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The Impact of Board Certified Teachers on Student Achievement

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Approval Page

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Abstract

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This research study explored the relationship that exists between National Board certified teachers (NBCTs) and the reading achievement of students in third through fifth grade in comparison to non-NBCTs as measured by EVAAS growth data. Additional research questions analyzed which elements contained in the five core propositions participants perceive to be the most effective in contributing to student achievement in comparing perceptions of NBCTs and non-NBCTs. In contrast to data in other studies reviewed for this research, the results of this study signify that there is no significant difference in reading growth between students who are taught by NBCTs and students who are taught by non-NBCTs. NBCTs and non-NBCTs demonstrated an alignment of perceptions on student impact for the majority of the practices indicated in the five core propositions of the National Board Professional Teaching Standards.

The EVAAS comparison data and the focused interviews were utilized, analyzed, and summarized in order to obtain insight into the comparison of NBCTs' and non-NBCTs' achievement growth impact and the perceptions of practices contained in the five core propositions on the impact on student achievement.

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Chapter 1: Introduction

Introduction

Much research has been published supporting the notion that effective teachers are key to school and student success (Marzano, 2003; Schmoker, 2006; Stronge, 2007). Most researchers agree that teacher effectiveness is key to impacting student achievement; however, it has been noted by Marzano (2010) that many researchers and practitioners vary on how to best prepare teachers to be effective. Studies in Tennessee and Texas produced results that quantify that "highly effective teachers are able to produce much greater gains in student achievement than their less effective counterparts" (Tucker & Stronge, 2005, p. 3). An effective teacher can make the difference between a student who achieves at high levels and a student who slips through the cracks (U.S. Department of Education, 2010). Research shows (Haycock, 2005; Marzano, 2003; Sanders & Horn, 1994) that top-performing teachers can make a dramatic difference in the achievement of their students and suggests that the impact of being assigned to top-performing teachers year after year is enough to significantly narrow achievement gaps.

Teacher effectiveness matters; research demonstrates that teacher effectiveness contributes more to improving student academic outcomes than any other school characteristic (Murphy, Elliot, Goldring, & Porter; 2006; Rivkin, Hanushek, & Kain, 2005; Waters, Marzano, & McNulty, 2003). Recognizing the need for improvement, the U.S. Department of Education (2010) issued Great Teachers and Great Leaders (GTGL), a research summary in support of its Blueprint for Reform. Studies have substantiated that a student who has effective teachers for consecutive years will be on a path of continued growth and success, while a student who is taught by a succession of less-effective teachers may experience lasting academic challenges (U.S. Department of

Education, 2010). According to the U.S. Department of Education (2010), "The key to student success is providing an effective teacher in every classroom and an effective principal in every school" (p. 3).

Problem Statement

> Our nation is at risk. . . . The educational foundations of our society are presently being eroded by a rising tide of mediocrity that threatens our very future as a nation and as a people. . . . We have, in effect, been committing an act of unthinking educational disarmament. (National Commission on Excellence in Education, 1983, p. 5)

Research shows that teacher effectiveness is the single most important school-based factor in student success (Aaronson, Barrow, & Sander, 2007; Goldhaber, 2002; Rivkin et al., 2005). According to Tucker and Stronge (2005), students who have highly effective teachers for 3 consecutive years will score 50 percentile points higher on achievement tests than students who have less-effective teachers 3 years in a row. One set of research proposes that assigning effective teachers 5 years in a row to a class of disadvantaged children could close the achievement gap between these students and their privileged peers (Rivkin et al., 2005). Evidence from the National Assessment of Educational Progress (NAEP, 2016), the only nationally representative and continuing assessment of what America's students know and can do in various subject areas, and the North Carolina end-of-grade (EOG) test provides a mixed picture as to whether states are successfully educating students. While state accountability systems suggest that the proportion of students meeting state benchmarks is rising, performance on the NAEP has been relatively stagnant (Rampey, Dion, & Donahue, 2009).

Parrett and Budge (2012) provoked thoughts around the effects of not having an

effective teacher in each classroom by asking the following questions:

> As a nation, are we content that 70 percent of our entering 9th graders read below grade level? Is it acceptable that one out of every three minority students attend a high school where 40 percent of the students drop out? Are we willing to continue to spend $2.6 billion a year replacing teachers, half of whom choose to leave the profession before they begin their sixth year in a classroom? Can we excuse the fact that kids are twice as likely to be assigned to inexperienced or uncertified teachers in schools with large enrollments of poor and minority students? (p. 2)

In addition, Parrett and Budge (2012) purported that as a country and as teacher professionals, the aforementioned questions have not been systematically asked or answered. Furthermore, the Alliance for Excellent Education (2012) similarly agreed that public education is in crisis.

Improving teacher quality has been central to significant national education initiatives in the Bush and Obama administrations. No Child Left Behind (NCLB), Public Law 107-110, is national legislation passed in 2001 that increased emphasis on state accountability systems. In response to the critical need for a high-quality teacher in every classroom, the NCLB legislation required that all teachers of core academic subjects be highly qualified by the end of the 2005-2006 school year. Kleiman (2004) defined *highly qualified* is as a teacher who

1. Has obtained full state certification or passed the state teacher licensing examination and holds a license to teach in the state,
2. Holds a minimum of a bachelor's degree,
3. Has demonstrated subject matter competency in each of the academic subjects

he or she teaches. (p. 1)

Historically, politicians and educational institutions have had similar goals for improving schools. On August 26, 1981, Secretary of Education T. H. Bell created the National Commission on Excellence in Education with the directive to examine the quality of education in the United States (National Commission on Excellence in Education, 1983). As a result, the National Commission on Excellence in Education (1983) published *A Nation at Risk: The Imperative for Educational Reform;* conclusions included that the American education system was a mediocre operation. Grady, Wayson and Zirkel (1989) reported that the effective schools movement was based on three assumptions:

1. Some schools are usually effective in teaching poor and minority children basic skills as measured by standardized tests.
2. Successful schools exhibit characteristics that are correlated with their success and are within the domain of educators to manipulate.
3. The characteristics of effective schools provide a basis for improving other schools.

After the public release of A Nation at Risk, a widespread concern regarding the state of American schools spread among politicians, educational institutions, and the general public. In summary, the report concluded that American students were not receiving a quality education in school and fundamentally altered the lens through which analysts, policymakers, and the public at large viewed and assessed schools. Prior to the report, a good school was defined by its inputs (per pupil expenditure, school size, etc). After the report, measures of a good school shifted to its outputs or outcomes (amount students know, gains in learning experience each year, higher education pursued, and long-term

employment and earnings opportunities; Hanushek, 2016). During this time frame, there seemed to be a national concern regarding the state of education and the major question was how can the American School system improve? Alerts about the condition of education have surfaced intermittently over the years. The U.S. government has engaged in school reform with the purpose of school improvement from 1983 when A Nation at Risk was introduced, to 2001 when NCLB was passed, to 2015 when the Every Student Succeeds Act (ESSA) was signed into action by President Obama.

Purpose of the Study

Extensive research has demonstrated the importance of teacher quality. Years of research on teacher quality support the fact that effective teachers not only make students feel good about school and learning, but their work also actually results in increased student achievement (Tucker & Stronge, 2005). The conclusion that individual teachers can have a profound influence on student learning even in schools that were relatively ineffective was first noticed in the 1970s when researchers began to examine effective teaching practices (Marzano, Pickering, & Pollock, 2001). According to Mortimore and Sammons (1987), the evidence is undisputable, having found that teaching had six to 10 times as much impact on achievement as all other factors combined (Mortimore & Sammons, 1987). Schmoker (2006) quoted numerous studies that Marzano (2003) pointed to demonstrating that two teachers working with the same socioeconomic population can achieve starkly different results on the same test: In one class, 27% will pass; in another, 72%, which could be a life-changing difference (Marzano et al., 2001).

In other research, Hanushek (2014) found that 5 years of instruction from an above-average teacher could, and has in some entire districts, eliminate the achievement gap on some assessments (Haycock, 2005). One study conducted by Haycock and Huang

(2001) showed that the best teachers in a school have six times as much impact as the bottom third of teachers (Haycock & Huang, 2001). Odden and Wallace (2003) concluded that "improved classroom instruction is the prime factor to produce student achievement gains" (p. 64).

Varlas (2009) reported that research shows that teacher effectiveness is the single most important factor in student success. According to Marzano (2003), effective teachers appear to have greater impact with students of all achievement levels regardless of the levels of heterogeneity in their classes. Marzano (2003) further argued that if the teacher is ineffective, students under that tutelage will achieve inadequate progress academically regardless of how similar or different they are in their academic achievement. Numerous studies indicate that there will be dramatic learning gaps between students assigned to an ineffective teacher and students assigned to a competent teacher for 2 consecutive years (Parrett & Budge, 2012).

Kane, McCaffrey, Miller, and Staiger (2013) continued to document teacher impact on student achievement growth through numerous studies on value-added estimates that capture important information about the causal effects of teachers and schools (Kane, 2014). Students assigned to highly effective teachers are more likely to attend college, attend higher ranked colleges, earn higher salaries, live in higher socioeconomic status neighborhoods, and save more for retirement (Chetty, Rockoff, & Friedman, 2014). Given the significant and far-reaching impacts of quality teaching, many have advocated for including measures of teacher effectiveness in policies that govern decisions about teacher hiring, certification, tenure, and advancement (Glazerman et al., 2010; Gordon, Kane, & Staiger, 2006).

In 1984, two statisticians, Dr. William L. Sanders and Dr. Robert A. McLean of

the University of Tennessee, published a working paper on the use of student achievement data as a basis for teacher assessment (McLean & Sanders, 1984). Utilizing 3 years of gain scores from student performance on a standardized state test in Grades 2-5, McLean and Sanders (1984) established a statistical system rendering the following findings:

1. There were measurable differences among schools and teachers with regard to their effect on indicators of student learning.
2. The estimates of school and teacher effects tended to be consistent from year to year.
3. Teacher effects were not site specific; a gain score could not be predicted by simply knowing the location of the school.
4. There was a very strong correlation between teacher effects as determined by the data and subjective evaluations by supervisors.
5. Student gains were not related to the ability or achievement levels of the students when they entered the classroom.

Subsequent studies incorporating data from two other school system had results of the initial findings (Sanders & Horn, 1994).

Sanders developed the Tennessee Value-Added Assessment System (TVAAS), also known as the Educational Value-Added Assessment System (EVAAS), a method for measuring a teacher's effect on student performance by tracking the progress of students against themselves over the course of their school career with their assignment to various teachers' classes (Sanders & Horn, 1994). EVAAS is based on over 10 years of research by Dr. Sanders and his colleagues on teacher effectiveness and value-added models. The statistical method was developed on the premise that society has a right to expect that

schools will provide students with the opportunity for academic gain regardless of the level at which the students enter the academic location (Sanders & Horn, 1994). The statistical process of EVAAS provides measures of the influence that school systems, schools, and teachers have on indicators of student learning (Sanders & Horn, 1994). The EVASS method is used for measuring a teacher's impact on student performance by tracking the progress of the student against themselves over the course of their school career with their assignment to various teachers' classes.

Known for his value-added studies, Sanders found that just 3 years of effective teaching accounts on average for an improvement of 35 to 50 percentile points, and the effects are enduring (Sanders & Horn, 1994). Stronge and Hindman (2006) agreed that one of the most critical elements in the success of any school is the quality of teaching that occurs every day in every classroom. Stronge and Hindman further stated that "If we want students to succeed to their maximum potential, having a quality teacher working with every student is paramount" (p. 1).

For the purpose of this study, teacher effectiveness is measured by EVAAS. If the student's progress is better than expected, the teacher has "added value." Following are the tiered levels to determine added value for teachers based on EVAAS.

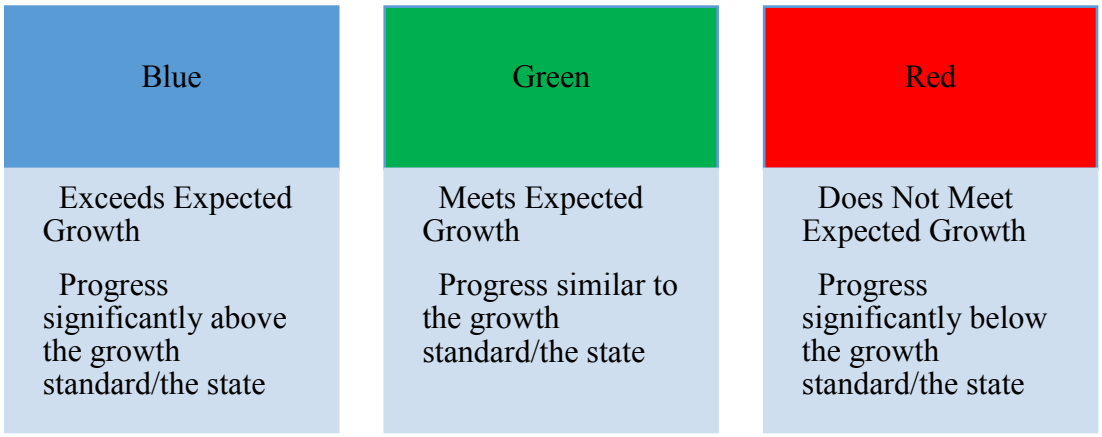

Figure 1. EVAAS Teacher Status.

The red label is given when student progress is 2+ standard errors below the progress of similar students in the state. The green label is given when student progress is not detectably different from the progress of similar students in the state. The blue label is given when student progress is 2+ standard errors above the progress of similar students in the state. EVAAS estimates for teachers, administrators, and schools are released in October of each following school year.

Stronge and Hindman (2006) reported that policy, practice, and research all suggest that teachers have a significant impact on the education of their students. The North Carolina Department of Instruction (NCDPI***), which is responsible for implementing the state's public school laws and the State Board of Education's (SBE) policies and procedures governing prekindergarten through 12th grade public education (Public Schools of North Carolina, 2016a), supports the suggestion that teachers significantly impact student education. NCDPI implements policies and procedures by providing leadership and service to 115 local public school districts, more than 2,500 traditional public schools, and 148 charter schools (Public Schools of North Carolina, 2016a). Areas of support provided by NCDPI include curriculum and instruction,

accountability, finance, teacher and administrator preparation, licensing, professional development, school business support, and operations (Public Schools of North Carolina, 2016a). An example policy was the READY accountability model developed in 2012 by NCDPI to ensure that administrators and teachers are responsible for achieving challenging yet attainable goals for students and that parents and the public have a clear, comparable understanding of the performance of students within North Carolina's public schools. The READY accountability model has three components.

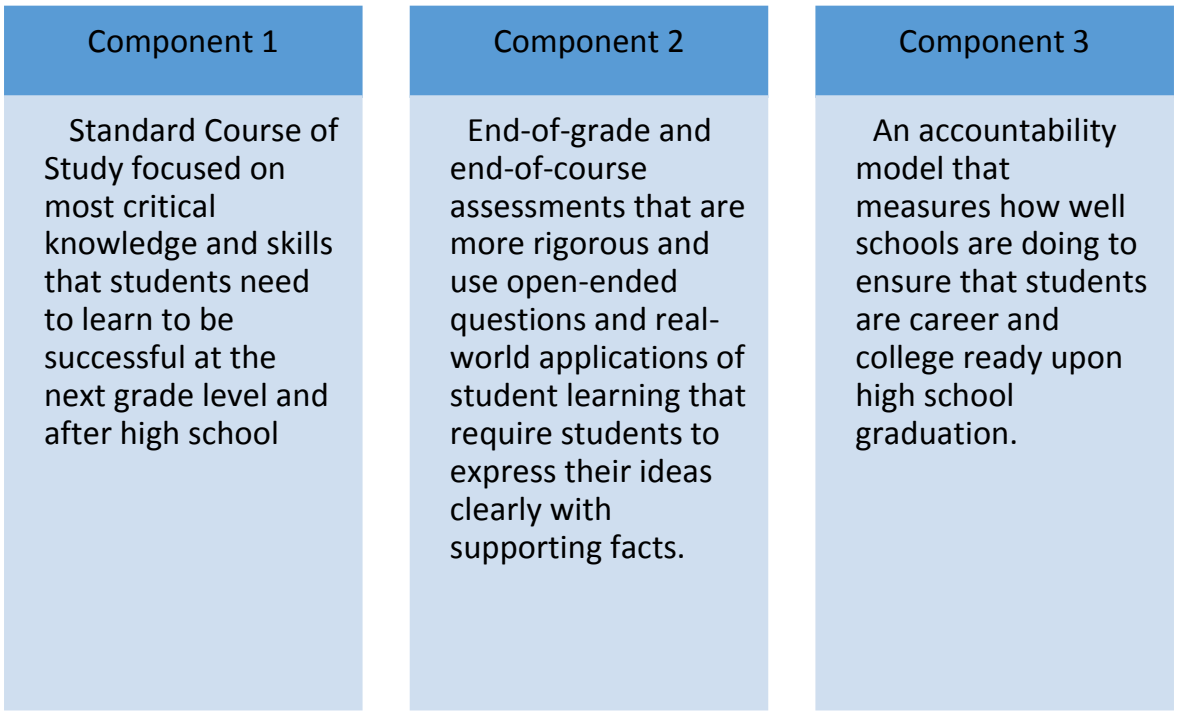

Figure 2. READY Accountability Model Components.

The North Carolina SBE and the North Carolina Professional Teaching Standards Commission worked to align the 1997 Core Standards for the Teaching Profession with the 2012 READY accountability model and considered "what teachers need to know and be able to do in 21st century schools" (Public Schools of North Carolina, 2016b, p. 7).

The first five aligned standards were adopted by the North Carolina SBE in 2007 and the sixth standard was adopted in 2012. As a component of the READY accountability model, all teachers in North Carolina receive a rating for Standard VI: Teachers Contribute to the Academic Success of Students which is measured by EVAAS. Standard VI was written to ensure that the work of teachers results in acceptable, measurable progress for students based on established performance expectations using appropriate data to demonstrate growth (Public Schools of North Carolina, 2016b).

The purpose of this study was to determine to what degree a relationship exists between National Board certified teachers (NBCTs) and the reading achievement of students in elementary school as compared to teachers who do not have National Board certification. Hattie (2003) stated that teachers account for about 30% of a variance in student success and that it is what teachers know, do, and care about which is very powerful in the learning equation. Most research on teacher effectiveness has examined a relatively small set of teacher characteristics such as graduate education and certification including National Board certification, which are collected by school administrators in order to satisfy legal requirements and set salaries. Previous nontraditional measures of teacher quality are, however, largely unrelated to any of the teacher characteristics generally available such as highest level of education (Clotfelter, Ladd, & Vigdor, 2007; Goldhaber, 2007); years of teaching experience after the first 2-3 years (Clotfelter et al., 2007; Goldhaber, 2002; Rivkin et al., 2005); or indicators of ability such as undergraduate institutions or test scores (Goldhaber, 2002, 2007; Harris & Sass, 2007; Kane, Rockoff, & Staiger, 2008).

For decades, conventional wisdom has been that by getting teachers the right type

and right amount of support, educational excellence would be right around the corner (The New Teacher Project [TNTP], 2015). How to support teachers has been the preoccupation of school systems and organizations like TNTP as well as the subject of countless research studies, op-eds, and books. According to the recent report from TNTP, school districts invest on average $18,000 on development for each teacher per year. Weisberg, CEO of TNTP stated, "We are bombarding teachers with a lot of help, but the truth is, it's not helping all that much" (Layton, 2015, p. 1) in a multitude of avenues to improve teacher quality and effectiveness.

One investment for teacher improvement is teacher preparation programs. Schools in the United States are continually making changes and experimenting with reform efforts to be one of the top leading countries in education. Recently, a variety of education policy organizations, researchers, legislators, and government officials have called for improvements to teacher preparation as well as concrete evidence that programs are graduating effective teachers (Jackson & Mackler, 2016). The recent emphasis on improving learning for all children has raised questions about the preparation teachers need to be effective in classrooms.

Education coursework in teacher preparation has come under considerable fire in recent years; however, one review of teacher preparation programs revealed that the amount and type of coursework was unrelated to teacher effectiveness (Constantine et al., 2009). Other researchers reached similar conclusions based on a study of 1,800 teaching candidates where studies suggested that measures of performance in education coursework were a better indication of teacher quality than the amount of coursework completed by teachers (Wilson & Robinson, 2012). Some studies indicate that lengthier periods of student teaching are beneficial; others do not find positive effects of extended

practice. For example, in a study of prospective teachers in a large urban district, Ronfeldt and Reininger (2012) found that lengthening student teaching has little effect on teacher outcomes; but in a nationally representative survey of teachers, those who completed more practice teaching felt better prepared and were more likely to stay in teaching.

Research has also shown that only about a quarter of traditional teacher preparation programs routinely gather information on the performance of their teacher candidates (Greenberg, McKee, & Walsh, 2013), and very few other programs gather data once teachers move into the classroom. According to a study by Greenberg et al., (2013), schools "have become an industry of mediocrity, churning out first-year teachers with classroom management skills and content knowledge inadequate to thrive in classrooms with ever-increasing ethnic and socioeconomic student diversity" (p. 1). The study consisted of overall ratings based on a set of key standards for 608 institutions which was a product of 8 years of development and 10 pilot studies. In the study, less than 10% of rated programs earned three or more stars: four programs, all secondary, earned four stars; and only one institution earned more than three stars for both an elementary (3 1/2 stars) and secondary (4 stars) program. Another concern mentioned in the study was the ease to which candidates were admitted into a teacher preparation program. The study showed that just over a quarter of programs restrict admission to students in the top half of their class compared with the highest performing countries, which limit entry to the top third (Greenberg et al., 2013). North Carolina began seeing a decline in its teaching population in 2009-2010 due to the impact of the Great Recession (SAS, 2016). This led to the acceptance of more teachers certified through alternative programs.

The use of mentor programs is another way many districts try to improve the effectiveness of teachers. Of the 29 states that require some type of support for new teachers, half (15 states) require support in teachers' first and second years. Twenty-one states still have no requirement for support for all new teachers. North Carolina has a Beginning Teacher Induction Program that provides a system of support for teachers in their first 3 years of service (North Carolina Public Schools, 2016b). The induction program in the targeted district is STAY (Supporting Teachers All Year). Induction programs are very important to novice teachers who are acclimating to the classroom; the school; and in some instances, the state. A 2015 federal analysis found that beginning teachers who were assigned a first-year mentor were significantly more likely to remain in the profession than those who were not assigned a first-year mentor (Goldrick, 2016). A critical factor in assisting new teachers is the quality of the mentor; however, when mentors do not have the time or training to help new teachers, those beginning educators do not have the support they need (Goldrick, 2016). Research completed by the New Teacher Center (NTC) suggests that comprehensive, multi-year induction programs reduce the rate of new teacher attrition, accelerate the professional growth of new teachers, provide a positive return on investment, and improve student learning. Informed by more than 2 decades of work with hundreds of school districts and states, NTC has found that a comprehensive and systemic approach to teacher induction is essential. NTC also found that few states have comprehensive policies to require high-quality induction for beginning teachers. Only three states meet NTC's most important criteria for a high-quality system of new teacher support.

DuFour, Dufour, and Eaker (2008) stated, "The use of professional learning communities (PLC) is the best, least expensive, most professionally rewarding way to

improve schools" (p. 67). Professional learning communities (PLCs) are other avenues schools use to improve teacher capacity and effectiveness.

According to DuFour et al. (2008), PLCs empower teachers to make key decisions that impact the school's operating procedures. As school districts become increasingly accountable for the success of all students, teachers will be expected to take more ownership of their teaching capacity as well as student learning capacity. Taking ownership of teaching and learning capacity will require teachers to use research-based strategies that ensure success for all students (Marzano, 2009, 2010; Marzano & Kendall, 1996).

The school district represented in the study implements PLCs as a way to increase teaching and learning capacity within the school environment. Most schools require that teachers meet 45-90 minutes a week with their grade level or team in Professional Learning Team (PLTs) meetings.

Earning an advanced degree, any degree beyond a bachelor, has also been looked at as a way to improve teacher effectiveness. Many teachers start their teaching careers with a master's degree and many more obtain a master's degree once they have entered the profession as a way to invest in the knowledge and skills that might improve their teaching (Ladd & Sorensen, 2015). Many empirical papers have explored the relationship between having a master's degree and higher student outcomes and demonstrate that teachers with master's degrees are no more likely to raise student test scores than those without master's degrees when all other factors are held constant (Ladd & Sorensen, 2015).

North Carolina legislature recently eliminated the 10% salary increase for a master's degree partly with reference to prior studies that showed no link between having

a master's degree and student test scores. The majority of the existing studies focus on teachers at the elementary level where master's degrees could potentially be less useful than at the higher levels (Ladd & Sorensen, 2015). Clofelter et al. (2007) studied the effect of teacher credentialing on student achievement using data on 75% of all children in North Carolina in Grades 3, 4, and 5 from 1994 to 2003. Their results showed that having a graduate degree has little effect on student achievement. The study further showed that teachers who started teaching with a master's degree, or who earned it within 5 years of beginning to teach, were as effective as teachers without a master's degree. They also found that teachers who earned a master's degree more than 5 years after they started teaching were less effective than those without master's degrees (Clotfelter et al., 2007).

Professional development is another avenue used to improve teacher effectiveness. Legislation can mandate that teacher qualifications meet specific standards; however, it cannot compel highly qualified and highly capable individuals to apply for teaching positions.

In recent years, teacher professional development has been criticized. Many reports (TNTP, 2015; Yoon, Duncan, Lee, Scarloss, & Shapley, 2007) noted a huge mismatch between enormous sums of money spent on such programs and the limited evidence of effectiveness in the investments (TNTP, 2015; Yoon et al., 2007). There are several studies that support the argument that, on average, after the first several years in the classroom, teachers do not improve. Performance plateau has been characterized as a fact in the research literature (Rice, 2013); and the idea has profoundly affected education policy (Rice, 2013). For example, a 2012 fact sheet by TNTP reported that teachers progressively reach a plateau after teaching 3-5 years (Papay & Kraft, 2016, p.

36). Along the same vein, Bill Gates asserted in 2009 that "once a teacher has taught for three years, their teaching quality does not change thereafter" (Papay & Kraft, 2016, p. 37). Teachers improve most rapidly in their first few years on the job which is common with nearly all professions.

> When teachers recognize that knowledge for improvement is something they can generate, rather than something that must be handed to them by so-called experts, they are on a new professional trajectory. They are on their way to building a true profession of teaching, a profession in which members take responsibility for steady and lasting improvement. They are building a new culture of teaching. (Hiebert & Stigler, 2004, p. 14)

This new professional trajectory starts with a recognition that identifying and cultivating the talent that already resides within schools is a must (Hiebert & Stigler, 2004). All researchers agree that the impact of decisions made by individual teachers is far greater than the impact of decisions made at the school level (Marzano, 2003). As documented by Berry (2008), over 1,700 highly accomplished teachers crafted a number of policy recommendations to improve teaching and learning based on research evidence and their experience; however, it is believed that too few policymakers and local education leaders understand what accomplished teachers (including NBCTs) know and can do in determining appropriate instructional strategies and in shaping policies and programs that will successfully recruit and retain good teachers for our most challenging teaching and learning environments (Berry, 2008).

Another way to enhance teacher effectiveness is to participate in the National Board certification process. Nationally, 9.3% of public school teachers leave before they

complete their first year, and nearly 30% leave the profession within 5 years of entry (Division of Teacher Education and Licensure, 2000). According to the Center for Teaching Quality (2008), one of the best strategies for high-needs schools may be to support current staff members to become National Board certified. Research shows that teachers who achieve board certification stay in the profession longer.

The National Board was established to help professionalize the field of teaching and provide an accepted definition of *accomplished* teaching as well as recognize teachers who do their jobs exceptionally well. The National Board partnered with master teachers and education experts to develop standards across subjects and grade levels to distinguish accomplished teaching*; defined* as "what teachers should know and be able to do" as it relates to the five core propositions:

1. Teachers are committed to students and their learning.
2. Teachers know the subjects they teach and how to teach those subjects to students.
3. Teachers are responsible for managing and monitoring student learning.
4. Teachers think systematically about their practice and learn from experience.
5. Teachers are members of Learning Communities.

According to Belson and Husted (2015), since its inception, states have invested in providing experienced teachers with professional development by supporting their work toward certification through the National Board for Professional Teaching Standards (NBPTS) program. The researchers further stated that "these teachers and stakeholders involved in K12 education operate on the expectation that board certification improves student achievement" (Belson & Husted, 2015, p. 2).

The National Board currently offers 25 different certificates in board certification

which consist of four components that combined assess a teacher's entire practice: content knowledge, differentiation in instruction, teaching practice and learning environment, and effective and reflective practitioner (Exstrom, 2015, p. 4). Each certificate has a set of standards for which candidates receive scores. Recent research brings new evidence to the mandate for making board certification the norm in teaching, as it is in other professions from medicine to engineering (Berry, 2008). Teaching experience is perhaps the only characteristic that has consistently been found related to teacher effectiveness; however, board certification appears to be among the teacher credentials most consistently associated with student learning gains (Cowan & Goldhaber, 2015). In a recent PDK/Gallup Poll, 81% of Americans across the political spectrum believed teachers should achieve board certification beyond licensure, as it is in other professions (Bushaw & Calderon, 2014).

This study compared NBCTs' impact on student growth in reading to non-NBCTs to scrutinize the National Board certification process as a mechanism for identifying effective teachers and utilizing the process as a means of professional development.

The following research questions regarding a relationship between NBCTs and student academic growth guided this study.

1. What is the impact of NBCTs in comparison to non-NBCTS on third- through fifth-grade student reading growth?
2. Which strategies contained in the five core propositions are the most effective on student achievement as perceived by NBCTs in comparison to non-NBCTs?

Significance

The findings from this study could add to the body of knowledge on strategies that impact the effectiveness of teachers. Results of this study could add to the body of research documenting that the most important factor affecting student leaning is the teacher. Further research into the effects of NBCTs on student achievement may help determine if the NBPTS identifying quality teachers.

It has become broadly recognized that quality teachers are the key ingredients to a successful school and to improved student achievement. Standard policies, however, do not ensure that quality teachers are recruited or retained in the profession (Hanushek, 2010). Based on a recent survey of the ERIC database, approximately 90% of the researchers in the field of teacher quality research and policy in the last couple of decades have cited information that can be viewed as theoretical statements about what makes for effective teaching; however, there continues to be no magic bullet or wand for recruiting or identifying an effective teacher. Hanushek (2010) stated,

> It is extremely disturbing to realize that student achievement in the United States currently ranks below average among the developed countries of the world, as revealed by regular testing of student achievement in math and science across a large number of countries. (p. 88)

Context of Study

The study was conducted in an urban school district located in the northwest region of North Carolina. It is the fourth largest system in North Carolina and the 81st largest in the nation. The school district has 43 elementary schools, 14 middle schools, 15 high schools, and nine nontraditional schools for a system-wide total of 81 schools. At

the start of this research study, the school district had an enrollment of approximately 54,000 students: 25,126 elementary students; 11,203 middle school students; 15,789 high school students; and 1,828 enrolled in nontraditional schools. The ethnic makeup of the school district was 40.2% White, 28.5% African-American, 24.5% Hispanic, 4.0% multiracial, 2.5% Asian, and less than 1% American Indian or Native Hawaiian/ Pacific. There were also 7,000 employees, including 4,000 classroom and part-time teachers.

Summary

Extensive research has led to the conclusion that student achievement is directly related to the quality of teachers delivering instruction. As long as there are failing and underperforming schools, there will be a need to seek more effective ways to ensure that schools are recruiting, hiring, and retaining highly effective teachers. In the age of accountability based on student achievement that is directly tied to teacher effectiveness, stakeholders want, need, and even demand to know what school systems are doing to improve student achievement.

Operational Definitions

The following terms have been defined for the purpose of this study.

NBCT. Teachers who have successfully gone through the National Board process and achieved National Board certification (NBPTS, 2016c).

National Board candidate. Teacher who is pursuing National Board certification (NBPTS, 2016c).

Effective. A teacher who receives a rating of at least "proficient" on each of the Teacher Evaluation Standards 1-5 and receives a rating of at least "meets expected growth" on Standard 6 of the Teacher Evaluation Instrument (Public Schools of North

Carolina, 2016a).

EVAAS. An educational resource that uses test scores from a variety of assessments that follows individual students over time to provide reflective value-added reports to assess the effectiveness of districts, schools, and teachers and proactive projection reports on individual student future performance.

Growth. Defined as what a student learned over 1 year: Standard is approximately 1 year of growth to 1 year of instruction (Public Schools of North Carolina, 2016a).

Highly effective. A teacher who receives a rating of at least "accomplished" on each of the Teacher Evaluation Standards 1-5 and receives a rating of "exceeds expected growth" on Standard 6 of the Teacher Evaluation Instrument (Public Schools of North Carolina, 2016a).

Annual measurable objectives. Unique targets in reading and mathematics for each subgroup, school, and district (North Carolina Public Schools, 2016a).

Adequate yearly progress. The measure by which schools, districts, and states were held accountable for student performance under Title I of NCLB used to determine if schools are successfully educating their students (North Carolina Public Schools, 2016a).

Master teacher. A teacher who has mastered the basics of teaching, goes above and beyond to ensure a positive learning experience for each student, and shares his or her knowledge with the broader learning community (Study.com, 2016).

Limitations and Delimitations

While the results of this study could potentially impact educators across many schools, districts, and states, this study was restricted to a large urban school district in

North Carolina.

Another limitation was participant level of involvement. All data were collected through the accountability department. The participants consisted of 50 NBCTs and 50 non-NBCTs of Grades 3-5 in 27 elementary schools.

A delimitation of the study is the lack of focus on social economic status and race of the participants. Another delimitation of the study is the purposeful selection of schools with three or more NBCTs; and because the researcher is in the NBCT family, some of the NBCTs may be known to the researcher.

Chapter 2: Literature Review

Introduction

The purpose of this study was to determine to what degree a relationship exists between NBCTs and the reading achievement of students in elementary school as compared to teachers who do not have National Board certification. The literature review includes an historic review of National Board certification, NBPTS, and the five core propositions. A Nation Prepared outlined a plan of action, including the establishment of a NBPTS. The board was to consist primarily of teachers but would include others from state and local education agencies as well as from businesses and higher education.

National Board certification was established in 1987 to define and recognize accomplished teaching practices and competencies and to advance teachers' commitment to student achievement (Brookins, 2016). According to Belson and Husted (2015), since its inception, states have invested in providing experienced teachers with professional development by supporting their work toward certification through the NBPTS program. The researchers further stated that "these teachers and stakeholders involved in K12 education operate on the expectation that board certification improves student achievement" (Belson & Husted, 2015, p. 2). Before the development of NBPTS, there had been no demand from policymakers or the public for the creation of a cadre of master teachers (Hunzicker, 2011).

To be eligible for National Board certification, teachers must have at least a bachelor's degree, 3 years of teaching experience, and a valid teaching license. Relative to the general teacher population, the teachers who apply for National Board certification are younger, have slightly fewer years of teaching experience (even with the minimum of 3 years of experience required to enter the program), and are more likely to have master's

degrees. Prior to revisions made by NBPTS in 2013, candidates were assessed through three classroom-based portfolio entries which included two sample videos and one portfolio entry to document "accomplishments outside of the classroom" (NBPTS, 2016c). In addition, candidates were to complete six standardized, computer-based exercises covering content knowledge in their specific licensure areas (e.g., elementary education or secondary English education). Starting at the eighth but prior to the tenth year, NBCTs can attempt to renew the 10-year certification. Approximately nine of 10 NBCTs successfully renew their certificates (NBPTS, 2016c), which may signify that most teachers who engage in the certification process value the professional growth.

Each certificate has its own set of standards that are all based on the five core propositions of *What Teachers Should Know and Be Able to Do.*

Table 1

NBPTS Certification Areas/Levels

Subject Area	Developmental Levels
Art	•Early Adolescence – Young Adult • Early and Middle Childhood
Career & Technical Education	• Early Adolescence – Young Adult
English as a New Language	• Early Adolescence – Young Adult • Early and Middle Childhood
English Language Arts	• Early Adolescence • Adolescence – Young Adult
Exceptional Needs	• Early Childhood – Young Adult
Generalist	• Early Childhood • Middle Childhood • Early Adolescence
Health Education	• Early Adolescence – Young Adult
Library Media	• Early Adolescence – Young Adult
Literacy: Reading – Language Arts	• Early and Middle Childhood
Mathematics	• Early Adolescence • Adolescence and Young Adult
Music	• Early and Middle Childhood • Early Adolescence – Young Adult
Physical Education	• Early and Middle Childhood • Early Adolescence – Young Adult School
School Counseling	• Early Childhood – Young Adult
Science	• Early Adolescence • Adolescence – Young Adult
Social Studies – History	• Early Adolescence • Adolescence – Young Adult
World Languages Other than English	• Early Adolescence – Young Adult

The NBPTS program and its framework promote a process of teacher professional development and teacher recognition centered around the five propositions which are the foundation of the NBPTS certification, with the first four propositions linked to the improvement of student learning and/or assessments while the fifth proposition relates to PLCs (NBPTS, 2016d). As an example, the portfolio for Middle Childhood Generalist (MC Generalist), which encompasses children ages 7-12, has four components addressing the nine standards for MC Generalist: Component 1, Content Knowledge; Component 2, Differentiation in Instruction; Component 3, Teaching Practice and Learning Environment; and Component 4, Effective and Reflective Practitioner. Using videotape, examples of student work, and artifacts representing professional accomplishments, teachers address questions in each section of the portfolio while constructing a presentation of their best practice. The final product serves as evidence demonstrating the teacher's impact upon classroom academic environment, student learning, and the school community.

There was early excitement that National Board certification was a solution for meeting the highly qualified mandates of NCLB. Many districts across North Carolina created local support networks to encourage more teachers to become National Board certified, such as the NBCT Support Network in the targeted district. With the support systems, a total of 1,826 teachers achieved National Board certification in 2014-2015, including 233 in North Carolina; a total of 20,677 had National Board certification in the United States in 2015 (NBPTS, 2016b).

Research by Cowen and Goldhaber (2015) showed that teachers who achieve board certification on their first attempt produce more than a month of additional learning gains compared to those teachers who pursue but never achieve board certification. The

study further revealed that the score a teacher receives on the assessment, in addition to whether or not a teacher achieves certification, is predictive of gains in student achievement (Cowen & Goldhaber, 2015). Two independent studies recently released in 2014 and 2015 provided new evidence that, on average, the students of NBCTs learn more than students in other classrooms. The first study conducted by Cowen and Goldhaber included students in Grades 4-8 using state standardized tests in math and reading. The study estimated that students of board certified teachers gained the equivalent of nearly one-and-a-half months of additional learning in middle school math classrooms and approximately one to two additional weeks of learning in elementary school and in middle school reading classrooms (Cowen & Goldhaber, 2015). The second study conducted by Cavalluzzo, Barrow, and Henderson (2014) built upon more than a decade of research that has established similar student achievement gains due to being taught by board certified teachers.

One of the goals of the Strategic Data Project (SDP), which currently partners with over 35 states and school districts, including two in North Carolina, was to design a human capital diagnostic report to demonstrate how districts can capitalize on existing data to better inform decision making. As part of the project, a study was conducted with NBCTs and non-NBCTs in Grades 3-5 for the years of 2006-2007 to 2010-2011. The findings included,

> on average, NBCTs outperform other teachers with the same levels of experience by 0.07 and 0.03 standard deviations in elementary math and ELA respectively, roughly equivalent to two months of additional math instruction and one month of additional ELA instruction. (SDP, 2012, p. 12).

Clotfelter, Ladd, Vigdor, and Wheeler (2006) used teacher and student data from

North Carolina elementary schools between 1994 and 2004 to study the relationship between NBCTs and student performance on state reading and math tests. They found NBCTs to be more effective than non-NBCTs. Clotfelter et al. (2007) carried out a similar study on North Carolina fifth graders who took exams between 1999 and 2000 and estimated a positive relationship between NBCTs and reading assessments but not in math. Goldhaber and Anthony (2007) examined teachers and students in North Carolina elementary schools between 1996 and 1999 and also found a positive impact of NBCTs on student performance in reading but not math.

Conceptual Framework

The combination of knowledge, skills, dispositions, and beliefs that characterize NBCTs and accomplished teaching is clustered under the five core propositions outlined below and is the conceptual framework within which this study was grounded.

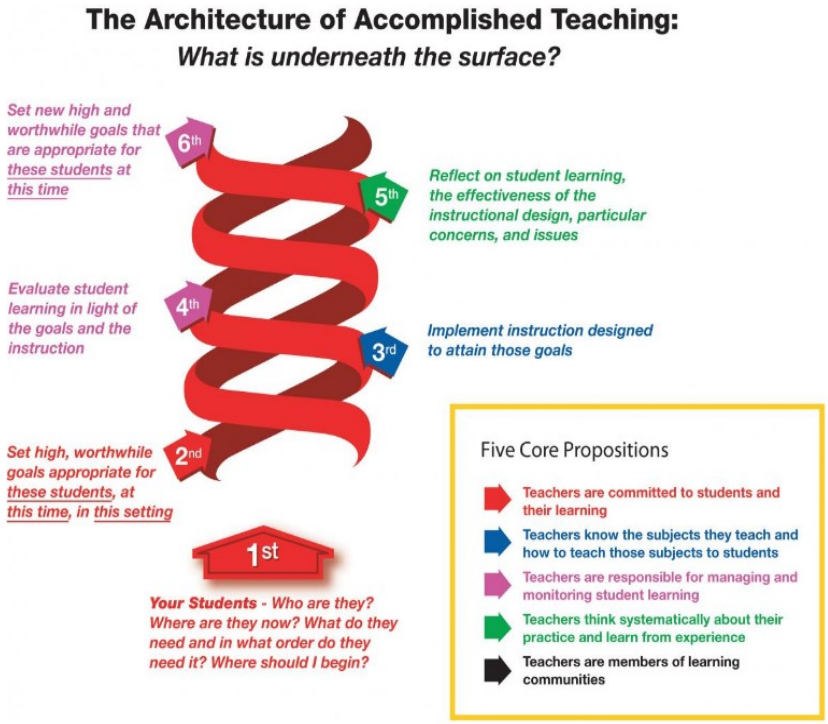

Figure 3. The Architecture of Accomplished Teaching (NBPTS, 2016c).

Synthesis of Findings

The NBPTS program and its framework promote a process of teacher professional development and teacher recognition centered around the five propositions which are the foundation of the NBPTS certification, with the first four propositions linked to the improvement of student learning and/or assessments while the fifth proposition relates to PLCs (NBPTS, 2016d). Hunzicker (2008) described learning leverage as "uncomfortable yet positive pressure experienced by National Board candidates that usually results in substantial teacher learning and is characterized by the interactive dynamics of risk, rigor, and reward" (p. 201). Griffin (2006) surveyed 277 Alabama principals concerning the effectiveness of NBCTs in comparison to non-NBCTs relative to the five core propositions: commitment to student learning, knowledge of subject matter and how to teach it, management and assessment of student learning, systematic thought about practice, and membership in learning communities. According to the principals, NBCTs significantly excelled on every measure. Coskie and Place (2007) suggested that the National Board process is a significant learning opportunity that can positively impact teacher practice over time.

Proposition 1. A recent study examining student-teacher relationships throughout elementary school (first through fifth grade) found that teacher-student closeness linked to gains in reading achievement, while teacher-student conflict related to lower levels of reading achievement (McCormick & O'Connor, 2014). Positive teacher-student relationships, demonstrated by teacher reports of low conflict, a great deal of closeness and support, and little dependency have been shown to support student adjustment to school, contribute to their social skills, promote academic performance, and nurture student resiliency in academic performance (Battistich, Schaps, & Wilson, 2004;

Birch & Ladd, 1997; Curby, Rimm-Kaufman, & Ponitz, 2009; Ewing & Taylor, 2009; Hamre & Pianta, 2001; Rudasill, Reio, Stipanovic, & Taylor, 2010).

Proposition 1 centers around the teacher student relationship:

> Accomplished teachers are dedicated to making knowledge accessible to all students. They act on the belief that all students can learn. They treat students equitably, recognizing the individual differences that distinguish one student from another and taking account of these differences in their practice. They adjust their practice based on observation and knowledge of their students' interests, abilities, skills, knowledge, family circumstances and peer relationships. Accomplished teachers understand how students develop and learn. They incorporate the prevailing theories of cognition and intelligence in their practice. They are aware of the influence of context and culture on behavior. They develop students' cognitive capacity and their respect for learning. Equally important, they foster students' self-esteem, motivation, character, civic responsibility and their respect for individual, cultural, religious and racial differences. (NBPTS, 2016d, p. 3)

Ichijo, Nonaka, and Von Krogh (2000) emphasized that a culture of care is vital for successful performance. They defined a culture of care in five dimensions: mutual trust, active empathy, access to help, lenience in judgment, and courage (Ichijo et al., 2000). According to Roeser, Midgley, and Urdan (1996), students who reported more positive teacher-student relationships also reported greater feelings of belonging and thus felt more academically efficient and less self-conscious. In the same manner, Koplow (2002) suggested that effective student-teacher relationships encourage greater confidence and classroom engagement much like a sensitive parent encourages a greater security and confidence. Strahan and Layell (2006) noted the importance of "establishing

a learner-centered environment that featured warm, supportive relationships with students" (p. 153). McEwan (2002) affirmed the belief by stating "Effective teachers appear to be those who are human in the fullest sense of the word" (p. 30). McEwan further stated that "their classrooms seem to reflect miniature enterprise operations in the sense that they are more open, spontaneous, and adaptable to change" (p. 30).

Marzano (2003) presented the results of several meta-analyses centered on teacher effectiveness. The initial results indicated four general components of importance including rules and procedures, disciplinary interventions, mental set, and teacher-student relationships. Although the latter was not the highest in terms of effect size (-.869), it is suggested to be "the keystone for the other factors" (Marzano, Marzano, & Pickering, 2003, p. 41).

Lee (2007) found that the trust developed between the student and the teacher can contribute to student academic performance. Noddings (1988 & 1992) shared that students make learning a higher priority and thus work harder for teachers they care about and perceive as also valuing their learning. Diener, King, and Lyubomirsky (2005) noted, "numerous successful outcomes, as well as behaviors paralleling success" (p. 803); the authors argued that the happiness-success link exists not only because success makes people happy but also because positive affect produces success. Three classes of evidence—cross-sectional, longitudinal, and experimental—were documented to test their model (Diener et al., 2005). Birch and Ladd (1997 & 1998) reported that the student-teacher relationship can influence students' future paths toward academic success and was positively linked with children's academic performance. Lastly, Miller (2000) found that the student-teacher relationship plays an important role in helping reduce the chances of future bad outcomes (i.e., dropping out of school). With this in mind, it is no

surprise that supportive teachers are often found in schools of high achievement. Salinis and Murray-Harvey (1995) reported students who indicated high feelings of adequacy in their interactions with their teachers in academically successful schools; and Hughes (1999) found "teachers who identify and address individual student needs" in high-achieving, rural, high-poverty elementary schools (p. 56).

Boals, Tyree, and Baker (1990) noted the importance of establishing high expectations when working with students of poverty. Jacobson (2000) found that the first step in creating environments with high expectations was getting to know each student, thus allowing the teacher a better chance of developing a positive rapport that can in turn facilitate and support the student's learning.

Extensive research has demonstrated the importance of teacher quality. Years of research on teacher quality support the fact that effective teachers not only make students feel good about school and learning, but their work also actually results in increased student achievement (Tucker & Stronge, 2005). Schmoker (2006) quoted numerous studies that Marzano (2003) highlighted demonstrating that two teachers working with the same socioeconomic population can achieve starkly different results on the same test: In one class, 27% will pass; in another, 72%, which could be a life-changing difference (Marzano et al., 2001).

Teachers who experience close relationships with students reported that their students were less likely to avoid school and appeared more self-directed, more cooperative, and more engaged in learning (Birch & Ladd, 1997; Decker, Dona, & Christenson, 2007; Klem & Connell, 2004). Teachers who use more learner-centered practices (i.e., practices that show sensitivity to individual differences among students; include students in the decision making; and acknowledge student developmental,

personal, and relational needs) produced greater motivation in their students than those who used fewer of such practices (Daniels & Perry, 2003). Allensworth, Bryk, Easton, Luppescu, and Sebring (2006) summed it up by stating, "The dynamic interaction of caring and high expectations leads to greater engagement in the learning process and to higher achievement" (p. 13). Notably, U.S. students rank near the bottom of students around the world in their attitudes toward reading, suggesting that generating motivation is a formidable and challenging task in U.S. schools (Duke & Block, 2012).

Proposition 2.

> Teachers know the subjects they teach and how to teach those subjects to students. Accomplished teachers have a rich understanding of the subject(s) they teach and appreciate how knowledge in their subject is created, organized, linked to other disciplines and applied to real-world settings. While faithfully representing the collective wisdom of our culture and upholding the value of disciplinary knowledge, they also develop the critical and analytical capacities of their students. Accomplished teachers command specialized knowledge of how to convey and reveal subject matter to students. They are aware of the preconceptions and background knowledge that students typically bring to each subject and of strategies and instructional materials that can be of assistance. They understand where difficulties are likely to arise and modify their practice accordingly. Their instructional repertoire allows them to create multiple paths to the subjects they teach, and they are adept at teaching students how to pose and solve their own problems. (NBPTS, 2016d, p. 3)

For the purpose of this study, the focus was on the content of reading. Barzun (1991) ascertained that "No subject of study is more important than reading and that all

other intellectual powers depend on it" (p. 21); however, results from the 2011 NAEP indicate that just 34% of both fourth graders and eighth graders are reading at or above a proficient level (NCES, 2012). According to the NAEP 2015 data, those numbers have remained relatively unchanged to date (U.S. Department of Education, 2016). Reading is not only a basic ability of the civilized world, but it is also a necessary ability. Many researchers including Huang, Tsai, and Hung (2015) concluded that it is only with the ability to read that humans can take in the understanding needed in a vast ocean of knowledge.

Knowing the importance and having concerns about reading, in 1995, the U.S. Departments of Education and Health and Human Services commissioned the National Research Council (NRC) to study the prevention of reading difficulties. A group of various respected experts in reading and related areas formed a committee that investigated various aspects of the problem and, in 1998, a report was issued: Preventing Reading Difficulties in Young Children (Duke & Block, 2012). The report was designed to translate research into advice and guidelines about what could be done in preschool through Grade 3 to better position students for reading success in later schooling (Duke & Block, 2012).

Huang et al. (2015) posited that reading ability is one of the most crucial factors in the learning process, for it is the basis where all learning starts and that the ability to read affects not only schoolchildren's study but also overall national competitiveness. It is definitely a link that should never be neglected in elementary education and national development (Huang et al., 2015).

Recognizing the need for additional research investment in reading comprehension, the Office of Educational Research and Improvement (OERI) in the

Department of Education created a grant competition in 2002 intended to

> expand scientific knowledge of how students develop proficient levels of reading comprehension, how reading comprehension can be taught most optimally, and how reading comprehension can be assessed in ways that reflect as well as advance our current understanding of reading comprehension and its development. (Douglas & Albro, 2014, p. 3)

Douglas and Albro (2014) shared that decades of reading research (National Reading Panel, 2000; Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2001; Snow, Burns, & Griffin, 1998) have improved our understanding of the ways young children learn how to read and of the component skills that support the ongoing development of reading and reading comprehension. In 2009, when the Institute's request for applications for the Reading for Understanding Research Initiative was released, the latest data from NAEP showed that one of three fourth graders and one of four eighth graders were not able to read at the basic level. Douglas and Albro (2014) concluded that "though the investments in reading research have changed reading instruction and reading outcomes for many learners, there are still too many children who are not reading at the basic level or reading with understanding" (p. 2). This is explained as, when reading grade-appropriate material, these students did not understand what they read (Douglas & Albro, 2014). Ongoing investment in reading research is needed and the data support a persistent and urgent need to increase the number of students who read for understanding (Douglas & Albro, 2014).

Huang et al. (2015) reported that reading is the most essential means to seek knowledge and that student reading performance is an important indicator of school effectiveness. They further suggested that reading is an important basis and

indispensable tool, where fluency of reading determines whether students can successfully learn during school education (Huang et al., 2015).

More than 18 years have passed since the publication of NRC's seminal report, Preventing Reading Difficulties in Young Children, which provided research-based recommendations on what could be done to help prepare students in prekindergarten through third grade for success in Grades 4 and above (Duke & Block, 2012). In spite of the report's recommendations, vocabulary knowledge, comprehension strategy use, and conceptual and content knowledge were still being neglected resulting in near stagnation in fourth-grade students' comprehension achievement (Duke & Block, 2012), indicating that teachers still do not know how to successfully teach reading. The Institute of Education Sciences created the Reading for Understanding Research Initiative in 2010 to fund a set of connected projects that would enrich the theoretical frameworks that undergird efforts to improve deep comprehension and to design and test new interventions and assessments to improve reading for understanding across all grades in U.S. schools (Douglas & Albro, 2014). Accumulating evidence (Gamse, Jacob, Horst, Boulay, & Unlu, 2008; Lemons, Fuchs, Gilbert, & Fuchs, 2014) suggests that research knowledge about how to support learning to read has changed a lot of reading instruction and supported the acquisition of foundational reading skills for many students (Douglas & Albro, 2014).

While the failure to build conceptual and content knowledge in the primary grades may not affect reading development in the short term, given the role of background knowledge in reading and the demands of tasks such as the questions presented in NAEP assessments, the long-term results of this failure may be substantial (Duke & Block, 2012).

Duke and Block (2012) identified three key obstacles that have prevented widespread adoption of best practices in teaching reading: (a) a short-term orientation toward instruction and instructional reform perpetuates a focus on the easier-to-learn reading skills at the expense of vocabulary, conceptual and content knowledge, and reading comprehension strategies; (b) a lack of expertise among many educators around how to effectively teach the harder-to-master reading skills; and (c) limited time available in the school day and year to meet unparalleled expectations for learning. They surmised that the challenge is to prepare and develop more teachers who are skilled at improving vocabulary, conceptual and content knowledge, and comprehension in students. Included in Proposition 2 is the statement that "Literacy, a foundational component of learning across content domains, is instrumental to comprehending subject matter and connecting one discipline to another" (NBPTS, 2016d, p. 19). According to Duke and Block (2012), policymakers should focus more on the challenge of increasing comprehending subject matter. The researchers suggest starting with decreasing the emphasis on adopting a core reading program as the major way to improve primary grade reading. They further concluded that teachers make more of a difference than programs in developing reading comprehension (Duke & Block, 2012).

Reading as a skill permeates all the areas of curriculum. It is an inherent part of language learning as well. Teachers are the prime source for students to cultivate the reading habit. They can execute this task only when they have the competence to play their role effectively (Jose & Raja, 2011). According to Sibberson and Szymusiak (2016), teachers in upper elementary grades face realistic fears about teaching reading. The authors continue by stating that many teachers received relatively little training on how to teach reading (Sibberson & Szymusiak, 2016). The implication that in

upper elementary levels, teachers do not spend time teaching children how to read has been added to by the public's continued belief that in k-2, students learn to read and in Grades 3-6 students read to learn. Much research has now shown that for all children, learning to read and reading to learn should be happening simultaneously and continuously (Sibberson & Szymusiak, 2016). Proposition 2 includes the statement "accomplished teachers believe that the acquisition of knowledge . . . represents a distinctly intellectual undertaking – a rich, demanding creative process calling in the strategic coordination of skills, abilities and dispositions to develop a deeper, more discerning matrix of understanding" (NBPTS, 2016d, p. 22). Huang et al. (2015) completed a study adopted by the analytic hierarchy process (AHP) to discuss the relevant factors in promoting reading activities in elementary schools as well as how the reading activities should be pushed forward to increase student interest in reading and help them form good reading habits. The results showed that there are three key success factors in promoting reading activities: (a) teacher emphasis on and implementation of reading activities, (b) the reading habits of parents and other family members, and (c) teacher professional knowledge and skills in guiding the students to read (Huang et al., 2015). The three success factors are referenced throughout the five core propositions and directly in Proposition 2: Teachers know the subjects they teach and how to teach those subjects to students.

Proposition 3.

Teachers are responsible for managing and monitoring student learning. Accomplished teachers create, enrich, maintain and alter instructional settings to capture and sustain the interest of their students and to make the most effective use of time. They also are adept at engaging students and adults to assist their

> teaching and at enlisting their colleagues' knowledge and expertise to complement their own. Accomplished teachers command a range of generic instructional techniques, know when each is appropriate and can implement them as needed. They are as aware of ineffectual or damaging practice as they are devoted to elegant practice. They know how to engage groups of students to ensure a disciplined learning environment, and how to organize instruction to allow the schools' goals for students to be met. They are adept at setting norms for social interaction among students and between students and teachers. They understand how to motivate students to learn and how to maintain their interest even in the face of temporary failure. Accomplished teachers can assess the progress of individual students as well as that of the class as a whole. They employ multiple methods for measuring student growth and understanding and can clearly explain student performance to parents. (NBPTS, 2016d, pp. 3-4)

Until about 40 years ago, teaching had not been systematically studied in a scientific manner. At the beginning of the 1970s, researchers began to look at the effects of instruction on student learning (Marzano et al., 2001). Researchers at Mid-continent Research for Education and Learning (McREL) analyzed selected research studies on instructional strategies that could be used by teachers in K-12 classrooms using meta-analysis to translate the results of a given study into a unit of measurement referred to as an effect size. An effect size expresses the increase or decrease in achievement in standard deviation units. One of the primary goals of the McREL study was to identify those instructional strategies that have a high probability of enhancing student achievement for all students in all subject areas at all grade levels. The nine categories of instructional strategies that affect student achievement listed by effect size are (a)

identifying similarities and differences (1.61); (b) summarizing and note taking (1.00); (c) reinforcing effort and providing recognition (.80); (d) homework and practice (.77); (e) nonlinguistic representations (.75); (f) cooperative learning (.73); (g) setting objectives and providing feedback (.61); (h) generating and testing hypotheses (.61); and (i) questions, cues, and advance organizers (.59). The nine categories are included in the five core propositions throughout the document *What Teachers Should Know and Be Able to Do*.

There are more than a dozen studies cited by NBPTS (2016a) noting the effectiveness of NBCTs on student achievement. The research was comprised of studies from Cowen and Goldhaber (2015), Cavalluzzo et al. (2014), and SDP (2012). Salvador and Baxter (2010), Goldhaber and Anthony (2007), and Clotfelter et al. (2007) included research from the state of the targeted district (NBPTS, 2016a). Fuller et al. (2006) as quoted in Marchant, Paulson and Shunk (2006) found that state test results exaggerate the annual rate of academic improvement when compared with the federal NAEP results. NAEP is the only nationally representative and continuing assessment of what America's students know and can do in various subject areas. NAEP's two major goals are to compare student achievement in states and other jurisdictions and to track changes in achievement of fourth, eighth, and twelfth graders over time. To accomplish these goals, NAEP selects nationally representative samples of students who participate in either the main NAEP assessment (Grades 4, 7, and 12) or the long-term trend (ages 9, 13, and 17) NAEP assessments. As reported by NAEP, these grades and ages were chosen because they represent critical junctures in academic achievement. NAEP provides results on subject-matter achievement, instructional experiences, and school environment for populations of students (e.g., all fourth-graders) and groups within those

populations. Subject-matter achievement is reported in two ways – scale scores and achievement levels. NAEP scale score results provide a numeric summary of what students know and can do in a particular subject. Achievement levels categorize student achievement as basic, proficient, and advanced using ranges of performance established for each grade. Below basic is reported for this scale but not considered an achievement level. Achievement levels are used to report results in terms of a set of standards for what students should know and be able to do.

Based on survey findings, Plecki, Elfers, St. John, and Finster (2010) found that NBCTs "report that National Board certification had a positive impact on their ability to evaluate individual student needs, use assessments to inform instruction, use multiple instructional strategies and make a difference in student achievement outcomes" (p. 26). Several studies that focused on student results on achievement tests in NBCT and non-NBCT classrooms found that students of NBCTs outperform students of non-NBCTs, with the positive effect more noticeable among minority students (Cavalluzzo, 2004; Goldhaber & Anthony, 2004; Hakel, Koenig, & Elliott, 2008).

Proposition 3 addresses assessments through the statements: "Accomplished teachers evaluate students to determine what they have learned from instruction. . . . Educators use those outcomes to decide if they should review skills within a topic, challenge students with related concept or advance to the next subject" (NBPTS, 2016d, p. 27) and "Accomplished teachers analyze data from standardized examinations, and they design their own assessment tools" (NBPTS, 2016d, p. 28). Providing feedback is included in Strategy 7 – setting objectives and providing feedback (Marzano et al., 2001) with an effect size of .61; and in the document *What Teachers Should Know and Be Able to Do*, in the statement, "By adding to their repertoire of assessment methods and by

monitoring student progress regularly, accomplished teachers provide students, families, caregivers and themselves with constructive feedback" (NBPTS, 2016d, p. 28).

The EOG is the instrument used to measure student growth and achievement at the elementary and middle school levels in the state of North Carolina. Student performance on the EOG assessments is reported in levels ranging from 1 to 5. Students are considered to be at or above grade level if they receive an Achievement Level 3 or above on the assessment and on track to be college-and-career ready if they receive an Achievement Level 4 or above. The EOG tests were the mediums by which student achievement was measured in the target school district at the time of this research study and serve as the framework for the research study. Focusing on literacy is important since effective literacy instruction is critical to the future academic success of children, and it has been shown that one of the most powerful factors in ensuring that success is a knowledgeable teacher.

In light of high stakes testing and high expectations in terms of student learning, educators have made a shift in how students are taught or in the content they teach (Ravitch, 2010). In her critique of high stakes tests for judging student achievement, Tatum (2007) stated, "The key to . . . academic success in school is not inborn ability, but rather effective effort produced in the context of high expectations" (Tung et al., 2015, p. 48).

Proposition 4.

Teachers think systematically about their practice and learn from experience. Accomplished teachers are models of educated persons, exemplifying the virtues they seek to inspire in students -- curiosity, tolerance, honesty, fairness, respect for diversity and appreciation of cultural differences -- and the capacities that are

> prerequisites for intellectual growth: the ability to reason and take multiple perspectives to be creative and take risks, and to adopt an experimental and problem-solving orientation. Accomplished teachers draw on their knowledge of human development, subject matter and instruction, and their understanding of their students to make principled judgments about sound practice. Their decisions are not only grounded in the literature, but also in their experience. They engage in lifelong learning which they seek to encourage in their students. Striving to strengthen their teaching, accomplished teachers critically examine their practice, seek to expand their repertoire, deepen their knowledge, sharpen their judgment and adapt their teaching to new findings, ideas and theories. (NBPTS, 2016d, p. 4)

A common claim made by teachers who have participated in National Board certification centers on the idea of becoming a more reflective practitioner. For the purposes of this study, reflection is defined as "a process by which teachers regularly analyze, evaluate, and strengthen the quality and effectiveness of their work" (Lustick & Sykes, 2006, p. 18). Evidence regarding NBPTS assessments' effect on the reflective nature of a teacher's practice seems to coincide strongly with NBPTS standards for what accomplished teachers should know and be able to do. More specifically, Proposition 4 states that teachers should "think systematically about their practice and learn from experience" (NBPTS, 2016d, p. 16). The proposition elaborates on this point by describing accomplished teachers as individuals who have "a commitment to lifelong professional development" (NBPTS, 2016d, p. 16). NBPTS proposes that the object of a teacher's systematic thinking should pertain to a whole array of practice parameters. From content understanding to collegial sources of teaching "wisdom," the

National Board places a significant emphasis on the teacher who learns to think more deeply and extensively about their practice (Kowalski, Spicer, Jones, & Tocci, 1997).

Coskie and Place (2007) conducted a 2-year qualitative study that followed five elementary teachers through the National Board process. The teachers in the study were Early Childhood or MC Generalist candidates working in elementary classrooms. Year 1 of the study focused on the teachers' journeys through the process from beginning to end. The second year focused on how the National Board process continued to impact teachers' thinking about their practice. During the study, researchers emphasized the teachers' adoption of National Board standards and portfolios as conceptual tools related to literacy instruction. Coskie and Place concluded that the National Board process did impact teacher ideas about literacy instruction and that the influence was sustained into the second year.

Teachers are likely to modify their instruction to bring it into alignment with the schoolwide plans. Without such curriculum alignment to standards, schools run the risk of weakening student learning opportunities and achievement through delays, repetitions, and gaps in core knowledge and skills (Smith, Smith, & Bryk, 1998). Hollandsworth (2006) examined the classroom practices of NBCTs and non-NBCTs in Grades 1 and 2 for differences in their use of 13 best practices as identified by the research of (Zemelman, Daniels, & Hyde, 1998). Hollandsworth asserted that NBCTs are more effective because they know how to put theory into practice (Singleton, 2010). According to Koonlaba (2016), "earning Board certification forced me to think deeply and critically about the decisions I was making with students and my teaching" (p. 1).

Many studies have found that teacher participation in the National Board process supports their professional learning and stimulates changes in their practice. Teachers

note that the process of analyzing their own and their students' work in light of standards enhances their abilities to assess student learning and to evaluate the effects of their own actions, while causing them to adopt new practices that are called for in the standards and assessments (Allensworth et al., 2006).

Tracz, Daughtry, Henderson-Sparks, Newman, and Sienty (2005) interviewed 25 teachers who had completed the NBPTS certification process, using an open-ended interview format. Teachers were asked six questions relating to how the National Board experience affected their instructional practices, with themes emerging including reflection, assessment, and professionalism (Tracz et al., 2005).

Proposition 5.

> Teachers are members of learning communities. Accomplished teachers contribute to the effectiveness of the school by working collaboratively with other professionals on instructional policy, curriculum development and staff development. They can evaluate school progress and the allocation of school resources in light of their understanding of state and local educational objectives. They are knowledgeable about specialized school and community resources that can be engaged for their students' benefit, and are skilled at employing such resources as needed. Accomplished teachers find ways to work collaboratively and creatively with parents, engaging them productively in the work of the school. (NBPTS, 2016d, p. 18)

According to Stigler and Hiebert (2011), improving teaching requires efforts of all players, students, parents, and politicians; but teachers must be the primary driving force behind change. Extensive research literature testifies to the importance of parental involvement as children move into their school years. Schools must find ways to develop

trusting relationships with parents and to work together with them to increase student learning. In more concrete terms, developments must occur along three dimensions: (a) teachers need to be knowledgeable about student culture and the local community and draw on these in their lessons, (b) school staff must reach out to parents and community to engage them in the processes of strengthening student learning, and (c) schools should draw on a network of community organizations to expand services for students and their families (Tung et al., 2015).

Raising student achievement so most students attain high academic standards requires profound changes in teacher capacities— their content knowledge and pedagogical skills and their abilities to work well with others (Allensworth et al., 2006). Research on professional development frequently underscores the importance of teachers working together to improve their collective practice, and over 90% of the nation's teachers report that their colleagues contribute to their teaching effectiveness (Tung et al., 2015). Establishing knowledge sharing practices is as much a route to creating collaborative culture as the organization must frame the giving and receiving of knowledge as a responsibility and must reinforce such sharing through incentives and opportunities to engage in it (Fullan, 2001).

Researchers have identified a number of tools and strategies that contribute to enhanced student learning. These include teaching parenting skills, communicating with parents to reinforce study habits and expectations, finding ways to extend learning at home for students, inviting parents to volunteer at the school, and encouraging parent participation in school decision making.

In order to reflect on their teaching and implement new practices, teachers must come out of the isolation of their classrooms, engage in dialogue with other teachers, and

work together to improve student learning (Allensworth et al., 2006). Professional community refers to close collaborative relationships among teachers, which are focused on student learning and coupled with strong norms governing teacher responsibility for all students. Extensive collaboration fosters sharing of expertise to address the core problems of practice. By engaging in reflective dialogue about teaching and learning, teachers deepen their understanding and expand their instructional repertoire (Allensworth et al., 2006). Students achieve more in mathematics and reading when they attend schools characterized by higher levels of teacher collaboration for school improvement (Goddard, Goddard, & Tschannen-Moran, 2007).

Rosenholtz (1989) argued that isolation was probably the greatest impediment to learning to teach or to improving existing skills because it forced teachers to rely on trial and error and to fall back on their own memories of schooling for models of teaching (Goddard et al., 2007, p. 878). Many studies have reported positive outcomes of collaboration for teachers including improved efficacy (Shachar & Shmuelevitz, 1997), more positive attitudes toward teaching (Brownell, Yeager, Rennells, & Riley, 1997), and higher levels of trust (Tschannen-Moran, 2001). Professional capacity depends greatly on the knowledge, skills, and dispositions of the faculty and staff and their ongoing learning and professional growth (Allensworth et al., 2006).

Research spanning more than 30 years testifies to the power of teacher collaboration. Advocates credit systems theorist Peter Senge's (1990) book with sparking administrators' and reformers' interest in PLCs as drivers of improvement in schools (National Academies of Sciences, Engineering, and Medicine, 2015). Senge defined a "learning organization" as one comprising individuals with a shared vision, a team approach to problem solving, and a disposition toward continual learning through

reflection and discussion (National Academies of Sciences, Engineering, and Medicine, 2015, p. 149). As noted by DuFour et al. (2008), "The use of professional learning communities is the best, least expensive, most professional rewarding way to improve schools" (p. 67).

Developing a collegiality among teachers is one of the specified aims of NBPTS. Proposition 5 states that "teachers are members of learning communities" (NBPTS, 2016d, p. 18). Another stream of evidence around what teachers learn from National Board assessment concerns the input of colleagues and community as a contributing contingency to the richness and quality of teaching and learning (Kowalski et al., 1997). This evidence supports the conclusion of others that National Board teachers represent a legitimate "discourse community" or "community of practice" (Burroughs, Roe, & Hendricks-Lee, 2000) and that these communities can alter teaching (Guskey & Huberman, 1995). This spirit of collegiality is not limited to a strictly local context. Some candidates expressed recognition of a larger community of National Board teachers serving as a vital resource to their practice.

This diverse group of teachers from across the United States has become an integral part of my professional support net (Jenkins, 2000). It would appear that National Board certification has broken through the isolation of more traditional approaches to teaching and infused many candidates with an increased regard for community membership and its role in serving the needs of teachers. The nature of this extended vision of teaching involves several facets. For example, teachers are not only expected to work with other teachers on issues of the immediate classroom but also with parents, community, and school leaders for the purpose of school improvement and education reform (Lustick & Sykes, 2006).

Given the importance of teachers' collective efforts to improve overall student achievement in a school, one component of documenting practice and outcomes should be focused on the work conducted by teacher teams and the contributions teachers make to school-wide improvements in practice through their work in curriculum development, sharing practices and materials, peer coaching and reciprocal observation, and collegial work with students (Darling-Hammond & Ducommun, 2010).

Tracz et al. (2005) asserted that teachers who have undergone the National Board process viewed it as enhancing their participation in the learning community and improving their teaching practice. Plecki et al. (2010) found that a majority of principals responded that NBCTs had a "very positive impact" in their ability to "develop professional relationships with colleagues, assume coaching and mentoring responsibilities, contribute to the quality of the professional community, work with building administrator(s), prioritize how to take on additional duties" (p. 30).

Researchers have carried out basic indirect empirical tests and found mixed evidence for the possibility of spillovers as a result of NBPTS certification. For example, Sun, Penuel, Frank, Gallagher, and Youngs (2013) described how teachers who are not directly receiving the professional development benefit as these practices are diffused throughout the school by the trained teachers. The researchers suggest that the diffusion of tested teaching practices into classrooms of teachers mentored by master teachers may benefit a wider group of students. NBCTs may be called on to serve as model teachers for novice teachers and others who need support in the elements, indicators, and standards of their performance appraisal instruments. For example, North Carolina uses the North Carolina Teacher Evaluation Instrument that includes a 21st century framework of five performance standards. Unlike the previous Teacher Performance Appraisal

Instrument- Revised that the state used prior to 2007, the North Carolina Educator Effectiveness System (NCEES) sets a higher standard of performance for all teachers.

Need for Further Research

The impact that NBCTs have on student achievement is not conclusive, but there are some studies and reports that substantiate positive correlation and thereby validate the esteem that educators attach to this award (Viadero & Honawar, 2008). Other studies on National Board certification and student achievement offer good information and guidance on areas to explore and consider. Closing the achievement gap has been a focus area for many states over the past 15 years. Despite the focus, there is still a substantial gap between the reading achievements of Caucasian students and minority students.

Viadero (2007) indicated that studies are mixed on the impact of NBCTs on student achievement. Viadero and Honawar (2008) also noted that there are more than a dozen studies that have tried to link National Board with student achievement with mixed results. The reports drew on statistics from Florida and North Carolina because both states have long-running data systems in place that use student "identifiers" so researchers can match student test scores to specific teachers and classrooms (Viadero, 2007).

As suggested by Lustick and Sykes (2006), 75% of National Board candidates experience some type of learning through National Board candidacy; however, the study cautions that the learning from National Board candidacy to classroom teaching practice is not yet clear. The studies on student-teacher relationship provide important insight; however, the limitations of these studies also include their inability to explain how these characteristics then affect students. Along the same vein, little has been done to test the prediction that teacher collaboration is associated with increased student achievement.

Based on the research cited in this study, more in-depth research is needed on the student-teacher relationship and teacher collaboration as they relate to the impact on student achievement.

Boyd and Reese (2006) contended that while NBPTS has had favorable influence on institutional change, developing high national standards for teachers, influencing the design of many teacher preparation programs, and helping to gain increased acceptance within the profession and the national teachers' associations for performance assessment and differential certification pay, there are still serious questions about the effects of NBCTs on student achievement and about the cost effectiveness of the process.

Researchers who do concede that National Board teachers might be more effective are still unsure as to the source of that effectiveness. Hakel et al. (2008) examined a large body of current research on National Board and, while acknowledging that students taught by NBCTs make greater gains on achievement tests than students taught by non-NBCTs, stressed that while National Board certification is a signal that a teacher is effective, it is not known whether the process itself makes teachers more effective or if high-quality teachers are attracted to the certification process.

If the National Board certification process changed teachers, student scores should increase. Using the student achievement data from four studies (Clotfelter et al., 2006, 2007; Goldhaber & Anthony, 2007; Harris & Sass, 2006), NRC (2008) made an effort to answer the question as to whether the process indicates or develops accomplished teaching. The studies' results of student achievement change from before, during, and after the National Board certification process indicated some student scores increased, some decreased, and some experienced no change. This indicated that most likely, the process both certifies and develops accomplished teaching. Consequently,

NRC (2008) stated that researchers may need ways other than using student achievement data to link the National Board certification process to changing student learning.

> To understand how teachers influence student learning, more data about teachers' practices and context are needed. Student learning evidence needs to be multifaceted and accompanied by an analysis of the teachers' students and teaching context, integrated into an evaluation of the teachers' practices that can both provide evidence about effectiveness and can focus attention on ways to measure effectiveness. (Darling-Hammond & Ducommun, 2010, p. 8)

Research Questions

1. How does teacher effectiveness based on EVAAS reading data of NBCTs compare to non-NBCTS?
2. Which strategies contained in the five core propositions do NBCTs in comparison to non-NBCTs perceive to be the most effective in contributing to student achievement?

Chapter 3: Methodology

Introduction

The purpose of this study was to determine to what degree a relationship exists between NBCTs and the reading achievement of students in elementary school as compared to teachers who do not have National Board certification. The study utilized a mixed-method design, gathering quantitative data utilizing reading EVAAS data based on EOG scores and qualitative data through focus interviews using open-ended questions to analyze teacher perceptions of the effectiveness of strategies indicated by the five core propositions. The study utilized reading EOG scores at the third, fourth, and fifth-grade levels for which there is a sufficient number of NBCTs for a sample group. This study tested the theory that NBCTs achieve higher academic gains with their students than non-NBCTs. This study also analyzed which of the elements contained in the five core propositions participants perceived to be the most effective in contributing to student achievement compared the perceptions of NBCTs and non-NBCTs.

Published in 1989, *What Teachers Should Know and Be Able to Do* articulated the National Board's five core propositions for teaching. Similar to medicine's Hippocratic Oath, the five core propositions emphasized the accomplished teacher's commitment to advancing student achievement. Together, the five propositions form the basis of all National Board standards and the foundation for National Board certification.

The EOG test reading index scores of identified NBCTs in Grades 3, 4, and 5 were used to obtain data for the study. The aggregate test scores are publicly available on NCDPI's website sorted by school and grade level. The investigation and collection of data focused on the relationship that exists between NBCTs and student reading growth in comparison to non-NBCTs as assessed by EOG tests and EVAAS data. In addition,

focus group interviews were conducted to assess teacher perceptions of which strategies indicated in the five core propositions impact their teaching practices the most.

Participants

The study was conducted in an urban school district located in the Northwest region of North Carolina. It is the fourth largest system in North Carolina and the 81st largest in the nation. The school district has 43 elementary schools, 14 middle schools, 15 high schools, and nine nontraditional schools for a system-wide total of 81 schools. At the start of this research study, the targeted district had an enrollment of approximately 54,000 students: 25,126 elementary, 11,203 middle school students, 15,789 high school students and 1,828 enrolled in nontraditional schools. The ethnic makeup of the target school district was 40.2% White, 28.5% African-American, 24.5% Hispanic, 4.0% multiracial, 2.5% Asian, and less than 1% American Indian or Native Hawaiian/Pacific. There were also 7,000 employees including 4,000 classroom and part-time teachers. The EOG data collection was conducted in the target school district's central office building. Research activities for this study required access to the district's Accountability and Testing Department where archived test data are stored.

The study used archived data compiled from state-mandated EOG assessments for the 2014 and 2015 school year. All students in the State of North Carolina are assessed on the EOG tests yearly as required by General Statute 115C-174.10 as a component of the North Carolina Annual Testing Program and includes reading comprehension and mathematics tests in Grades 3-8 (North Carolina Public Schools, 2016a).

The researcher sought participation from a sample population of 50 NBCTs and 50 non-NBCTs from the targeted school district. Participants must have taught at their

current grade level for the 2014 and 2015 school years. To control for the variable of experience, all teachers in the sample groups had at least 3 years of teaching experience.

The sample size consisted of third-, fourth-, and fifth-grade teachers with and without National Board certification who have EOG test data in reading for the 2014 and 2015 school years. The sample of NBCTs and teachers without National Board certification were identified and confirmed from the total list of teachers in Grades 3, 4, and 5 from the Accountability and Research Department. Of the 541 NBCTs, 51 taught in Grades 3, 4, and 5 during the time covered by the study.

A Teacher Consent Letter (Appendix A) explaining the study and assuring the anonymity of the data collection was emailed or given to the participants and/or their principals. Reading Index scores were collected on students who had a NBCT, and another set of scores were collected from the same grade level students who were not being taught by a NBCT. The sampling method can be described as both convenient and purposeful. Due to the high rate of mobility, data were recorded for only those students in the school year 2014-2015 who were in attendance in October 2016 and who took the EOG in June 2015. Data were collected during January 2017 through March 2017. The study was retrospective in nature needing 2 years of data for each teacher in order to compute the gain score for each teacher.

Instruments

The study consisted of a mixed-methods design gathering both quantitative and qualitative data through the North Carolina EOG reading test which consisted of 44 questions for the school years of 2014 and 2015, and teacher focus interviews consisting of 10 open-ended questions and a ranking scale consisting of 10 elements of effective teaching developed by the researcher (Appendix B). The 10 elements were decided upon

by the researcher through correlating the five core propositions and the five standards of the North Carolina Teacher Evaluation Instrument. The Teacher Evaluation Instrument was designed by McREL at the request of NCDPI and was based on the standards developed by the North Carolina Professional Teaching Standards Commission which was adopted by the SBE in 2007 (Public Schools of North Carolina, 2016b). A chart correlating the two documents was created (Appendix C) by researching the documents Teacher Evaluation: A Resource Guide for NEA Leaders and Staff and What Teachers Should Know and Be Able to Do National Board for Professional Teaching Standards. The 10 strategies were derived from effective strategies that are stressed in the two documents as related to effective teaching and learning.

The North Carolina EOG reading test was selected for this study because the test has been standardized and validated for the population of students who are tested on an annual basis. The EOG test instrument was appropriate for the quantitative design of the research study because of the availability of test data that could be used to answer a portion the research question, support, and validate the purpose of the study. The reading component of the EOG test is aligned with the Common Core State Standards (CCSS) and objectives for reading. For the study years of 2014 and 2015, CCSS were composed of the content objectives taught to all students according to student grade levels.

Validity and Reliability

Different forms of validity are important in different situations. The EOG tests have already gone through rigorous measures to ensure content validity, criterion validity, and construct validity. As a result of the standardized EOG reading tests being used as the instrument, most issues of concern were alleviated as archived data were used from previous administrations of the test. The instrument is a state-supported, endorsed,

and mandated instrument that has undergone all reliability and validity checks. The reliability of the test results depends on the extent to which the tests are consistently administered and the accuracy with which the results are interpreted. Rigorous guidelines are passed down to school districts from the North Carolina Department of Accountability and Testing to which school districts must adhere or face penalties for irregularities in testing procedures.

The EOG tests were assessed for all reliability components referenced earlier. Inter-rater reliability is by definition the fidelity with which test data are collected, analyzed, interpreted, and the purposes for which they are used. The state assessments are approved by the SBE and are made public by NCDPI's Accountability and Testing Department through various websites.

The questionnaire and ranking scale developed by the researcher consists of 10 questions based on the NBPTS five core propositions and the North Carolina Teacher Evaluation tool. To improve content validity, a panel of experts (Appendix D) examined the questionnaire using criteria suggested by Dillman (2007; Appendix E). A committee of NBCTs answered the questions and attested that the questions were valid and questions were asked in a clear manner assessing what was needed to be known.

Procedures

In the attempt to determine if there is a correlation between reading achievement and NBCTs and which of the five core propositions has the greatest impact, data were collected that were appropriate to the research design. Reading EVAAS were based on EOG reading scores for the 2014 and 2015 school year. The North Carolina Testing and Accountability Services Section of NCDPI requires annual assessment in reading and math of all students in Grades 3-8 (North Carolina Public Schools, 2016a).

For the purpose of this study, teacher EVAAS data based on the EOG reading scores of students in Grades 3, 4, and 5 were used to determine if a relationship exists between NBCTs and reading achievement in these grade levels. Student achievement growth is measured by the change in student performance on the North Carolina EOG reading test from the previous year. The Teacher Value Added Report shows the index score and whether the teacher met, did not meet, or exceeded expected growth. Growth was specifically chosen to reflect the teacher contribution for that school year rather than student ability or IQ. The names of all NBCTs who taught in Grades 3, 4, and 5 and had EVAAS data based on EOG reading scores for the 2014 and 2015 school year were supplied by the researcher. Non-NBCT EVAAS data based on the EOG reading scores for Grades 4 and 5 for the 2014 and 2015 school year were supplied by the district with non-identifiers. Teachers were referred to as NBCT 1, non-NBCT 1, etc.

The North Carolina Testing and Accountability Services Section via EVAAS calculates growth for the year. The reading index scores of NBCTs and teachers without National Board certification in Grades 3, 4, and 5 were needed to complete the study. The test data were accessed by the Office of Accountability and Testing within the target school district.

Qualitative data were simultaneously gathered through focus teacher interviews through the use of open-ended questions and an opportunity for teachers to rank the effectiveness of the strategies from 1-10 based on their perceptions. Participants had four opportunities to participate in focus teacher groups. The sessions consisted of a minimum of three and a maximum of five NBCTs in an interview session and a minimum of three and a maximum of five non-NBCTs in a separate interview session. Participants were provided with a written version of the questionnaire. The

questions were read to the participants one at a time. After responding to the questions, participants were given the 10 elements to rank based on teacher perceptions of the impact on effective teaching. Responses were recorded and transcribed verbatim. Teacher names were only useful in the study until the responses were recorded. Once the responses were recorded, the teacher name information was destroyed and all data were described by a case number. Any hard copies of information collected at the research site were stored in a secure location during the time the information was not being used by the researcher.

A mixed method is appropriate to the study because student test scores were correlated to NBCTs and non-NBCTs to analyze student growth, and teachers were participating in focus interviews to determine how the five core propositions inform and/or impact teaching practices. The Licensure Reporting tool of the Human Resources Management System (HRMS) was used to confirm and identify all NBCTs in the target school district. NCEdCloud also known as Power School was considered for a back-up data information system to ensure that NBCTs were linked to the correct school.

Data Analysis

A *t* test is an analysis of two populations' means through the use of statistical examination; a *t* test with two samples is commonly used with small sample sizes, testing the difference between the samples when the variances of two normal distributions are not known. Teacher reading index scores were used to analyze for statistical significance using the *t* test. The research study was conducted using a p value of .05 (p=.05) which allowed the researcher to determine if a relationship existed between NBCTs and reading achievement by using preexisting EOG test scores. To show a significant difference, the probability value (p value) must be less than 0.05.

The data used in the study were comprised of secondary data sets of EOG reading index scores from the 2014 and 2015 school year. Of interest in this study was whether or not the average reading index scores of NBCTs were significantly different from the average reading index scores of the teachers in the sample population without National Board certification.

Qualitative data were analyzed using frequency distribution to calculate responses to each interview question. Data were analyzed to determine which of the strategies contained in the five core propositions participants perceived to be the most effective in student achievement and to compare the perceptions of NBCTs and non-NBCTs. Qualitative data were used to validate the frequency distribution data regarding the five core propositions. The data were analyzed for emerging themes including similarities and differences between NBTs and non-NBCTs.

Overview of Chapter 4

In Chapter 4, the results of the study are discussed in three sections. First, a demographic profile of the participant sample is provided to summarize career status. Next, the results associated with EVAAS data are discussed. Finally, the results of the focus teacher interviews and the effectiveness ranking of the strategies based on perceptions are discussed.

The qualitative and quantitative samples combined consisted of 100 participants, 50 who are NBCTs and 50 who are non-NBCTs. EVAAS data were collected from all participants for the 2014-2015 academic year, and the data were provided by the Accountability and Testing Department staff. These data assessed the student achievement growth which is measured by the change in student performance on the North Carolina EOG reading test from the previous year. The reading index value was

provided for each teacher. These results indicated either a significant or nonsignificant difference in average student achievement growth of reading between NBCTs or non-NBCTs.

Chapter 4: Results

Introduction

This study analyzed the relationship that exists between NBCTs and non-NBCTs when comparing the reading achievement of students in elementary school. The study utilized a mixed-method design. Quantitative data were gathered utilizing teacher EVAAS data from reading EOG index scores at the third-, fourth-, and fifth-grade levels. Qualitative data were gathered through focus interviews using 10 open-ended questions and one demographic question along with a ranking component to analyze teacher perceptions of the effectiveness of practices indicated by the five core propositions of NBPTS. Data were collected to address the following research questions.

1. How does teacher effectiveness based on EVAAS reading data of NBCTs compare to non-NBCTS?
2. Which strategies contained in the five core propositions do NBCTs in comparison to non-NBCTs perceive to be the most effective in contributing to student achievement?

Chapter 4 presents the data and findings collected by these instruments during this study.

The quantitative data were acquired from the Research and Accountability department of the targeted school district and consisted of 97 deidentified teachers including NBCTs and non-NBCTs from 17 elementary schools. The NBCTs had careers spanning from a minimum of 10 years to a maximum of 40 years. The non-NBCTs had careers spanning from a minimum of 3 years to a maximum of 34 years. Three years is the minimum number a teacher must have taught to attempt National Board certification.

Research Question 1

For the purpose of this study, teacher effectiveness was measured by EVAAS

utilizing the teacher's reading index. EVAAS predicts or estimates how well a student will do on a particular test and contends that regardless of the test administered, a strong relationship typically exists between each student's current achievement scores and his or her scores on previous tests. Value-added analyses capitalize on these relationships to estimate the impact of teachers and schools on student achievement. When the student's progress is better than expected, the teacher has "added value."

Student achievement is a common variable used by researchers, but growth was specifically chosen to be reflective of the teacher's contribution for that school year rather than the ability or IQ of the students. In this study, growth was defined as a change in test scores from one point in time to another.

EVAAS data were collected from 94 of the possible 100 participants of the target population. The goal for this study was to include third-, fourth-, and fifth-grade teachers with and without National Board certification from various elementary schools throughout the district. There were 47 NBCTs who taught in Grades 3-5 during the school year of 2016-2017. Of the 47 NBCTs, 37 had EVAAS data for both the 2014 and 2015 school year. Seven of the 2017 NBCTS did not have any EVAAS data for the 2014 and 2015 school years. Two NBCTs had EVAAS data for the 2014 school year only, and one had EVAAS data for the 2015 school year only. This was completed by accessing all current NBCTs in the targeted grades for the school year of 2017 and gathering data for the school years of 2014 and 2015 to expedite the data collection process so as not to be dependent on the scores for 2016 when the study originated.

Results

In statistics, Levene's test is an inferential statistic used to assess the equality of variances for a variable calculated for two or more groups. In this study, a *t* test for

which Levene's test was used to test for the assumption that the variances of populations (NBCTs and non-NBCTs) from which different samples (reading indexes) were drawn were equal.

Figure 4 presents the mean, standard deviation, and standard error mean for the average reading index for each teacher group.

	NBCT (Y/N)	N	Mean	Std. Deviation	Std. Error Mean
Avg. Rdg Index	Yes	37	.176756757000000	.746329180000000	.122695761000000
	No	47	.289255319000000	.953742046000000	.139117575000000

Figure 4. Teacher Group Statistics.

The *t* test in Figure 5 indicates a significance of .301, not a significant difference in variables with a 95% confidence interval. The test results indicated that the variances, the spread of the data, is the same between NBCTs and non-NBCTs. The data require that only the top line of the chart is reviewed due to the assumption that the variances are equal based on the Lavene's test.

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Avg. Rdg Index	Equal variances assumed	1.084	.301	-.589	82	.557	-.1124985620	.1909460010	-.4923509860	.2673538620
	Equal variances not assumed			-.606	81.999	.546	-.1124985620	.1854937990	-.4815048710	.2565077460

Figure 5. Levene's Test for Equality of Variances.

To show a significant difference, the probability value (p value) must be less than 0.05. The p value in the study was .557, greater than 0.05, indicating there is not a significant difference in the variability between NBCTs and non-NBCTs based on reading index scores. Figure 5 provides teacher reading index data based on EVAAS growth for both NBCTs and non-NBCTs. The data illustrated in the figure indicate that there is a 0.1125 mean difference between the average index scores of NBCTs and non-NBCTs.

Of the data collected from the 94 teachers, two non-NBCTs exceeded expected growth and one did not meet expected growth based on the reading index average of the 2 years for which the data were collected. All NBCTs met expected growth based on the reading index average for the 2 years for which the data were collected.

Table 2

Positive and Negative Teacher Growth by Certification

	Overall	NBCTs	Non-NBCT
Positive growth	52	24	28
Negative growth	32	13	19
Total teachers	84	37	47

Table 2 illustrates that overall, more than half of the teachers held a positive growth index, 62%; whereas 38% held a negative growth index. Twenty-four of 37 NBCTs (65%) demonstrated a positive index growth and 28 of 47 non-NBCTs (60%) demonstrated a positive growth index.

Research Question 2

Creswell (2014) stated that response rates in published journals are generally 50% or better. Survey data were collected from 29 of the targeted 50 participants, a response

rate of 58%. The data collection included three group interviews consisting of six participants, 16 in-person individual interviews, and seven telephone interviews. All interviews were audio recorded and transcribed by the researcher for subject approval before being analyzed. Teacher names were used in the gathering of data until the responses were recorded. Once the responses were recorded, the teacher name information was destroyed, and all data were described by a case number.

Teacher perception scores were calculated based on teacher responses to the questions in the questionnaire and ranking scale. The questionnaire was developed by the researcher and validated by a committee of NBCTs who answered the questions to attest that the questions were valid and asked in a clear manner that assessed what was needed to be known. The questionnaire consists of 10 questions based on the NBPTS five core propositions and the North Carolina Teacher Evaluation tool and one profile question.

The qualitative data were acquired from interviewing 29 teachers: 15 NBCTs from 11 schools and 14 non-NBCTs from nine different schools. The perception surveys consisted of one demographic question that inquired of the teachers' years of experience. The NBCTs' teaching experience spanned from a minimum of 13 years to a maximum of 31 years. The non-NBCTs' teaching experience spanned from a minimum of 5 years to a maximum of 30 years. The survey also consisted of 10 best strategies, also referred to in this study as practices, in a ranking component.

Procedures

From February 2017 through May 2017, information was gathered through teacher interviews. The researcher conducted three focus group interviews and 23 individual interviews. Each participant willingly signed consent forms to participate in the interviews. Interview and audio recording protocols and confidentially guidelines

were discussed before beginning the interviews. All teacher interviews were completed either before or after school. Interview completion times ranged from 9 minutes to 50 minutes. The researcher utilized audio recordings and transcribed all recordings personally. Teachers were told there were no right or wrong answers and they had the freedom to respond to each question with as much or as little detail as they desired.

Efforts to ensure reliability of interviews were established by the researcher listening carefully and not allowing personal biases to influence teacher responses. This section focuses on emergent themes from the teacher interviews that answered Research Question 2: Which strategies contained in the five core propositions do NBCTs in comparison to non-NBCTs perceive to be the most effective in contributing to student achievement? Table 3 displays the practices included in the teacher ranking components and the abbreviations.

Table 3

Teacher Practices

Practice Title	Practice Abbreviation
Differentiated Instruction	DI
Student Engagement	SI
Cultural Diversity	CD
Rigorous Curriculum	RC
Student Motivation	SM
Tracking Student Progress	TSP
Reflective Practice	RP
Professional Development	PD
Collaboration with Colleagues	CC
Parental and Community Engagement	PCE

The researcher read the directions to the participants to rank the strategies perceived to have the greatest impact on student achievement with 10 having the highest impact and 1 having the lowest impact. The ranking component was given to the participants to complete. Tables 4 and 5 display the results of participant rankings for the

10 practices.

Table 4

NBCTs' Perception Rankings

Teacher	DI	SE	CD	RC	SM	TSP	RP	PD	CC	PCE
1	1	2	6	9	3	8	4	10	5	7
2	2	1	7	8	3	5	4	10	6	9
3	4	1	8	7	2	5	3	10	9	6
4	9	10	1	8	6	5	7	3	2	4
5	5	9	1	8	10	6	7	3	2	4
6	8	7	4	9	6	3	10	1	2	5
7	5	10	1	8	9	6	4	2	7	3
8	5	6	3	8	10	7	9	1	4	2
9	5	10	2	6	7	8	9	1	3	4
10	3	7	1	6	4	5	10	2	9	8
11	6	7	4	3	10	2	5	1	8	9
12	4	9	3	2	10	7	6	5	8	1
13	3	2	9	10	1	6	4	8	7	5
14	3	8	2	10	9	1	5	6	4	7
15	2	1	8	7	7	9	6	10	4	5

Table 5

Non-NBCTs' Perception Rankings

Teacher	DI	SE	CD	RC	SM	TSP	RP	PD	CC	PCE
1	7	10	4	6	9	5	8	1	2	3
2	9	10	2	6	3	8	7	5	4	1
3	9	10	8	4	7	6	5	2	1	3
4	10	8	2	5	9	4	7	3	6	1
5	8	8	3	7	9	6	5	1	4	2
6	8	10	1	4	7	5	9	6	3	2
7	9	1	9	3	2	5	4	10	7	6
8	9	5	2	10	6	7	8	1	3	4
9	7	10	3	7	8	2	1	6	5	4
10	8	10	1	8	3	9	6	5	4	2
11	10	8	2	5	7	6	9	3	4	1
12	9	10	4	8	6	5	2	1	7	3
13	9	10	6	8	5	7	4	1	3	2
14	9	10	2	7	8	3	6	5	4	1

The researcher calculated the mean and mode of the perception rankings for each

of the teacher groups. Calculating the mean and the mode allowed the researcher to determine the rank of each practice for NBCTs and non-NBCTs. Table 6 displays the mean and mode of the perception rankings.

Table 6

Mean and Mode of Teacher Perception Rankings

Practice	NBCTs		Non-NBCTs	
	Mean	Mode	Mean	Mode
Differentiated Instruction	4.33	5	8.64	9
Student Engagement	5.62	7	8.57	10
Cultural Diversity	4	1	3.5	2
Rigorous Curriculum	7.26	8	6.28	7 & 8
Student Motivation	6.46	10	6.35	7 & 9
Tracking Student Progress	5.53	5	5.57	5
Reflective Practice	6.2	4	5.78	Multimodal
Professional Development	4.86	1 & 10	3.57	1
Collaboration with Colleagues	5.33	2 & 4	4.07	4
Parental and Community Engagement	5.26	4	2.5	2

Four practices (rigorous curriculum, student motivation, professional development, and collaboration with colleagues) were bimodal. Teachers ranked reflective practice as 4, 5, 6, 7, 8, and 9 two times each. As a result, the practice was multimodal. The mode for tracking student progress was equivalent for NBCTs and non-NBCTs.

The mean for three practices were within .50 of a point between NBCTs and non-NBCTs indicating that both teacher groups held similar perceptions about the impact student motivation, tracking student progress, and reflective practice had on student achievement. There were three practices where the mean scores of NBCTs and non-NBCTs showed a difference of 2.75 or more. Parental and community engagement had a difference of 2.76, student engagement demonstrated a 2.95 difference, and differentiated instruction had the greatest difference with 4.31. These differences indicate NBCTs and

non-NBCTs differ significantly concerning the impact the three practices have on student achievement.

Interview Responses

Figures 6-15 present each of the 10 practices and the responses from teacher participants for the ranking component of the survey.

Differentiated Instruction

Differentiated instruction as defined by Tomlinson (2000) is "tailoring instruction to meet individual needs" (p. 1). Tomlinson further contended that "whether teachers differentiate content, process, products, or the learning environment, the use of ongoing assessment and flexible grouping makes this a successful approach to instruction" (p. 2).

Figure 6 displays the teacher responses for differentiated instruction.

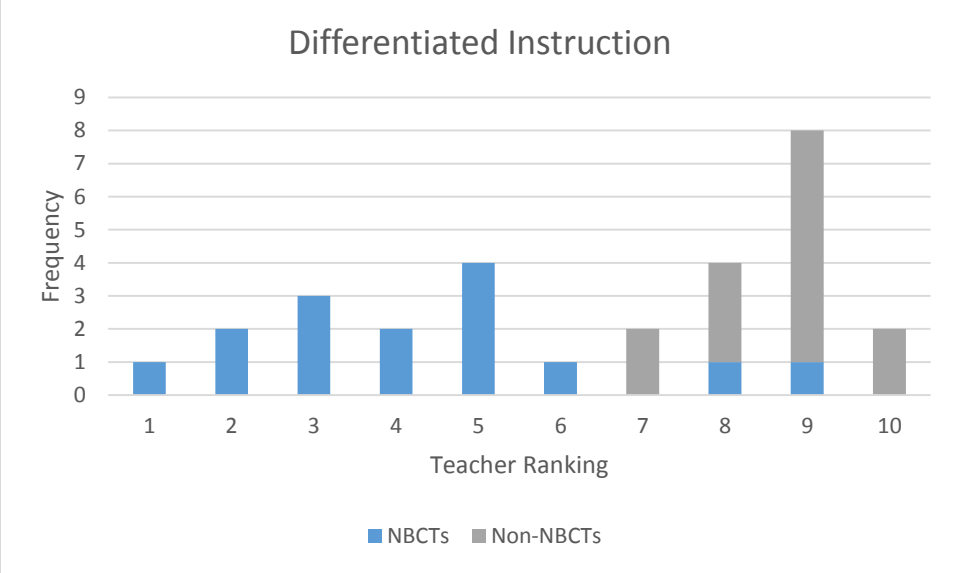

Figure 6. Differentiated Instruction.

On a scale of 1 (the least impact on student learning) to 10 (the highest impact on student learning), when teachers were asked "how do you know when to differentiate your students' instruction," all non-NBCTs ranked differentiated instruction on the high

end (6 or above), while all NBCTs except one (14 of 15) ranked differentiated instruction on the low end (5 or below). Specifically, seven of 14 non-NBCTs (50%) ranked differentiated instruction 9 of 10. According to the data, non-NBCTs perceived differentiated instruction to have a greater impact on student achievement than NBCTs.

A common theme expressed in teacher responses to the question, "How do you know when to differentiate your students' instruction and what strategies do you use to differentiate," was to put students in small groups. Non-NBCT 11 stated that she "uses any data on the subject already to differentiate either by teaching it in small group setting and applying different strategies like the previous standards or the standards for the next grade and use that to determine the gaps" to emphasize how she groups students for differentiation.

Small group instruction was mentioned by 10 of 15 NBCTs (67%) and seven of 14 non-NBCTs (50%), with a total of 17 teachers citing small groups as a differentiated instruction strategy. Non-NBCT 12 stated that "I see who is struggling that day and then . . . I can just pull that little group." Teacher responses concerning how they differentiate were more aligned than their perception about the practice's impact on student achievement.

The data indicate that there is a significant difference between how NBCTs and non-NBCTs ranked differentiated instruction resulting in the greatest range between the two teacher group responses in the 10 practices. Interview responses demonstrated that though NBCTs did not rank differentiated instruction as high on the scale as non-NBCTs, they utilize differentiation in similar ways. For example, NBCT 3 elaborated on Tomlinson's (2000) ideas that having students work in small groups is beneficial with the statement, "I would pull students that I feel need remediation with that same standard";

and NBCT 4 stated, “I differentiate to meet their needs and grouping them according to what the weaknesses are or maybe what strengths are”; while NBCT 12 stated that “differentiation could be anything from me altering an assignment to me pulling the child one on one or partnering the child with another student.” In summary, the qualitative data appear to be in contrast with the quantitative data for the practice of differentiated instruction; however, both teacher groups utilize differentiated instruction in similar ways. The manner in which both groups discussed implementing differentiated instruction coordinates with Proposition 1: Teachers are committed to students and their learning. More specifically the responses were in line with the section of Proposition 1 that states,

> They treat students equitably, recognizing the individual differences that distinguish one student from another and taking account of these differences in their practice. They adjust their practice based on observation and knowledge of their students' interests, abilities, skills, knowledge, family circumstances and peer relationships. (NBPTS, 2016d, p. 3)

Student Engagement

In this study, student engagement refers to the degree of attention, curiosity, interest, optimism, and passion students show when they are learning or being taught (Schlechty, 1994). Schlechty (1994) also posited that “students who are engaged exhibit three characteristics: (1) they are attracted to their work, (2) they persist in their work despite challenges and obstacles, and (3) they take visible delight in accomplishing their work” (p. 5). The section of Proposition 1 that directly relates to student engagement is the statement that teachers “are aware of context and culture on behavior. They develop students' cognitive capacity and their respect for learning. Equally important, they foster

students' self-esteem, motivation, character, civic responsibility and their respect for individual, cultural, religious and racial differences" (NBPTS, 2016d, p. 3).

Figure 7 displays the teacher responses for student engagement.

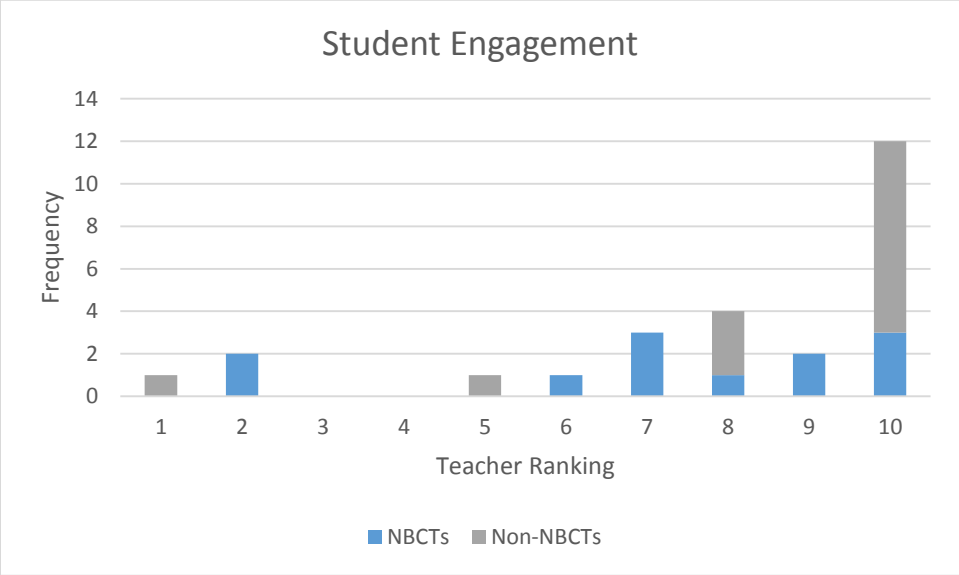

Figure 7. Student Engagement.

When assessing the data, the second largest difference between NBCTs and non-NBCTs was related to student engagement. For example, when comparing teachers who rated student engagement as 10 (the highest possible ranking), nine of 14 non-NBCTs (64%) rated student engagement the highest, while three of 15 NBCTs (20%) rated student engagement the highest. The mean for non-NBCTs was 8.57 with a mode of 10 in comparison to a mean of 5.62 and a mode of 7 for NBCTs. These data indicate that non-NBCTs perceive student engagement to have a greater impact on student achievement than NBCTs.

The most common answer to the question, "how do you know your students are engaged in learning," was students engaging in discussions either by responding to or asking questions or while having conversations in whole group or small group. Seven of

15 NBCTs (47%) mentioned discussion as an indicator of student engagement, while 12 of 14 non-NBCTs (86%) mentioned this indicator as a form of student engagement. Non-NBCT 9 shared that she knows students are engaged when they are "anxious to read or anxious to answer questions or they have an input that they want to put in the class." NBCT 5's answer appears to corroborate the majority response: "they can answer questions you ask them based on what we are talking about . . . they don't have to have the right answer, but they have to have a thought related to what we are talking about."

The second most common answer to the question, "how do you know your students are engaged in learning," was visual delight (most commonly referred to as body language and visual cues); seven of 15 NBCTs mentioned visual delight as an indicator of student engagement, while three of 14 non-NBCTs mentioned this indicator as well.

Non-NBCT 4 stated that she knows her students are engaged when "they don't even realize they are learning." Connecting with Schlechty's (1994) definition of engagement is the response from NBCT 14 who stated, "I know kids are engaged when they are actively participating, when they are talking, moving, answering, thinking writing."

Cultural Diversity

Amadeo (2017) stated that cultural diversity is "when differences in race, ethnicity, age, ability, language, nationality, socioeconomic status, gender, religion or sexual orientation are represented within a community. The community can be a country, region, city, neighborhood, company or school" (p. 1). To add to the definition of cultural diversity, Proposition 1 states that "Equally important, they (teachers) foster students' self-esteem, motivation, character, civic responsibility and their respect for individual, cultural, religious and racial differences" (NBPTS, 2016d, p. 3). NBCT 7's

statements indicate an awareness of the importance of cultural diversity.

> I try to build understanding between cultural diversity and sometimes cultures can be other than colors. Cultures can be socioeconomic; cultures can be a single parent or not a single parent . . . if you do team building you have an environment of tolerance and acceptance and I think that's important.

Figure 8 displays the teacher responses for cultural diversity.

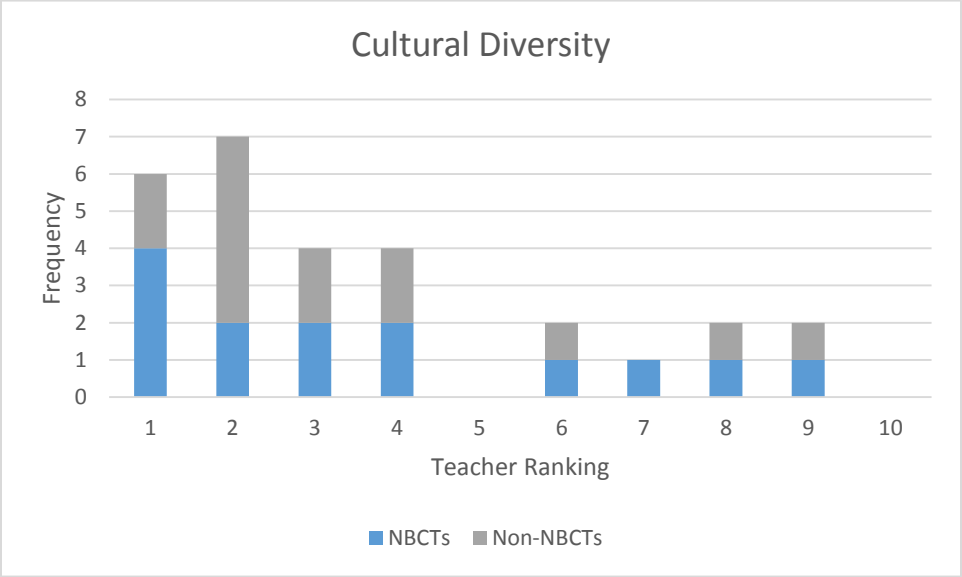

Figure 8. Cultural Diversity.

According to the ranking component data, none of the participants perceived cultural diversity as a practice having the greatest impact on student achievement. None of the 29 participants ranked cultural diversity as a 10. As indicated by Figure 8, one of the total number of NBCTs and non-NBCTs ranked cultural diversity as a 6, 8, or 9; and one NBCT ranked it a 7 to describe the impact on student learning. The mean and the mode for cultural diversity supports the results of the ranking component for both teacher groups. The mean for cultural diversity as a result of NBCTs' rankings was 4, and the mean for non-NBCTs was 3.5. The mode for cultural diversity for NBCTs was 1, and the

mode for non-NBCTs was 2. Non-NBCT 8 contended that "this (CD) is a hard one for me because I don't do this very well" when responding to the question. NBCT 5 responded in a similar manner when she stated, "a lot of the things that I am doing are not standard, I probably need to work on that a little bit."

A common theme that was included in teacher responses for cultural diversity was the use of literature to include cultural diversity in the classroom. When assessing the response data, literature (novels, books, newspapers, news weekly) was cited by 23 of 29 teachers as a resource for including cultural diversity in the classroom. Use of literature was mentioned by 11 NBCTs and 12 non-NBCTs as a way of including cultural diversity into the classroom.

NBCT 8 stated, "I'd like to think that it is in everything we do . . . using a variety of literature and not always choosing the same type of pictures – the same culture pictures." The quantitative data indicate that neither teacher group perceives cultural diversity as a high impact practice on student achievement. The qualitative data revealed that some teachers agree with the definitions of culture presented while also disclosing that there is more work to do in the area of cultural diversity in the classroom.

Rigorous Curriculum

In the education field, rigor is commonly applied to lessons that "encourage students to question their assumptions and think deeply" (Great Schools Partnership, 2017).

> Based on more than 2 million data points generated by classroom observations and analyzed by Learning Sciences Marzano Center that document the pedagogical strategies teachers are currently using in their classrooms, we have uncovered evidence that the majority of teachers are not adequately prepared to

> make the critical instructional shifts necessary to meet the requirements for rigor in college and career readiness standards. (Marzano & Toth, 2014, p. 6)

Teacher comments indicate a need for improvement in understanding how to increase rigor in the classroom according to the definition given. Specifically, NBCT 11 stated, "this is always my area of I've got to push myself . . . always the area I want to grow more in . . . I used to think early on that rigorous curriculum meant that you could point to the next grade level."

Marzano and Toth (2014) also contended that "academic rigor is no longer an option but a requirement for all students" (p. 6). Marzano and Toth's quote is corroborated by non-NBCT 9's statement:

> I struggle to grow my higher level kids . . . I can make it rigorous for my lower level kids because it's already a struggle because they are not on 5th grade level, but I have higher level kids and I struggle with them every year . . . if I can get some help on that one, that would be great.

Proposition 2 states, "Teachers know the subjects they teach and how to teach those subjects to students" (NBPTS, 2016d, p. 3). The proposition further details that "Accomplished teachers have a rich understanding of the subject(s) they teach and appreciate how knowledge in their subject is created, organized, linked to other disciplines and applied to real-world settings" (NBPTS, 2016d, p. 3).

NBCT 6's comments appear to corroborate this idea by stating, "Rigor doesn't just mean hard but it's depth and complexity . . . it's curriculum, you have to know your curriculum." Proposition 2 also contends that "Their (accomplished teachers) instructional repertoire allows them to create multiple paths to the subjects they teach, and they are adept at teaching students how to pose and solve their own problems"

(NBPTS, 2016d, p. 3). Non-NBCT 8's response gives the impression of agreement: "I make the curriculum rigorous by making sure that I always ask higher level questions to see if students are able to go above and beyond that surface level of knowledge."

Figure 9 displays the teacher responses for rigorous curriculum.

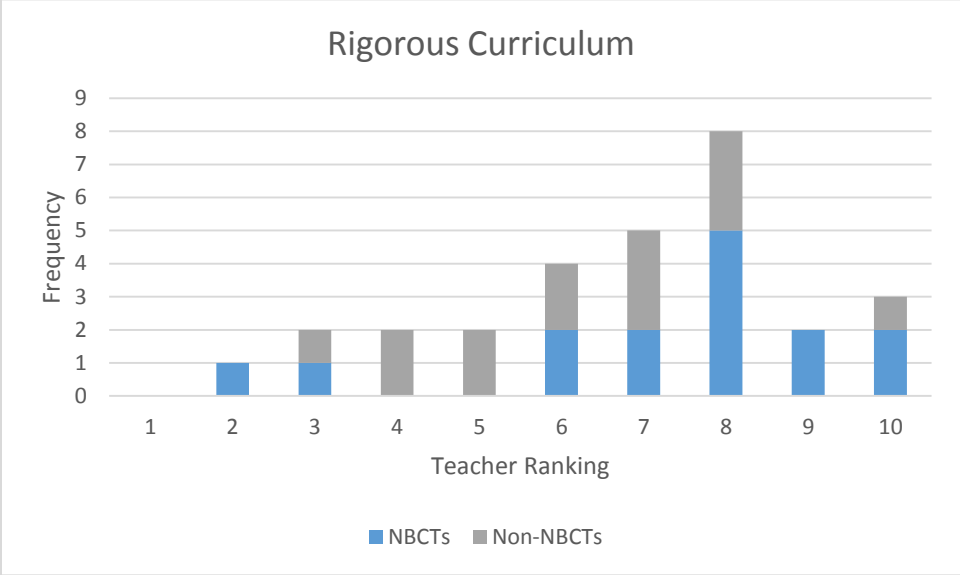

Figure 9. Rigorous Curriculum.

When assessing the data for rigorous curriculum, there were some discernable differences in how NBCTs and non-NBCTs perceived the practice and its impact on student learning. Two of 15 NBCTs (13%) ranked rigorous curriculum on the low end of the scale, 1 through 5 in comparison to five of 14 non-NBCTs ranking the practice on the low end 36% of the time. Rankings on the high end of the scale, 6 through 10, highlighted the differences as well. Thirteen of 15 NBCTs (87%) gave rigorous curriculum a ranking of 6 through 10 in comparison to nine of 14 non-NBCTs who ranked rigorous curriculum between 6 and 10 (64%). The calculated mean for rigorous curriculum (7.26), which was the highest of the 10 practices for NBCTs supports the data that NBCTs perceive rigorous curriculum as a high impact practice on student

achievement. In comparison, rigorous curriculum held the third highest mean (6.28) for non-NBCTs.

The most repeated response to the question, "How do you make your curriculum rigorous," involved the use of CCSS to ensure rigor. Eight of 14 non-NBCTs (57%) and nine of 15 NBCTs (60%), a combined total of 17 (57%) teachers citied the use of curriculum in the form of common core as a way of ensuring rigor in the classroom. This was evident in the statement by non-NBCT 12 implying that understanding the standards is the answer to increasing rigor in the classroom:

> I really try to follow the standards and I know a lot of people don't care much for Common Core but I like . . . the way it is laid out . . . I think I understand it better . . . I think I am a better teacher having the standards laid out.

Student Motivation

Student motivation, according to Bomia et al. (1997), is "A student's willingness, need, desire, and compulsion to participate in, and be successful in the learning process; it seeks to increase the factors that move a student toward becoming more involved in the class and the subject matter" (p. 4). Proposition 3 states, "Teachers are responsible for managing and monitoring student learning" (NBPTS, 2016d, p. 3). Details of Proposition 3 as it specifically relates to student motivation, purport that

> Accomplished teachers create, enrich, maintain and alter instructional settings to capture and sustain the interest of their students and to make the most effective use of time. They also are adept at engaging students and adults to assist their teaching and at enlisting their colleagues' knowledge and expertise to complement their own. They understand how to motivate students to learn and how to maintain their interest even in the face of temporary failure. (NBPTS, 2016d, p. 3)

According to NBCT 8, student motivation is "getting kids to buy into a subject even if it is not the most interesting one, a teacher's attitude is a huge deal."

Figure 10 displays the teacher responses for student motivation.

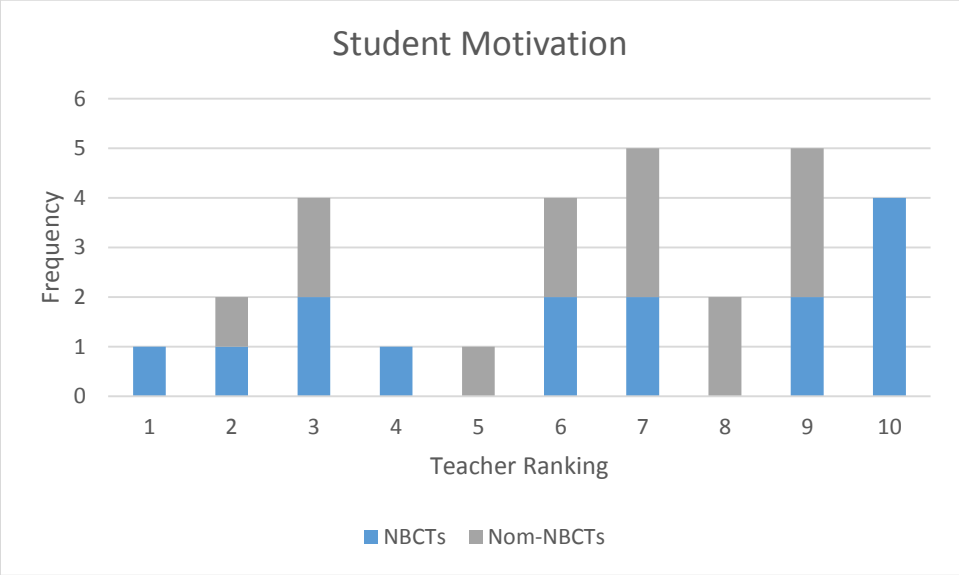

Figure 10. Student Motivation.

According to the data, on average, NBCTs perceived student motivation to be a greater impact on student learning than non-NBCTs. When ranking student motivation, four NBCTs in comparison to zero non-NBCTs ranked the practice a 10 (the highest on the ranking scale). Non-NBCTs and NBCTSs ranked student motivation six or greater at the rate of more than 50%. More specifically, the two teacher groups gave student motivation a ranking of 10, 57% and 53% respectively.

A common theme that was included in teacher responses for student motivation was modeling excitement to create motivation. Modeling was mentioned by seven NBCTs and six non-NBCTs with a total of 13 teachers citing modeling motivation to answer the question "how do you motivate students to learn?" NBCT 14's statement that "the more excited you are the more excited they are" supports Afifi's (2010) philosophy

that "most students respond well to a well-organized course taught by an enthusiastic instructor that cares about students" (p. 10). Comments from non-NBCT 4, "by *being* motivated to learn, they see it, they know it. They know I enjoy the learning and I think that they just feed right off of it – modeling the process," substantiate the value of modeling motivation for students.

In addition, non-NBCT 1's comments indicate strategies as well as difficulties related to student motivation:

> Children are more and more difficult to motivate these days. Unless immediately gratified, many struggle to show the stamina needed to work through high-level problem solving. I model a lot to help make connections, and use a gradual release model in all lessons. . . . When motivating students at 5th grade, I like to create challenges and use student work to show other students/classes. Inviting students to show thinking and allowing multiple strategies . . . has increased awareness and intrinsic value of academic work.

The similarities of the responses between the two teacher groups hold true with the mean of the two groups. The NBCT mean for student motivation was 6.46, and the non-NBCT mean was 6.35; a 0.11 difference between the two groups. These data indicate that there is no significant difference between how the two groups perceive student motivation as an impact on student achievement.

Tracking Student Progress

Proposition 3 addresses tracking student progress by stating that "Accomplished teachers can assess the progress of individual students as well as that of the class as a whole. They employ multiple methods for measuring student growth and understanding and can clearly explain student performance to parents" (NBPTS, 2016d, p. 4).

Non-NBCT 11 demonstrated agreement with portions of Proposition 3 through the statement,

> Different kinds of checks for me to know if they are understanding that specific skill. What I do with the CFAs (Common Formative Assessment) is analyze them to know what are the common mistakes class makes as a whole and then the students that are not proficient, why are they not proficient.

Tracking student progress in teacher responses was frequently referred to as monitoring student progress. Progress monitoring is a practice that helps teachers use student performance data to continually evaluate the effectiveness of their teaching and make more informed instructional decisions. Non-NBCT 7 affirmed the concept of progress monitoring in response to the question, "how do you track students' progress and what is the purpose of each evaluation method," by stating,

> Some group progress monitoring. Some individual progress monitoring and then obviously some of those items are taken for a grade and some of those grades are recorded so that parents can see those grades. Part of that assessment process is to make sure students are learning what they need to learn and that students are truly absorbing the material.

Figure 11 displays the teacher responses for tracking student progress.

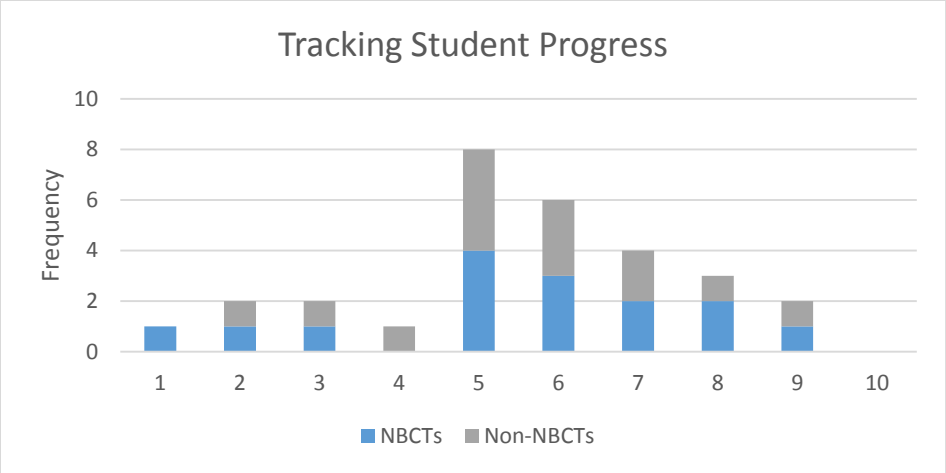

Figure 11. Tracking Student Progress.

There were two common themes that were included in teacher responses for tracking student progress: the use of informal or formative assessments and formal assessments or tests. Informal assessments were mentioned by 15 NBCTs (100%) and 11 non-NBCTs (79%). The biggest difference in responses between NBCTs and non-NBCTs was evident in the second part of the question relating to the purpose of tracking student progress. Eight of 15 NBCTs included giving grades as part of the purpose for tracking student progress in comparison to three non-NBCTs.

In response to the purpose of tracking student progress, NBCT 8 stated that "the purpose is to ensure they are learning what they need to learn; that they are successful"; and NBCT 2 stated, "the reason why I evaluate my students is to find where their weaknesses are and to strengthen those weaknesses and also to find out where some of their strengths lie so I can continue to build them up also."

The tracking student progress mean for non-NBCTs was 5.57, and NBCTs mean for tracking student progress was 5.53. Tracking student progress demonstrated the smallest difference (0.04) between the means of the 10 practices. The mode for both

groups was 4, indicating no difference between NBCTs' and non-NBCTs' perceptions of the impact of tracking student progress on student achievement.

Reflective Practice

For the purposes of this study, reflection is defined as "a process by which teachers regularly analyze, evaluate, and strengthen the quality and effectiveness of their work" (Lustick & Sykes, 2006, p. 18). Reflection, as defined by NBPTS (2017), is a "deliberate, purposeful, sustained process that helps teachers consider aspects of their practice in a careful, analytical manner to improve teaching and learning" (p. 60). Proposition 4, teachers think systematically about their practice and learn from experience, is often referred to by educators as the reflection proposition. The proposition correlates to Standard 5, "teachers reflect on their practice," of the North Carolina Teacher Evaluation Tool. Figure 12 displays teacher responses for reflective practice.

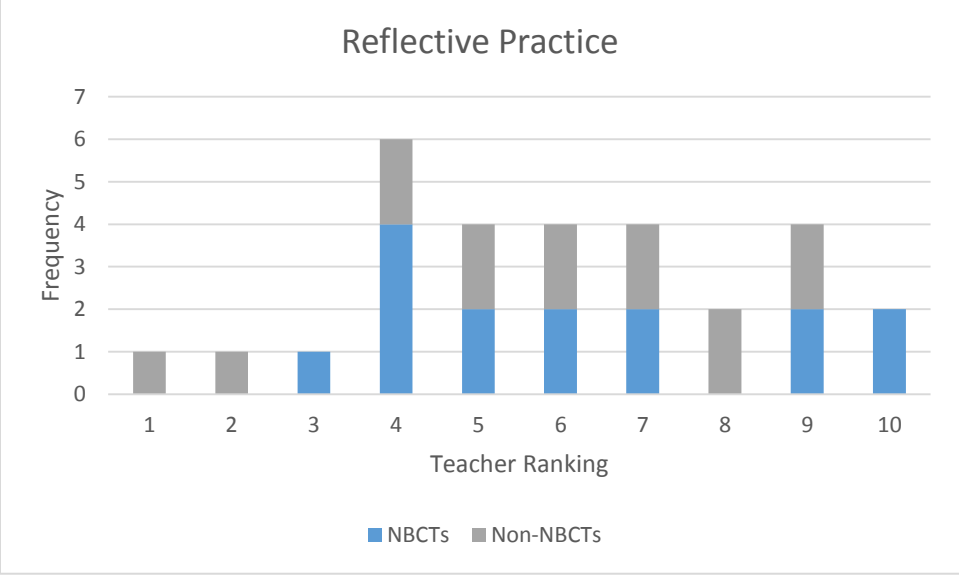

Figure 12. Reflective Practice.

When assessing the data, eight of each teacher group ranked reflective practice 6

or greater. Two of 15 NBCTs ranked reflective practice as 10 compared to zero non-NBCTs. In comparison, two non-NBCTs ranked reflective practice on the low end of the scale, a 1 or 2; and zero NBCTs ranked reflective practice lower than 3.

In detail, Proposition 4 states, "Striving to strengthen their teaching, accomplished teachers critically examine their practice, seek to expand their repertoire, deepen their knowledge, sharpen their judgment and adapt their teaching to new findings, ideas and theories" (NBPTS, 2016d, p. 4).

Statements such as "I reflect independently and collaboratively. I need that feedback from my partner as well as my administrators. We do that weekly. I also reflect with my students. They watch me reflect and they are now reflective" from non-NBCT 2 highlight the portion of Proposition 4 that states, "They (accomplished teachers) engage in lifelong learning which they seek to encourage in their students" (NBPTS, 2016d, p. 4).

Responses to the question, "how and why do you reflect on your teaching," yielded the highest alignment of responses from non-NBCTs and NBCTs where two themes strongly emerged. Twenty-three of 29 teachers (79%) gave the response of "independently" to answer *how* they reflect. Three more NBCTs than non-NBCTs gave independently as a response. The second most reoccurring theme was the response "to make changes or get better" when answering *why* teachers reflect. One more NBCT (12) than non-NBCT (11) gave the above answer as a response, resulting in a total of 23 participants.

As an example, non-NBCT 11 stated,

> I reflect looking at the data and I reflect looking at how or what percentage of the class was successful. Why is kind of obvious, I would not be an efficient teacher

if I did not reflect on my teaching.

In agreement, NBCT 6 declared,

> Reflection is how we grow . . . as teachers we need, we must be in constant reflection of our own work, our own progress and reflection of our students work and progress because it guides what we do next.

After reading and analyzing all responses to the question, "how and why do you reflect on your teaching," NBCT 8 summed up the majority of the answers with the response,

> I think teachers should and do reflect on a daily basis, if not like moment to moment about how things went and I think you reflect to know this worked, went well . . . or didn't, what should I do to modify, what do I need to do to increase it so they are being challenged more. So I think that's one of the most important parts of teaching and to realize you know that there are some things that you can do well and there are some things that you don't but you can always have another chance to try again. So I think that's an important part to keep kids learning is to reflect.

Although reflective practice had the highest alignment of responses, it had the third smallest difference between means. The mean for reflective practice for NBCTs was 6.2, and the mean for non-NBCTs was 5.78; a 0.42 difference, much greater than the 0.11 difference in means for student motivation and the 0.04 difference for tracking student progress.

Professional Development

Professional development, as defined by The Glossary of Education Reform (Great Schools Partnership 2017), is used to refer to a wide variety of specialized

training, formal education, or advanced professional learning intended to help administrators, teachers, and other educators improve their professional knowledge, competence, skill and effectiveness. Proposition 4 of NBPTS (2016d) states,

> Accomplished teachers draw on their knowledge of human development, subject matter and instruction, and their understanding of their students to make principled judgments about sound practice. Their decisions are not only grounded in the literature, but also in their experience. They engage in lifelong learning which they seek to encourage in their students. (p. 31)

NBCT 14's comments appear to be an example that agrees with Proposition 4 of NBPTS as it relates to professional development. NBCT 14 stated,

> I see what I need, where I'm weakest and what I'm interested in. I want to keep my skills fresh. If I feel like things are stagnant anywhere – I want to learn new things all the time. I want new things, I want fresh things, I want exciting ideas and if I feel weak in it. That is certainly something I want to know about.

Figure 13 displays the teacher responses for professional development.

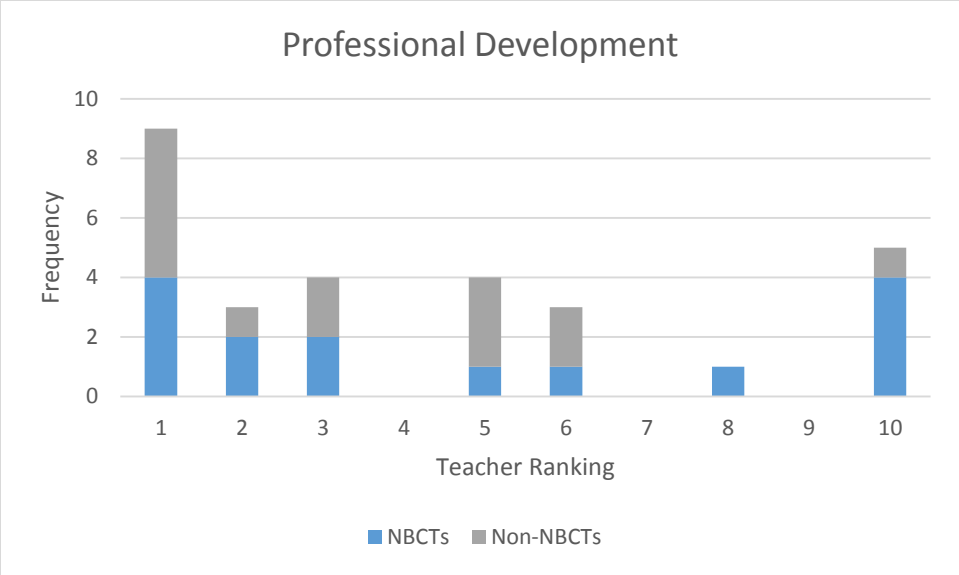

Figure 13. Professional development.

When assessing the data, one of 14 non-NBCTs (.07%) ranked professional development as 10 (the highest possible ranking), while four of 15 NBCTs (27%) rated professional development the highest. An extended look at the data showed that six NBCTs (40%) rated professional development between 6 and 10 in comparison to three non-NBCTs (21%).

A common theme that was included in both NBCTs' and non-NBCTs' responses to the question, "how do you decide what professional development to attend," was "the need to improve teaching skills or content knowledge." NBCTs gave the aforementioned response 12 of 15 times (80%), and non-NBCTs responded equivalently nine of 14 times (64%). The greatest difference in responses between the two groups of teachers was evident in the second common response for professional development. Five of 15 NBCTs (33%) in comparison to 12 of 14 non-NBCTs (86%) answered that they participated in professional development that was mandated by the principal or by the district. Data showed seven of 15 NBCTs (47%) mentioned attending professional

development based on interest in comparison to zero non-NBCTs giving the reason of interest for attending professional development. Non-NBCT 6's statement, "I attend all professional development that I am required to attend and I don't have options on it," validates the quantitative responses. In comparison NBCT 1 stated,

> When I am actually choosing what to go to it's a combination of if I have a high interest in it . . . I wanted to go to it because I thought it would benefit my room . . . areas that I want to improve I try to go to those when I can.

This appears to be in contrast to comments made by non-NBCT 6. Non-NBCT 9 added to the response of professional development being mandated rather than chosen with the statement, "I can honestly say this year I have not done anything outside of my school and it's shocking."

The mean for professional development was below 5 for both teacher groups. NBCTs had a mean of 4.86, and non-NBCTs had a mean of 3.57. The modes for the two teacher groups were somewhat aligned with NBCTs demonstrating a bi-modal response of 1 and 4, while non-NBCTs presented a mode of 4. Both sets of data indicate that although there was a difference in the mean of 1.29, neither teacher groups perceived professional development to have a high impact on student achievement.

Collaboration with Colleagues

Collaboration, as defined by DuFour et al. (2008), is "A systematic process in which teachers work together, interdependently, to analyze and impact professional practice in order to improve results" (p. 16). Proposition 5, teachers are members of learning communities, substantiates Dufour et al.'s philosophy about collaboration which is evident by the statement, "Accomplished teachers contribute to the effectiveness of the school by working collaboratively with other professionals on instructional policy,

curriculum development and staff development" (NBPTS, 2016d, p. 5).

Figure 14 displays the teacher responses for collaboration with colleagues.

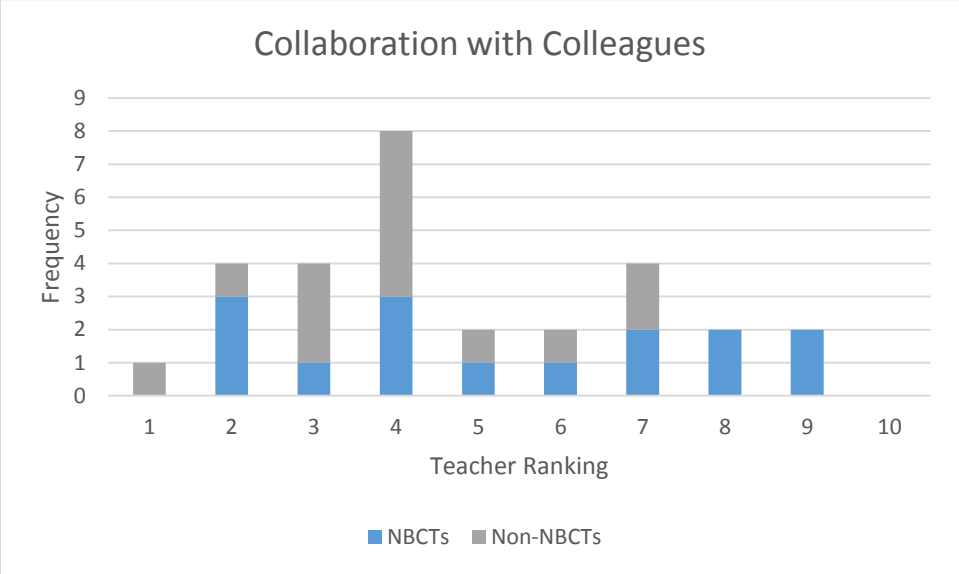

Figure 14. Collaboration with Colleagues.

When assessing the data, more than twice as many NBCTs (7) ranked collaboration with colleagues 6 through 10 than non-NBCTs (3). Eleven of 14 non-NBCTs (73%) ranked collaboration with colleagues between 1 and 5 in comparison to eight (53%) NBCTs. The data are in alignment with the mean for collaboration with colleagues with each teacher group. NBCTs' mean for collaboration with colleagues was 5.33 in comparison to non-NBCTs' mean which was 4.07, a mean difference of 1.26. The data indicate that NBCTs perceive collaboration with colleagues to have a greater impact on student achievement than non-NBCTs.

Informal conversations emerged from participant responses as a theme for a form of collaboration with colleagues. Eight of 14 non-NBCTs (57%) and 14 of 15 NBCTs (93%) mentioned informal conversations during the response to the question, "how do you participate in collaborative efforts to improve your effectiveness?" Planning for

collaboration was mentioned equally by both groups. Each teacher group mentioned planning five times as a way to collaborate with colleagues. Five of 14 non-NBCTs (36%) and five of 15 NBCTs (33%) referenced planning. The greatest difference in responses between the groups was evident when 64% of non-NBCTs spoke of PLCs as a way to collaborate with colleagues in comparison to 27% of NBCTs.

NBCT 3's statement, "we do a lot in PLTs, we collaborate quite a bit – I seek out teachers who are better at certain things than me and I ask them if I can come watch them in their classroom," was one of the four that included PLTs in the response. In comparison, NBCT 6, in particular, stated,

> I honestly probably struggle with that (collaboration), not that I don't like to work with others, I do. It can be difficult when you have co-workers on your team who maybe think a little more traditional than you do and you want to go further, indicating a lack collaboration in PLTs on the grade level.

Comments from non-NBCT 12, "Collaboration is sometimes hard in elementary school and I don't know why . . . My grade level does very well to plan together," substantiate the comments that collaboration is sometimes difficult. NBCT 7's comments that "my colleagues and I are talking non-stop. In fact, our whole lunch time is discussing curriculum and discussing these children" indicate that collaboration happens in a more informal manner more often than in a formal manner such as PLTs. NBCT 15 corroborated the benefits of informal collaboration with the statement, "We have a great team in that we have our normal conversations sometimes –why don't we or what if we…and I love that just unplanned, spontaneous conversation."

Comments from non-NBCT 14 who stated, "Just talking and seeing what we can do, I talk a lot to the 5th grade team about what they are doing" and from non-NBCT 1,

"Good teachers steal from each other," support the overall consensus that informal conversations are the most used avenue for collaborating with colleagues.

Parental and Community Engagement

Reform Support Network (2014) gave the explanation for Parental and Community Engagement as "A school exists to educate the children of a community, and by embracing community engagement, political and educational leaders demonstrate their recognition that families and communities have an important say in what happens inside its doors" (p. 3). In Proposition 5, references concerning parental and community engagement can be found in the statement,

> They (Accomplished teachers) are knowledgeable about specialized school and community resources that can be engaged for their students' benefit, and are skilled at employing such resources as needed. Accomplished teachers find ways to work collaboratively and creatively with parents, engaging them productively in the work of the school. (NBPTS, 2016d, p. 5)

NBCT 7's answer to the question, "how do you engage parents and community in the education of students," confirmed many of the ideas shared by Proposition 5 of NBPTS:

> I guess just letting the people in the community know what are we doing in class whether it's to ask for a donation for a field trip or whatever you are doing to let the community know that this is an active place with active people and sometimes we have some people in need. So just letting them know that.

Figure 15 displays the teacher responses for parental and community engagement.

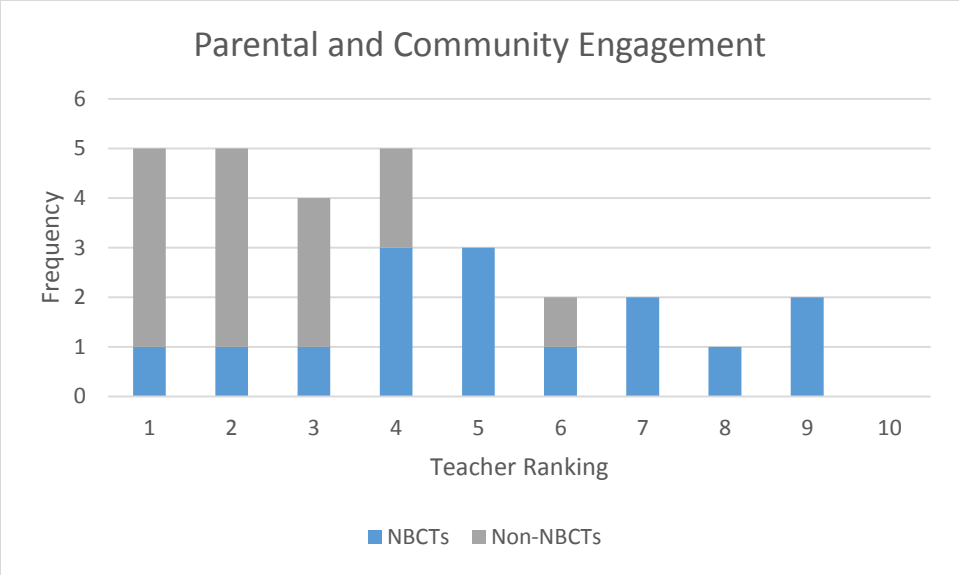

Figure 15. Parental and Community Engagement.

When assessing the data, one non-NBCT (7%) ranked parental and community engagement 5 or higher, while 13 (93%) ranked it 4 and below. In comparison, six NBCTs (40%) ranked parental and community engagement 5 or higher, while nine (60%) ranked it 4 and below.

Inviting parents into the classroom and communication were two common themes that emerged from teacher responses to the question, "how do you engage parents and others in the community in the education of students?" Twenty-one of 29 participants (72%) mentioned inviting parents into the classroom to engage them in the education of students, while 19 of 29 (66%) included communication in their response to the question. There was not a significant difference in how NBCTs and non-NBCTs responded to the question, 10 (67%) and 11 (78%) respectively.

Responses from other teachers used similar phrases. For example, non-NBCT 9 stated, "we invite our parents in and actually we teach them what we are teaching our students because a lot of our parents have been out of school for a while." Non-NBCT 13

stated,

> I have an open door policy. I tell my parents that they can come and sit in during my instructional time . . . I make contact and let them know that they are welcome and that a lot of stuff that their children are involved in, we want your support.

According to teacher responses, engagement of the community appeared to be more difficult for both groups. For example, NBCT 4 commented that "as far as in the community, I think we have the resources here, but as far as personally in the community, I live in a different county so it's a little more of an issue to involve the community"; and NBCT 5 stated, "I feel like we do a lot as a school with the community but me personally I don't feel like I do enough with the community." Non-NBCT 5 appeared to echo the sentiment when answering the question about parents and community engagement and stated, "A lot of parent conferences – I don't do well with the in community."

Several participant statements indicated various strategies used to engage parents and the community in the education of students. For example, NBCT 12 stated,

> I've invited parents into my room to learn the 962 ways to do . . . Common Core. I usually have takers on that night. I have actually had them seriously come in and be taught how to help their kids. I also invite people in the community in. When they have an expertise . . . An electricity unit you invite a lineman in. You have nutrition you invite you invite in a nutritionist.

One participant's comments may be considered an outlier in answering the parent engagement portion of the question. NBCT 13 stated that "we're very fortunate because our parents have to volunteer one hour per week per child so they are here a lot." However, the comment about community engagement, "I do think we need to do more in the community so people can know who we are and what we are and what's going on in

our school," was comparable to other participant responses.

The two group means for parental and community engagement validated the difference in comments between NBCTs and non-NBCTs. The mean for non-NBCTs was 2.5, and NBCTs' mean for parental and community engagement was 5.33, demonstrating the second largest difference (2.76) of the 10 practices between the two teacher groups. In addition, the modes for both groups were relatively low: NBCTs' mode was 4, and non-NBCTs' mode was 2, indicating both groups perceived the impact of parental and community engagement on student achievement to be low.

Summary

Chapter 4 provided the data and results of this study. There was no significant difference between NBCT and non-NBCT effectiveness on the average reading index from the EVAAS data. There were several significant differences in how the 10 strategies contained in the five core propositions were perceived to be effective in contributing to student achievement as ranked by NBCTs in comparison to non-NBCTs. The largest mean difference based on perceptions of student impact between NBCTs and non-NBCTs was differentiated instruction (4.31) with NBCTs' mean measuring 4.33 in comparison to non-NBCTs' mean of 8.64. The second largest mean difference based on perceptions of student impact between NBCTs and non-NBCTs was student engagement (2.95) with NBCTs' mean measuring 5.62 in comparison to non-NBCTs' mean of 8.57. The third largest mean difference based on perceptions of student impact between NBCTs and non-NBCTs was parental and community engagement (2.76) with NBCTs' mean measuring 5.26 in comparison to non-NBCTs' mean of 2.50.

There were several practices where the two teacher groups were very closely

aligned in perceptions of impact on student achievement. The smallest mean difference based on perceptions of student impact between NBCTs and non-NBCTs was tracking student progress (0.04) with NBCTs' mean measuring 5.53 in comparison to non-NBCTs' mean of 5.57. The second smallest mean difference based on perceptions of student impact between NBCTs and non-NBCTs was student motivation (0.11) with NBCTs' mean measuring 6.46 in comparison to non-NBCTs' mean of 6.35. The third smallest mean difference based on perceptions of student impact between NBCTs and non-NBCTs was reflective practice (0.42) with NBCTs' mean measuring 6.20 in comparison to non-NBCTs' mean of 5.78. The four remaining practices had a mean difference between 0.50 and 1.29.

Analysis of the data indicated that NBCTs and non-NBCTs were aligned in the quantitative data, showing no significant difference. The qualitative data also indicated that the two teacher groups were more aligned than not on the perception of the strategies indicated in the five core propositions. Chapter 5 will further analyze these findings, relate the findings to other studies, and provide implications for practice and further study.

Chapter 5: Discussion

Introduction

Research shows that teacher effectiveness is the single most important school-based factor in student success (Aaronson et al., 2007; Goldhaber, 2002; Rivkin et al., 2005). According to Mortimore and Sammons (1987), the evidence is indisputable, having found that teaching had as much as 10 times more impact on achievement than all other factors combined.

This study examined the degree to which a relationship exists between NBCTs and the reading achievement of students in Grades 3-5 as compared to non-NBCTs. The study also examined the two teacher groups' perceptions of 10 practices aligned with the five core propositions. Chapter 5 further analyzes these findings, relates the findings to other studies, and provides implications for practice and further study.

Discussion

This chapter uses the data from Chapter 4 to answer each of the research questions. This study sought to address these two specific research questions.

1. How does teacher effectiveness based on EVAAS reading data of NBCTs compare to non-NBCTs?
2. Which strategies contained in the five core propositions do NBCTs in comparison to non-NBCTs perceive to be the most effective in contributing to student achievement?

Research Question 1

Viadero (2007) indicated that studies are mixed on the impact of NBCTs on student achievement. Viadero and Honawar (2008) also noted that there are more than a dozen studies that have tried to link National Board certification with student

achievement with mixed results.

Most research on teacher effectiveness has examined a relatively small set of teacher characteristics such as graduate education and certification including National Board certification, which are collected by school administrators in order to satisfy legal requirements and set salaries (Clotfelter et al., 2007; Goldhaber, 2007).

The first research question addressed in this study was, "How does teacher effectiveness based on EVAAS reading data of NBCTs compare to non-NBCTS?" McLean and Sanders (1984) conducted research using 3 years of gain scores from student performance on standardized state tests in Grades 2-5 and established a statistical system. Utilizing this data, Dr. Sanders later developed the TVAAS, also known as EVAAS, a method for measuring a teacher's effect on student performance by tracking the progress of students against themselves over the course of their school career with their assignment to various teachers' classes. Based on over 10 years of research by Dr. Sanders and his colleagues on teacher effectiveness and value-added models, the statistical method was developed on the premise that society has a right to expect that schools will provide students with the opportunity for academic gain regardless of the level at which the students enter the academic location (Sanders & Horn, 1994). Sanders found that just 3 years of effective teaching accounts on average for an improvement of 35 to 50 percentile points, and the effects are enduring (Sanders & Horn, 1994).

In North Carolina, teachers receive a rating for Standard VI: Teachers Contribute to the Academic Success of Students which is measured by EVAAS. Standard VI was written to ensure that the work of teachers results in acceptable, measurable progress for students based on established performance expectations using appropriate data to demonstrate growth (Public Schools of North Carolina, 2016a).

EVAAS data were collected from 94 of the possible 100 participants of the target population. Of the 47 NBCTs who taught in Grades 3-5 during the school year of 2016-2017, 37 had EVAAS data for both the 2014 and 2015 school year, seven did not have any EVAAS data for the 2014-2015 school year, two had data for 2014, and one had EVAAS data for the 2015 school year only.

A *t* test, an inferential statistic measure used to assess the equality of variances for a variable calculated for two or more groups, was conducted. The *t* test indicated a significance of .301 with a p value of .557. These measures indicate that there is no significant (p=0.5) difference in the variability between NBCTs and non-NBCTs based on reading index scores. In contrast to data in other studies reviewed for this research, the results of this study signify that there is no significant difference in reading growth between students who are taught by NBCTs and students who are taught by non-NBCTs.

Research Question 2

Teacher perception scores were calculated based on teacher responses in the questionnaire and ranking scale. The questionnaire consisted of 10 open-ended questions based on the NBPTS five core propositions and the North Carolina Teacher Evaluation tool and one teacher profile question. The first four propositions are linked to the improvement of student learning and/or assessments, while the fifth proposition relates to PLCs (NBPTS, 2016d).

Qualitative data were acquired by interviewing 29 teachers from February 2017 through May 2017. Teachers were informed that they had the freedom to respond to each question with as much or as little detail as they wanted. Following the audio recording, teachers completed the ranking component with instructions to rank the strategies perceived to have the greatest impact on student achievement, with 10 perceived to have

the highest impact and 1 the lowest.

This study found that NBCTs and non-NBCTs varied in their perceptions of the impact of the five core propositions and the effectiveness in contributing to student achievement. The two teacher groups were very closely aligned in perceptions of impact on student achievement on three practices and had mean differences less than 0.50: tracking student progress (0.04), student motivation (0.11), and reflective practice (0.42). The two teacher groups showed significant mean differences, greater than 2.00, in perceptions on three practices: differentiated instruction (4.31), student engagement (2.95), and parental and community engagement (2.76). There was not a significant difference, either positively nor negatively, in perceptions of NBCTs in comparison to non-NBCTs regarding the impact on student achievement for four practices. Each of the final four practices had mean differences that were greater than 0.50 but less than 2.00: cultural diversity (0.50), rigorous curriculum (0.98), collaboration with colleagues (1.26), and professional development (1.29).

According to the qualitative data, the two teacher groups demonstrated an alignment of perceptions for the majority, six of 10 (60%), of the strategies indicated in the five core propositions of NBPTS. Of the 10 practices included on the ranking component, seven had a mean score difference less than 1.50, indicating an even greater alignment of perceptions for the two teacher groups. The interview responses from NBCTs and non-NBCTs and the emerging themes and patterns revealed that the two teacher group responses were more similar than different. For example, tracking student progress had the smallest mean difference (0.04) between NBCTs and non-NBCTs. Statements about tracking student progress from NBCT 8, “the purpose is to ensure they are learning what they need to learn; that they are successful,” and non-NBCT 7, “part of

that assessment process is to make sure students are learning what they need to learn and that students are truly absorbing the material," indicate how closely aligned the teacher responses were for the two groups. The positive perception of impact was substantiated by individual teachers who ranked the practice, 7 and 5 respectively where numbers of 5 and above indicate a high ranking on the scale and a positive perception of the practice. Proposition 3 aligns with tracking student progress, by stating that "Accomplished teachers can assess the progress of individual students as well as that of the class as a whole. They employ multiple methods for measuring student growth and understanding and can clearly explain student performance to parents" (NBPTS, 2016d, p. 4).

The mean scores for tracking student progress by the teacher groups corroborated the higher perception rankings of impact. The mean score for NBCTs was 5.53 in comparison to a 5.57 mean score for non-NBCTs. Several studies focused on student results on achievement tests in NBCT and non-NBCT classrooms found that students of NBCTs outperform students of non-NBCTs, with the positive effect more noticeable among minority students (Cavalluzzo, 2004; Hakel et al., 2008; Goldhaber & Anthony, 2004). Plecki et al. (2010) corroborated those findings in his 2010 study which found that NBCTs "report that National Board certification had a positive impact on their ability to evaluate individual student needs, use assessments to inform instruction, use multiple instructional strategies and make a difference in student achievement outcomes" (p. 26). However, the qualitative and quantitative data included in this study did not confirm a significant difference between the impact of NBCTs' and non-NBCTs' ability to evaluate individual student needs, use assessments to inform instruction, use multiple instructional strategies, or make a difference in student achievement outcomes based on test data.

Student motivation had the second smallest mean difference (0.11) between NBCTs and non-NBCTs. Both teacher groups demonstrated mean scores greater than 6, which is on the high end of the 10-point scale. NBCTs and non-NBCTs had mean scores of 6.46 and 6.35 respectively, indicating that both groups perceived student motivation to have a fairly significant impact on student achievement.

Proposition 3 stated, "Teachers are responsible for managing and monitoring student learning" (NBPTS, 2016d, p. 3). Details of Proposition 3, as it specifically relates to student motivation, stated that

> Accomplished teachers create, enrich, maintain and alter instructional settings to capture and sustain the interest of their students and to make the most effective use of time. . . . They understand how to motivate students to learn and how to maintain their interest even in the face of temporary failure. (NBPTS, 2016d, p. 3)

The closely aligned statement from NBCT 14, "the more excited you are the more excited they are," and comments from non-NBCT 4, "by *being* motivated to learn, they see it, they know it. They know I enjoy the learning and I think that they just feed right off of it –modeling the process," appear to be in alignment with Afifi's (2010) viewpoint that "most students respond well to a . . . course taught by an enthusiastic instructor that cares about students" (p. 10) and Huang et al.'s (2015) study adopted by the AHP that discussed the relevant factors in promoting reading activities in elementary schools and how reading activities should be pushed forward to increase student interest in reading and help them form good reading habits. Both researchers give the impression of substantiating the value of modeling motivation for students to impact student achievement.

Reflective practice had the third smallest mean difference (0.42) between NBCTs and non-NBCTs. The two teacher groups both ranked reflective practice 5 and above with mean scores of 6.2 for NBCTs and 5.78 for non-NBCTs, indicating that both groups perceived reflective practice to have a significant impact on student achievement. Proposition 4 states, "Teachers think systematically about their practice and learn from experience" (NBPTS, 2016d, p. 4). More specifically, Proposition 4 relates to reflective practice through the statement, "Striving to strengthen their teaching, accomplished teachers critically examine their practice, seek to expand their repertoire, deepen their knowledge, sharpen their judgment and adapt their teaching to new findings, ideas and theories" (NBPTS, 2016d, p. 4). Reflective practice had the highest alignment of responses with 23 participants, one more NBCT (12) than non-NBCTs (11) responding "to make changes or get better" when answering *why* teachers reflect.

Tracz et al. (2005) completed research interviewing 25 teachers who had completed the NBPTS certification process using an open-ended interview format. Teachers were asked six questions relating to how the National Board experience affected their instructional practices. One of the primary themes that emerged in the study was reflection.

Further studies have found that teacher participation in the National Board process supports their professional learning and stimulates changes in their practice, as documented by Allensworth et al. (2006).

Non-NBCT 5's statement, "if I am not reflecting, it's not going to get better and some of the reflection is what can I change and it still be effective," and NBCT 6's statement, "Reflection is how we grow . . . as teachers we need, we must be in constant reflection of our own work, our own progress and reflection of our students work and

progress because it guides what we do next," support the results in this study indicating that both teacher groups perceived reflective practice to have a positive impact on student achievement. This is in line with evaluation data in the state of North Carolina which shows that the majority of teachers are rated as proficient or above on Standard 5: Teachers reflect on their practice on the NCEES.

Cultural diversity presented the fourth smallest mean difference between (.50). Comments from NBCT 5, "I probably need to work on that a little bit," and non-NBCT 8, "this (CD) is a hard one for me because I don't do this very well," were substantiated by the individual teacher rankings of the practice, 1 and 2 respectively. Proposition 1 which is aligned with cultural diversity states, "they (teachers) treat students equitably, recognizing the individual differences that distinguish one student from another and taking account of these differences in their practice" (NBPTS, 2016d, p. 3). In connection to Proposition 1, Jacobson (2000) found that the first step in creating environments with high expectations was getting to know each student, thus allowing the teacher a better chance of developing a positive rapport that can in turn facilitate and support student learning. The mean rankings for cultural diversity by NBCTs (4) and non-NBCTs (3.5) corroborated that the perceptions were closely aligned even when given low perception scores. The results also indicated that lower perception scores, representing low impact, were given to practices where teachers felt the need to improve.

Rigorous curriculum demonstrated the fifth lowest mean score difference between NBCTs and non-NBCTs and was given the highest mean score by NBCTs (7.26) and the third highest by non-NBCTs (6.28). NBCT 6's comment on the practice, "Rigor doesn't just mean hard but it's depth and complexity," and non-NBCT 8's comment, "I make the curriculum rigorous by making sure that I always ask higher level questions" appear to

corroborate the idea that both teacher groups perceive rigorous curriculum to have a high impact on student achievement. Even when both groups revealed the need to understand rigorous curriculum better, their comments were still in alignment. For example, responses by non-NBCT 9, "I struggle to grow my higher level kids . . . I can make it rigorous for my lower level kids because it's already a struggle," and NBCT 11's statement, "this is always my area of I've got to push myself . . . always the area I want to grow more in," demonstrate a desire for improvement as well as an alignment in perceptions. Jose and Raja (2011) substantiated that teachers may need extra support and are the prime source for students to cultivate the reading habit. They further posited that teachers can execute this task only when they have the competence to play their role effectively (Jose & Raja, 2011).

Proposition 2 includes the statement, "accomplished teachers believe that the acquisition of knowledge . . . represents a distinctly intellectual undertaking – a rich, demanding creative process calling in the strategic coordination of skills, abilities and dispositions to develop a deeper, more discerning matrix of understanding" (NBPTS, 2016d, p. 22). Realizing the need to help support teachers in helping students to successfully navigate a rigorous reading curriculum such as Common Core English/language arts, the Institute of Education Sciences created the Reading for Understanding Research Initiative in 2010 to fund a set of connected projects that would enrich the theoretical frameworks that undergird efforts to improve deep comprehension and to design and test new interventions and assessments to improve reading for understanding across all grades in U.S. schools (Douglas & Albro, 2014).

One of the key obstacles identified by Duke and Block (2012) was "a lack of expertise among many educators around how to effectively teach the harder-to-master

reading skills" (p. 55). The reading component of the EOG test in this study was aligned with CCSS and objectives for reading. The foundation of CCSS is a focus on rigor (McClure, 2013). The quantitative data for both teacher groups reflected that more than half of the teachers held a positive reading growth index; 62%. Twenty-four of 37 NBCTs (65%) demonstrated a positive reading index growth and 28 of 47 non-NBCTs (60%) demonstrated a positive reading growth index indicating that teachers are achieving moderate success with student reading growth while teaching CCSS.

Collaboration with colleagues demonstrated the sixth lowest mean score difference between NBCTs and non-NBCTs (1.26). The two teacher groups were closely aligned, although NBCTs ranked collaboration with colleagues on the high end of the scale (5.33), and non-NBCTs ranked collaboration with colleagues on the lower end of the scale (4.07). Proposition 5, teachers are members of learning communities, more specifically, accomplished teachers contribute to the effectiveness of the school by working collaboratively with other professionals on instructional policy, curriculum development, and staff development (NBPTS, 2016d), supports the benefit of collaboration with colleagues. NBCT 7 commented, "my colleagues and I are talking non-stop. In fact, our whole lunch time is discussing curriculum and discussing these children"; and non-NBCT 14 commented, "just talking and seeing what we can do, I talk a lot to the 5th grade team about what they are doing."

To raise student achievement so most students attain high academic standards requires profound changes in teacher capacities – their content knowledge and pedagogical skills and their abilities to work well with others (Allensworth et al., 2006). In contrast to research that demonstrates over 90% of the nation's teachers report that their colleagues contribute to their teaching effectiveness (Tung et al., 2015), this study

revealed that the greatest difference in responses between the groups was evident when 64% of non-NBCTs spoke of PLCs as a way to collaborate with colleagues in comparison to 27% of NBCTs. According to the responses, NBCTs identified communicating with colleagues in an informal setting, for example, talking during lunch time, to be a more valuable collaboration strategy then more formal collaboration such as participating in PLCs. The differences in the numbers demonstrating that NBCTs ranked collaboration with colleagues higher on the perception ranking scale than non-NBCTs indicate that NBCTs value other forms of collaboration with colleagues more than collaboration through PLCs, whereas non-NBCTs place a higher value on PLCs.

Professional development revealed the seventh lowest and final mean score difference less than 2.00 between NBCTs and non-NBCTs (1.29). Proposition 4 states that teachers should "think systematically about their practice and learn from experience" (NBPTS, 2016d, p. 16). The proposition elaborates on this point and in detail as it relates to professional development by describing accomplished teachers as individuals who have "a commitment to lifelong professional development" (NBPTS, 2016d, p. 16). Many reports (TNTP, 2015; Yoon et al., 2007) noted a huge mismatch between enormous sums of money spent on such programs and the limited evidence of effectiveness in the investments. According to Belson and Husted (2015), since the National Board Certification inception, states have invested in providing experienced teachers with professional development by supporting their work toward certification through the NBPTS program. Researchers further stated that "these teachers and stakeholders involved in K12 education operate on the expectation that board certification improves student achievement" (Belson & Husted, 2015, p. 2). This study did not reveal a significant difference in teacher effectiveness based on reading EVAAS.

Both teacher groups had a mean score below 5 for professional development. NBCTs had a mean score of 4.86 and non-NBCTs had a mean of 3.57, indicating that neither group perceived professional development to have a high impact on student achievement. Comments from non-NBCT 6, "I attend all professional development that I am required to attend and I don't have options on it," and NBCT 4, "Sometimes our school decides and sometimes central office decides," and the low rating that professional development received demonstrate an indication that teachers may give lower perception scores of impact to practices over which they feel they do not have any control. This is further alluded to in the comment, "When teachers recognize that knowledge for improvement is something they can generate, rather than something that must be handed to them by so-called experts, they are on a new professional trajectory" (Hiebert & Stigler, 2004, p.14).

Differentiated instruction demonstrated the largest difference in mean scores between the two teacher groups (4.31) based on perceptions of student impact. NBCTs demonstrated a mean of 4.33, and non-NBCTs demonstrated a mean of 8.64. Small group instruction was mentioned by 10 of 15 NBCTs (67%) and seven of 14 non-NBCTs (50%); a total of 17 teachers citing small groups as a differentiated instruction strategy indicated that although the two teacher groups differed significantly in their perceptions of the impact of differentiated instruction, they were fairly closely aligned in their strategies.

> Teacher responses were aligned with the portion of Proposition 1 that stated, They treat students equitably, recognizing the individual differences that distinguish one student from another and taking account of these differences in their practice. They adjust their practice based on observation and knowledge of

> their students' interests, abilities, skills, knowledge, family circumstances and peer relationships. (NBPTS, 2016d, p. 3)

Comments from non-NBCT 12, "I see who is struggling that day and then . . . I can just pull that little group," and NBCT 3, "I would pull students that I feel need remediation with that same standard" corroborate the alignment of small group instruction as a differentiated instruction strategy. Based on the overall differentiated instruction data, non-NBCTs perceived differentiated instruction to have a greater impact on student achievement than NBCTs.

Student engagement demonstrated the second largest difference in mean scores between the two teacher groups (2.95). The section of Proposition 1 that directly relates to student engagement is the statement that teachers "are aware of context and culture on behavior. They develop students' cognitive capacity and their respect for learning" (NBPTS, 2016d, p. 9). The mean for non-NBCTs was 8.57, and the mean for NBCTs was 5.62 indicating that non-NBCTs perceive student engagement to have a greater impact on student achievement than NBCTs. Non-NBCT 9 stated that she knows students are engaged when they are "anxious to read or anxious to answer questions," and NBCT 5 perceives students as being engaged when "they can answer questions you ask them based on what we are talking about." These responses along with many others indicate that how the two teacher groups classify student engagement is closely aligned, although the perception value placed on student impact is significantly different.

Parental and community engagement demonstrated the third largest difference in mean scores between the two teacher groups (2.76). Extensive research literature testifies to the importance of parental involvement as children move into their school years. Schools must find ways to develop trusting relationships with parents and to work

together with them to increase student learning (Tung et al., 2015). Inviting parents into the classroom was to the question, "how do you engage parents and others in the community in the education of students?" Twenty-one of 29 participants (72%) mentioned inviting parents into the classroom to engage them in the education of students, making it the most common response from NBCTs and non-NBCTs. Comments from non-NBCT 13, "I have an open door policy. I tell my parents that they can come and sit in during my instructional time," and NBCT 9, "we invite our parents in and actually we teach them what we are teaching our students," demonstrate how they engage parents and community in student learning which reiterates Tung et al.'s (2015) belief that "School staff must reach out to parents and community to engage them in the processes of strengthening student learning, and that schools should draw on a network of community organizations to expand services for students and their families" (p. 9). Both teacher groups expressed having more difficulties getting the community involved than parents; however, NBCTs placed a higher perception of impact value (5.26 mean score) than non-NBCTs (2.5 mean score) on parental and community engagement.

Conclusions

The impact NBCTs have on student achievement is not conclusive, but there are some studies and reports that substantiate positive correlation and thereby validate the esteem that educators attach to this award (Viadero & Honawar, 2008). The data revealed that six of the 15 NBCTs (40%) in comparison to one of 14 non-NBCTs (7%) taught students identified as academically gifted. Given this data, teacher responses were still very similar in the perceptions of the impact of the practices. One reason for the similarities could be that all participants have taught in the same school district for at least 3 consecutive years.

The study did not lend itself to full disclosure of teacher credentials from the quantitative data; however, the fact that there are only 47 total NBCTs teaching Grades 3-5 in the district, lends to the possibility that some of the NBCTs interviewed were the same NBCTs included in the EVAAS database.

Limitations of Study

The limitations of a study provide useful parameters about possible weaknesses of a study which may affect results (Creswell, 2014). Outlining the possible limitations of a study allows consumers of research to gauge the ability to generalize results and can be useful to other potential researchers who seek to conduct a similar study.

Limitations in this study included the restriction to a large urban school district in North Carolina with a smaller number of NBCTs than non-NBCTs. The subjects from the study were selected from a total population of 47 NBCTs (n=47) in third through fifth grade. The sample group of NBCTs at third-, fourth-, and fifth-grade levels was established by factoring in only those teachers who had EVAAS data for the 2 years of the study. The use of standardized, multiple choice tests creates some limitations to the study. This test provides only a single snapshot of student academic achievement.

The qualitative portion of this study relied upon the interview responses from teachers to be honest and open about their perceptions regarding the 10 practices. The study is limited by the lack of control over the honesty of the responses.

Delimitations

This study was conducted in the third-, fourth-, and fifth-grade classrooms of 20 schools in a single school district of North Carolina. It is the fourth largest school system in North Carolina and the 81st largest in the nation with 43 elementary schools. Approximately 50% of the elementary schools participated in the study which limits the

ability to generalize to other districts or schools.

Recommendations for Further Study

The quantitative findings of this study indicated a *t*-test significance of .301with a p value of .557. These measures indicate that there is no significant (p=0.5) difference in the variability between NBCTs and non-NBCTs based on reading index. The outcomes of the research do not support the hypothesis that there is a difference between NBCTs' and non-NBCTs' impact on third- through fifth-grade student reading achievement; however, it should be noted that the limitations of the sample size invite further investigation.

As the number of NBCTs continues to increase in school districts of North Carolina, there will be growing interest in studying the ongoing effect on student achievement. Studies from the literature review (Clotfelter et al., 2006, 2007; Goldhaber & Anthony, 2007; Harris & Sass, 2006; NRC, 2008) made an effort to answer the question as to whether the process indicates or develops accomplished teaching. The studies' results of student achievement change from before, during, and after the National Board certification process, indicating some student scores increased, some decreased, and some experienced no change. Darling-Hammond and Ducommun (2010) stated,

> To understand how teachers influence student learning, more data about teachers' practices and context are needed. Student learning evidence needs to be multifaceted and accompanied by an analysis of the teachers' students and teaching context, integrated into an evaluation of the teachers' practices that can both provide evidence about effectiveness and can focus attention on ways to measure effectiveness. (p. 8)

More research is needed to draw clear conclusions on how teacher use of practices and

their perceptions of said practices impact elementary student achievement in reading.

This study also provided insight into the perceptions of NBCTs and non-NBCTs regarding the impact on student achievement of 10 strategies found in the five core propositions. There are multiple variables that could affect the outcome of studies between schools, districts, and states.

Further research could be conducted to study the impact of professional development on student achievement, whether required to attend or exposed. In addition, more study would be beneficial regarding the perceptions of NBCTs and non-NBCTs on the effectiveness of professional development. Recommendations for the district as it relates to professional development could include surveying teachers to assess for targeted professional development that would be beneficial to various teacher groups; for example, grade level professional development, certification professional development (academically gifted), struggling learners, on-grade-level learners, and content professional development. Targeted professional development for teachers could vastly improve teaching and learning opportunities.

Further research could be conducted on how NBCTs in comparison to non-NBCTs are rated on each standard of the Teacher Evaluation tool to discern if those standards have a positive alignment with the five core propositions. This would also allow us to see themes and patterns through comparing the standards in NCEES to the standards from NBPTS to further increase teacher support and ultimately student learning. The research could study the extent to which a connection exists between NBCTs and certain evaluation standards and core propositions in comparison to non-NBCTs.

A linear longitudinal study could be conducted on how teachers felt about the

practices before, during, and after the process to assess if going through the process strengthens, weakens, or has no impact on the perception of the practice. Included in this study could be knowledge gleaned that would allow schools, districts, and/or states to learn how going through the National Board process could improve teacher practices; in particular, practices in which NBCTs place a high perception value on alignment with improved student achievement such as rigorous curriculum, student motivation, and reflective practice. The research would be beneficial and could help administrators gain more knowledge and ideas concerning which of the practices teachers may need support or coaching to positively impact student achievement gains. The study could build upon research by Sun et al. (2013) which suggests that the diffusion of tested teaching practices into classrooms of teachers mentored by master teachers may benefit a wider group of students. The researchers further suggest that NBCTs may be called on to serve as model teachers for novice teachers and others who need support in the elements, indicators, and standards.

Research could be conducted on NBCTs in comparison to non-NBCTs as it relates to teacher leadership. Districts could garner if and how NBCTs have been better equipped to handle teacher leadership roles and the accompanying impact on student achievement.

The literature review revealed several studies (Rice, 2013; TNTP, 2015; Yoon et al., 2007) that support the argument that on average after the first several years in the classroom, teachers do not improve. Performance plateau has been characterized as a fact in the research literature. Researchers may want to explore the performance plateau phenomena researched by Rice (2013), TNTP (2015), and Yoon et al. (2007) to discern the possible impact the National Board certification process has on teacher longevity and

effectiveness. Research by the Center for Teaching Quality (2008) revealed that NBCTs remain in the classroom longer. All NBCTs in this study had taught for 10 years or more. This finding may support the argument that on average, after the first several years in the classroom, teachers do not improve; which could point to the reason why the EVAAS data of NBCTs showed no significant difference from non-NBCTs.

Recommendations for Practices

Student engagement. The second largest mean difference based on perceptions of student impact between NBCTs and non-NBCTs was student engagement. Results of this study revealed that teachers identified students answering questions as the primary way to identify student engagement. It would be beneficial to have teachers explore definitions of engagement and identify when students are engaged in learning. Research from Antonetti and Garver (2015) and research based on the work of Schlechty (2002) may help support teachers in recognizing, identifying, and fostering student engagement in the classroom. Having a unified definition and recognition of student engagement would support student increased engagement, teacher perceptions of the impact of student engagement, and ultimately the outcome of increased student engagement on student achievement.

Differentiated instruction. Differentiated instruction demonstrated the largest difference in mean scores between the two teacher groups. Although the two teacher groups differed significantly in their perceptions of the impact of differentiated instruction, they were fairly closely aligned in the use of a few strategies. Responses indicated that teachers would benefit from support in understanding various ways to differentiate instruction. The results also indicated that both groups, especially the NBCT group, need more support in how to differentiate instruction with high-performing

students, as the majority of NBCTs in the study identified as teaching academically gifted students. All students can benefit from differentiation and compacting student instruction. Escalating support to increase understanding and teacher practices around differentiation has the potential to help teachers improve student growth which will impact school and district growth as well.

Cultural diversity. The data indicate a low rating of **c**ultural diversity and that neither teacher group perceived cultural diversity as a high-impact practice on student achievement. This indicates that there is more work to be done in the area of cultural diversity in the classrooms. It is suggested that the work begin with supporting teachers' understanding of cultural diversity and the many facets that it encompasses. Teachers would also benefit from knowing how to infuse cultural diversity in the classroom to support student learning and impact student achievement. As stated in the NBPTS five core propositions, knowing how to foster student self-esteem, motivation, character, civic responsibility, and their respect for individual, cultural, religious, and racial differences will increase teacher understanding of their students, families, and communities which can in turn increase knowledge on how to better educate the student which ultimately leads to student growth and achievement.

Summary

The findings of this study indicate that given the setting and measures employed in this study, there is not a significant difference in the majority of teacher perceptions of the impact on student learning around the five core propositions. All in all, both teacher groups, NBCTs and non-NBCTs, were more aligned than different in their perceptions of the 10 practices in the five core propositions. The findings of this study also indicate that there is no statistical difference in NBCTs and non-NBCTs based on EVAAS reading

index scores.

The use of teacher effectiveness based on EVAAS is a growing area of research in education. North Carolina utilizes EVAAS to measure the *value added* by an individual teacher. More specifically, North Carolina's definition of a highly effective teacher is a teacher who receives a rating of at least "accomplished" on each of the Teacher Evaluation Standards 1-5 and receives a rating of "exceeds expected growth" on Standard 6 of the Teacher Evaluation Instrument (Public Schools of North Carolina, 2016a). The limitations and findings of this study are useful for planning and exploring the variables that influence growth, including teacher value-added studies.

Why National Board?

Despite the results of this study indicating there is no significant difference between students taught by NBCTs and non-NBCTs, it is this researcher's belief that National Board certification has value and benefit to students, teachers, and the schools in which they teach. As a professional development tool, National Board certification is an avenue for teachers to improve and grow. Going through the National Board process may not *make* an accomplished teacher; however, the process may identify accomplished teachers. In light of teacher shortages, attrition, and high turnover rates in some schools, becoming an NBCT may be the answer in teachers staying in the education field and having an opportunity to hone their skills and practice to make even greater improvements in student achievement. Relative to the general teacher population, the teachers who apply for National Board certification are younger, have slightly fewer years of teaching experience (even with the minimum of 3 years of experience required to enter the program), and are more likely to have master's degrees. NBCTs are a part of a community that continues to invest in accomplished teaching and NBCTs are more likely

to participate in true teacher leadership in the school, the district, and the state. All of these components could equate to a stronger, more prepared and dedicated teaching force that would only benefit everyone involved, especially the students.

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Appendix A

Teacher Consent Letter

Cassandra Y. Dobson

January 9, 2017

Dear Mrs. Jones:

Please allow me to introduce myself. My name is Cassandra Dobson and I am an Assistant Principal and a National Board Certified Teacher.

I am also a doctoral student at Gardner-Webb University currently working on my dissertation. My dissertation topic is National Board Certified teachers and their effect on student learning gains in reading. As part of my data collection, I will need to collect information on the impact of ten specific elements on student achievement. I will do this through focused teacher interviews. The interviews will consisting of eleven questions with a follow-up ranking component. There will be no more than five teachers during the interview.

You have been identified as a National Board Certified teacher. It is my hope that you will participate in an interview allowing me to collect data on your perceptions of the impact of the ten elements in my study.

I will email you for a convenient time and location for me to conduct the interview and collect this data. Data collected for the study will be kept confidential at all times. The data will be stored and secured in the researcher's home while waiting to be transcribed. After the audio recordings have been transcribed and approved by the subject, the recordings will be destroyed. Once the data collection is completed, all identifiers will be eliminated and the remainder of the process will be anonymous. There will be no names of students, teachers, or schools, used in the reporting on this project. The data collected will be coded for emerging themes found in the data. Multiple schools in the district will compose the data group.

Gardner-Webb University Dissertation Committee and Institutional Review Board have approved this research effort. If you have any questions, please feel free to contact me at XXXXXX.

I look forward to meeting you in the future.

Sincerely,

Cassandra Y. Dobson

Appendix B

Teacher Survey Questions with Ranking Component

Survey Questions for Teachers

1. How long have you been working as a teacher? Please exclude extended periods of absence (e.g. career breaks).

a. 3-5 years

b. 6-10 years

c. 11-15 years

d. 16-20 years

e. More than 20 years

2. How do you know when to **differentiate** your students' **instruction** and what strategies do you use to **differentiate?**

3. How do you know your **students** are **engaged** in learning?

4. How do you include **cultural diversity** in your classroom?

5. How do you make your **curriculum rigorous**?

6. How do you **motivate** students to learn?

7. How do you **track** students' **progress**? What is the purpose of each evaluation method?

8. How and why do you **reflect** on your teaching?

9. How do you decide what **professional development** to attend?

10. How do you participate in **collaborative efforts** to improve your effectiveness?

11. How do you **engage parents** and others in the **community** in the education of students?

*12) Have you ever been through the National Board Certification Process? If so what year?

*For Non-Certified Teachers only

Rank the strategies below you perceive to have the greatest impact on student achievement with 10 having the highest impact and 1 having the lowest impact.

_____ **Differentiated instruction**

_____ **Student Engagement**

_____ **Cultural Diversity**

_____ **Rigorous Curriculum**

_____ **Student Motivation**

_____ **Tracking Student Progress**

_____ **Reflective Practice**

_____ **Professional Development**

_____ **Collaboration with Colleagues**

_____ **Parental and Community Engagement**

Appendix C

Comparison of Interview Questions, Five Core Propositions, and NC Teacher's Evaluation Tool

The interview for this study will consist of 10 questions representing the Five Core Propositions in conjunction with the Five standards of the NC Teacher Evaluation Tool. Each question was modeled after one of the five core propositions portfolio entries. In addition, background and school context information will also be collected. Table 2 summarizes the similarities and differences between the structured interview questions and the portfolio entries.

Table 2
Comparison of Structured Interview Questions, Five Core Propositions and NC Teacher's Evaluation Tool

Interview Question	Core Proposition	NC Teacher Standard
Question #2	Teachers are committed to students and their learning.	Teachers facilitate learning for their students.
Question #3	Teachers are committed to students and their learning.	Teachers facilitate learning for their students.
Question #4	Teachers are committed to students and their learning.	Teachers facilitate learning for their students.
Question #5	Teachers know the subjects they teach and how to teach those subjects to students.	Teachers know the content they teach.
Question #6	Teachers are responsible for managing and monitoring student learning.	Teachers establish a respectful environment for a diverse population of students
Question #7	Teachers are responsible for managing and monitoring student learning.	Teachers establish a respectful environment for a diverse population of students
Question #8	Teachers think systematically about their practice and learn from experience.	Teachers reflect on their practice.
Question #9	Teachers think systematically about their practice and learn from experience.	Teachers reflect on their practice.
Question #10	Teachers are members of learning communities.	Teachers demonstrate leadership.
Question #11	Teachers are members of learning communities	Teachers establish a respectful environment for a diverse

Interview Questions Protocols

NBPTS Propositions/Standards

To assess the quality of individual teacher responses to the structured questions in the interview, I will use the rubrics and scoring procedures developed by the NBPTS for candidates.

Standard I: Teachers demonstrate leadership.

Standard II: Teachers establish a respectful environment for a diverse

population of students.

Standard III: Teachers know the content they teach.

Standard IV: Teachers facilitate learning for their students.

Standard V: Teachers reflect on their practice.

> **Proposition 1:** Teachers are committed to students and their learning.
>
> **Proposition 2:** Teachers know the subjects they teach and how to teach those subjects to students.
>
> **Proposition 3:** Teachers are responsible for managing and monitoring student learning.
>
> **Proposition 4:** Teachers think systematically about their practice and learn from experience.
>
> **Proposition 5:** Teachers are members of learning communities.

Published in 1989, the document *What Teachers Should Know and Be Able to Do* articulated the National Board's Five Core Propositions for Teaching. Similar to medicine's Hippocratic Oath, the Five Core Propositions underscored the accomplished teacher's commitment to advancing student achievement. Together, the propositions form the basis of all National Board Standards and the foundation for National Board Certification.

Appendix D

Panel of Experts

Kyle Mendenhall, NBCT: Teacher, North Carolina

Pam Misher, Ed.D.: Administrator, North Carolina

Cheryl Frazier, Ed.D.: Principal, North Carolina

Kathy Ford: NBCT: Teacher, North Carolina

Marci Harvey NBCT: Teacher, North Carolina

Debra Troxell, NBCT: Instructional Facilitator, North Carolina

Alecia Eubanks, Ed.D.: Washington, DC

Scarlet Sink NBCT: Teacher, North Carolina

The survey was also reviewed for errors, content, and validity by Stephen Laws, Ed.D: Professor, Gardner-Webb University, in October 2016.

Appendix E

Content Validity Questions

To validate the Teacher Survey Questions the following criteria suggested by Dillman (2007) will be used:

1. Are instructions and questions easily understood and free from abbreviations or unconventional phrases?
2. Are questions vague or precise?
3. Are questions biased, objectionable, or too demanding?
4. Do questions contain double questions or double negatives?
5. Has the researcher made reasonable assumptions regarding respondents' knowledge and behavior?
6. Are questions technically accurate?