fifth grade teachers in the sample and math scale scores for the classes ($r = 0.19$, $p < 0.05$).

The results of the Pearson *r* correlation test showed no relationship between the fifth grade teachers' degree levels achieved and communication arts scale scores for the classes ($r = 0.10$, $p < 0.05$). The test results also indicated no significant relationship between the fifth grade teacher's degree level achieved and math scale scores for the classes ($r = 0.06$, $p < 0.05$).

Results of Multiple Regression Analysis

A multiple regression analysis was used in the study to determine the effect of the independent variables on the dependent variable and whether this determination was statistically significant. According to StatsSoft (2012), "the general purpose of multiple regression (the term was first used by Pearson, 1908) is to learn more about the relationship between several independent or predictor variables and a dependent or criterion variable" (para. 1). The data were analyzed to determine the regression line which provided the ability to predict where the dependent variable should fall based on the value of the independent variable. According to StatSoft (2012), "the degree to which two or more predictors (independent or X variables) are related to the dependent (Y) variable is expressed in the correlation coefficient *R*, which is the square root of *R*-square. In multiple regression, *R* can assume values between 0 and 1" (para. 9). There were four separate regression analyses conducted with the independent variables, experience and degree completion, consistent through all four analyses. The dependent variables for each test were third grade math scores, third grade communication arts scores, fifth grade math scores, and fifth grade communication arts scores.

Regression analysis was first run for the third grade teachers and the student achievement results for his or her classrooms. The multiple regression analysis found R^2 for communication arts was 0.0197. The variables explain only 2% of the variation in student test scores. The results were also not statistically significant ($F = 0.7497$). Regression analysis for third grade math R^2 was 0.0301, explaining only 3% of the variation between achievement scores due to the independent variables. These results

were also not statistically significant ($F = 0.6422$). In Table 8 are the coefficients for the variables.

Table 8

Multiple Regression Analysis Results for Third Grade

	Communication Arts			Math		
	B	*SE B*	β	*B*	*SE B*	β
Experience	-0.3407	0.5820	0.5628	0.1443	0.7153	0.8415
Degree Level	4.7258	6.3150	0.4603	4.6098	7.7617	0.5572

Note. B = Unstandardized Coefficient

When multiple regression analysis for fifth grade was used to determine effect, the results again indicated little to no effect on classroom scores. For communication arts in fifth grade, the variables only explained 4% of the variation in test scores, $R^2 = 0.0442$. These results were not statistically significant ($F = 0.538$). For mathematics, $R^2 = 0.0373$, which explained only 4% variation of classroom test scores. The results were not statistically significant ($F = 0.5873$). In Table 9 the coefficients for the variables in fifth grade are listed.

Table 9

Multiple Regression Analysis Results for Fifth Grade

	Communication Arts			Math		
	B	*SE B*	β	*B*	*SE B*	β
Experience	0.4012	0.4066	0.3323	0.3723	0.3740	0.3280
Degree Level	1.3680	6.0746	0.8235	0.2886	5.0520	0.9549

Note. B = Unstandardized Coefficient

Summary

The results of this study showed no correlation between teacher experience and degree level achievement in student MAP scores in both third and fifth grade. There was a slight positive correlation in terms of teacher experience and success in fifth grade classrooms, but nothing statistically significant enough to be considered anything more than a weak correlation. None of the other teacher characteristics had a large enough correlation coefficient to be considered statistically significant. The results showed that both teacher experience and degree level completion did not have an effect on the performance of the students in that classroom on the MAP test in communication arts or mathematics.

These findings could have lasting ramifications in the world of education, should additional consistent research corroborate these findings. The body of research indicated that teacher experience and degree level completed have no significant impact on the performance of teachers' students on standardized tests (Campbell & Lopez, 2008;

Clotfelter et al., 2007; Dobbie & Fryer Jr., 2011; Hanushek & Rivkin, 2012; Harris & Sass, 2009; Huang & Moon, 2009). Controversy remains surrounding school reform and the changes that could and should be made to improve student performance.

This study was completed using small, rural school districts. These districts qualified for the small, rural school grants through the Federal Department of Education by having an average daily attendance of less than 600 students. Descriptive statistics were utilized in order to gain a clearer picture of the school and the applicable educator demographics – teaching experience and advanced degree completion – that education experts claim are the two most important factors to consider when assessing teacher quality. These data, as well as MAP scale scores for each classroom, were used as the basis for further analysis and hypotheses testing.

In Chapter Four, data from the study were analyzed to determine whether these two characteristics alone had the most profound effect on student test scores. Pearson *r* scores revealed the correlation between the variables, and multiple regression analysis was used to determine the ability to predict student scores based on teacher experience and degree completion. The data were analyzed to determine whether or not to reject the null hypotheses for the study. The testing of the data determined there were no correlations between the dependent and independent variables.

The two teacher characteristics used in multiple personnel policies, teacher experience and degree completion, seemed to have no effect on the performance of students on the MAP test. The null hypotheses of the study were not rejected due to the lack of statistical significance. The analysis of these data should give assistance to educational leaders and policy-makers on the implications of the salary schedule and

whether the schedule as currently formatted is the best policy moving forward. It could also be a determinant of whether other school policies should be based on these two characteristics of teachers.

In Chapter Five, there is continued discussion of the data presented in Chapter Four. There is also a review of the findings and conclusions made according to the data presented. Recommendations for practice and policy are included in the narrative of Chapter Five. There is a discussion of recommendations for future research on the teacher salary schedule and teacher experience and degree completion in regard to student achievement on standardized tests. These discussions revolve around the data collected in this study and how the data could be used to improve teaching quality and practice in school districts.

Chapter Five: Summary and Conclusions

The results of this study could have major implications for many policies in education. This study analyzed the effects of a teacher's experience and degree level on standardized test scores of third and fifth grade students included in the sample. These characteristics are widely used in education to drive policies and provide salary compensation.

NCLB legislation tied teacher quality to these characteristics under the Highly Qualified Teacher umbrella (U.S. Department of Education, 2002). In order to be highly qualified, a teacher must have completed at least a bachelor's degree, must be certified, and must be able to show content area knowledge by passing a licensure exam (U.S. Department of Education, 2002). However, the content area knowledge requirement could be bypassed by completing the requirements on a HOUSSE form (U.S. Department of Education, 2002). Teachers who opt for the HOUSSE route can earn points for education and experience (U.S. Department of Education, 2002). Instead of passing the licensure exam, a teacher with a master's degree and five years of experience could become highly qualified according to the law (U.S. Department of Education, 2002).

A major policy and compensation practice using the characteristics from this study is the single salary schedule for education. There are a number of other policies, including teacher tenure, hiring and retention policies, removal policies, and staff reduction policies that rely on these variables and these variables alone as determinants (MCE, 2013f; Mo. Rev. Stat., 2012i). This study was conducted to determine whether there is a correlation between the two major components of the salary schedule, teacher experience and degree level, and student performance on MAP tests.

Since so many educational policies and practices continue to rely on experience and higher education degree completion, it was important to determine the association between these characteristics and the success of students in those teachers' classrooms. Ultimately, a school district's goal is the success of each student during and following his or her school years. The number one factor in the success of those students is, and has always been, the teacher in the classroom (Marzano, 2007; Wong, 2009). Therefore, it is important to determine what exact characteristics these teachers possess that improves student learning and retention, so that each student may achieve higher test scores.

Experience and degree level attainment is a high priority in seeking and retaining teachers in the classroom (Rockoff et al., 2011). It would make sense to expect these two factors to have a marked impact on student success in the classroom. The classroom achievement measure in this study was classroom mean scale scores in communication arts and mathematics. Scale scores were used, because they were the most easily quantifiable and comparable measure of student success and because of their inclusion as achievement measurements in NCLB legislation.

The goal of this study was to determine if there was a relationship between the two teacher characteristics that guide educational policies and student achievement on standardized tests. In the review of literature, multiple studies found no link between degree completion and student scores or achievement (Campbell & Lopez, 2008; Clotfelter et al., 2007; Dobbie & Fryer Jr., 2011; Hanushek & Rivkin, 2012; Harris & Sass, 2009; Huang & Moon, 2009). Most studies from the research found no link between experience and student achievement outside the first five years of teaching (Clotfelter et al., 2007; Dobbie & Fryer Jr., 2011; Harris & Sass, 2009; Hanushek &

Rivkin, 2012). The findings of this research agreed with the majority of these previous studies.

In Chapter Five the pertinent findings of the research study are presented. In Chapter Five, these results are analyzed and conclusions made on whether experience and degree level has an effect on student achievement. There is also discussion on the implications of this research and the recommendations for future research on the subject.

Findings

The study analyzed data from 65 third and fifth grade teachers in 23 southwest Missouri school districts. There were 32 third grade teachers and 33 fifth grade teachers. The mean ADA for the schools in the study was 328.61 students. The teachers had completed varying levels of experience. The range of teacher experience with the highest percentage of teachers in third grade was four to six years of experience. In that range were 37.5% of the total third grade teachers. In fifth grade the highest number was in the seven to 10 years of experience range, with 25.81% of the fifth grade teachers falling in that category.

The degree level attainment of both third and fifth grade teachers was also split. For third grade teachers, 53.13% held a bachelor's degree, and in fifth grade, 54.84% held a bachelor's degree. The mean MAP scores for third grade were 640.42 for communication arts, and 628.96 for mathematics. The mean scores for fifth grade were 673.51 for communication arts and 666.03 for mathematics.

The research questions that guided this study focused on the experience level and degree completion for teachers in third and fifth grade. These characteristics were then compared to the achievement of the teachers' students on the MAP test in communication

arts and math. The research questions guiding this study and the findings from the analyses are presented:

Research question 1. What relationship exists, if any, between the years of teaching experience of a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Communication Arts test?

The years of experience for a third grade teacher seemed to have no effect on the student scores. The Pearson *r* showed no significant relationship between the variables, ($r = -0.03$, $p < 0.05$). The null hypothesis ($H1_0$: $\beta = 0$) was not rejected.

Research question 2. What relationship exists, if any, between the years of teaching experience of a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Communication Arts test?

Correlational methods using the Pearson *r* showed a negligible relationship between fifth grade teachers' years of experience and the classes' achievement on the MAP test ($r = 0.21$, $p < 0.05$). The relationship was not statistically significant. The null hypothesis ($H2_0$: $\beta = 0$) was not rejected.

Research question 3. What relationship exists, if any, between the years of teaching experience of a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Math test?

Student achievement results on the math tests were unaffected by years of experience for third grade teachers. Results of the Pearson *r* showed no significant relationship ($r = 0.13$, $p < 0.05$) between third grade teaching experience and math scores. The null hypothesis ($H3_0$: $\beta = 0$) was not rejected.

Research question 4. What relationship exists, if any, between the years of teaching experience of a fifth grade teacher and the performance of that teacher's students on the fifth Grade Missouri Assessment Program Math test?

The years of experience for a fifth grade teacher had no effect on student math scores. The Pearson *r* showed no significant relationship between the years of teaching experience for fifth grade teachers and the achievement of the teachers' students on the math test ($r = 0.19$, $p < 0.05$). The null hypothesis ($H4_0$: $\beta = 0$) was not rejected.

Research question 5. What relationship exists, if any, between the academic degree held by a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Communication Arts test?

The academic degree level of third grade teachers had no effect on the performance of students on the communication arts MAP test. The results of the Pearson *r* showed no significant relationship between the variables, ($r = 0.09$, $p < 0.05$). The null hypothesis ($H5_0$: $\beta = 0$) was not rejected.

Research question 6. What relationship exists, if any, between the academic degree held by a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Communication Arts test?

In communication arts, the degree level of the teacher had no effect on the student achievement scores. The Pearson *r* showed no significant relationship between the degree level of fifth grade teachers and the teachers' class results on the MAP test ($r = 0.10$, $p < 0.05$). The null hypothesis ($H6_0$: $\beta = 0$) was not rejected.

Research question 7. What relationship exists, if any, between the academic degree held by a third grade teacher and the performance of that teacher's students on the third grade Missouri Assessment Program Math test?

The degree level held by third grade teachers did not have an effect on the performance of students in math. The results of the Pearson *r* showed no significant relationship between the third grade teachers' degree level and the performance of the students on the MAP test ($r = 0.15$, $p < 0.05$). The null hypothesis ($H7_0$: $\beta = 0$) was not rejected.

Research question 8. What relationship exists, if any, between the academic degree held by a fifth grade teacher and the performance of that teacher's students on the fifth grade Missouri Assessment Program Math test?

The fifth grade math test results were unaffected by the degree level held by the classroom teacher. The Pearson *r* showed no significant relationship between the fifth grade teachers' degree level achieved and the math scores ($r = 0.06$, $p < 0.05$). The null hypothesis ($H8_0$: $\beta = 0$) was not rejected.

When using multiple regression analysis, similar results were found. In third grade, teaching experience and degree completion explained very little of the variation in classroom scores on the communication arts and math tests. In essence, the degree level or experience of a third grade teacher had no bearing on how successful the teachers' students were on these standardized tests. The same can be said when analyzing experience and degree completion for fifth grade teachers and the relationship to student test scores in communication arts and math. In fifth grade, the success of students on the

MAP could not be determined solely by the experience level and degree completion of the students' teachers.

Implications

This study and previous research could be used as a guide for educational policy makers in creating policies to improve education in the state and country. The findings could also be used by district and school leaders to improve compensation, recruitment, and teaching quality in school districts. The research could have many different implications throughout the educational community.

The findings of this study should make educators question the validity of using these teacher characteristics when crafting important educational policy. While these characteristics may be two of the more quantifiable characteristics of teachers, these characteristics alone have shown to have little bearing on the success of students. Ultimately, most policies involving teachers in education should focus on providing the best teachers for students to help achieve student success. This study and the previous research revealed these two characteristics may not be the best way to compensate teachers or create teacher employment policies.

One implication for practice in education would be to question the current framework of the teacher salary schedule. Currently, the salary schedule is based on experience and degree completion for teachers. This research has shown these two factors have little impact on student achievement in the classroom. However, the teacher has the single biggest impact on student achievement in the classroom (Marzano, 2007). The salary schedule could be revised to attract higher quality teachers and to provide salary increases based on proven factors that improve student learning and performance.

An update to the salary schedule may need to be considered to better reflect the characteristics of teachers that have been proven to improve instruction and student learning.

This could be especially true in small, rural districts where money is tighter and the applicant pool is typically smaller. Smaller schools often find it more difficult to recruit and hire teachers with these qualifications (Beesley et al., 2010). The ability to adjust salary schedules to focus on a wide array of teacher characteristics or qualities, not just experience and education, could very well assist smaller school districts in competing with larger schools in terms of salary and benefits.

Additionally, with only one or two grade level teachers per class, smaller schools are often left with lower performing teachers whose impact is felt more significantly than if that same teacher were in a large district with a greater number of teachers per class or subject. Administrators and school leaders at small schools often have few options when it comes to removing teachers due to tenure laws or in times of staff reduction. This could cause a higher quality teacher with less experience to be removed, even if the school leadership is aware of a more experienced teacher who should have been removed in his or her place.

The quality or application of advanced degree programs in education is another area in which the results of this study could have implications. In this study, the numbers of teachers with a master's degree or higher were a large portion of the total number of teachers. The lack of significant improvements in student achievement for teachers with an advanced degree leads to questioning the high priority of teachers with advanced degrees. The attainment of an advanced degree can be a long and costly process for the

teacher and expensive for the district as well. If the practice does not justify itself with student achievement results, educational leaders should question the methods or requirements.

Recommendations for Practice

One area in which the salary schedule could be revised is in the base salary. Many possible high quality teaching candidates shy away from education because of the low pay. According to Pink (2009), this is because the typical starting teacher salary is much lower than comparable careers in the private sector. In *Drive*, Pink (2009) wrote:

> The best use of money as a motivator is to pay people enough to take the issue of money off the table. Raising base salaries would do that. Instead of fretting about paying their bills on an insufficient salary or scheming to get a small bonus, teachers could focus on the work they love. (p. 192)

A higher base salary would likely entice higher quality applicants to enter the teaching profession. Likewise, this would increase the number of quality candidates from which administrators search to select new hires. A highly ambitious teacher workforce would improve the overall quality of education, and thus raise test scores. In a study of effective businesses, author Jim Collins (2001) wrote in his book, *Good to Great*, that effective leaders of companies who became great started with finding great people. Collins (2001) asserted:

> The executives who ignited the transformations from good to great did not first figure out where to drive the bus and then get people to take it there. No, they first got the right people on the bus (and the wrong people off the bus) and then figured out where to drive it. (p. 41)

The salary schedule should also vary based on the subject area of teaching. It has been discussed that teachers in specialized subjects, such as math or science, have many more opportunities for employment outside of education (Podgursky, 2012). Often, these opportunities pay much more than a public teacher's salary. As a result, it is much more difficult for administrators and school leaders to find high quality teachers in those areas (Podgursky, 2012). In basic economics, the law of supply and demand determines the price point of a product (Podgursky, 2012). If there is a low supply or a high demand for a product, the product's price point moves higher. Teachers in these subject areas tend to be in high demand, and school leaders would benefit by being able to pay these teachers more.

School administrators should have the flexibility to pay these teachers on a higher step or to have a separate salary schedule for those who fill specialized or difficult-to-fill positions. Since it is such a struggle to find teachers in the areas of math, science, and special education it makes sense to pay those teachers higher salaries as opposed to the subject areas where there are plenty of teachers available in the pool. This, in turn, may entice professionals educated in these fields, who previously may not have considered public education, to turn their eyes toward the classroom.

Another way the salary schedule could be adjusted is to fine-tune the advanced degree steps in the salary schedule. These step increases and tuition reimbursements have made it much more common for a teacher to go back to school to advance his or her education. In fact, studies have shown that more teachers have master's degrees than the bachelor's degree initially required for certification (Drury & Baer, 2011). In order to qualify for any benefits on the salary schedule because of an advanced degree, or before

receiving tuition reimbursement for a future master's program, the hours or degree progress should be in the teacher's subject area. In most school districts, educators can move up a step on the salary schedule for merely completing hours towards a master's degree or higher, regardless of the subject matter.

Teacher tenure and removal policies should be changed to allow school and district leaders to remove staff based on teaching effectiveness rather than time-in-service. Teacher tenure policies do not make it impossible to remove ineffective teachers, but the policies do make the process more intensive and difficult. To improve and replace tenure policies, administrators should be allowed to offer more effective teachers multi-year contracts. This would allow opportunities to improve upon teacher stability and afford teachers the chance to be part of the annual evaluation process.

The last-in first-out policies for staff reduction and removal should also be revisited. A district's administration should be able to remove the least effective teachers, rather than just the teachers who have been in district the shortest amount of time. There could also be an appeal process written into the policy to protect experienced teachers who feel they were removed from a position to save salary costs for the district.

Elementary and secondary education leaders should be working with members of the higher education community to improve the standards and quality of master's degree programs. Administrators could work with higher education departments to help design programs that focus more on instructional strategies, classroom management, and a deeper knowledge of content to improve the teacher's instructional ability. School districts could even work with a local university to provide quality professional

development and degree advancement options, tailored to the school district's needs, but allowing the teacher to improve skills and earn college credit hours.

Recommendations for Future Research

This research can lead to a number of future research projects. It would be helpful to see this research replicated with a larger group of teachers. With a greater sampling size, the statistical results could show different results or the same results with more of a statistical significance. The results would be more applicable to the population if there was a more populous statistical sample. This study could also be replicated on a state or national level to present a more extensive picture than offered by the current study, which only used data from rural schools in southwest Missouri.

This research could also be replicated for school districts that possess different characteristics than those used in the current study. School districts with an average daily attendance (ADA) of over 600 students, secondary schools, or high poverty districts are examples of different types of school districts whose characteristics differ from those used in the study. Most of these districts use the same salary schedule, and it would benefit each to know whether the characteristics of the salary schedule influence student performance in any way.

The research could also be conducted with a different indicator of student success as the dependent variable. Experts continually discuss whether student scores on standardized tests are a true measure of student achievement. Studies could be centered around classroom grades, graduation or retention rates, and reading levels, or even with longitudinal studies that correlate teacher quality with college and career placement or future earnings.

Determining whether the type of degree program correlates with student success is another area in which future research could be completed. Most of the previous research base for this area focuses on advanced degree completion and does not specify the types of advanced degrees achieved. As was discussed earlier, there are many different types of master's degrees that teachers could achieve. It would greatly benefit education leaders and policy makers to know whether specific areas of degree completion equate to higher quality teaching and increased student test scores.

Summary

The purpose of this study was to determine whether or not there was a correlation between teacher experience and degree level attainment, and student test scores. These are the traditional characteristics tied to teacher quality and effectiveness. Specifically, the variables focused on third and fifth grade teachers and the classroom mean scale scores on the MAP test for mathematics and communication arts. Each classroom teacher's experience and academic degree level was paired with the classroom scale scores for his or her classrooms.

This topic was chosen because of the continuous debate within the educational community centered on teacher quality and effectiveness. Research continues to focus on teacher quality, due to the fact that teachers are such a meaningful element to student success (Marzano, 2007). These two characteristics obviously hold a high regard in the world of education as evidenced by the number of policies and procedures that use this criteria as a determining factor in salary, hiring, and retention (MCE, 2013f; Mo. Rev. Stat., 2012i). The highest profile policy based on these characteristics is the salary schedule used for the majority of schools throughout the country. The single salary

schedule, which uses a series of steps and lanes to determine a teacher's yearly salary, rewards experience and advanced degree completion and little more. As a teacher progresses through the scale, each step equals an increase in salary.

The highly qualified teacher requirement of the NCLB Act has caused more emphasis to be placed on teacher experience and degree level completion (U.S. Department of Education, 2002). Other policies and procedures that put a premium on teacher experience and degree level completion past the bachelor's degree are teacher tenure, hiring and retention practices, reduction in force, and last-in first-out policies (Mo. Rev. Stat., 2012e; Mo. Rev. Stat., 2012i).

The study was centered in southwest Missouri using small, rural school districts. These districts had less than 600 ADA and were eligible for the Department of Education's Small, Rural Schools funding (U.S. Department of Education, 2003). Small school districts typically have had issues recruiting quality teachers due to limited funding for teacher salaries, remote locations, and the small number of teachers in the building (Beesley et al., 2010). These factors make it imperative that education experts attempt to determine what makes a successful teacher.

These school districts were identified through demographic data from the MODESE. Once identified as possible participants, the superintendent of each school district was sent a letter describing the study and asking for permission to obtain teacher experience and degree completion for all third and fifth grade teachers in the district. The district administrator was also asked for MAP scale scores in math and communication arts for the students in those classrooms. Principals for the elementary schools were also contacted to obtain data for the study. Permission forms were obtained from the

superintendents for every school district that allowed teacher data to be used for the study.

The Pearson *r* was used to determine the correlation between the test variables: teacher experience, degree level achievement, and class MAP scale scores for communication arts and math. The Pearson *r* showed no significant correlations for the variables. The highest correlation between any of the variables was with fifth grade teaching experience. The relationship between fifth grade teaching experience and communication arts scores in the class ($r = 0.21$, $p < 0.05$) represented the highest correlated values. Slightly lower than this was the relationship between fifth grade teaching experience and math scores ($r = 0.19$, $p < 0.05$). Even at these levels, the relationships between the variables were weak. The results showed no relationship between the teacher characteristics used in the study and student achievement scores on the MAP tests.

It continues to be crucial for school districts and leaders to be able to determine the qualities and characteristics of top-notched teachers. Current education policies are focused mainly on just two teacher characteristics, teacher experience and degree level completion. This study indicated there was not a relationship between these characteristics and student achievement for the sample studied. These findings pose serious questions for the validity of these characteristics in determining quality teachers. Further study is necessary in order to uncover the true attributes that constitute a high quality teacher and educator capable of nurturing student academic growth and development.

Appendix A

IRB Approval Document

DATE: July 31, 2013

TO: Jared Terry
FROM: Lindenwood University Institutional Review Board

STUDY TITLE: [491837-1] The Connection to Improved Student Performance for Teacher Experience and Advanced Degree Completion above Bachelor's Level

IRB REFERENCE #:
SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: July 31, 2013
EXPIRATION DATE: July 31, 2014
REVIEW TYPE: Expedited Review

Thank you for your submission of New Project materials for this research project. Lindenwood University Institutional Review Board has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document. Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the IRB.

This project has been determined to be a Minimal Risk project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the

completion/amendment form for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of July 31, 2014.

Please note that all research records must be retained for a minimum of three years.

If you have any questions, please contact Tameka Moore at (618) 616-7027 or tmoore@lindenwood.edu.

Please include your study title and reference number in all correspondence with this office.

If you have any questions, please send them to IRB@lindenwood.edu. Please include your project title and reference number in all correspondence with this committee. This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within Lindenwood University Institutional Review Board's records.

Appendix B

Permission Letter for Superintendent

August 1, 2013

Dear Superintendent _____,

I am conducting a research project entitled, *The Connection to Improved Student Performance for Teacher Experience and Advanced Degree Completion above Bachelor's Level*, in partial fulfillment of the requirement for a doctoral degree in educational administration at Lindenwood University.

The research gathered should assist in providing insights and perspectives into the correlation between components of the standard educational salary schedule, years of experience and degree completion, and student achievement for third and fifth grade teachers on the MAP test.

I am seeking your permission as the superintendent of the <*Name Here*> School District to obtain teacher experience, teacher degree level completion, and mean classroom scale scores for each 3rd and 5th grade teacher whose class took a MAP grade level test as part of the data collection and analysis process.

Consent is voluntary, and you may withdraw from the study at any time without penalty. The identity of the participants, as well as the identity of the school district will remain confidential and anonymous in the dissertation or any future publications of this study.

Please do not hesitate to contact me with any questions or concerns about participation (phone: 417-[redacted] or electronic mail: jterry@norwood.k12.mo.us). You may also contact the dissertation advisor for this research study, Dr. Cherita Graber, (phone: 417-[redacted] or electronic mail: cgraber@lindenwood.edu). A copy of this letter and your written consent should be retained by you for future reference.

Yours truly,

Jared Terry
Doctoral Candidate

Permission Letter

I, <*Name of Superintendent*>, grant permission for Jared Terry to obtain teacher experience, teacher degree level completion, and mean classroom scale scores for each teacher whose class took a MAP grade level test as part of a research project entitled, *The Connection to Improved Student Performance for Teacher Experience and Advanced Degree Completion above Bachelor's Level*. By signing this permission form, I understand that the following safeguards are in place to protect the participants:

1. I may withdraw my consent at any time without penalty.

2. The identity of the participants, as well as the identity of the school district will remain confidential and anonymous in the dissertation or any future publications of this study.

I have read the information above, and any questions that I have posed have been answered to my satisfaction. Permission, as explained, is granted.

_____ _____

Superintendent's Signature Date

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Vita

Jared Flay Terry graduated in 2006 from Drury University in Springfield, Missouri, with a bachelor's degree in Exercise and Sport Science. After graduation from college, he began teaching physical education and coaching high school basketball at the Lutie School District in Theodosia, Missouri. He continued in that position for four years. While in that position, Mr. Terry returned to Drury University to acquire a master's degree in curriculum and instruction. After completing his master's in instruction, he began attending Lindenwood University to complete a master's degree in educational administration. Mr. Terry then entered the administration field as the K-12 assistant principal for the district. After two years as assistant principal, Mr. Terry then accepted his current position as elementary principal for the Norwood School District in Norwood, Missouri. Mr. Terry is in his second year as elementary principal.