ABSTRACT

Amy Cooper Rogers, PREDICTIONS, ASSIGNED GRADES, AND OUTCOMES: IMPLICATIONS FOR SCHOOL LEADERSHIP (Under the direction of Dr. Lynn Bradshaw), Department of Educational Leadership, January, 2011.

This study analyzed relationships between teachers' ability to predict proficiency levels on standardized end-of-grade tests for grades three through eight in reading and mathematics relative to students' actual proficiency levels. This study also analyzed relationships between teacher-assigned grades in reading and mathematics for grades three through eight relative to student's actual proficiency levels. The research was conducted using state assessment data reports for an eastern North Carolina school district, a midsize district with over 17,000 students and 900 teachers. Data were organized into tables for examining relationships of teacher predictions and teacher-assigned grades to student achievement qualitatively through descriptive analysis. The Fisher's exact test was applied as the statistic of analysis for examining teacher predictions of proficiency and non-proficiency with actual student achievement. The Fisher's exact test was also applied as the statistic of analysis for examining teacher-assigned grades with actual student achievement.

Results of this study determined the pattern of predictions more closely aligned to actual scores on Proficiency Level III in both reading and mathematics. The Fisher's exact test showed a statistically significant relationship exists between teacher prediction and actual student proficiency level. Twenty percent of students failed the reading test and 9% failed the mathematics test, even though their teachers had predicted they would pass with a Level III or IV. In both reading and mathematics, teachers in grade span 3-5 show a closer prediction to the actual achievement level obtained by the students than in grade span 6-8.

More results determined misalignment in grading. In reading, of students with a C average, 56% were non-proficient on the end-of-grade assessment. In mathematics, of students with a C average, 30% were non-proficient, and of students with a D average, 56% were proficient on the end-of-grade assessment. In both reading and mathematics in grade span 3-5 the teacher-assigned grades in the A-B-C group showed a higher percentage in the proficient category at more levels than in grade span 6-8.

Recognizing misalignment in teacher prediction and student achievement provides the foundation for an educational discussion regarding effective teaching practices and the ability of teachers to provide immediate intervention and support.

PREDICTIONS, ASSIGNED GRADES, AND OUTCOMES:

IMPLICATIONS FOR SCHOOL LEADERSHIP

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PREDICTIONS, ASSIGNED GRADES, AND OUTCOMES:

IMPLICATIONS FOR SCHOOL LEADERSHIP

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DEDICATION

I wish to dedicate this dissertation to my family. To my mother, I thank you for all the love and support through the years. You were my first teacher and my best teacher. You always assured me that anything was possible. You truly gave me my love of learning.

To my husband, Scott, who encouraged me, even harassed me at times to achieve my goal. I can never thank you enough for all your love and support, and all the times you took on extra responsibilities with our children to allow me time to work. I am so glad we are friends and partners through life.

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CHAPTER 1: INTRODUCTION

Throughout history, successfully educating all students has been a challenge. Educators today face similar challenges to educators of the past as they strive to meet the challenges that come with accountability standards for all students (Rury, 2009). Despite years of development in educational theories and practices, today the answers to the question of how best to educate all of our students continues to elude educators (Spring, 1997).

From the beginnings of our nation, the government stressed the need for education in order to create good citizens, but the actual practice of education for all is economically and logistically challenging in our dynamic society. This was also true from an historical perspective. The lower class of the early settlers could not read or write because they received little education (Pulliam, 1995; Rury, 2002). By the early 1700s, the colonial governments became involved in education by requiring training for the poor. This minimal instruction was to train the youth with the basic personal skills needed for survival. Charity schools were introduced about this time to educate the orphans and paupers. Even as Revolutionary times approached, there was still very little education for all students (Johnson, Collins, Dupuis, & Johansen, 1969). In 1805 the Free School Society was formed under the premise that equality of opportunity and industriousness would improve the standard of life (Rothstein, 1994). One of the first types of schools was the Lancastrian school. In a Lancastrian school, 365 to 1000 students were housed in one room with a teacher and many unpaid assistants. This type of school produced better educational results than other schools of the time. The popularity of the Lancastrian schools spread throughout the United States and Mexico, not because of the educational results, but because of the cost effectiveness of educating the masses (Johnson et al., 1969; Rothstein, 1994; Rury, 2002). Society felt the poor needed a place to learn corrective behavior and moral insight (Rury, 2002).

Shortly after this time the arguments began both for and against state supported schools. Those arguing for these schools felt that schools were an essential part of a republican government and they would prevent pauperism, and social and economic distress. Those opposed felt that the expense outweighed the benefits. During the next century, the concept of state-supported schools became commonplace as the population grew and the needs of society changed from an agrarian-based economy to an industrial-based economy (Rothstein, 1994). As state supported schools became more and more prevalent, both citizens and industry required more accountability for the tax dollars spent on education of the nations' youth (Walburg, 1986). In the mid-to-late twentieth century, the addition of vocational and other federal funding placed increasing demands for accountability which persist even now (Moores, 2004; Pulliam, 1995).

In today's society, the factors related to student achievement are complex. Education does not operate in a vacuum. Schools are microcosms of the communities that surround and support them, the district and the state in which they operate, and the national structures and incentives that are in place at any given time. They are subject to a myriad of influences of a diverse public perception. Results and outcomes on every level are influenced by countless variables. The studies relating to student achievement focus on one or two factors related to student achievement, and the results of these studies generally do not present a picture of why students achieve at certain levels. Studies related to student achievement have been grouped and analyzed according to similarities in their influential factors, such as general levels of funding, leadership, teacher quality, and instructional practices.

The research indicated that while general funding does not of itself improve the quality of teaching and learning, targeted funding can have varying degrees of success (Archibald, 2006; Sutton & Soderstrom, 1999; Tajalli & Ophein, 2004). Similarly, leadership qualifications such as

years of experience, years in education, and consistency of leadership in the same school did not show a positive relationship to quality teaching and learning. The creation of a positive school climate may have an impact on the employment and retention of quality teachers (Goldhaber & Anthony, 2003; McElroy, 2004). An atmosphere of collaboration and professional development strengthens the quality of teaching and learning (Beecher & Sweeney, 2008; Ding & Sherman, 2006; Janisch & Johnson, 2003; Kaufman, Johnson, Kardos, & Liu, 2002). There was also a positive correlation between sound instructional practices such as reduced class size (Achilles, 2003; Thompson & Cunningham, 2001) good curricular design (Marzano, 2003; Wiliam, Lee, Harrison, & Black, 2004) and strong teacher prediction strategies as they relate to quality teaching and learning (McMillan, Myran, & Workman, 2002).

Statement of the Problem

This study investigated the relationships between teachers' ability to predict levels of proficiency on standardized end-of-grade tests in reading and mathematics relative to the students' actual levels of proficiency in grade 3-8 according to state data. This study also investigated the relationships between teacher-assigned grades in reading and mathematics relative to the student's actual levels of proficiency in grades 3-8 according to state data. According to state level data from across all of North Carolina in these same grade levels, of all the students predicted by their teachers to be at Level III which was proficient, approximately 60% actually scored proficient on the end-of-grade tests in both reading and mathematics. Therefore, approximately 40% of those students predicted to be proficient with a Level III by their teachers did not demonstrate proficiency on the test. Approximately 60% of the students with a teacher-assigned grade of B were proficient on the test, while approximately 30% of those with a teacher-assigned grade of C were proficient in both reading and mathematics. Therefore,

approximately 40% of students with teacher-assigned grades of B and approximately 70% of students with teacher-assigned grades of C were not proficient in both reading and mathematics (North Carolina Department of Public Instruction [NCDPI], 2009b). The review of the literature in Chapter 2 indicates that there are many situational and instructional factors that may positively impact student performance and achievement. However, there seems to be no single factor which, in isolation, consistently impacts this achievement. This study was needed to determine to what extent existing data relating to teacher prediction from standardized state testing could provide foundational data that could help instructional leaders provide assistance to and evaluation of both existing and potential instructional personnel in the actualization of high student achievement.

Significance

Where teacher predictions, assigned grades, and student performance on end-of-grade tests are not aligned, there are urgent needs for intervention and support. Marzano (2003) stated that specific attention must be given to curriculum design and flow for increased student achievement to occur. When data provided by periodic assessment increases teacher awareness of students' academic achievement and needs, tangible benefits in student success occur on state mandated tests (Wiliam et al., 2004). This study contributed to the literature concerning the education of all students and how teachers can understand assessment data to guide and strengthen instruction of students. The results of the study provided foundational data that can be used by superintendents and principals as they are developing processes to support teachers in the continuous improvement of student achievement.

Purpose

The purpose of this study was to determine the extent to which teacher's predictions of student performance and assigned grades are consistent with actual performance on state end-of-grade tests. Data regarding teacher predictions were found in surveys that were a part of the state testing program.

Research Questions

In order to determine the extent to which teacher's predictions of student performance and assigned grades were consistent with actual performance on state end-of-grade tests this study investigated:

1. To what extent were teachers able to accurately predict student level of proficiency on standardized tests?

   1a. To what extent were teacher predictions of student level of proficiency on standardized end-of-grade tests on reading in grades 3-8 consistent with the actual level of proficiency achieved by students?

   1b. To what extent were teacher predictions of student level of proficiency on standardized end-of-grade tests on mathematics in grades 3-8 consistent with the actual level of proficiency achieved by students?

   1c. To what extent was the accuracy of teacher predictions of student level of proficiency on standardized end-of-grade tests in reading consistent across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

   1d. To what extent was the accuracy of teacher predictions of student level of proficiency on standardized end-of-grade tests in mathematics consistent

across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

2.	To what extent were teacher-assigned grades consistent with actual student levels of proficiency achieved on standardized end-of-grade tests?

2a.	To what extent were teacher-assigned grades in reading consistent with actual student levels of proficiency achieved on standardized end-of-grade tests in grades 3-8?

2b.	To what extent were teacher-assigned grades in mathematics consistent with actual student levels of proficiency achieved on standardized end-of-grade tests in grades 3-8?

2c.	To what extent were teacher-assigned grades in reading consistent with actual student levels of proficiency across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

2d.	To what extent were teacher-assigned grades in mathematics consistent with actual student levels of proficiency across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

Overview of Methodology

To investigate the research questions, the data were obtained from the North Carolina Department of Public Instructions' Accountability Services division from one eastern North Carolina school district for the 2008-2009 school year and included the predictions of student performance levels on state standardized tests by the teachers and the actual levels achieved by the students.

During the 2008-2009 school year the district served a total student enrollment of 17,773 students in 28 schools. The ethnic distribution of students in the district was 53% African American, 36% Caucasian, 7% Latino/Hispanic, 2% multi-racial, 1% Asian, and 1% American Indian. During this same year the graduation rate was 65.8%, as compared to the state rate of 71.7%. Eight percent of students were English Language Learners. Approximately 62% of students qualified for free and reduced lunch (District X, 2008).

The district employed 917 teachers. At the elementary level 97% of these teachers were fully licensed and 100% were highly qualified. At the middle school level 92% were fully licensed and 99% were highly qualified. There were 20% of elementary teachers and 21% middle school teachers with advanced degrees. Another advanced step is National Board Certification. The district had 51 elementary and 20 middle school teachers with this certification. The percentages of teachers with ten-plus years of experience were 61% at the elementary level and 62% at the middle school level. Teacher turnover for the district at elementary and middle school was 12% and 14%, respectively. The study also included teacher-assigned grades and the proficiency levels attained by the student. Both qualitative and quantitative analyses were performed on this data. Data were organized into tables for reading and mathematics, to examine the relationship of teacher predictions to student achievement qualitatively through descriptive analysis. Trends in the data were examined through the application of a series of Fisher's Exact Tests to determine the relationships of teacher predictions to actual student achievement and proficiency.

Limitations of the Study

The findings of the study were based on the elementary and middle schools located in one district in eastern North Carolina. The study will be limited in generalizability because the

data were taken only from eastern North Carolina and may not be true for other districts of North Carolina or the United States. This study assessed the teachers' predictions, not the teacher's levels of effectiveness. Further, this study did not assess the effectiveness of each teacher in teaching the North Carolina Standard Course of Study—it assumed that each teacher aligned instruction with the standard course of study.

Definitions and Terms

Several terms are defined below for clarity and understanding when reading the research.

1. *North Carolina End-of-Grade Tests of Reading Comprehension and Mathematics (EOG)*: State mandated multiple choice tests given at the end-of-grades 3-8 in the state of North Carolina. "These curriculum-based achievement tests are specifically aligned to the North Carolina Standard Course of Study and include a variety of strategies to measure the achievement of North Carolina students" (NCDPI, 2009a). Reading and mathematics scores were used in this study.

2. *Proficiency*: Proficiency levels, also known as achievement levels, were predetermined performance standards that compared a student's score on the North Carolina end-of-grade test to that of grade-level expectations (NCDPI, 2009a). There were four achievement levels, I, II, III, and IV, with students scoring at Level III and IV being considered at or above grade-level expectations (NCDPI, 2009a). Percent proficiency was a means by which a school, district, or state could demonstrate the number of students in a grade level who were at Level III or IV on a specific grade-level end-of-grade test.

3. *Actual Level of Proficiency*: The level actually achieved on end-of-grade tests. These were expressed as Level I, II, III or IV.

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4. *Teacher-assigned Grades*: A number or letter representing quality based on observation. Standardized measurement of varying levels of comprehension within a subject area.

5. *Teacher prediction of level of proficiency*: A teacher's forecast of a student's performance on a particular end-of-grade test as indicated in the survey section on the answer document for that test.

6. *Outcomes*: Knowledge, skills, and abilities students gain from the learning process as reported by formal and informal assessment.

7. *Cut Scores*: The scores at which one achievement level ends and another achievement level beings (NCDPI 2009c).

Summary

Chapter 1 provided an introduction to the study and described the history of the struggle to educate all students and the issues teachers face when applying testing results to teaching practices. The purpose of this study was to determine the extent to which teacher's predictions of student performance and teacher-assigned grades were consistent with actual performance on state end-of-grade tests. Schools continue to struggle to find ways to improve student achievement. This study suggested a foundation of teacher practice that may translate to a better understanding of the body of knowledge represented by the state educational standards for each subject, and, in turn, to improved test results. Limitations were noted and terms were defined. Chapter 2 will review the historical perspective of educating all students, synthesize the research on factors associated with increased student achievement, identify factors controlled or influenced by schools associated with increased student achievement, and explore how teachers

might reconcile differences in teacher perception of student performance on standardized testing through systematic teaching practices to improve student achievement.

CHAPTER 2: REVIEW OF LITERATURE

The purpose of this chapter was to review the literature and research on factors related to improved student achievement for all students. Of particular interest was an understanding of how teachers attempt to accurately make appropriate instructional decisions in the classroom. In order to do this, they should be able to assess what students know and what they need to learn. The chapter begins with a history of the effort to educate all children and the factors that continue to make it challenging to achieve that goal. Studies of factors related to improved student achievement are reviewed next. This chapter concludes with a discussion of the need for this study.

Studies of factors related to student achievement were located using several databases including *Academic Search Premier*, *JSTOR*, and *Education Research Complete*. Several search terms were particularly useful: *student achievement*, *teacher retention*, *teacher quality*, *leadership*, *class size*, and *teacher perception*. Articles published in peer-reviewed journals published since 2002 were prioritized. In addition, relevant research studies cited in these articles were also reviewed and included if they specifically addressed the terms *student achievement*, *teacher quality*, *instructional practices*, and *teacher perception*.

The collection of literature was synthesized to review the resources that support the teacher in the curricular design, instructional practices, and assessment as educators strive to increase student achievement. The synthesis of research was relevant to the relationship between the instructional process of understanding the level of student achievement and the prediction of outcomes on assessments.

The Roots of Education for All Children

Education in Colonial America

Historically in the United States, there has been a desire and an urgency to educate all children. However, before the 1800's, the urban poor and immigrant children had very little formal education (Rury, 2009; Spring, 1997).

Educational opportunities in Colonial America. Access to education in Colonial America seemed to be related to social class in the colonies. The children of upper class colonist were likely to have access to strong educational programs including Latin preparatory schools in main colonial cities and personal tutors on the plantations in the south. The children of the new middle class or commercial class were more likely to attend academies for skills training. In contrast, the lower class of the early settlers was typically unable to read or write because they received little or no formal education. Forward-thinking leaders including Jefferson and Webster recognized the need for an educated citizenry. Because many families could not afford to send their children to school, the idea evolved for government funded free schools (Rury, 2009; Spring, 1997). In contrast there was a strong feeling among the wealthy that each family should be responsible for educating their own children and that free schools would be a mistake of society (Pulliam, 1995).

Commitment to the education of all children. In the early 1700s, the New England colonies became involved in education by requiring training for the poor. The purpose of the minimal training was to allow the student to develop the skills necessary to provide the basic needs for themselves and their families. Charity schools were created about this time to educate orphans and paupers (Pulliam, 1995).

Growing interest in free universal education. As the time of the American Revolution approached, there was still very little education for the poor, but both John Locke and John Amos Comenius, philosophers in education, were laying the groundwork for free, universal education (Johnson et al., 1969).

The need for an educated citizenry. One approach was brought out by Horace Mann who felt that schooling for all would preserve order, extend wealth, and secure property (Rothstein, 1994). Also during this time, arguments for and against state supported schools grew. Those arguing for state supported schools felt they were essential in a Republican form of government in order to prevent pauperism and social and economic distress. Meanwhile, there was opposition to state supported schools by the wealthy, conservative aristocrats who questioned the practicality of one man paying for another man's child to be educated (Rothstein, 1994). This opinion grew from an ideology that poverty was a consequence of an inability or unwillingness to work (Rury, 2002). There were also concerns about the influence of non-English speaking immigrants (Rothstein, 1994). Despite the concerns of the wealthy there developed an importance of teaching basic principles of a republican government to create an educated citizenry (Spring, 1997).

Education and the standard of living. In 1805, the Free School Society formed and influenced the belief that equality of opportunity and industriousness would improve the standard of living for all citizens (Rothstein, 1994). The Society used the Lancastrian techniques of educating both the freed Black children and the poor children in moral character. Education of these students was important in society in order to end crime and poverty, and to develop a strong society (Spring, 1997).

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Responsibility for education. Following the Revolution, the Founding Fathers included many important aspects of the newly formed country in the Constitution, but they left education as the responsibility of each state (Johnson et al., 1969). Because education is not directly addressed in the Bill of Rights of the United States Constitution, it indirectly is left to the responsibility of individual states as declared by the Tenth Amendment. Conforming to this constitutional thought, the Federal government remained in the background of education for almost 200 years (Sanders, 2000; Silver & Silver, 1991; Wong & Nicotera, 2004).

Meanwhile, the need for education was deemed important to create good citizens so the new government would be successful. Because the newly formed state governments were taking on many responsibilities, these governing bodies sometimes accepted help from outside areas. In major cities, the church took an active role in organizing agencies such as the Society for the Propagation for the Gospel and Sunday School Societies that served the poor children from ill and factory families (Pulliam, 1995; Rury, 2002). Different groups who became involved in the education business felt it was a way to provide children with knowledge and values from their culture (Gutek, 1970). Even though the Founding Fathers delegated the details of education to the states, they made provisions to assist the states as evidenced by the Ordinance of the Northwest Territory, a plan by which the sixteenth lot of each territory was designated for educational use (Johnson et al., 1969).

Education Opportunities in the New Nation

Several different options in education emerged in the new nation. As the opportunities grew, support structures became more formal as illustrated by the following examples.

Lancastrian schools. About this same time, the first Lancastrian schools were established and spread throughout the United States and Mexico. These schools showed better

educational results in student achievement than other types of schools of this time period. However, they gained popularity because they were cost efficient. The Lancastrian schools included the teachings of proper behavior and morals from the church, reached a greater number of poor children than the church schools, and did it cheaply. A typical Lancastrian school would have from 365 to 1000 students in one room with one teacher and many volunteer assistants, thus the cost effectiveness (Johnson et al., 1969; Rothstein, 1994; Rury, 2002).

Common schools. The challenges of educating all children continued during the 1820s with the Common school movement. Common schools were a uniform system of mass public education governed by the states to prevent social problems and to develop economic and political structure within the citizenry (Rury, 2009). Many, including Horace Mann, felt that educating all children was a worthwhile endeavor because of the benefits to society (Johnson et al., 1969; Pulliam, 1995; Rury, 2002). Mann's ideas were to bring together all cultures in a nonsectarian manner. He supported longer school years, systematic exams, better teacher training, and higher levels of instruction for all, especially for the purpose of imparting societal norms of behavior to the poor (Rury, 2002). Because of the concentrated populations of poor and immigrant children, the leaders of the large cities led the way in recognizing the need for good workers and better citizens through education, thus reducing the need for more prisons (Rury, 2002). As these Common Schools became more prevalent across the newly formed nation the focus turned to the quality of education (Rury, 2009).

Growing focus on curriculum and instruction. By 1823, organized state school systems supported by taxes existed all over the nation (Pulliam, 1995; Rury, 2002). Educators were beginning to concentrate on pedagogy. Now that schools were established, educators needed to determine how schools could become more effective and to develop better methods of

instruction. There was also an interest in the development of standards for teachers and administrators (Pulliam, 1995; Rury, 2002). The working class was getting larger, becoming a stronger political power, and families wanted better education for their children (Rury, 2002). One strategy to help improve the educational system was to lower class size. The large class size in the poorer schools prompted school superintendents to try to lower class size to below 60 students per class. Other new reforms for this time period included more industrial education, providing more guidance for students, and setting up schools for the very young (Rothstein, 1994). These new trends included graded schools, concerns for proper scheduling and supervision, and the development of teacher salary schedules (Pulliam, 1995).

      Influences of the business community. During the latter portion of the nineteenth century, concerns from the business community began to play a much larger role in school decisions (Rothstein, 1994). The business community was interested in students who were rational and self-disciplined. This created the need for accountability measures including recordkeeping in categories such as daily attendance, promptness, and other behavioral characteristics that businesses rely on for success. Business also asked schools to prepare future workers, but the industrial revolution complicated this because many factories hired children, even very young children, who should have been in school. Without education, many of these students were destined to a life of poverty. The industrial revolution also brought about the challenge to educate children from growing urban slums and to Americanize the children of immigrant parents who came to America seeking jobs (McCormick, 1975; Pulliam, 1995; Rury, 2002). Out of these concerns expressed by the business community, compulsory attendance became a strategy of educating the poor in the United States (Johnson et al., 1969). This need was recognized as so important that compulsory attendance regulations began to be strictly

enforced. During this same time period, the needs of rapidly expanding business and industry caused the federal government to reconsider its hands-off policy toward funding of education (Walburg, 1986).

The Beginning of Federal Support for Education

As education continued to grow, the federal government became involved in efforts to assure quality.

Early federal involvement in education through vocational education. Before World War I, the United States experienced an increase in school enrollment, the lengthening of the school year, and increasing concerns about teacher quality. The federal government began its involvement in education by funding vocational education programs (Walburg, 1986).

National Defense Education Act (NDEA). Following World War II, the United States enjoyed a time of economic prosperity. The general public did not recognize the growing problem of poverty; therefore, government officials were reluctant to get involved in any anti-poverty legislation. However, the public started to take notice and view the educational system in a different light with the 1957 launching of Sputnik. This event caused the people of the United States to question the quality of their education system (Marzano, 2003). The federal government became more involved in education with the National Defense Fund of 1958 with support of science and mathematics education funding throughout the United States (Johnson et al., 1969).

Elementary and Secondary Education Act (ESEA). At the beginning of the 1960s, the federal government's roll increased significantly with the number of federally mandated programs jumping from 20 to 130. Lyndon B. Johnson's administration recognized poverty as a serious public issue (Hoff, 1999; Silver & Silver, 1991). One very prominent piece of legislation during this time was the Elementary and Secondary Education Act (ESEA) of 1965, which called

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for the equal education of the disadvantaged (Johnson et al., 1969; Sanders, 2000). This was the first time in history that federal financial support was distributed across the country (Sanders, 2000).

The funding of schools continued to be an issue in the forefront of political concerns for more than thirty years. Some feel strongly that additional funding does not improve student achievement (Hanushek, 1989; Hedges, Laine, & Greenwald, 1994); others argue that funding does enhance student achievement (Divers-Stemnes, 1995; Levine, 1998; Payne & Biddle, 1999). Divers-Stemnes (1995) argued that schools with large populations of poverty need more money just to level the playing field for their students.

The Beginnings of Federal Accountability for Education

Strong public opinions of this time period caused deeper involvement of the federal government in the challenges of education.

Goals 2000. Late in the 20th century, the leaders of the United States established a federal framework for reform entitled *Goals 2000*. During President George W. H. Bush's State of the Union Address, he set forth the objectives of *Goals 2000* (Moores, 2004; Moynihan, 1991). This reform outlined such goals as:

- Preparing children for school prior to the beginning of the kindergarten year

- Raising the graduation rate to 90%

- Providing professional development

- Raising science and mathematics standards

- Providing safe and drug-free schools

- Implementing benchmark tests in grades 4, 8, and 12

- Promoting parental involvement

These goals laid the foundation for even more federal governmental influence (Moynihan, 1991; Pulliam, 1995; Sanders, 2000). The national goals set in *Goals 2000* were the early beginnings of the accountability movement. Yet, with the push for higher standards, there were cuts in funding (Pulliam, 1995). President Clinton, with the Educate America Act of 1994, continued the *Goals 2000* ideal. This act was designed to raise academic standards, measure student progress, and provide support for students to meet these standards (Kennedy, 2005).

During the 1990s*, Goals 2000* raised awareness and concern that education was the key to successful progress in the new century. The changes in the global economy fueled changes in the workforce and, once again, the need for higher standards, stronger schools, better teachers, and better strategies for educating the citizenry. Concerns for all children included specifically low income, minority, disabled, and English as second language learners. Kennedy (2005) stated that education should provide an equal opportunity for all if it is to remain the pathway to the American dream. The expectations set in Goals 2000 were not met by the year 2000 and the legislation failed to reach its desired results, leaving education as a growing concern.

Lawmakers were also concerned about the economic achievement gap. Gewertz (2003) followed Black and Hispanic lawmakers in seven states as they tried to bring together communities and lawmakers to improve the school experience and school success for disadvantaged children. Throughout the seven states represented, disadvantaged students attended schools that were overcrowded, had inadequate funding, and were staffed with inexperienced teachers. These lawmakers were trying to make a difference by passing legislation that combined policy, funding, and community involvement.

No Child Left Behind (NCLB). The No Child Left Behind legislation was a reauthorization of the Elementary and Secondary Education Act. With concerns about education

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continuing to grow, President George W. Bush introduced and campaigned for the *No Child Left Behind* law. This law was considered to be the most significant federal legislation in the history of the United States concerning education. It was viewed as both powerful and controversial because it set high standards and accountability measures, but lacked the appropriate levels of funding to make this vision a reality (Yell, Katsiyannas, & Shiner, 2006).

By 2001, forty-nine states had standards and fifteen of the states were assessing students through standardized testing aligned to those standards. The focus shifted to closing achievement gaps among diverse groups within the population. There was concern that lower income students were not receiving a quality education. Data showed that 77% of middle and high school students attending high poverty schools were more likely to be taught by teachers with no background in pedagogy or who were teaching out of field. This No Child Left Behind legislation (NCLB) set two goals. The first of these was making schools accountable and the second was providing support for schools and students not reaching the set standards (Kennedy, 2005; Rabb, 2004). The accountability portion of this legislation assesses students in specific subjects based on diverse demographic categories and subsequently evaluates overall success based on the individual successes of each subgroup (Moores, 2004).

Accountability and Reform

An additional set of factors that influence the history of education were the accountability and reform challenges outlined in the Coleman Report and responded to by the Effective Schools Movement.

The Coleman Report. During the Lyndon B. Johnson administration, a study was commissioned concerning the quality of schools in the United States. This two-volume report included data from 570,000 students and 60,000 teachers. The study set out to prove that the

quality of the school was the most important factor in student achievement, but the 1966 study

initially indicated that the child's family and the socioeconomic makeup of the school were the

best predictors of student achievement (Hoff, 1999; Jencks, 1972; Kosters & Mast, 2003;

Marzano, 2003; Silberman, 1970; Towers, 1992; Wong & Nicotera, 2004). The 1966 Equality of

Educational Opportunity, better known as the Coleman Report, has impacted education in

numerous ways (Marzano, 2003; Towers, 1992; Wong & Nicotera, 2004). When it was first

released, it sent shockwaves through the educational community because conclusions concerning

the use of educational reform were negative. James Coleman concluded that spending more

money on students, teachers, and school facilities had little effect on student achievement

(Moynihan, 1991; Seligman, 1998; Towers, 1992; Wong & Nicotera, 2004). To analyze the data,

Coleman used the percentage of variance method. Robert Rosenthal and Donald Rubin analyzed

the same data using the binomial effect size display. The pass rate in the effective schools was

two-thirds, as opposed to the pass rate in the ineffective schools being only one-third. This

interpretation of the data, along with other interpretations by Hoff, Bane and Jencks, Marzano,

and Wang, indicate that highly effective schools can almost entirely overcome the effects of the

student's backgrounds (Marzano, 2003). The idea that problems existed within the Coleman

study led to additional research and incentives in public education seeking measures to insure

better accountability and also seeking to reform issues pointed out by the various interpretations

of the Coleman data. This led to a period that became known as the Effective Schools

Movement.

  The Effective Schools Movement. During the 1960s, the Effective Schools Movement

grew in response to the Coleman Report (Lezotte, 1992a). The movement, which examined

schools where students were achieving in spite of family background, led to an emphasis on

visionary leadership, standardized curriculum, and schools being held accountable for the learning of every student (Lezotte, 1992b).

A Nation at Risk. By the 1980s, the American public was losing faith in the public school system in part because of *A Nation At Risk*, a report sanctioned by the White House. This report described public education as mediocre and contended that it would be the downfall of our country. There was a public outcry for schools to be more accountable as a result of this report (Marzano, 2003; Towers, 1992).

Educational standards and testing. The NCLB required each state to design regulations for the improvement of teaching and learning. The regulations included objectives, mastery levels, professional development to support teachers, and assessment programs to measure achievement. NCLB also provided regulation demanding schools share specific information with parents (Kennedy, 2005). As each state strived to reach NCLB standards, there was a lack of funding, with the legislation being funded at only two-thirds the full level (Kennedy, 2005; Moores, 2004; Rabb, 2004).

Research Factors Related to Student Achievement

The factors related to student achievement are, unarguably, complex. Education does not operate in a vacuum. Each school is a microcosm of the community that surrounds it and supports it, the district and state in which it operates, and the national structures and incentives that are in place at any given time, as well as the myriad influences of public perception. For this reason, results and outcomes on every level are influenced by countless variables (Marzano, 2003). The studies relating to student achievement are generally focused on one or two factors related to student achievement, and the results of these studies often cannot and do not present a complete picture of why students achieve at certain levels. In the following paragraphs, studies

related to student achievement are grouped and analyzed according to similarities in their influential factors, such as general levels of funding, leadership, teacher quality, and instructional practices.

Funding

Funding of education is always challenging as communities, states, and the federal government attempt to balance the complex needs of society with the equally complex needs of education.

General funding levels. Experts and researchers have explored the positive and the negative effects of funding and how they relate to student achievement. In the controversial Coleman Report, James Coleman concluded that spending more money on students, teachers, and school facilities had little effect on student achievement (Seligman, 1998; Wong & Nicotera, 2004). Some research would suggest otherwise, particularly research regarding funding which can be targeted toward specific needs and specific situations at the school level.

In a broad study conducted by Okpala, Okpala, and Smith in 2001, the researchers examined parental involvement, instructional expenditures, family socioeconomic attributes and student achievement using a Pearson product-moment correlation and ordinary least squares regression method. Okpala examined the effect of instructional supplies expenditures in low socio-economic status students in 50 elementary schools in an Eastern North Carolina district in grade four. This study indicated an insignificant correlation between per pupil expenditures and student achievement in both mathematics and reading.

Sutton and Soderstrom (1999) working through the University of Southern Indiana and using data obtained from the Illinois School Report Card, studied relationships between school demographic variables and student achievement using correlation analysis, bivariate, multiple

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liner regression, and stepwise multiple regression. This study concluded that giving money to a school may not raise student achievement. However, money targeted to specific programs may raise student achievement. The study indicated that additional research was needed to disentangle the controllable factors and specifically funding those factors.

Targeted spending. Archibald (2006) using data from the Washoe County School District in Reno, Nevada conducted a three-level hierarchical linear model study of targeted spending. Approximately 70,000 third through sixth grade students and 420 classrooms in approximately 55 schools were studied relative to instruction, instructional support, leadership, and operations and maintenance. This study indicated that per-pupil expenditure appeared to impact student performance in the area of reading, but not in mathematics. The study suggested the need for further research about how funding directly related to the improvement of student achievement through such factors as professional development per teacher might affect such achievement.

Both Archibald and Sutton found that funding must address certain programs, especially those for low socioeconomic students if such funding is to improve student achievement. Two similar studies reinforced this notion and added the idea that reducing inequalities among low socio-economic students was vital to increasing their performance and achievement (Marks, Creswell, & Ainley, 2006; Tajalli & Ophein, 2004). In a study conducted in Australia to explain socioeconomic inequalities in student achievement, the researchers attempted to determine to what extent material, social and cultural resources coupled with school tracking impacted the relationship between socio-economic status and student achievement. This quantitative study used achievement data and regression models to determine that cultural resources played a large

role in socio-economic status inequalities. Providing materials also reduced socio-economic inequalities and were vital to student achievement (Marks et al., 2006).

Similarly, Tajalli and Opheim (2004) studied the relationships between socioeconomic status, and gaps in student achievement. This quantitative study using dependent variables, independent variables, and regression models examined factors that contribute to the success of some schools and the failure of others. All indications of this study pointed to the importance of decision-making in economically disadvantaged schools. Targeted funding to pay more experienced and generally more costly teachers had a greater impact on student performance in poorer schools according to the Tajalli study. The study further cited the need for additional research into the use of resources in educational systems under great pressure of accountability. None of the above studies clearly indicated that targeted funding is a definitive solution to the challenge of improved student performance. Targeted funding clearly had more impact than general funding when it came to improving student achievement. However, funding is not the only variable that impacts the improvement of student performance.

School leadership. A number of studies have been conducted to assess the power of leadership as it relates to student achievement. A wide range of factors in leadership have been considered through these studies, and a wide range of findings can be cited.

In 1996, Hallinger and Heck surmised that strong educational leadership occurs where the leaders work well with and through others to reach organizational goals. Barker (2007) found through qualitative study based on interviews and observations that leadership focused with vision, ambitious goals, and a collaborative culture produce only small gains in academic outcomes.

Gieselman (2009) examined relationships between student achievement and several different leadership qualities, including experience, gender, and levels of education through a survey analyzed through multiple regression. In this study of elementary school principals in a state heavily involved with comprehensive school reform, the research indicated that there was no significant relationship to principal level of education, principal experience, tenure at the school, years of teaching experience, principal gender or principal leadership skills and student achievement. A need was expressed by the researchers for further definition of instructional leadership and a closer examination of how collaborative efforts are linked to student achievement.

McGuigan and Hoy (2006) working through Ohio State University, conducted a study employing a teacher questionnaire of 40 elementary schools. Using a Likert scale, they found that the way a principal organizes and runs a school can create academic optimism and can increase student achievement even with low socioeconomic students.

Again, the argument supported strong leadership as a vital component of creating a positive school climate. Being able to hire and retain teachers of highest quality was the most important factor in predicting student achievement according to both Goldhaber and Anthony (2003) and McElroy (2004).

A study by Borders (2004) supported empowerment of teachers through the placement of veteran teachers into leadership positions coaching other teachers. Along with shared leadership, informed leadership can implement and support programs that support student achievement.

While pinpointing what effective school leadership entails, several studies had relevance in attempting to define more closely what was encompassed by the term instructional leadership and how it might positively impact student performance.

Teacher Quality and Retention

  Several studies have been conducted in an effort to determine what is embodied in the concept of teacher quality and how teacher retention impacts teaching and learning.

  Teacher quality. One cannot explore teacher quality or effectiveness without attempting to clearly describe what is encompassed in the concept of an effective teacher. Ding and Sherman (2006) reviewed issues of teacher quality as a significant factor in student achievement, along with school resources, leadership, and individual student variables. Teacher quality is sometimes defined by level of education or years of experience, as the following examples illustrate. Tajalli and Opheim (2004) found the decisions in hiring to be very important at all grade spans, especially in low socioeconomic schools. They also found experience to be a significant factor. Interestingly, with regard to levels of education, Okpala, Smith, Jones, and Ellis (2000) found teachers with a Masters degree showed significant increase in student achievement in mathematics, but not in reading.

  Additional factors that affect teacher quality are harder to study and measure, including active participation in professional development, participation in collaborative communities, and in establishment of high expectations. Through a qualitative study using interviews and observations conducted at Texas Tech, Janisch and Johnson (2003) found significant increases in student test scores when teachers participated in collaborative learning, participated in professional development, and worked collaboratively in this type of learning and teaching environment. While this study was limited to one school, it examined the improvement of literacy learning and content area knowledge in one school with professional development, collaborative environment and high expectations. The study indicated that the performance was significantly improved in this type of setting.

Beecher and Sweeney (2008) found teachers who also participated in professional development but added rewriting the curriculum showed improved student achievement and a reduction of the achievement gap between culturally, linguistically, ethnically, and economically diverse groups. In this eight-year long qualitative study, conducted in West Hartford School, school documents including minutes of meetings, were examined. Strategies that are normally reserved for gifted and talented students were employed during the eight-year period, along with a more global cultural approach to the curriculum. Over the period, students reading performance advanced from the 30th percentile to the 75th percentile. Gaps in achievement between students of differing socioeconomic status narrowed from 62% to 10%. While the obvious success of this school in narrowing the achievement gap was encouraging, there is a clearly a need to determine if other schools could achieve this level of success through the employment of similar strategies.

Two other programs that included attempts to enhance teacher quality in the school environment were part of a study by Prete (2006). This review outlined two qualitative case studies with strong basis in professional development. In the first case study, a high school was quite successful and benefited from a school-university partnership that included a teacher development component. In the other case study, a high school struggled to show advances in student achievement through enhanced teacher quality with the school university partnership. As with all research in the arena of teacher quality, the variable factors that contribute to levels of success present challenges to the generalization of the outcomes of the studies. It is unclear precisely what differences in the two university partnerships might have caused the differing results in achievement. Additional analysis is needed to show the variables in the two partnerships more clearly.

One tool used to monitor these types of complicating factors relating to teacher quality is a performance-based system of teacher evaluation, a system which attempts to rank each teacher's performance based on an accepted set of standards and/or objectives. Some of these standards and objectives are content related, some refer to teaching strategies, and others relate to leadership and community involvement. In addition, these evaluations may include information regarding student performance on standardized test and related growth. Archibald (2006) showed an evaluation system based on observation and artifacts was positively related to increased student achievement. This was true because it could measure and document participation in and fidelity of implementation of the factors of professional development, collaborative instruction, high curriculum standards, and other variables that were generally difficult to assess.

Teacher retention. As school districts recognize the importance of teacher quality, there is an emphasis placed on hiring the highly qualified, providing professional development throughout the employment period, and the retention of quality teachers. This has become more and more of a challenge as a generation of career baby-boomer teachers approaches retirement. These career teachers, hired during an era when women were, of financial necessity, entering the workplace full time, represent a significant portion of all teachers in today's schools. As there were more and varied options for women and minorities in the career markets following these baby-boomer hires, fewer people opted to enter the teaching profession. Currently these experienced career teachers are being replaced by a young and inexperienced generation of teachers from a proportionally smaller hiring pool as women and minorities opt for a still wider variety of career options. This creates teacher shortages. Many schools have difficulty locating even inexperienced teachers to replace those teachers who are leaving the profession. The situation is still further complicated when a limited number of teachers seek to fill many job

openings. These perspective teachers can be more selective in deciding where to teach, leaving less desirable positions unfilled or filled with less qualified personnel.

Surveys conducted by the National Center for Education Statistics and Teaching also indicated a growing problem due the phenomena known as the *graying* of the current teacher population and to increased enrollment in schools (Ingersoll, 2004). As many experienced teachers approach retirement, they are often difficult to replace (Bracey, 2002). New teachers coming into the profession have an attrition rate of 40-50% within the first five years of employment. Even when school districts can find teachers, many times they are faced with hiring out-of–field personnel to meet the growing needs when certification/licensure areas do not coincide with need. Staffing is a constant challenge with the constant flow of teachers into and out of the profession (Ingersoll, 2005).

According to several different studies, there were many factors beyond the graying of the teacher base that contribute to teacher turnover rates. Useem and Neild (2001) found evidence in the Philadelphia School District of various complications in teacher staffing in a study conducted including low salaries, more stringent state certification requirements, and intense competition nationwide for new teacher graduates. The teacher turnover was high, and teacher applications were down, resulting in an increase of the district relying on emergency certified teachers. The findings of this report illustrated that teachers were more likely to remain in schools that have active principals with strong interpersonal and organizational skills and a management style that was respectful of teacher skills and of teachers' personal lives.

In independent studies regarding teacher retention, other factors that underlie teacher attrition were examined. Many of these studies supported the findings of Useem and Neild and Ingersoll and further clarify why both experienced and inexperienced teachers of varying degrees

of quality leave the profession. As shown in the following studies, working in isolation, salaries and working conditions, working with low-socioeconomic populations, and poor leadership contribute to the departure of teachers on all levels.

- Kaufman et al. (2002) working through Harvard University examined through a qualitative study 50 first- and second-year Massachusetts teachers and cited that in schools where there are clear state standards and assessments, novice teachers who had little or no guidance of what to teach or how to teach struggled day-to-day.

- Loeb, Darling-Hammond, and Luczak (2005) quantitatively analyzed California teacher survey data to examine school conditions that precede teacher attrition and determined that salaries and working conditions including large class size, facility issues, multi-track schools, lack of textbooks, and poor or inadequate support from administration couple with the lack of a sense of empowerment were determining factors in teachers transferring or exiting the profession.

- Falch and Ronning (2007) in a quantitative study conducted in Norway, found teachers tend to quit schools with low student achievement.

- Elfers et al. (2006) in a University of Washington study, also quantitatively analyzed databases from the state of Washington and Washington's teacher workforce to determine that schools with higher retention rates, in general have characteristics of low poverty, high population of white students, and high student achievement.

Instructional Practices

In addition to targeted funding, quality leadership, and retaining a quality teaching faculty, instructional practices may have varying impacts on student achievement. Instructional practices include reduction of class size, good curricular design, teacher-assigned grades, and

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teacher perception of student ability. As with targeted funding, quality of leadership, and teacher quality, there has been considerable research in each area of instructional practices with varying conclusions. The variation in conclusions tends to again predictably illustrate that education does not operate in a vacuum and that each of these areas is impossible to separate from the whole, despite the best practices of researchers and the most careful research. The following studies indicated trends and ideas derived from research on instructional practices.

Class size. One instructional practice that can be affected at the state and district level is the reduction of class size. It requires increased funding, and therefore, creates a strong debate from all sides. The argument for smaller class sizes has intertwined throughout the last 200 year of education in the United States. From the early history of the Lancastrian schools having from 300 to 1,000 pupils in one room, one strategy to help improve the educational system was to lower class size (Rothstein, 1994). While it would seem that smaller class sizes would allow for more individual instruction and interaction, today the argument continues because the research does not entirely support reductions in class size having a positive correlation with improved student achievement.

A study from Burke County, North Carolina, found improvement due to class size reduction. The mixed method study showed that smaller classes in the first through third grades in consecutive years outperformed the larger classes significantly on state measures (Thompson & Cunningham, 2001). The smaller classes created an environment for more individualized and small-group instruction, fewer discipline problems, more student-teacher collaboration, and more teacher-parent contact. In a later mixed method study conducted over a three-year period in the U.K., Blatchford, Bassett, Goldstein, and Martin (2003) found the lowest performing students to benefit from smaller classes in reading when teachers adapted instruction. In 2003, Charles

Achilles examined data from the Tennessee Student Teacher Achievement Ratio (STAR) project, a well-documented, longitudinal study funded by the Tennessee legislature that included 12,000 students in kindergarten through third grade. His analysis of the research supported the idea that smaller classes improve academic achievement. He also argued that the result of increased achievement may be from several other factors made possible from smaller classes. Konstantopoulos (2008) using data from the same STAR project analyzed the variability in each classroom and employed quantile regression to conclude that higher achieving students benefited from smaller classes in the early grades. Through a study in Texas, using correlation regression and added value model, Rivkin, Hanushek, and Kain (2005) found it to be more beneficial and economical to have a qualified teacher in the classroom than to reduce class size by ten students.

In an examination of class size versus teacher quality, and in light of the aforementioned studies, the question then becomes, "Does the increase in student achievement derive from smaller classes or from better instructional practices, or perhaps from some combination of the two?" As the research trends towards the importance of a high quality teacher in the class room, Jepsen and Rivkin (2009) in a study of an incentive program to reduce class sizes in California, found benefits to mathematics and reading achievement in smaller classes, but also found that the smaller classes created a higher need for teachers, thus placing more unqualified teachers in the classroom.

Borland, Howsen, and Trawick (2005) set out to investigate the relationship between class size and student achievement while removing as many of the variables as possible. They found that this relationship was quite complex even when trying to control for variables.

In light of the research indicating that class size, general and targeted funding, and teacher quality all can impact achievement, but do not necessarily always have desirable impact,

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there is a need to examine additional classroom and school variables in a quest for how to best effect positive student achievement. One of these variables is curricular design.

Curricular design and classroom atmosphere. Teacher-level factors include such instructional practices as classroom management, classroom curricular design, and instructional strategies according to Marzano (2003) from a review of his own research and of research conducted by Scheerens and Basker, Sammons, Levine and Lezotte, and Edmonds. Wang, Haertal, and Walberg (1993) related the importance of classroom management to student achievement in their meta-analysis of 50 years of research. In fact, their research ranked classroom management as the top factor impacting student achievement. Based on this research, it would seem logical that the teacher should strive to establish a learning atmosphere, then deliver a well-planned curricular design through research-based instructional strategies in order to enable high student achievement. Marzano (2003) defined this process as the sequencing, pacing, and student experiences within the classroom. The classroom teacher must identify the specific knowledge of the lesson, engage the students in tasks fostering the transfer of knowledge, and expose the students to the knowledge multiple times. Once this sequence has been completed by the teacher, assessment of the success of this process is needed to determine the student levels of understanding, a process known as formative assessment. High-stakes testing has created the need for educators to assess students periodically through instruction in order to provide students with re-teaching and re-learning opportunities before the administration of the high-stakes test.

Teacher Perceptions of Student Achievement

Teacher perceptions of student achievement are derived from a number of sources and reported in a number of different ways to students, parents and administrators. With increased

accountability concerns, these perceptions also have become a part of state data through survey information obtained through state testing (NCDPI, 2009b). This section includes an examination of formative assessment, grading practices, and high-stakes testing as they relate to teacher perceptions of student achievement.

Formative assessment. Formative assessment is the timely feedback provided throughout a learning experience (McMillan, 2000). Formative assessment is a relatively new term, but the concept has been used as a common practice by educators as a part of instructional design to check for student understanding of curricular material presented by teachers and based on what teachers perceived students should know. Along the curricular timeline, in most states teachers must begin the teaching-learning process with curricular goals or standards dictated by the state and end the process with state assessments of these goals or standards (Popham, 2004; Reys & Lappan, 2007). Teachers are then charged with creating a day-to-day curriculum of instructional practices that connect this beginning to the end in a successful manner (Ornstein, 1994).

Teachers continue to use traditional methods of instruction and assessment, such as class work, homework, quizzes, and teacher-made tests to assess content knowledge acquired by students. Wiliam et al. (2004) completed a quantitative study of a group of educators who were asked to incorporate formative assessment into classroom practice. This study showed that improving formative assessment produced tangible benefits in student achievement on state-mandated tests. A new challenge is that most states now provide standards and objectives as a guide for content and also a state assessment to measure student achievement in relation to the state standards and objectives. Sharkey and Murnane (2006) in an investigation of the challenges of implementing a formative assessment system within the parameters of state and federal

mandates, find that there were many decisions to make concerning the actual assessment as well as in developing a culture in which there was time for collaboration and a willingness to understand the data.

Summative evaluations and grading practices. Summative assessment occurs at the end of the learning experience (McMillan, 2000). Summative assessment occurs at times in the learning experience where there is a need to measure and report growth. This may be at the end of a unit of study, at the end of a specific grade or class, or at any point where there is a conclusion to a significant body of knowledge. Classroom teachers traditionally use multiple factors to assess student performance and assign grades. Many teachers, especially at the elementary level, will use both quantitative and qualitative academic and behavioral characteristics, such as effort, participation, and extra credit in the assessment of students in addition to the standards-oriented state and local tests. Teachers use these types of factors not only to predict achievement, but also to assign grades (McMillan et al., 2002). Bowers (2010) examined a cohort of students through cluster analysis to find that grades were a stronger indicator than cognitive ability of whether a student would graduate or drop out. This was because teachers admitted to awarding 65 to 75% of grades based on participation, behaviors, attendance, and effort rather than cognitive ability and achievement.

Rakoczy, Klieme, Burgermeister, and Harks (2008) found that mathematics teachers assigned grades according to a frame of reference. In deciding grades, teachers compared students to themselves for growth, students to others in the class, or students to a specific set of criteria. With the demands in today's educational system, teachers grading practices must concentrate on the latter. As federal and state requirements have increased pressure on states, districts, schools, teachers, and students to perform better on the high-stakes testing, the

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traditional instructional delivery has forced teachers to reflect and transform their instructional practices in the classroom.

Randall and Engelhard (2009) used interviews and focus groups to ascertain the degree of disconnection between hypothetical student situations and real student situations and to examine differences in the grading practices of elementary and middle school teachers. They measured responses to 53 scenarios using the Rasch measurement model to analyze teacher assigned grades. Using a representative group of schools in the Southeastern US, they questioned whether there were grade-level differences in grading practices. Additionally, they studied whether these differences were linked to student characteristics. Through the use of a questionnaire using Guttman's Facet Theory Results they found that elementary teachers assigned higher grades overall, however, these were not linked to student characteristics.

High-stakes testing. High-stakes testing refers to tests that occur at the end of courses or grade levels to measure standards set by states or other entities with the purpose of measuring whether students have attained the goals set by the standards. They are called "high stakes" because they are often a one-time opportunity for a student to demonstrate understanding and because teachers, schools, and districts are judged for effectiveness, in part or whole, based on the results. High-stakes testing was found to leverage change, and it did motivate teachers and administrators to change instructional practices in an effort to meet the rigor of the exams. However, many of the changes in instruction may have lead to superficial coverage of objectives and equally superficial test preparation as teachers strove to find ways to better prepare students. This study emphasized a need for further studies on how to act on assessment data to affect instruction (Supovitz, 2009).

Anderson (2009) reported that most high-stakes testing across the US occurred in grades 3-8 in the subject areas of language arts and mathematics. This report indicated that teachers generally believe that high-stakes testing has caused:

1. A "dumbed-down" curriculum that addresses only the goals set by the state but does not allow a more challenging curriculum for the advanced student.

2. The limitation of using whole-group instruction to cover large amounts of material in a short time.

3. A view that test preparation itself is over-emphasized as opposed to sound teaching practices that allow for deep and thorough coverage of standards.

However, the research indicated that:

1. Questioning techniques and other teaching strategies have not significantly changed since high-stakes testing was implemented.

2. The quantity of whole class instruction has not changed significantly since high-stakes testing was implemented.

3. While there was more time devoted to test preparation, this additional time showed no evidence of working.

There is still a critical need to actively engage students in meaningful learning, but high-stakes testing skews the perceptions of teachers, students, and parents regarding teaching practices and how they relate to results attained on these tests.

Zimmerman and Dibenedetto (2008) completed a study at the University of New York using interviews with qualitative analysis. Responses showed that teachers were deeply concerned about using high-stakes testing for accountability purposes, but there was far less

concern from teachers who used the model of mastery learning, formative assessment, and adaptive instruction.

A University of Iowa study investigated whether student achievement levels affected how a teacher used test preparation and how ethics played into how teachers approach test preparation. Using questionnaires and telephone interviews with a two way multivariate analysis of variance, they discovered that student achievement levels did not affect the strategies teacher used for test preparation—the same strategies were employed across the spectrum of student achievement levels. Teachers also felt that the use of practice tests as a part of test preparation did not invalidate the test results as long as representative questions were used instead of actual test questions (Lai & Waltman, 2008).

Teacher perceptions. In reaction to high-stakes testing, instructional practices are changing. Many teachers are adding formative assessment and reflection upon their own teaching to differentiate, tier, and re-teach when necessary for students to gain the needed content knowledge. The teacher's use of data is important in the shaping of perceptions of students ability to achieve. Helwig, Anderson, and Tindal (2001) used quantitative analysis to study teacher perceptions of student achievement. They found that teachers used actual mathematics and reading academic scores to predict student achievement, without bias to gender. The movement to use specific data, instead of gender assumptions in teacher predictions of student performance was a positive shift in thinking. Other studies were not so positive. Eckert et al. (2006) found a discrepancy in teachers' abilities to accurately assess students on specific instructional skills and their prediction of academic performance. This difficulty in alignment was partially explained by Parke and Lane (2008) who found that most classroom activities do align with state standards and state assessments, but the classroom assessments are not aligned

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with state standards contributing to the discrepancy between teachers' ability to predict student level of achievement and the actual student level of achievement on the end-of-year high-stakes tests.

The addition of other student factors further complicated teacher perceptions of student achievement. Autwater and Arugette (2008) found the addition of socio-economic status influenced perception of student achievement. Teachers rated high socio-economic male students more favorably than high socio-economic female students, but they rated low socio-economic females more favorably than low socio-economic males.

Another complicating factor in teacher perception was student behavior. Espinoso and Laffey (2003) found students with challenging classroom behaviors were perceived by teachers to have lower academic potential in pre-kindergarten through first grade. This mixed-method study was focused on urban primary teachers.

When teachers struggle to accurately predict student ability in academic performance, the question of how to support student achievement becomes unclear and misdirected. In order for teachers to provide the needed interventions and instructional practices, the teacher must be able to understand the curriculum, deliver the instruction, assess, diagnose, and then treat any deficiencies. An accurate perception of the situation is a key component for continuous improvement for both the student and the teacher.

Summary

Existing studies have explored and suggested that school effects and teacher effects are related in some way to student achievement in schools. Research shared in this review of literature suggested that funding, leadership, and teacher quality each have a role to play in student achievement in schools. Archibald (2006) and Tajalli and Opheim (2004) found a

slightly positive relationship between funding and student achievement, but only when distributed at the student level. McGuigan and Hoy (2006) found leadership to have a positive relationship on student achievement indirectly through positive school climate, and supporting quality teacher employment and retention. With the ever-present demand at the teacher level to increase student achievement, it is vital that teachers accurately diagnose student performance and prescribe educational support for increased achievement. However, there are no current studies examining the relationship between teacher perceptions of student achievement levels and actual student achievement levels. It is possible that a better understanding of the teacher's ability to evaluate student learning and make appropriate teaching decisions could help teachers increase student learning and achievement. The purpose of this study was to determine the extent to which teacher's predictions of student performance and teacher-assigned grades were consistent with actual performance on state end-of-grade tests.

CHAPTER 3: METHODOLOGY

The purpose of this study was to determine the extent to which teacher's predictions of student performance and teacher-assigned grades were consistent with actual performance on state end-of-grade tests. Data regarding teacher predictions were found in surveys that were a part of the state testing program. This chapter presented the research questions, described the population and the design of the study, and examined the data collection procedures and the analysis of the data.

Statement of the Problem

This study investigated the relationships between teachers' ability to predict levels of proficiency on standardized end-of-grade tests in reading and mathematics relative to the students' actual levels of proficiency in grade 3-8. This study also investigated the relationships between teacher-assigned grades in reading and mathematics relative to the student's actual levels of proficiency in grades 3-8. The review of literature in Chapter 2 showed that there were many situational and instructional factors could have positively impacted student performance and achievement. However, there was no single factor which in isolation consistently impacted this achievement. The literature indicated that while some teacher practices appear to have consistent and measureable impact on achievement, deriving an exact formula that can be generalized in educational settings and employed universally to affect high achievement is still elusive. The results of the study provided data that can be used by superintendents and principals of schools who are looking for a process to support teachers in the continuous improvement of student achievement.

Research Questions

The research questions of this study were:

1. To what extent were teachers able to accurately predict student level of proficiency on standardized tests?

    1a.   To what extent were teacher predictions of student level of proficiency on standardized end-of-grade tests on reading in grades 3-8 consistent with the actual level of proficiency achieved by students?

    1b.   To what extent were teacher predictions of student level of proficiency on standardized end-of-grade tests on mathematics in grades 3-8 consistent with the actual level of proficiency achieved by students?

    1c.   To what extent was the accuracy of teacher predictions of student level of proficiency on standardized end-of-grade tests in reading consistent across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

    1d.   To what extent was the accuracy of teacher predictions of student level of proficiency on standardized end-of-grade tests in mathematics consistent across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

2. To what extent were teacher-assigned grades consistent with actual student levels of proficiency achieved on standardized end-of-grade tests?

    2a.   To what extent were teacher-assigned grades in reading consistent with actual student levels of proficiency achieved on standardized end-of-grade tests in grades 3-8?

2b.   To what extent were teacher-assigned grades in mathematics consistent with actual student levels of proficiency achieved on standardized end-of-grade tests in grades 3-8?

2c.   To what extent were teacher-assigned grades in reading consistent with actual student levels of proficiency across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

2d.   To what extent were teacher-assigned grades in mathematics consistent with actual student levels of proficiency across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

Context of Study

The data used for this research was generated from state assessment reports for an eastern North Carolina school district for the 2008-2009 school year. During the 2008-2009 school year the district served a total student enrollment of 17,773 students in 28 schools. The ethnic distribution of students in the district was 53% African American, 36% Caucasian, 7% Latino/Hispanic, 2% multi-racial, 1% Asian, and 1% American Indian. During the 2008-2009 school year, the graduation rate was 65.8%, as compared to the state rate of 71.7%. Eight percent of students were English Language Learners and approximately 62% of students qualified for free and reduced lunch (District X, 2008).

Participants

Participants of this study included 7,804 students in 15 elementary schools, 5 middle schools, and 1 alternative school with middle school students, all from one district in North Carolina. Survey responses of 238 teachers in reading and mathematics in grade levels 3-8 were analyzed to address the research questions. Data collected from approximately 50 middle school

reading teachers and 54 middle school mathematics teachers, as well as 134 elementary school teachers were included in the study. At the elementary level 97% of these teachers were fully licensed and 100% were highly qualified. At the middle school level 92% of these teachers were fully licensed and 99% were highly qualified. Of the teachers included in this study, there were 20% of elementary teachers and 21% of middle school teachers with advanced degrees. Another advanced step is National Board Certification. Of the teachers included in this study, the district had 9 elementary and 13 middle school teachers with this certification. The percentages of teachers included in this study with ten-plus years of experience were 60% at the elementary level and 70% at the middle school level. Teacher turnover for the district at elementary and middle school was 12% and 14%, respectively (see Table 1).

End-of-Grade Test

The North Carolina End of Grade Test (EOG) is a curriculum-based multiple choice achievement test. It is aligned to the North Carolina Standard Course of Study in each specific subject area. It is administered at the end of each grade level, 3 through 8, in the subject areas of reading and mathematics. The test is given within the last 22 days of the school year. Multiple versions of the test are administered on the same day to preserve test security. The North Carolina EOG test is designed and validated by the North Carolina Department of Public Instruction (NCDPI, 2009c).

At the time of the study, the Reading EOG measured the 2004 goals and objectives as defined by the North Carolina English Language Arts Standard Course of Study. Students read authentic selections and answered questions about different genres, such as fiction, nonfiction, poetry, content, and consumer. Vocabulary was assessed through application and understanding within the context.

Table 1

Description of Teacher Participants

Academic Level	*n*	Fully Licensed	Highly Qualified	Advanced Degree	Nation Board Certified Teacher	Greater 10 years Experience	Teacher Turnover
Elementary	134	97%	100%	20%	9	60%	12%
Middle	104	92%	99%	21%	13	70%	14%

At the time of the study, the current Mathematic EOG measured 2003 goals and objectives as defined by the North Carolina Mathematic Standard Course of Study. The Mathematics EOG assessed students in five areas: number sense and operations, measurement, geometry, data analysis and probability, and algebra. The Mathematics EOG was divided into calculator active and calculator inactive sections for grades three through seven and calculator active for grade eight. Grade eight students were allowed to use calculators for the entire range of items.

Student Standardized Test Results

Student achievement was reported by developmental scale score and achievement level. The North Carolina Department of Public Instructions explained the reported values in the North Carolina Technical Report (NCDPI, 2009c).

Development Scale Scores

The developmental scale score was converted from the number of items answered correctly by an individual student using the three item response theory parameters of threshold, slope, and asymptotes developed for each item by L. L. Thurstone Psychometric Laboratory at the University of North Carolina Chapel Hill (NCDPI, 2009c). Because there were several forms of each test, a unique conversion table was developed for each form.

Achievement Levels

While developmental scale scores have value to students and teachers alike in examining individual performance, for the purposes of this study, only achievement levels were considered as indicators of group achievement.

Achievement level ranges and cut scores were recommended by a standard-setting team using the Bookmark Method (Lewis, Mitzel, & Green, 1996). All test items were ordered from

least difficult to most difficult as determined by the team. The order was processed through several revisions. The cut scores, or specific scores which signify a change in the relative level of performance or proficiency ranges were based on the median ordered item booklet page number and the corresponding theta location. These cut scores set the limit of each achievement level (NCDPI, 2009b).

Achievement levels for the North Carolina End-of-Grade were set using the contrasting groups method for standard setting. This method involved North Carolina teachers categorizing students into various achievement levels based their knowledge of the students' achievement in various domains outside the testing situation. During the initial field testing teachers were asked to categorize students into one of four achievement levels based on a comparison to an external standard. Teachers were also given the option to categorize students into a not clear category when students did not fit into one of designated achievement levels (NCDPI, 1999).

Achievement Level I described a student who does not have sufficient mastery of knowledge and skills in the subject area to be successful at the next grade level. The student showed minimal understanding and computational accuracy and did not use problem solving strategies.

Achievement Level II described a student who showed inconsistent mastery of knowledge and skills in the subject area and was minimally prepared for the next grade level. The student showed some evidence of understanding and computational accuracy and limited use of problem solving strategies.

Achievement Level III described a student who consistently demonstrated mastery of grade-level subject matter and skills and was well-prepared for the next grade level. The student

generally showed understanding and computational accuracy and used a variety of problem solving strategies.

Achievement Level IV described a student who consistently performed in a superior manner, clearly beyond that which was required to be proficient at grade level work. The student generally showed a high level of understanding and computational accuracy and showed flexibility by using a variety of problem solving strategies.

The standard for grade-level proficiency, and the standard by which schools were judged by the state, was an achievement level of III or above (NCDPI, 2009a).

Teacher Judgment of Proficiency

The answer sheet of each student taking the end-of-grade test contained a section that required teachers to predict the anticipated proficiency level in reading and mathematics and required teachers to code the teacher-assigned grade in reading and mathematics for each student. An area of the answer sheet contained the reading teacher's prediction of proficiency level based on mastery of reading goals and objectives in the Standard Course of Study, following a coding system of 1 for Achievement Level I, 2 for Achievement Level II, 3 for Achievement Level III, and 4 for Achievement Level IV. A second area contained the mathematics teacher's prediction of proficiency level based on mastery of mathematics goals and objectives of the Standard Course of Study, following the same coding system as described above in reading. A third area of the answer sheet was coded with the reading teacher's prediction or estimation of the student's final reading grade for the course, following a coding system of 4 for A, 3 for B, 2 for C, 1 for D, and 0 for E or F. A fourth area was coded with the mathematics teacher's prediction or estimation of the student's final mathematics grade for the course, following the same coding system as described above in reading.

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State Rates of Teacher Predictions

An examination of the raw state data retrieved from the 2008-2009 *North Carolina State Testing Results*, relating teacher predictions to student performance on end-of-grade testing indicated a discrepancy particularly in the midrange predictions (NCDPI, 2009b). Accuracy of predictions regarding student performance tended to be stronger with Proficiency Levels I and IV, with strongest discrepancies between predictions and actual performances at Proficiency Levels II and III. The following graphs illustrate these accuracies and discrepancies divided by subject area and by test performance and class performance indicators. The bars represent the groups of students predicted to score at each level. Within each predicted level the dark gray area indicates the percentage of the students who actually performed at a proficient level on the End-of-Grade assessment and the light gray areas indicate the percentage of the students who actually performed at a non-proficient level on the End-of-Grade assessment. According to Figure 1, in reading grades 3-8 at the state level of all of the students predicted to make a Level I, lowest proficiency level, 94.8% did score non-proficient on the assessment. Of students predicted to make a Level II, a non-proficient level, 81.9% actually did score at the non-proficient level, but 18.1% scored proficient on the assessment. Of students predicted to make a Level III, a proficient level, 60.2% actually did score at the proficient level, but 39.8% scored non-proficient on the assessment. Of students predicted to make a Level IV, highest proficiency level, 93.6% actually did score at the proficient level on the assessment.
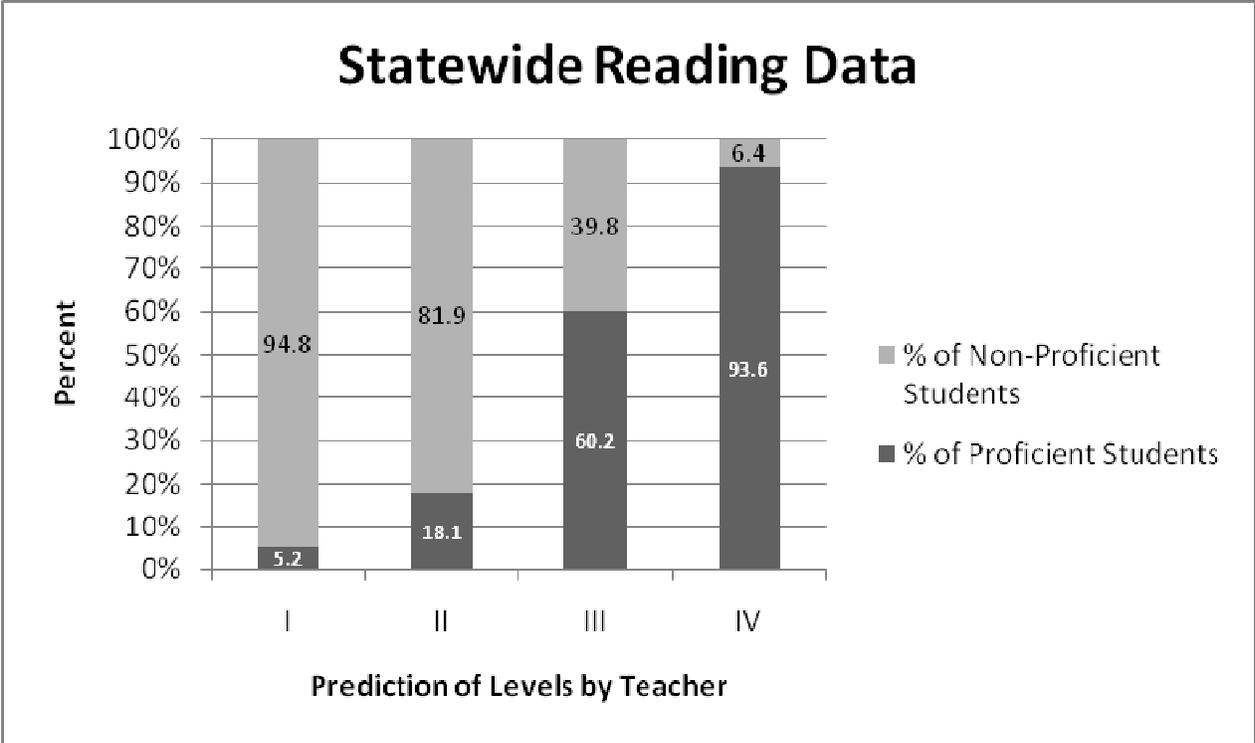
Figure 1. Statewide reading teacher predictions—levels.

According to Figure 2, in mathematics grades 3-8 at the state level of all of the students predicted to make a Level I, lowest proficiency level, 95% did score non-proficient on the assessment. Of students predicted to make a Level II, a non-proficient level, 81.9% actually did score at the non-proficient level, but 18.1% scored proficient on the assessment. Of students predicted to make a Level III, a proficient level, 58.9% actually did score at the proficient level, but 41.1% scored non-proficient on the assessment. Of students predicted to make a Level IV, highest proficiency level, 92.4% actually did score at the proficient level on the assessment.

Accuracy of the relationship between teacher-assigned grades and actual student performance tended to be stronger with letter grades A and F, with strongest discrepancy at letter grades B and C. The graphs below illustrate these accuracies and discrepancies divided by subject area and by test performance and class performance indicators. The bars represent the groups of students within each teacher-assigned grade. Within each teacher-assigned grade the dark gray area indicates the percentage of the students who actually performed at a proficient level on the End-of-Grade assessment and the light gray areas indicate the percentage of the students who actually performed at a non-proficient level on the End-of-Grade assessment.

According to Figure 3, in reading grades 3-8 at the state level of all of the students with a teacher-assigned grade of A, the highest grade, 90.2% did score proficient on the assessment. Of students with a teacher-assigned grade of B, 60.8% did score at the proficient level, but 39.2% scored non-proficient on the assessment. Of students with a teacher-assigned grade of C, only 28.9% did score at the proficient level, with 71.1% scoring non-proficient on the assessment. Of students with a teacher-assigned grade of D, 86.4% did score at the non-proficient level, with 13.6% scoring proficient on the assessment. Of students with a teacher-assigned grade of F, 89.6% did score at the non-proficient level, but 10.4% scored proficient on the assessment.
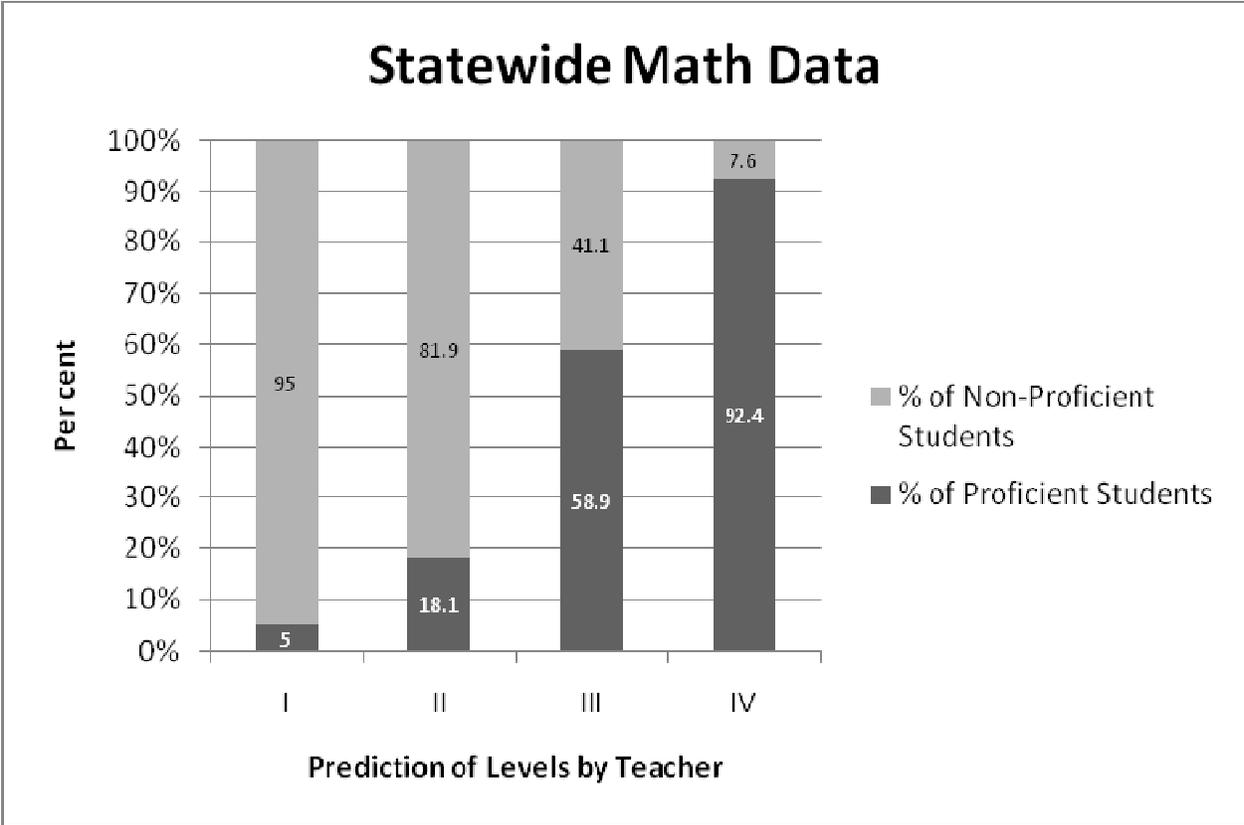
Figure 2. Statewide mathematics teacher predictions—levels.
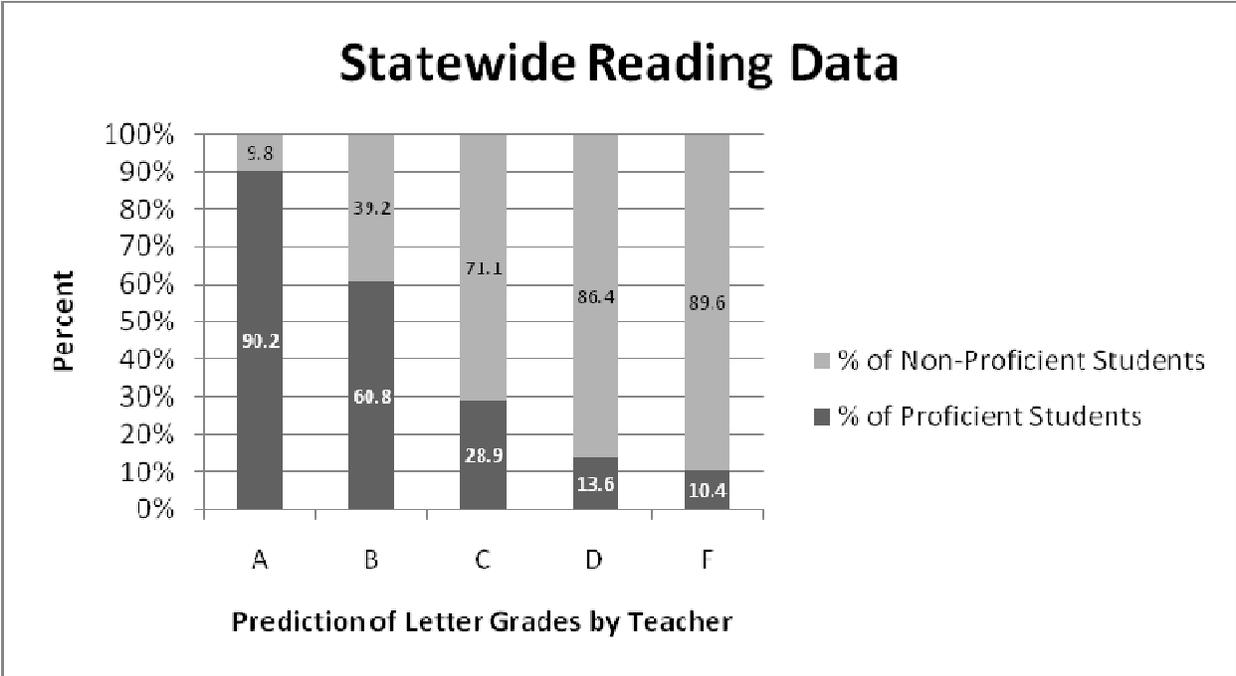
Figure 3. Statewide reading teacher-assigned grades.

According to Figure 4, in mathematics grades 3-8 at the state level of all of the students with a teacher-assigned grade of A, the highest grade, 89.2% did score proficient on the assessment. Of students with a teacher-assigned grade of B, 62.9% did score at the proficient level, but 37.1% scored non-proficient on the assessment. Of students with a teacher-assigned grade of C, only 33.7% did score at the proficient level, with 66.3% scoring non-proficient on the assessment. Of students with a teacher-assigned grade of D, 83.3% did score at the non-proficient level, with 16.7% scoring proficient on the assessment. Of students with a teacher-assigned grade of F, 89.7% did score at the non-proficient level, but 10.3% scored proficient on the assessment.

Threats to Validity

There were several scenarios that resulted in validity challenges to the teacher predictions discussed above. These included, but were not limited to:

1. Errors in Coding—Data obtained for this study relied heavily upon several codes provided on each student answer sheet in a special coding area. Classroom teachers and other school personnel were responsible for several different codes for each student. Human error was probable in this study.

2. Lack of Student Effort—Data obtained for this study relied heavily upon students putting forth complete effort in both the classroom and while taking the EOG Tests.

3. Lack of Teacher Effort—Data obtained for this study relied heavily on coding provided on each student answer sheet in a special coding area. Classroom teachers and other school personnel were responsible for several different codes for each student. Because the Special Codes section did not affect the outcome of
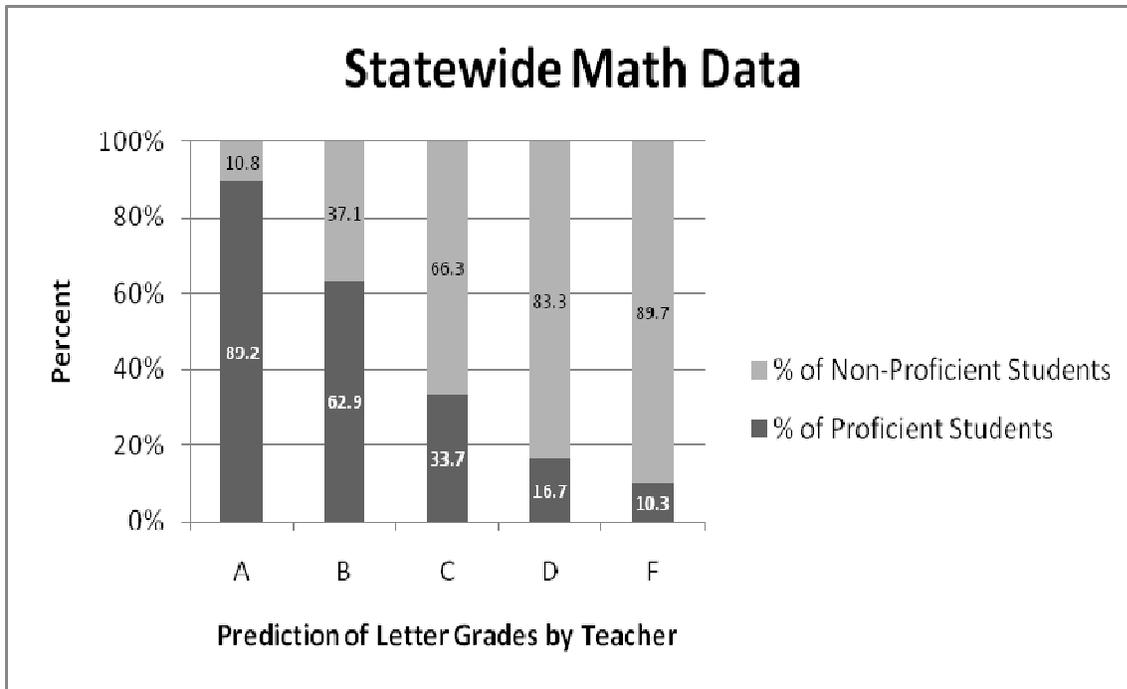
Figure 4. Statewide mathematics teacher-assigned grades.

4. the actual student score, it was sometimes not coded with complete effort and accuracy.

5. Generalizability—Generalizations to other districts could not be made due to factors unique to other school districts, regions, and states.

Data Collection Procedures

During the last 22 days of the 2008-2009 school year all third through eighth grade students in the district took an end-of-grade (EOG) test in reading and mathematics. The data were compiled and reported to the public using www.ncreportcards.org in the form of school report cards, and district report cards. In-depth reporting was also available through the North Carolina Department of Public Instruction's Accountability Services Division in the form of a database that included all data collected through the testing instrument for each student tested. The data included identifying information and demographics about the student, scores attained by the student, and survey data from both the student and the teacher. Data for the study were provided by the district through their accountability and technology department. The data used in this report related to:

1. Teachers' reading judgment (prediction) and teachers' mathematics judgment (prediction) of proficiency level as it related to actual proficiency level.

2. Teachers' reading judgment (prediction) and teachers' mathematics judgment (prediction) of proficiency level as it related to actual teacher-assigned grades for the course.

Analysis of Data

Both qualitative and quantitative analyses were performed on each of the above categories of data to determine if associations existed.

Qualitative

Data were organized into six tables for reading and six tables for mathematics examining the relationship of teacher predictions to student proficiency qualitatively through descriptive analysis (see Figures 5 and 6).

Figure 5 illustrates the general table design for reading in grades 3-8 for the comparison of teacher prediction of proficiency levels to actual student proficiency levels attained. Two additional tables were included to illustrate comparable data for grade spans 3-5 and 6-8. Three comparable tables were included for the same data in mathematics.

Figure 6 illustrates the general table design for reading in grades 3-8 for the comparison of teacher prediction of teacher assigned grades to actual student proficiency levels attained. Two additional tables were included to illustrate comparable data for grade spans 3-5 and 6-8. Three comparable tables were included for the same data in mathematics.

Quantitative

The Fisher's exact test was applied as the statistic of analysis for examining teacher predictions of proficiency and non-proficiency with actual student performance. The Fisher's exact test calculated the probability of getting a 2x2 table as great as or greater than the observed table (Sheskin, 2004). The formula for the Fisher's (2004, p. 506) exact test is as follows:

Research Question 1

GRADES 3-8 READING					
Teacher Predictions of Proficiency Levels	Actual Student Proficiency Level—Reading				
	I	II	III	IV	Total of Teacher Predictions of Proficiency Levels
I					
II					
III					
IV					

Figure 5. Reading teacher predictions of proficiency levels and actual student proficiency levels.

Research Question 2

GRADES 3-8 READING					
Teacher Assigned Grades	Actual Student Proficiency Level—Reading				
	I	II	III	IV	Total of Teacher-Assigned Grades
A					
B					
C					
D					
F					

Figure 6. Reading teacher-assigned grades and actual student proficiency.

2x2 Frequency Table

a	b
c	d

$$P = \frac{(a+c)! \ (b+d)! \ (a+b)! \ (c+d)!}{n! \ a! \ b! \ c! \ d!}$$

where

          P   is the probability of obtaining the observed frequencies

    a, b, c, d   are the categorical frequencies observed.

          N   is the sample size

In order to perform a Fisher's exact test, variables were combined into proficient and non-proficient categories for both teacher predictions and actual scores. In the first set of matrices, proficiency consisted of student achievement levels of III and IV, while non-proficiency consisted of student achievement levels of I and II. Separate Fisher's exact tests were performed for:

- Grades 3-8 in both reading and mathematics

- Grade span 3-5 in both reading and mathematics

- Grade span 6-8 in both reading and mathematics.

In the second set of matrices, proficiency consisted of letter grades A, B, and C, while non-proficiency consisted of letter grades D and F for both teacher predictions and actual scores. This delineation of grades was based on the standard definition of grades A, B, and C indicating average or above average, while D and F indicating below average performance.

Separate Fisher's exact tests were performed for:

- Grades 3-8 in both reading and mathematics

- Grade span 3-5 in both reading and mathematics

- Grade span 6-8 in both reading and mathematics.

The combinations of grade spans 3-5 and 6-8 used in this study were typical of the delineations used in North Carolina Schools with regard to elementary and middle school levels, while the combined grade spans of 3-8 refer to all primary data.

For each Fisher's exact test conducted in this study, the level of significance was set at .05, or p<.05. All statistical analyses were performed using the PASW 18.0 quantitative software package.

Summary

The purpose of this study was to examine the relationship between teacher prediction of proficiency level and actual student proficiency level, as well as the relationship between teacher-assigned grades and actual student proficiency level achieved on the EOG. Chapter 3 detailed the research questions, data collection, and the method of data analysis of this study. Chapter 4 presented the results of the analysis.

CHAPTER 4: DATA ANALYSIS

Introduction

This study explored two research questions, each with four parts, focused on the extent to which teachers know and understood what their students had mastered in order to predict outcomes of student achievement. The teacher predictions included proficiency levels in both reading and mathematics and teacher-assigned grades in both reading and mathematics for students in grades 3-8. Existing studies have explored and suggested that school effects and teacher effects were related in some way to student achievement in schools. The review of literature in Chapter 2 suggested that funding, leadership, and teacher quality each have a role to play in student achievement in schools. Archibald (2006) and Tajalli and Opheim (2004) found a slightly positive relationship between funding and student achievement, but only when distributed at the student level. McGuigan and Hoy (2006) found leadership to have a positive relationship on student achievement indirectly through positive school climate, and supporting quality teacher employment and retention. With the ever-present demand at the teacher level to increase student achievement, it is vital that teachers accurately diagnose student performance and prescribe educational support for increased achievement. Teacher perceptions of student achievement are derived from a number of sources and according to Wiliams et al. (2004), educators who incorporated formative assessment into classroom practice as one of those sources produced tangible benefits in student achievement on state-mandated tests. Another source that may have influenced teacher perception, possibly in a negative manner, was teacher-assigned grades. Bowers (2010) found that teachers admit to awarding 65 to 75% of grades based on participation, behaviors, attendance, and effort rather than cognitive ability and achievement. However, there were no current studies examining the relationship between teacher perceptions

of student achievement levels and actual student achievement levels. It is possible that a better understanding of the teacher's ability to evaluate student learning and make appropriate teaching decisions could help teachers increase student learning and achievement. This study provided basic foundational data for superintendents and principals to guide teachers through the importance of knowing what their students know and do not know in order to affect instruction for the continuous improvement of student achievement.

This study focused on the relationship between teachers' ability to predict levels of proficiency on standardized end-of-grade tests in reading and mathematics relative to the students' actual levels of proficiency in grade 3-8. It also focused on the relationships between teacher-assigned grades in reading and mathematics relative to the student's actual levels of proficiency in grades 3-8. This study utilized student reading and mathematics achievement data and teacher survey data from the North Carolina End-of-Grade assessment. These assessments were implemented as part of the North Carolina ABCs of Public Education accountability system in order to measure student proficiency. These assessments were aligned with the North Carolina Standard Course of Studies for reading and mathematics.

The data used for this research were collected from an eastern North Carolina school district for the 2008-2009 school year. In this chapter the process for data collection and the analysis of the data for the research questions that form the basis of this study were presented. This study addressed the following questions:

1. To what extent were teachers able to accurately predict student level of proficiency on standardized tests?

1a.   To what extent were teacher predictions of student level of proficiency on standardized end-of-grade tests on reading in grades 3-8 consistent with the actual level of proficiency achieved by students?

1b.   To what extent were teacher predictions of student level of proficiency on standardized end-of-grade tests on mathematics in grades 3-8 consistent with the actual level of proficiency achieved by students?

1c.   To what extent was the accuracy of teacher predictions of student level of proficiency on standardized end-of-grade tests in reading consistent across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

1d.   To what extent was the accuracy of teacher predictions of student level of proficiency on standardized end-of-grade tests in mathematics consistent across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

2. To what extent were teacher-assigned grades consistent with actual student levels of proficiency achieved on standardized end-of-grade tests?

2a.   To what extent were teacher-assigned grades in reading consistent with actual student levels of proficiency achieved on standardized end-of-grade tests in grades 3-8?

2b.   To what extent were teacher-assigned grades in mathematics consistent with actual student levels of proficiency achieved on standardized end-of-grade tests in grades 3-8?

2c.   To what extent were teacher-assigned grades in reading consistent with actual student levels of proficiency across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

2d.   To what extent were teacher-assigned grades in mathematics consistent with actual student levels of proficiency across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

Description of Participants

As discussed in chapter 3, the participants for the study were all third through eighth grade students who participated in the North Carolina End-of-Grade assessment in reading and mathematics and all the teachers who taught these respective students. Survey responses of 238 teachers in reading and mathematics in grade levels 3-8 were analyzed to address the research questions. Data collected from 50 middle school reading teachers and 54 middle school mathematics teachers, as well as 134 elementary school teachers were included in the study. For more information about the elementary and middle school teachers in the district, see Table 1 in Chapter 3.

Description of Student Achievement Data

All of the 2008-2009 elementary and middle school students in grades three (n= 1338 students), four (n= 1324 students), five (n= 1335 students), six (n= 1280 students), seven (n= 1306 students), and eight (n= 1321 students) were included in the database with each student assigned a teacher of record. These data were analyzed through the incorporation of descriptive tables by subject, grade, and grade span to explore relationships between teacher prediction of proficiency level and actual student proficiency level as well as teacher-assigned grades and actual student proficiency level.

Analysis of Data

Research Question 1: The extent to which teachers were able to accurately predict student level of proficiency on standardized tests

Teacher predictions of proficiency levels in relation to actual student proficiency level were analyzed for patterns. Both reading and mathematics proficiency levels were measured by the 2009 North Carolina End-of-Grade assessment and the teacher predictions of proficiency level was obtained from the teacher survey section of the 2009 North Carolina End-of-Grade assessment.

Descriptive Analysis

Reading grades 3-8. Table 2 illustrates the general trend in the overall pattern of the teachers' ability to predict students' levels of proficiency on the End-of-Grade assessment in grades three through eight. The pattern of predictions more closely aligned to actual scores on Proficiency Levels III and I (**bold**) than on Proficiency Levels II and IV.

The highest rate of accurate prediction of proficiency level from the teachers in comparison to the actual student level achieved was at Level III with correct prediction at 64%. Of the remaining students, 1363 (36%) scored at a level other than the predicted proficiency Level III. The 1029 (20%) students who scored a Level I or II failed the test even though their teachers had predicted that they would pass with a Level III or IV.

Reading grades 3-5. Table 3 illustrates the general trend in the overall pattern of the teachers' ability to predict students' levels of proficiency on the End-of-Grade assessment in grades three through five. The pattern of predictions more closely aligned to actual scores on Proficiency Levels III and I (**bold**) than on Proficiency Levels II and IV.

Table 2

Teacher Predictions of Reading Proficiency Levels and Actual Student Reading Proficiency

Levels

GRADES 3-8 READING

Actual Student Proficiency Level—Reading

Teacher Predictions of Proficiency Levels	I	II	III	IV	Total of Teacher Predictions of Proficiency Levels
I	**344 (56%)**	207	66	1	618
II	552	889 (42%)	674	19	2134
III	200	813	**2392 (64%)**	350	3755
IV	1	15	632	649 (50%)	1297

Table 3

Teacher Predictions of Reading Proficiency Levels and Actual Student Reading Proficiency

Levels by Grade Span 3-5

GRADES 3-5 READING

Actual Student Proficiency Level—Reading

Teacher Predictions of Proficiency Levels	I	II	III	IV	Total of Teacher Predictions of Proficiency Levels
I	**208 (59%)**	110	36		354
II	258	480 (43%)	366	12	1116
III	89	310	**1251 (69%)**	172	1822
IV		6	274	322 (53%)	602

For reading teachers in grade span 3-5 the highest rate of accurate prediction of proficiency level in comparison to the actual student level achieved was at Level III with correct prediction at 69%. Of the remaining students, 571 (31%) scored at a level other than the predicted proficiency Level III. The 405 (17%) students who scored a Level I or II failed the test even though their teachers had predicted that they would pass with a Level III or IV.

Reading grades 6-8. Table 4 illustrates the general trend in the overall pattern of the teachers' ability to predict students' levels of proficiency on the End-of-Grade assessment in grades six through eight. The pattern of predictions more closely aligned to actual scores on Proficiency Levels III and I (**bold**) than on Proficiency Levels II and IV.

For reading teachers in grade span 6-8 the highest rate of accurate prediction of proficiency level in comparison to the actual student level achieved was at Level III with correct prediction at 59%. Of the remaining students, 792 (41%) scored at a level other than the predicted proficiency Level III. The 624 (24%) students who scored a Level I or II failed the test even though their teachers had predicted that they would pass with a Level III or IV.

In reading the teachers in grade span 3-5 show a closer prediction to the actual achievement level obtained by the students than in grade span 6-8. Even though there is a closer prediction of student achievement level in the three through five grade span there is still mismatch that ranges from 31% to 57% across the different proficiency levels.

Mathematics grades 3-8. Table 5 illustrates the general trend in the overall pattern of the teachers' ability to predict students' levels of proficiency on the End-of-Grade assessment in grades three through eight. The pattern of predictions more closely aligned to actual scores on Proficiency Levels III and IV (**bold**) than on Proficiency Levels I and II.

Table 4

Teacher Predictions of Reading Proficiency Levels and Actual Student Reading Proficiency

Levels by Grade Span 6-8

GRADES 6-8 READING

Actual Student Proficiency Level—Reading

Teacher Predictions of Proficiency Levels	I	II	III	IV	Total of Teacher Predictions of Proficiency Levels
I	**136 (52%)**	97	30	1	264
II	294	409 (40%)	308	7	1018
III	111	503	**1141 (59%)**	178	1933
IV	1	9	358	327 (47%)	695

Table 5

Teacher Predictions of Mathematics Proficiency Levels and Actual Student Mathematics

Proficiency Levels

GRADES 3-8 MATHEMATICS

Actual Student Proficiency Level—Mathematics

Teacher Predictions of Proficiency Levels	I	II	III	IV	Total of Teacher Predictions of Proficiency Levels
I	110 (19%)	331	124		565
II	146	865 (41%)	1103	13	2127
III	25	401	**2852 (75%)**	526	3804
IV	1	10	431	**866 (66%)**	1308

The highest rate of accurate prediction of proficiency level from the teachers in comparison to the actual student level achieved was at Level III with correct prediction at 75%. Of the remaining students, 952 (25%) scored at a level other than the predicted proficiency Level III. The 437 (9%) students who scored a Level I or II failed the test even though their teachers had predicted that they would pass with a Level III or IV.

Mathematics grades 3-5. Table 6 illustrates the general trend in the overall pattern of the teachers' ability to predict students' levels of proficiency on the End-of-Grade assessment in grades three through five. The pattern of predictions more closely aligned to actual scores on Proficiency Levels III and IV (**bold**) than on Proficiency Levels I and II.

The highest rate of accurate prediction of proficiency level from the teachers in comparison to the actual student level achieved was at Level III with correct prediction at 76%. Of the remaining students, 454 (24%) scored at a level other than the predicted proficiency Level III. The 156 (6%) students who scored a Level I or II failed the test even though their teachers had predicted that they would pass with a Level III or IV.

Mathematics grades 6-8. Table 7 illustrates the general trend in the overall pattern of the teachers' ability to predict students' levels of proficiency on the End-of-Grade assessment in grades six through eight. The pattern of predictions more closely aligned to actual scores on Proficiency Levels III and IV (**bold**) than on Proficiency Levels I and II.

The highest rate of accurate prediction of proficiency level from the teachers in comparison to the actual student level achieved was at Level III with correct prediction at 74%. Of the remaining students, 498 (26%) scored at a level other than the predicted proficiency Level III. The 281 (11%) students who scored a Level I or II failed the test even though their teachers had predicted that they would pass with a Level III or IV.

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Table 6

Teacher Predictions of Mathematics Proficiency Levels and Actual Student Mathematics

Proficiency Levels by Grade Span 3-5

GRADES 3-5 MATHEMATICS

Actual Student Proficiency Level—Mathematics

Teacher Predictions of Proficiency Levels	I	II	III	IV	Total of Teacher Predictions of Proficiency Levels
I	64 (20%)	186	74		324
II	46	399 (38%)	607	6	1058
III	7	148	**1439 (76%)**	299	1893
IV		1	165	**465 (74%)**	631

Table 7

Teacher Predictions of Mathematics Proficiency Levels and Actual Student Mathematics

Proficiency Levels by Grade Span 6-8

GRADES 6-8 MATHEMATICS

Actual Student Proficiency Level—Mathematics

Teacher Predictions of Proficiency Levels	I	II	III	IV	Total of Teacher Predictions of Proficiency Levels
I	55 (22%)	145	50		250
II	100	466 (44%)	496	7	1069
III	18	253	**1413 (74%)**	227	1911
IV	1	9	266	**401 (59%)**	677

In mathematics the teachers in grade span 3-5 show a closer prediction to the actual achievement level obtained by the students than in grade span 6-8. Even though there is a closer prediction of student achievement level in the three through five grade span there is still mismatch that ranges from 26% to 78% across the different levels.

Analysis through Fisher's Exact Test

To examine the relationship between teacher predictions levels of proficiency on standardized end-of-grade tests in reading and mathematics relative to the students' actual levels of proficiency in grade 3-8, six Fisher's exact tests were performed. The analysis compared the teacher prediction of proficiency level (proficiency/non- proficiency) and the actual proficiency level (proficiency/non-proficiency) obtained by the student. In this set of matrices, proficiency will consist of student achievement levels of III and IV, while non-proficiency will consist of student achievement levels of I and II.

Reading grades 3-8. A statistically significant relationship does exist between the teacher prediction and the actual student proficiency level (see Table 8). A Fisher's exact test determined a significant relationship (x^2 (1) = 2031.629, p< 0.000.)

Mathematics grades 3-8. A statistically significant relationship does exist between the teacher prediction and the actual student proficiency level (see Table 9). A Fisher's exact test determined a significant relationship (x^2 (1) = 1993.046, p< 0.000.)

Reading grades 3-5. A statistically significant relationship does exist between the teacher prediction and the actual student proficiency level (see Table 10). A Fisher's exact test determined a significant relationship (x^2 (1) = 1186.345, p< 0.000.)

Table 8

Contingency Table for Teacher Prediction and Student Proficiency Levels in Reading

Grades 3-8

	ACTUAL STUDENT READING LEVEL		
TEACHER PREDICTION READING LEVEL	Non-Proficient	Proficient	Total
Non-proficient	1992	760	2752
Proficient	1029	4023	5052
Total	3021	4783	7804

Table 9

Contingency Table for Teacher Prediction and Student Proficiency Levels in Mathematics

Grades 3-8

	ACTUAL STUDENT MATHEMATICS LEVEL		
TEACHER PREDICTION MATHEMATICS LEVEL	Non-Proficient	Proficient	Total
Non-proficient	1461	1240	2701
Proficient	437	4675	5112
Total	1898	5915	7813

Table 10

Contingency Table for Teacher Prediction and Student Proficiency Levels in Reading

Grades 3-5

| | ACTUAL STUDENT READING LEVEL | | |
TEACHER PREDICTION READING LEVEL	Non-Proficient	Proficient	Total
Non-proficient	1056	414	1470
Proficient	405	2019	2424
Total	1461	2433	3894

Reading grades 6-8. A statistically significant relationship does exist between the teacher prediction and the actual student proficiency level (see Table 11). A Fisher's exact test determined a significant relationship (x^2 (1) =872.174, p< 0.000.)

Mathematics grades 3-5. A statistically significant relationship does exist between the teacher prediction and the actual student proficiency level (see Table 12). A Fisher's exact test determined a significant (x^2 (1) = 1019.62, p< 0.000.)

Mathematics grades 6-8. A statistically significant relationship does exist between the teacher prediction and the actual student proficiency level (see Table 13). A Fisher's exact test determined a significant (x^2 (1) = 992.950, p< 0.000.)

According to Table 14 a statistically significant relationship did exist in each subject and grade span between teachers' ability to predict students' levels of proficiency on the End-of-Grade assessment. Although there were significant relationships the Fisher's exact tests do not describe the specific type of relationship.

Research Question 2: The extent to which teacher assigned grades were consistent with student level of proficiency on standardized tests

Teacher-assigned grades in relation to actual student proficiency level were analyzed for patterns. Both reading and mathematics proficiency levels were measured by the 2009 North Carolina End-of-Grade assessment and the teacher assigned grades were obtained from the teacher survey section of the 2009 North Carolina End-of-Grade assessment.

Descriptive Analysis

Reading grades 3-8. Table 15 illustrates the general trend in the overall pattern of the teacher-assigned grades in relation to actual student proficiency levels on the End-of-Grade assessment in grades three through eight. The pattern of teacher-assigned grades showed highest

Table 11

Contingency Table for Teacher Prediction and Student Proficiency Levels in Reading

Grades 6-8

	ACTUAL STUDENT READING LEVEL		
TEACHER PREDICTION READING LEVEL	Non-Proficient	Proficient	Total
Non-proficient	936	346	1282
Proficient	624	2004	2628
Total	1560	2350	3910

Table 12

Contingency Table for Teacher Prediction and Student Proficiency Levels in Mathematics

Grades 3-5

| | ACTUAL STUDENT MATHEMATICS LEVEL | | |
TEACHER PREDICTION MATHEMATICS LEVEL	Non-Proficient	Proficient	Total
Non-Proficient	695	687	1382
Proficient	156	2368	2524
Total	851	3055	3906

Table 13

Contingency Table for Teacher Prediction and Student Proficiency Levels in Mathematics

Grades 6-8

| | ACTUAL STUDENT MATHEMATICS LEVEL | | |
TEACHER PREDICTION MATHEMATICS LEVEL	Non-Proficient	Proficient	Total
Non-Proficient	766	553	1319
Proficient	281	2307	2588
Total	1047	2860	3907

Table 14

Summary Results of Fisher's Exact Tests for Teacher Prediction and Student Proficiency Levels

Teacher Prediction and Student Proficiency Levels	n	Chi Square	*P*
Reading Grades 3-8	7804	2031.629	0.000
Mathematics Grades 3-8	7813	1993.046	0.000
Reading Grades 3-5	3894	1186.345	0.000
Reading Grades 6-8	3910	872.174	0.000
Mathematics Grades 3-5	3906	1019.621	0.000
Mathematics Grades 6-8	3907	992.950	0.000

Table 15

Teacher-Assigned Grades in Reading and Actual Student Reading Proficiency Levels

GRADES 3-8 READING

Teacher-Assigned Grades	Actual Student Proficiency Level—Reading				
	I	II	III	IV	Total of Teacher-Assigned Grades
A	7	35	678	624	1344
B	141	514	1781	296	2732
C	460	918	979	82	2439
D	332	315	263	16	926
F	159	107	63	1	330

numbers of proficient students with an A average as well as lowest numbers of proficient students with an F average.

Table 16 indicates the actual aggregation of teacher-assigned grades and actual student proficiency levels by percentage in the non-proficient and proficient categories. Specific areas of interest were at both the B average grade level where 24% and the C average grade level where 56% of the students were non-proficient on the end-of-grade assessment.

Reading grades 3-5. Table 17 illustrates the general trend in the overall pattern of the teacher-assigned grades in relation to actual student proficiency levels on the End-of-Grade assessment in grades three through five. The pattern of teacher-assigned grades showed highest numbers of proficient students with an A average as well as lowest numbers of proficient students with an F average.

Table 18 indicates the actual aggregation of teacher-assigned grades and actual student proficiency levels by percentage in the non-proficient and proficient categories. Specific areas of interest were at both the B average grade level where 21% and at the C average grade level where 59% of the students were non-proficient on the end-of-grade assessment.

Reading grades 6-8. Table 19 illustrates the general trend in the overall pattern of the teacher-assigned grades in relation to actual student proficiency levels on the End-of-Grade assessment in grades six through eight. The pattern of teacher-assigned grades showed highest numbers of proficient students with an A average as well as lowest numbers of proficient students with an F average.

Table 20 indicates the actual aggregation of teacher-assigned grades and actual student proficiency levels by percentage in the non-proficient and proficient categories. Specific areas of

Table 16

Teacher-Assigned Grades in Reading and Actual Student Reading Proficiency Levels by Non-

Proficient and Proficient in Percentages

GRADES 3-8 READING

	Actual Student Proficiency Level—Reading	
Teacher-Assigned Grades	Non-Proficient	Proficient
A	3%	97%
B	24%	76%
C	56%	44%
D	70%	30%
F	81%	19%

Table 17

Teacher-Assigned Grades in Reading and Actual Student Reading Proficiency Levels by Grade

Span 3-5

GRADES 3-5 READING

Actual Student Proficiency Level—Reading

Teacher-Assigned Grades	I	II	III	IV	Total of Teacher-Assigned Grades
A	3	13	353	348	717
B	72	239	1021	140	1472
C	234	481	474	16	1205
D	192	157	65	2	416
F	56	17	14	0	87

Table 18

Teacher-Assigned Grades in Reading and Actual Student Reading Proficiency Levels by Non-

Proficient and Proficient in Percentages by Grade Span 3-5

GRADES 3-5 READING

	Actual Student Proficiency Level—Reading	
Teacher-Assigned Grades	Non-Proficient	Proficient
A	2%	98%
B	21%	79%
C	59%	41%
D	84%	16%
F	84%	16%

Table 19

Teacher-Assigned Grades in Reading and Actual Student Reading Proficiency Levels by Grade

Span 6-8

GRADES 6-8 READING

Actual Student Proficiency Level—Reading

Teacher-Assigned Grades	I	II	III	IV	Total of Teacher-Assigned Grades
A	4	2	325	276	627
B	69	275	760	156	1260
C	226	437	505	66	1234
D	140	194	198	14	546
F	103	90	49	1	243

Table 20

Teacher-Assigned Grades in Reading and Actual Student Reading Proficiency Levels by Non-

Proficient and Proficient in Percentages by Grade Span 6-8

GRADES 6-8 READING

	Actual Student Proficiency Level—Reading	
Teacher-Assigned Grades	Non-Proficient	Proficient
A	4%	96%
B	27%	73%
C	54%	46%
D	61%	39%
F	79%	21%

interest were at both the B average level where 27% and at the C average level where 54% of the students were non-proficient on the end-of-grade assessment.

In reading in grade span 3-5 the teacher-assigned grades in the A-B-C group showed a higher percentage in the proficient category at more levels than in grade span 6-8. Also, at the grade span 3-5 the teacher-assigned grades in the D-F group showed a higher percentage in the non-proficient category. Even though there was a closer relationship between teacher-assigned grades and student achievement level in the three through five grade span there was still a mismatch that ranged from 54% to 59% where the C grade level students were non-proficient on the end-of-grade assessment across both grade spans.

Mathematics grades 3-8. Table 21 illustrates the general trend in the overall pattern of the teacher-assigned grades in relation to actual student proficiency levels on the End-of-Grade assessment in grades three through eight. The pattern of teacher-assigned grades showed highest numbers of proficient students with an A average as well as lowest numbers of proficient students with an F average.

Table 22 indicates the actual aggregation of teacher-assigned grades and actual student proficiency levels by percentage in the non-proficient and proficient categories. Specific areas of interest were at both the C average grade level where 30% of the students were non-proficient and at the D average grade level where 47% of the students were proficient on the end-of-grade assessment.

Mathematics grades 3-5. Table 23 illustrates the general trend in the overall pattern of the teacher-assigned grades in relation to actual student proficiency levels on the End-of-Grade assessment in grades three through five. The pattern of teacher-assigned grades showed highest

Table 21

Teacher-Assigned Grades in Mathematics and Actual Student Mathematics Proficiency Levels

GRADES 3-8 MATH

Teacher-Assigned Grades	Actual Student Proficiency Level—Mathematics				
	I	II	III	IV	Total of Teacher-Assigned Grades
A		16	435	762	1213
B	24	246	1904	521	2695
C	93	624	1535	106	2358
D	109	507	526	14	1156
F	65	217	111	2	395

Table 22

Teacher-Assigned Grades in Mathematics and Actual Student Mathematics Proficiency Levels by

Non-Proficient and Proficient

GRADES 3-8 MATHEMATICS

Teacher-Assigned Grades	Actual Student Proficiency Level—Mathematics	
	Non-Proficient	Proficient
A	1%	99%
B	10%	90%
C	30%	70%
D	53%	47%
F	71%	29%

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Table 23

Teacher-Assigned Grades in Mathematics and Actual Student Mathematics Proficiency Levels by

Grade Span 3-5

GRADES 3-5 MATHEMATICS

Teacher-Assigned Grades	Actual Student Proficiency Level—Mathematics				
	I	II	III	IV	Total of Teacher-Assigned Grades
A		2	201	473	676
B	10	101	1044	255	1410
C	39	306	779	36	1160
D	46	238	223	6	513
F	22	89	38	0	149

numbers of proficient students with an A average as well as lower numbers of proficient students with an F average.

Table 24 indicates the actual aggregation of teacher-assigned grades and actual student proficiency levels by percentage in the non-proficient and proficient categories. Specific areas of interest were at both the C average grade level where 30% of the students were non-proficient and at the D average grade level where 45% of the students were proficient on the end-of-grade assessment.

Mathematics grades 6-8. Table 25 illustrates the general trend in the overall pattern of the teacher-assigned grades in relation to actual student proficiency levels on the End-of-Grade assessment in grades six through eight. The pattern of teacher-assigned grades showed highest numbers of non-proficient students with an A average as well as lowest numbers of proficient students with an F average.

Table 26 indicates the actual aggregation of teacher-assigned grades and actual student proficiency levels by percentage in the non-proficient and proficient categories. Specific areas of interest were at both the C average grade level where 31% of the students were non-proficient and at the D average grade level where 48% of the students were proficient on the end-of-grade assessment.

In mathematics in grade span 3-5 the teacher-assigned grades in the A-B-C group showed a higher percentage in the proficient category at more levels than in grade span 6-8. Also, at the grade span 3-5 the teacher-assigned grades in the D-F group showed a higher percentage in the non-proficient category. Even though there was a closer relationship between teacher-assigned grades and student achievement level in the three through five grade span there was still a

Table 24

Teacher-Assigned Grades in Mathematics and Actual Student Mathematics Proficiency Levels by

Non-Proficient and Proficient by Grade Span 3-5

GRADES 3-5 MATHEMATICS

	Actual Student Proficiency Level—Mathematics	
Teacher-Assigned Grades	Non-Proficient	Proficient
A	0%	100%
B	8%	92%
C	30%	70%
D	55%	45%
F	74%	26%

Table 25

Teacher-Assigned Grades in Mathematics and Actual Student Mathematics Proficiency Levels by

Grade Span 6-8

GRADES 6-8 MATHEMATICS

| | Actual Student Proficiency Level—Mathematics | | | | |
Teacher-Assigned Grades	I	II	III	IV	Total of Teacher-Assigned Grades
A	0	14	234	289	537
B	14	145	860	266	1285
C	54	318	756	70	1198
D	63	269	303	8	643
F	43	128	73	2	246

Table 26

Teacher-Assigned Grades in Mathematics and Actual Student Mathematics Proficiency Levels by

Non-Proficient and Proficient by Grade Span 6-8

GRADES 6-8 MATHEMATICS

	Actual Student Proficiency Level— Mathematics	
Teacher-Assigned Grades	Non-Proficient	Proficient
A	3%	97%
B	12%	88%
C	31%	69%
D	52%	48%
F	70%	30%

mismatch that ranged from 30% to 31% where the C grade level students are non-proficient on the end-of-grade assessment across both grade spans.

Analysis through Fisher's Exact Test

  Reading grades 3-8. A statistically significant relationship does exist between the teacher-assigned grades and the actual student proficiency level (see Table 27). A Fisher's exact test determined a significant relationship (x^2 (1) = 786.351, p< 0.000.)

  Mathematics grades 3-8. A statistically significant relationship does exist between the teacher-assigned grades and the actual student proficiency level (see Table 28). A Fisher's exact test determined a significant relationship (x^2 (1) = 1185.429, p< 0.000.)

  Reading grades 3-5. A statistically significant relationship does exist between the teacher assigned-grades and the actual student proficiency level (see Table 29). A Fisher's exact test determined a significant relationship (x^2 (1) = 528.536, p< 0.000.)

  Reading grades 6-8. A statistically significant relationship does exist between the teacher-assigned grades and the actual student proficiency level (see Table 30). A Fisher's exact test determined a significant relationship (x^2 (1) = 298.186, p< 0.000.)

  Mathematics grades 3-5. A statistically significant relationship does exist between the teacher-assigned grades and the actual student proficiency level (see Table 31). A Fisher's exact test determined a significant relationship (x^2 (1) = 668.852, p< 0.000.)

  Mathematics grades 6-8. A statistically significant relationship does exist between the teacher-assigned grades and the actual student proficiency level (see Table 32). A Fisher's exact test determined a significant relationship (x^2 (1) = 519.739, p< 0.000)

Table 27

Contingency Table for Teacher-Assigned Grades and Student Proficiency Levels in Reading

Grades 3-8

| | ACTUAL STUDENT READING LEVEL | | |
TEACHER PREDICTION READING LEVEL	Non-Proficient	Proficient	Total
Non-Proficient	949	343	1292
Proficient	2075	4440	6515
Total	3024	4783	7807

Table 28

Contingency Table for Teacher-Assigned Grades and Student Proficiency Levels in Mathematics

Grades 3-8

TEACHER PREDICTION MATHEMATICS LEVEL	ACTUAL STUDENT MATHEMATICS LEVEL		
	Non-Proficient	Proficient	Total
Non-Proficient	898	653	1551
Proficient	1003	5263	6266
Total	1901	5916	7817

Table 29

Contingency Table for Teacher-Assigned Grades and Student Proficiency Levels in Reading

Grades 3-5

| | ACTUAL STUDENT READING LEVEL | | |
TEACHER PREDICTION READING LEVEL	Non-Proficient	Proficient	Total
Non-Proficient	422	81	503
Proficient	1042	2352	3394
Total	1464	2433	3897

Table 30

Contingency Table for Teacher-Assigned Grades and Student Proficiency Levels in Reading

Grades 6-8

	ACTUAL STUDENT READING LEVEL		
TEACHER PREDICTION READING LEVEL	Non-Proficient	Proficient	Total
Non-Proficient	527	262	789
Proficient	1033	2088	3121
Total	1560	2350	3910

Table 31

Contingency Table for Teacher-Assigned Grades and Student Proficiency Levels in Mathematics

Grades 3-5

	ACTUAL STUDENT MATHEMATICS LEVEL		
TEACHER PREDICTION MATHEMATICS LEVEL	Non-Proficient	Proficient	Total
Non-Proficient	395	267	662
Proficient	458	2788	3246
Total	853	3055	3908

Table 32

Contingency Table for Teacher-Assigned Grades and Student Proficiency Levels in Mathematics

Grades 6-8

| | ACTUAL STUDENT MATHEMATICS LEVEL | | |
TEACHER PREDICTION MATHEMATICS LEVEL	Non-Proficient	Proficient	Total
Non-Proficient	503	386	889
Proficient	545	2475	3020
Total	1048	2861	3909

According to Table 33 a statistically significant relationship did exist in each subject and grade span between s teacher-assigned grades and students' levels of proficiency on the End-of-Grade assessment. Although there were significant relationships the Fisher's exact tests do not describe the specific type of relationship.

Summary

This study focused on the extent to which teachers know and understand what their students have mastered in order to predict outcomes of student achievement based on the North Carolina End-of-Grade Tests in reading and mathematics. This study used the survey section of the North Carolina End-of-Grade Tests and the actual student proficiency levels in mathematics and reading to explore the relationship of teachers' ability to predict student achievement and the relationship of teacher-assigned grades. The analysis was determined through pattern review and Fisher's exact test with a population of 7,820 students and 238 teachers in grades three through eight.

In addressing the first research question the analysis of data revealed that reading teachers' ability to predict students' levels of proficiency on the End-of-Grade assessment in both grade spans three through five and six through eight showed a general trend in the overall pattern. The most closely aligned predictions from the teachers in comparison to the actual student level achieved were at Level III with correct predictions from 59% to 69%. Even with these percentages exactly aligned to the prediction to the actual achievement there was still only a 40% to 50% correspondence at the other levels at the different grade spans.

In reading the teachers who delivered instruction to students in grade span three through five showed a closer prediction to the actual achievement level obtained by the students than in grade span six through eight. Even though there was a closer prediction of student achievement

Table 33

Summary Results of Fisher's Exact Tests for Teacher-Assigned Grades and Student Proficiency

Levels

Teacher-Assigned Grades and Student Proficiency Levels	n	Chi Square	*P*
Reading Grades 3-8	7807	786.351	0.000
Mathematics Grades 3-8	7817	1185.429	0.000
Reading Grades 3-5	3897	528.536	0.000
Reading Grades 6-8	3910	298.186	0.000
Mathematics Grades 3-5	3908	668.852	0.000
Mathematics Grades 6-8	3909	519.739	0.000

level in the three through five grade span there was still a mismatch that ranged from 43% to 69% across the other levels.

In mathematics teachers' ability to predict students' levels of proficiency on the End-of-Grade assessment in grades three through five and six through eight showed a general trend in the overall pattern. The most closely aligned predictions from the teachers in comparison to the actual student level achieved were at Level III with correct predictions from 74% to 76%. Even with these percentages exactly aligned to the prediction to the actual achievement at Level III there was still only a 19% to 74% correspondence at the other levels at the different grade spans.

In mathematics, teachers who delivered instruction to students in grade span three through five showed a closer prediction to the actual achievement level obtained by the students than in grade span six through eight. Even though there was a closer prediction of student achievement level in the three through five grade span there was still a mismatch that ranged from 19% to 66% across the other levels.

A statistically significant relationship did exist in each subject and grade span between teachers' ability to predict students' levels of proficiency on the End-of-Grade assessment

In addressing the second research question the analysis of the data revealed that teacher-assigned grades and students' levels of proficiency on the North Carolina End-of-Grade assessment in reading in both grade spans three through five and six through eight showed a general trend in the overall pattern.

In reading specific areas of interest were at both the B average grade level where 24% and at the C average grade level where 56% of the students were non-proficient on the end-of-grade assessment in grades three through eight.

In mathematics specific areas of interest were at both the C average grade level where 30% of the students were non-proficient and at the D average grade level where 47% of the students were proficient on the end-of-grade assessment in grades three through eight.

A statistically significant relationship did exist in each subject and grade span between teacher-assigned grades and students' levels of proficiency on the North Carolina End-of-Grade assessment.

The next chapter provided conclusions based on these data analyses results. Chapter 5 will also offer the implications for educational leaders based upon the study's results, as well as recommendations for future research on these topics.

CHAPTER 5: DISCUSSION AND CONCLUSION

The purpose of this study was to determine the extent to which teachers' predictions of student performance and assigned grades are consistent with actual performance on the North Carolina End-of-Grade Tests in reading and mathematics. The data used for this research were collected from one eastern North Carolina school district for the 2008-2009 school year. Teacher predictions of student proficiency levels in reading and math were disaggregated and analyzed for comparison with actual student proficiency levels on state standardized tests. Also, teacher-assigned grades in reading and mathematics were disaggregated and analyzed for comparison with actual student proficiency levels on state standardized tests. Chapter 4 presented the results of the study in relation to the research questions. This chapter includes further discussion, conclusions, and recommendations for further research and practice.

Research Questions

This study was designed to address two sets of research questions. The first set of research questions examined teacher ability to accurately predict student level of proficiency on standardized tests in reading and math. The second set of research questions compared teacher assigned course grades with the level of student proficiency on standardized tests in reading and math.

1. To what extent were teachers able to accurately predict student level of proficiency on standardized tests?

    1a. To what extent were teacher predictions of student level of proficiency on standardized end-of-grade tests on reading in grades 3-8 consistent with the actual level of proficiency achieved by students?

1b.   To what extent were teacher predictions of student level of proficiency on standardized end-of-grade tests on mathematics in grades 3-8 consistent with the actual level of proficiency achieved by students?

1c.   To what extent was the accuracy of teacher predictions of student level of proficiency on standardized end-of-grade tests in reading consistent across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

1d.   To what extent was the accuracy of teacher predictions of student level of proficiency on standardized end-of-grade tests in mathematics consistent across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

2. To what extent were teacher-assigned grades consistent with actual student levels of proficiency achieved on standardized end-of-grade tests?

2a.   To what extent were teacher-assigned grades in reading consistent with actual student levels of proficiency achieved on standardized end-of-grade tests in grades 3-8?

2b.   To what extent were teacher-assigned grades in mathematics consistent with actual student levels of proficiency achieved on standardized end-of-grade tests in grades 3-8?

2c.   To what extent were teacher-assigned grades in reading consistent with actual student levels of proficiency across elementary (grade span 3-5) and middle school (grade span 6-8) grades?

2d.   To what extent were teacher-assigned grades in mathematics consistent

with actual student levels of proficiency across elementary (grade span

3-5) and middle school (grade span 6-8) grades?

State and District Comparisons

According to state level data including all school districts in North Carolina, of all the

students predicted by their teachers to score Level III (proficient), approximately 60% actually

scored proficient on the end-of-grade tests in both reading and mathematics. Therefore,

approximately 40% of those students predicted to be proficient by their teachers did not

demonstrate proficiency on the test (NCDPI, 2009b). In this study, results in a single district,

teacher predictions were more accurate. There were still too many students who failed the state

tests in reading and mathematics, even though their teachers predicted that they would score at

Level III or IV (proficient). Approximately 27% of those students predicted to be proficient with

a level III by their teachers did not demonstrate proficiency in reading and 11% did not

demonstrate proficiency in math.

Similar patterns existed at both the state and district level in the relationship between

teacher-assigned grades and proficiency on standardized tests. At the state level approximately

60% of the students with a teacher-assigned grade of B were proficient on the test, while

approximately 30% of those with a teacher-assigned grade of C were proficient on the test.

Therefore, approximately 40% of students with teacher-assigned grade of B and approximately

70% of students with teacher-assigned grades of C had failed to demonstrate proficiency on the

state tests in both reading and mathematics (NCDPI, 2009b). At the district level approximately

24% of students with teacher-assigned grade of B and approximately 56% of students with

teacher-assigned grades of C failed to demonstrate proficiency on the state tests in reading.

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Approximately 10% of students with teacher-assigned grade of B and approximately 30% of students with teacher-assigned grades of C failed to demonstrate proficiency on the state tests in mathematics.

Teacher Ability to Predict Student Performance on Standardized Tests

The first set of research questions in this study addressed the extent to which teachers were able to accurately predict student level of proficiency on the North Carolina End-of-Grade Tests in reading and mathematics in grades three through eight, and grade spans three through five and six through eight. The analysis of teacher predictions and student achievement yielded several conclusions.

Reading in Grades 3-8

In examining the relationship between the teacher predictions and the actual student proficiency level on the North Carolina End-of-Grade assessment in reading in grades three through eight, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors. In examining the overall pattern of the teachers' ability to predict students' levels of proficiency, the strongest alignment existed at Level III where 64% of the predictions were correct. Even though a statistical relationship was evident, this best-case scenario still left 36% of the teacher predictions incorrect. In other words, at best, teachers were not able to accurately predict the performance on standardized tests of 36% of the students they taught.

Mathematics in Grades 3-8

In examining the relationship between the teacher prediction and the actual student proficiency level on the North Carolina End-of-Grade assessment in mathematics in grades three through eight, the Fisher's exact test revealed that a statistically significant relationship existed

between these two factors. In examining the overall pattern of the teachers' ability to predict students' levels of proficiency, the strongest alignment existed at Level III where 75% of the predictions were correct. Even though a statistical relationship was evident, this best-case scenario still left 25% of the teacher predictions incorrect. In other words, at best, teachers were not able to accurately predict the performance on standardized tests of 25% of the students they taught.

Reading in Grade Spans 3-5 and 6-8

When disaggregating data for elementary and middle grades, patterns were mixed with teachers predictions least accurate for middle school teachers. In examining the relationship between the teacher prediction and the actual student proficiency level on the North Carolina End-of-Grade assessment in reading in grade span three through five, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors in both grade spans. In examining the overall pattern of the teachers' ability to predict students' levels of proficiency, the strongest alignment existed at Level III where 69% of the predictions were correct. Even though a statistical relationship was evident, this best-case scenario still left 31% of the teacher predictions incorrect. In other words, at best, teachers were not able to accurately predict the performance on standardized tests of 31% of the students they taught.

In examining the relationship between the teacher prediction and the actual student proficiency level on the North Carolina End-of-Grade assessment in reading in grade span six through eight, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors in both grade spans. In examining the overall pattern of the teachers' ability to predict students' levels of proficiency, the strongest alignment existed at Level III where 59% of the predictions were correct. Even though a statistical relationship was evident,

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this best-case scenario still left 41% of the teacher predictions incorrect. In other words, at best, teachers were not able to accurately predict the performance on standardized tests of 41% of the students they taught.

Mathematics in Grade Spans 3-5 and 6-8

In examining the relationship between the teacher prediction and the actual student proficiency level on the North Carolina End-of-Grade assessment in mathematics in grade span three through five, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors in both grade spans. In examining the overall pattern of the teachers' ability to predict students' levels of proficiency, the strongest alignment existed at Level III where 76% of the predictions were correct. Even though a statistical relationship was evident, this best-case scenario still left 24% of the teacher predictions incorrect. In other words, at best, teachers were not able to accurately predict the performance on standardized tests of 24% of the students they taught.

In examining the relationship between the teacher prediction and the actual student proficiency level on the North Carolina End-of-Grade assessment in mathematics in grade span six through eight, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors in both grade spans. In examining the overall pattern of the teachers' ability to predict students' levels of proficiency, the strongest alignment existed at Level III where 74% of the predictions were correct. Even though a statistical relationship was evident, this best-case scenario still left 26% of the teacher predictions incorrect. In other words, at best, teachers were not able to accurately predict the performance on standardized tests of 26% of the students they taught.

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Teacher-Assigned Grades and Student Performance on Standardized Tests

The second set of research questions in this study addressed the extent to which teacher-assigned grades were consistent with actual student levels of proficiency on the North Carolina End-of-Grade Tests in reading and mathematics in grades three through eight, and grade spans three through five and six through eight. The analysis of teacher-assigned grades and student achievement yielded several conclusions.

Reading in Grades 3-8

In examining the relationship between the teacher-assigned grade in reading and the actual student proficiency level on the North Carolina End-of-Grade assessment in reading in grades three through eight, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors. In examining the overall pattern of the teacher-assigned grades and students' levels of proficiency, specific patterns of interest occurred for students receiving grades of B and C. Twenty-four percent of students who received a B in reading and 56% of the students who received a C in reading actually failed to demonstrate proficiency on the end-of-grade assessment in reading.

Mathematics in Grades 3-8

In examining the relationship between the teacher-assigned grade in mathematics and the actual student proficiency level on the North Carolina End-of-Grade assessment in mathematics in grades three through eight, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors. In examining the overall pattern of the teacher-assigned grades and students' levels of proficiency, specific patterns of interest occurred for students receiving grades of C and D. Thirty percent of students who received a C in mathematics actually failed to demonstrate proficiency on the end-of-grade assessment in

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mathematics and 47% of the students who received a D in mathematics actually did demonstrate proficiency on the end-of-grade assessment in mathematics.

Reading in Grade Span 3-5

In examining the relationship between the teacher-assigned grade in reading and the actual student proficiency level on the North Carolina End-of-Grade assessment in reading in grade span three through five, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors in this grade span. In examining the overall pattern of the teacher-assigned grades and students' levels of proficiency, specific patterns of interest occurred for students receiving grades of B and C. Twenty-one percent of students who received a B in reading and 59% of the students who received a C in reading actually failed to demonstrate proficiency on the end-of-grade assessment in reading.

Reading in Grade Span 6-8

In examining the relationship between the teacher-assigned grade in reading and the actual student proficiency level on the North Carolina End-of-Grade assessment in reading in grade span six through eight, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors in this grade span. In examining the overall pattern of the teacher-assigned grades and students' levels of proficiency, specific patterns of interest occurred for students receiving grades of B and C. Twenty-seven percent of students who received a B in reading and 54% of the students who received a C in reading actually failed to demonstrate proficiency on the end-of-grade assessment in reading.

Mathematics in Grade Span 3-5

In examining the relationship between the teacher-assigned grade in mathematics and the actual student proficiency level on the North Carolina End-of-Grade assessment in mathematics

in grade span three through five, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors in this grade span. In examining the overall pattern of the teacher-assigned grades and students' levels of proficiency, specific patterns of interest occurred for students receiving grades of C and D. Thirty percent of students who received a C in mathematics actually failed to demonstrate proficiency on the end-of-grade assessment in mathematics and 45% of the students who received a D in mathematics actually did demonstrate proficiency on the end-of-grade assessment in mathematics.

Mathematics in Grade Span 6-8

In examining the relationship between the teacher-assigned grade in mathematics and the actual student proficiency level on the North Carolina End-of-Grade assessment in mathematics in grade span six through eight, the Fisher's exact test revealed that a statistically significant relationship existed between these two factors in this grade span. In examining the overall pattern of the teacher-assigned grades and students' levels of proficiency, specific patterns of interest occurred for students receiving grades of C and D. Thirty-one percent of students who received a C in mathematics actually failed to demonstrate proficiency on the end-of-grade assessment in mathematics and 48% of the students who received a D in mathematics actually did demonstrate proficiency on the end-of-grade assessment in mathematics.

Summary

Both the descriptive analysis and the Fisher's exact test found positive relationships among teacher prediction of proficiency and teacher-assigned grades with student performance. At this time, more so than ever before, the focus is on the education of all students.

Even at best, the percentages of incorrect teacher predictions of student performance on standardized tests and the misalignment of assigned grades with student performance on standardized tests are unacceptable.

Limitations

The findings of the study were based on the elementary and middle schools located in one district in eastern North Carolina. The study was limited in generalizability because the data were taken only from one eastern North Carolina district and may not be true for other districts in North Carolina or the United States. This study assessed the teachers' predictions, not the teacher's levels of effectiveness. Furthermore, this study did not assess the effectiveness of each teacher in teaching the North Carolina Standard Course of Study, but it assumed that each teacher was aligning instructions with the standard course of study.

Implications for Educational Leaders

High-stakes testing is widely used to leverage change, motivating teachers and administrators to alter instructional practices in an effort to meet the rigor of the standardized tests. However, many of the changes in instruction lead to superficial coverage of objectives and equally superficial test preparation as teachers strive to find ways to better prepare students to be successful with standardized tests (Supovitz, 2009). High-stakes testing is usually a summative assessment used to measure progress toward accountability standards and to report student achievement. In order for teachers to make meaningful instructional decisions, they must have an accurate assessment of each student's current performance. The results of this study have implications for educational leaders at all levels.

Teachers

As instructional leaders in the classroom, teachers should examine these data and reflect on their own rates of success and failure. For which students were their predictions of performance on standardized tests correct and incorrect? For which students were the assigned grades aligned with their actual levels of proficiency? When was that alignment missing?

Teacher reflection on these issues can appropriately become a collaborative effort through conversations in a variety of professional learning communities, including grade level teams, subject areas, and vertical teams. These conversations could explore curriculum alignment, instructional practices, and the use of formative assessment to continuously inform instructional decisions.

Principals

As instructional leaders of the school, principals are challenged to work with and through others to reach the organizational goals, but the question becomes how to help teachers specifically focus on the strategies that will make a difference in student achievement (Hallinger & Heck, 1996). As principals try to make sense of the abundance of data provided to them, they must recognize the opportunity to use these data on teacher predictions of student performance and the alignment of teacher-assigned grades. These teacher prediction and assigned grades data are provided annually to each district as part of the North Carolina End-of-Grade testing data by North Carolina Department of Public Instruction's Accountability Services Department. Principals must begin to explore how well teachers are able to predict student proficiency and examine how well the teacher has assessed the student's academic progress throughout the year. This study also suggested the need for a closer examination of the taught curriculum and related instructional and assessment practices. When examining grading trends, principals must work

with teachers to assure that grading practices are aligned with standards, objectives, and actual student performance. This study revealed a particular need for close examination of grading practices.

Because the North Carolina End-of-Grade Test is a summative assessment, more attention must be given to formative assessment. Formative assessment has the potential to inform instructional decisions, and adjust instruction immediately and continuously. These adjustments throughout the school year could strengthen instruction and increase student achievement.

It will also be important for principals to help teachers recognize the value of reliable data. In order to use these data to make instructional improvements, teachers much have taken the survey seriously and coded their responses to the survey questions accurately.

Superintendents

As the executive leader of the school district, the superintendent is held accountable for the success of the students in the district. This research suggested that there were significant relationships between teacher predictions of proficiency levels and actual student levels on end-of-grade assessments. The descriptive analysis showed the strongest relationship at proficiency Level III, but it showed prediction gaps at this level and other levels. This research provided district leadership with evidence to support district initiatives in which teacher professional learning is targeted at understanding these data and the importance of the teacher recognizing what the student knows and how well the student can apply that knowledge on measures such as the end-of-grade test. An even stronger district initiative could include the routine use of formative assessment and benchmark assessments in order to provide the teacher with an understanding of what the student knows throughout the course so that the teacher could provide

interventions and support through remediation and re-teaching. The research suggested that strong educational leadership occurs where the leaders work well with and through others to reach organizational goals (Hallinger & Heck, 1996). District and school leadership cannot make a difference in student achievement without complete understanding and support from the classroom teacher.

This research also revealed there were significant relationships between teacher-assigned grades and actual student proficiency levels on End-of-Grade assessments. The descriptive analysis provides district leadership with evidence of the need to support examination of district grading policy with an emphasis on closer alignment of grading practices with the state standards and objectives so that grades reflect student knowledge and application of concepts and reducing emphasis in grading on student behaviors and effort, participation, and extra credit (McMillan et al., 2002).

Recommendations for Further Research

The following recommendations for further research were based upon the findings and implications of this study. The recommendations addressed expansion of the study to include additional districts, closer examination of classroom instruction and assessment, and grading practices.

Expansion of the Study

Replication of this study using additional districts or sets of districts could be helpful in understanding the scope of the patterns found in this initial study. Disaggregation of the state data by geographic location, socioeconomic status, teacher retention rates, and other factors could also provide insights related to these results. Disaggregation of results by teacher

characteristics could help explain what instructional and assessment strategies were most closely associated with accurate predictions of student performance and aligned grades.

Instruction Aligned with State Standards

Additional studies could also be designed to explore the relationship of teacher knowledge and practice to the ability to accurately predict student achievement on standardized tests and to align teacher-assigned grades with that performance level. For example, to what extent do the depth and breadth of teachers' knowledge of the state-defined curriculum relate to teachers' ability to predict student achievement? To what extent does the implementation of state-defined curriculum relate to teachers' ability to predict student achievement? First, there is a need to determine whether teachers fully understand the curriculum content. Second, it is important to determine how effectively they have implemented it in the classroom.

Formative Assessment

In order for teachers to make appropriate instructional decisions, it is essential to continuously monitor the progress of each student. Formative assessment allows teachers to inform and shape the day-to-day instructional practice. Additional studies should be designed to examine the extent to which teacher ability to use formative assessment relates to teachers' ability to predict student achievement. By keeping a finger on the pulse of student learning relative to the goals and objectives, teachers can help assure that students are mastering the standards as instruction progresses, thereby increasing the likelihood that students' performance will be more closely aligned with teacher prediction of student performance and teacher-assigned grades.

Grading Practices

Finally, what grading practices are most likely to support alignment of teacher-assigned grades with actual student achievement? What practices could reduce the teacher's reliance on extra credit, effort, participation and other behaviors that are not indicative of mastery of the standards (McMillan et al., 2002). Studies could be designed to identify grading practices by teacher, schools, and districts and to explore the relationship of these practices to the accuracy of teacher predictions of student performance on standardized tests and the alignment of teacher-assigned grades.

Summary

This study revealed significant relationships between teacher predictions of student performance and actual student performance on North Carolina End-of-Grade Tests in reading and mathematics in grades 3-8. However, the descriptive analysis revealed there was a discrepancy. Predictions of student performance on standardized tests were most accurate for students performing very well or very poorly. For students performing at Level II predictions were less accurate and closer examination revealed that teacher predictions were more accurate and more likely to be aligned at the elementary level in both reading and mathematics. This study also found significant relationships between teacher-assigned grades and actual student performance on North Carolina End-of-Grade Tests in reading and mathematics in grades three through eight using the Fisher's exact test. However, the descriptive analysis revealed a misalignment. Comparisons of teacher-assigned grades and student performance on standardized tests were most accurate for students performing very well or very poorly. Students receiving a C in either reading or mathematics were less accurate and closer examination

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revealed that teacher-assigned grades were more accurate and more likely to be aligned with student proficiency at the elementary level in both reading and mathematics.

Factors that may affect the success of teacher prediction in both proficiency level and teacher-assigned grades may reside in how well the teachers know the standard course of study, how well they teach the standard course of study, and how well they continuously assess the students' knowledge of the concepts and applications in the standard course of study. This research may provide foundational data to support teachers in the continuous improvement of student achievement through a better understanding and implementation of curriculum, assessment, and grading standards.

REFERENCES

Achilles, C. (Director) (2003, February 24). How class size makes a difference: What the research says. The impact of class-size reduction. *Research and Policy Symposium on Class-Size Reduction and Beyond*. Lecture conducted from SERVE, Raleigh.

Anderson, L. (2009). Upper elementary grades bear the brunt of accountability. *Phi Delta Kappan*, *2*, 413-418.

Archibald, S. (2006). Narrowing in on educational resources that do affect student achievement. *Peabody Journal of Education*, *8*(4), 23-42.

Autwater, A., & Arugette, M. (2008). Effects of student gender and socioeconomic status on teacher perception. *The Journal of Educational Research*, *101*(4), 243-246.

Barker, B. (2007). The leadership paradox: Can school leaders transform student outcomes. *School Effectiveness and School Improvement: An International Journal of Research, Policy and Practice, 18*(1), 21-43.

Beecher, M., & Sweeny, S. (2008). Closing the achievement gap with curriculum enrichment and differentiation. *Journal of Advanced Academics*, *19*(3), 502-530.

Blatchford, P., Bassett, P., Goldstein, H., & Martin, C. (2003). Are class size differences related to pupils' educational progress and classroom processes? *British Educational Research Journal*, *29*(5), 709. Retrieved June 25, 2005, from the EBSCO host database.

Borders, D. G. (2004). Veteran teachers: The linchpin of school reform. *Education Week, 24*(6), 30-32.

Borland, M., Howsen, R., & Trawick, M. (2005). An investigation of the effect of class size on student academic achievement. *Education Economics*, *13*(1), 73-83. Retrieved August 31, 2007, from the Academic Search Premier database.

Bowers, A. (2010). Grades and graduation: A longitudinal risk perspective to identify student dropouts. *Journal of Educational Research*, *103*(3), 191-207.

Bracey, G. (2002). About that teacher shortage. *Phi Delta Kappan*, *84*(4), 331-334.

Ding, C., & Sherman, H. (2006). Teaching effectiveness and student achievement: Examining the relationship. *Educational Research Quarterly*, *29*(4), 39.

Diver-Stemnes, A. (1995). *Lives in the balance: Youth, poverty, and education in watts*. Albany: SUNY Press.

District X. (2008). *Fast facts 2008.* [Brochure]. Nashville, NC.

Eckert, T., Dunn, E., Codding, R., Begeny, J., & Kleinmann, A. (2006). Assessment of mathematics and reading performance: an examination of the correspondence between direct assessment of student performance and teacher report. *Psychology in the Schools*, *43*(3), 247-265.

Elfers, A., Plecki, M., & Knapp, M. (2006). Teacher mobility: Looking more closely at "the movers" within a state system. *Peabody Journal of Education*, *81*(3), 94.

Espinosa, L., & Laffey, J. (2003). Urban primary teacher perceptions of children with challenging behaviors. *Journal of Children & Poverty*, *9*(2), 135-156.

Falch, T., & Ronning, M. (2007). The influence of student achievement on teacher turnover. *Education Economics*, *15*(2), 177-202.

Gewertz, C. (2003). State leaders launch achievement-gap effort. *Education Week*, *23*(15), 20. Retrieved April 2, 2005, from the Academic Search Elite database.

Gieselman, S. (2009). Principal and school factors that impact elementary school student achievement. *Mid-Western Educational Researcher*, *22*(2), 16-22.

Goldhaber, D., & Anthony E. (2003, May). Teacher quality and student achievement. *ERIC Clearinghouse on Urban Education, Urban Diversity Series* No. 115.

Gutek, G. (1970). *A historical introduction to American education*. New York: Thomas Y. Crowell Company.

Hallinger, P., & Heck, R. (1996). Reassessing the principal's role in school effectiveness: A review of the empirical research, 1980-1995. *Educational Administration Quarterly*, *32*, 5-44.

Hanushek, E. (1989). Expenditures, efficiency and equity in education: The federal government's role. *American Economic Review*, *79*(2), 46-51.

Hedges, L., Laine, R., & Greenwald, R. (1994). An exchange: Part 1: Does money matter. A meta-analysis of studies of the effects of differential school inputs on student outcomes. *Education Researcher*, *23*(3), 5-14.

Helwig, R., Anderson, L., & Tindal, G. (2001). Influence of elementary student gender on teacher's perceptions of mathematics achievement. *The Journal of Educational Research*, *95*(2), 93-101.

Hoff, J. D. (1999). Echoes of the Coleman Report. *Education Week*, *18*(28), 33.

Ingersoll, R. (2004). Why some schools have more underqualified teachers than others. In D. Ravitch (Ed), *Brookings papers on education policy*. Washington, DC: Brookings Institution.

Ingersoll, R. (2005). The problem of under qualified teachers: A sociological perspective. *Sociology of Education*, *78*(2), 175-178.

Janisch, C., & Johnson, M. (2003). Effective literacy practices and challenging curriculum for at-risk learners: Great expectations. *Journal of Education for Students Placed at Risk*, *8*(3), 295-308.

Jencks, C. (1972). *Inequality; A reassessment of the effect of family and schooling in America.* New York: Basic Books.

Jepsen, C., & Rivkin, S. (2009). Class size reduction and student achievement. *The Journal of Human Resources*, *44*(1), 223-250.

Johnson, J., Collins, H., Dupuis, V., & Johansen, J. (1969). *Introduction to the foundations of American education*. Boston: Allyn and Bacon Inc.

Kauffman, D., Johnson, S., Kardos, S., & Liu, E. (2002). Lost at sea: New teachers' experiences with curriculum and assessment. *Teachers College Record*, *104*(2), 273-301.

Kennedy, E. (2005). The No Child Left Behind Act. *Human Rights: Journal of the Section of Individual Rights and Responsibilities*, *32*(4), 16-18.

Konstantopoulos, S. (2008). Do small classes reduce the achievement gap between low and high achievers? Evidence from Project STAR. *The Elementary School Journal*, *108*(4), 275-291.

Kosters, M., & Mast, B. (2003). *Closing the educational achievement gap: Is Title I working?* Washington DC: The AEI Press.

Lai, E., & Waltman, K. (2008). Test preparation: Examining teacher perception and practices. *Educational Measurement: Issues and Practices*, Summer, 28-45.

Levine, E. (1998). Management for educational success: A grounded theory of low-income Latino parent involvement in their children's education. (Doctoral Dissertation, University of Maryland, College Park 1998). *Dissertation Abstracts International,* 59(06), 1914.

Lewis, D. M., Mitzel, H. C., & Green, D. R. (1996, June) Standard setting: A bookmark approach. In D. R. Green (Chair), *IRT-based standard-setting procedures utilizing behavioral anchoring*. Symposium conducted at the Council of Chief State School Officers National Conference on Large-Scale Assessment, Phoenix, AZ.

Lezotte, L. (1992a). Learn from effective schools. *Social Policy*, 22(3), 34-36.

Lezotte, L. (1992b). Principal insights from effective schools. *Education Digest*, 58(3), 14-16.

Loeb, S., Darling-Hammond, L., & Luczak, J. (2005). How teaching conditions predict teacher turnover in California schools. *Peabody Journal of Education*, 80(3), 44-70. Retrieved August 31, 2007, from the Academic Search Premier database.

Marks, G., Cresswell, J., & Ainley, J. (2006). Explaining socioeconomic inequalities in student achievement: the role of home and school factors. *Educational Research and Evaluation*, 12(2), 105-128.

Marzano, R. J. (2003). *What works in schools: Translating research into action*. Alexandria, VA: Association for Supervision &Amp; Curriculum Development.

McElroy, E. (2004). Teaching for the long term. *Teaching Pre K-8*, 35(2), 6.

McGuigan, L., & Hoy, W. (2006). Principal leadership: Creating a culture of academic optimism to improve achievement for all students. *Leadership and Policy in Schools*, 5, 203-229.

McMillan, J., Myran, S., & Workman, D. (2002). Elementary teacher's classroom assessment and grading practices. *The Journal of Educational Research*, 95(4), 203-213.

McMillan, J. H. (2000). *Basic assessment concepts for teachers and administrators*. Thousand

    Oaks, CA. Corwin Press.

McCormick, M. (1975). *Primary education for the disadvantaged: What the literature reveals: a*

    literature review and annotated bibliography. La Jolla, California: Western Behavioral

    Sciences Institute.

Moores, D. (2004). No Child Left Behind: The good, the bad, and the ugly. *American Annals of*

    the Deaf, *148*(5), 347-348.

Moynihan, D. (1991). Educational goals and political plans. *Public Interest*, *102*, 32-49.

North Carolina Department of Public Instruction. (1999, Spring). *Assessment brief:*

    Understanding end-of-grade testing: Achievement levels. Raleigh, NC.

North Carolina Department of Public Instruction. (2009a, November). *Understanding the*

    individual student report for the North Carolina end-of-grade tests: Grades 3, 4, and 5.

    Raleigh, NC.

North Carolina Department of Public Instruction, (2009b). *North Carolina state testing results.*

    Raleigh, NC.

North Carolina Department of Public Instruction, (2009c). *North Carolina state technical report.*

    Raleigh, NC.

Okpala, C., Okpala, A., & Smith, F. (2001). Parental involvement, instructional expenditures,

    family socioeconomic attributes, and student achievement. *Journal of Educational*

    Research, *95*(2), 110-117.

Okpala C., Smith, F., Jones, E., & Ellis, R. (2000). A clear link between school and teacher

    characteristics, student demographics, and student achievement. *Education, 120*(3), 487-

    494.

Ornstein, A. (1994). The textbook-driven curriculum. *Peabody Journal of Education*, *Spring*, 70-85.

Parke, C., & Lane, S. (2008). Examining alignment between state performance assessment and mathematics classroom activities. *The Journal of Educational Research*, *101*(3), 132-146.

Payne, K., & Biddle, B. (1999). Poor school funding; Child poverty, and mathematics achievement. *Educational Researcher*, *28*(6), 4-13.

Popham, J. (2004). Curriculum matters. *American School Board Journal*, *191*(11), 30-33.

Prete, T. (2006). Equity and effectiveness: Challenge and promise in a tale of two schools and a partnership. *Equity and Excellence in Education, 39*(1), 47-54.

Pulliam, J. (1995). *History of education in America* (6th ed.). New York: Macmillan, International.

Rabb, T. (2004). "No Child" Left Behind Historical Literacy. *Education Digest*, *70*(2), 18-21.

Rakoczy, K., Klieme, E., Burgermeister, A., & Harks, B. (2008). The interplay between student evaluation and instruction. *Journal of Psychology*, *215*(2), 111-124.

Randall, J., & Engelhard, G. (2009). Differences between teachers' grading practices in elementary and middle schools. *The Journal of Educational Research, 102*(3), 175-186.

Reys, B., & Lappan, G. (2007). Consensus or confusion? *Phi Delta Kappan*, *88*(9), 676-680.

Rivkin, S., Hanushek, E., & Kain, J. (2005). Teachers, schools, and academic achievement. *Econometrica*, *73*(2), 417-458.

Rothstein, S. W. (1994). *Schooling the poor: A social inquiry into the American educational experience (Critical studies in education and culture series)*. Westport, CT: Bergin & Garvey.

Rury, J. (2009). *Education and social change: Contours in the history of American schooling* (3rd ed.). New York: Rutledge.

Rury, J. L. (2002). *Education and social change: Themes in the history of American schooling*. Mahwah, NJ: Lawrence Erlbaum Associates.

Sanders, M. (2000). *Schooling students placed at risk: Research, policy, and practice in the education of poor and minority adolescents*. Mahwah, NJ: Lawrence Erlbaum.

Seligman, D. (1998). Ignoring the facts. *Forbes*, *161*(12), 104-106.

Sharkey, N., & Murnane, R. (2006). Tough choices in designing a formative assessment system. *American Journal of Education*, *1*(12), 572-588.

Sheskin, D. J. (2004). *Handbook of parametric and nonparametric statistical procedures* (3rd ed.). Boca Raton, FL: Chapman & Hall.

Silberman, C. E. (1970). *Crisis in the classroom*. New York: Random House.

Silver, H., & Silver, P. (1991). *An educational war on poverty: American and British policy-making*. New York: Cambridge University Press.

Spring, J. (1997). *The American school, 1642-1996* (4th ed.). New York: McGraw-Hill Companies.

Supovitz, J. (2009). Can high stakes testing leverage educational improvement? Prospects from the last decade of testing and accountability reform. *Journal of Educational Change*, *10*, 211-227.

Sutton, A., & Soderstrom, I. (1999). Predicting elementary and secondary school achievement with school related-and demographic factors. *Journal of Educational Research*, *92*(6), 330-338.

Tajalli, H., & Ophein, C. (2004). Strategies to closing the gap; Predicting student performance in

    economically disadvantaged schools. *Educational Research Quarterly*, *28*(4), 44-54.

Thompson, C., & Cunningham, E. (2001). The lessons of class size reduction. *ERIC Digest*, *1*.

    Retrieved April 2, 2005, from the ERIC database.

Towers, J. (1992). Twenty-five years after the Coleman Report: What should we have learned?

    Clearing House, *65*(3), 138-140.

Useem, E, & Neild, R. C. (2001). Teacher staffing in the school district of Philadelphia. *The*

    Philadelphia Education Fund. Philadelphia.

Walberg, H. (1986). What works in a nation still at risk. *Educational Leaders*, *44*(1), 7-10.

    Retrieved April 2, 2005, from the Academic Search Elite database.

Wang, M., Haertal, G., & Walberg, H. (1993). What helps students learn? *Educational*

    Leadership, *12*(4), 74-79.

Wiliam, D., Lee, C., Harrison, C., & Black, P. (2004). Teachers developing assessment for

    learning: Impact on student achievement. *Assessment in Education*, *11*(1), 50-65.

Wong, K., & Nicotera, A. (2004). Brown v. Board of Education and the Coleman Report: Social

    science research and the debate on educational equality. *Peabody Journal of Education*,

    79(2), 122-135.

Yell, M., Katsiyannas, A., & Shiner, J. (2006). The no child left behind adequate yearly progress,

    and students with disabilities. *Teaching Exceptional Children, 38*(4), 32-39.

Zimmerman, B., & Dibenedetto, M. (2008). Mastery learning and assessment: Implications for

    students and teachers in an ERA of high-stakes testing. *Psychology in the Schools*, *45*(3),

    206-216.

APPENDIX: INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
1L-09 Brody Medical Sciences Building• 600 Moye Boulevard • Greenville, NC 27834
Office 252-744-2914 • Fax 252-744-2284 • www.ecu.edu/irb

Date: September 7, 2010

Principal Investigator: Amy Rogers, BS
Dept./Ctr./Institute: School of Education
Mailstop or Address: 2007 Cooper Fields Dr, Nashville, NC 27856

RE: **Exempt Certification**
UMCIRB# 10-0457
Funding Source: unfunded

Title: "Predictions, Assigned Grades, and Outcomes: Implications for School Leadership"

Dear Ms. Rogers:

On 9.3.10, the University & Medical Center Institutional Review Board (UMCIRB) determined that your research meets ECU requirements and federal exemption criterion #4 which includes research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. NOTE: 1) This information must be existing on the date this IRB application is submitted. 2) The data collection tool may not have an identifier or code that links data to the source of the information.

It is your responsibility to ensure that this research is conducted in the manner reported in your Internal Processing Form and Protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

The UMCIRB Office will hold your exemption application for a period of five years from the date of this letter. If you wish to continue this protocol beyond this period, you will need to submit an Exemption Certification Request at least 30 days before the end of the five year period.

Sincerely,

Chairperson, University & Medical Center Institutional Review Board

pc: Dr. Lynn Bradshaw