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TITLE I SCHOOLS

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## Dedication Page

I tell you the truth, if you have faith as small as a mustard seed, you can say to this mountain, 'Move from here to there' and it will move. Nothing will be impossible for you." Matthew 17:20

I would like to dedicate this dissertation to my mother, Helen Sullivan and my late father, Earnest L. Sullivan. You taught me about faith through your words and your actions and I have stood on it my whole life. You never believed there was anything that I couldn't do, and through your eternal love and encouragement, you made me believe it too. How can I ever re-pay you for what you have selflessly given to me? I only pray that I can pass it on to my children as they reach for their stars. I love you both, always!

I would also like to dedicate this dissertation to all of the people along the path of my life who believed in me and have helped shape me into the person that I am today. God put you in my life throughout different seasons to help me along my journey and I am blessed because of all of you!

"If I have seen farther than others, it is because I was standing on the shoulders of giants." Isaac Newton

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Most of all I would like to give God all the Honor and Praise because without Him I never would have made it!

"Commit to the LORD whatever you do, and your plans will succeed."

Proverbs 16:3

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ABSTRACT

NATIONAL BOARD CERTIFICATION AND STUDENT ACHIEVEMENT IN  
TITLE I SCHOOLS

The state of Oklahoma and the federal government have spent hundreds of millions of dollars over the past decade in pursuit of expanding the National Board for Professional Teaching Standards (NBPTS) as a means of ensuring highly qualified teachers for every student. This study aimed to discover whether or not there was any relationship between teachers who attained the National Board Certification and higher student achievement in Title I schools over one academic school year. The researcher examined the reading and math benchmark scores of 610 third, fourth, and fifth grade students in 16 Title I schools from an urban fringe school district. The purpose was to measure the differential achievement effect attributed to National Board Certified Teachers (NBCT). Results suggested that NBCT was not a significant predictor of student achievement among students in the sample.

## CHAPTER I

### NATIONAL BOARD CERTIFIED TEACHERS AND TITLE I SCHOOLS

#### Introduction

Educational reform has been a topic of much interest to Americans throughout the years. The government continues to investigate educator accountability to determine the most effective methods of improving student achievement. On January 8, 2002, President Bush signed into law the No Child Left Behind (NCLB) Act, which reauthorized the Elementary and Secondary Education Act (ESEA) of 1965. The stated purpose of NCLB was to provide every child with a fair and equal opportunity to obtain a high quality education, and reach proficiency on challenging state academic achievement standards and assessments (NCLB, 2001). Title II of the NCLB legislation was written to bring attention to the need for every child to have a highly qualified teacher. The National Board for Professional Teaching Standards (NBPTS) has established evaluative criteria to be used in determining what an accomplished teacher knows and is able to do. Teachers who earn National Board certification are considered highly qualified in their certification area.

The NBPTS was launched in 1987 and it represented the cutting edge of the teacher quality movement (NBCT, 2008). It was created as an outgrowth of the Carnegie Forum on Education and the Economy (Humphrey, Koppich, & Hough, 2005). The National Board was established to create rigorous standards

that could be used to measure effective instruction (NBCT, 2000). It was also designed to reflect a substantially higher level of professional achievement, thereby bringing teaching in line with other professions in which state licensing boards set minimum standards for advanced certification to identify accomplished practice (Humphrey, 2005). While state licensing is for entry level teachers, National Board Certification is for experienced teachers who wish to demonstrate their accomplished practice (Liquanti, 2001). Teachers who complete certification note the process is challenging, and they routinely rate the process as more beneficial than that of advanced university coursework because of the sustained analysis and reflection of their teaching practice required to meet portfolio requirements (Liquanti, 2001).

It is often said that great schools begin with great teachers. NBPTS has defined great teaching to align with its five core propositions (NBCT, 2008):

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 (pg.5).

Ostensibly, National Board Certified Teachers have demonstrated teaching effectiveness through the certification process and their teaching practices. The state of Oklahoma and the federal government have spent hundreds of millions of dollars over the past decade in pursuit of expanding the NBPTS as a means to improve teacher quality in high poverty schools. Unfortunately, data concerning the distribution of NBCTs across the United States are confounding. Despite some evidence of NBCTs ability to raise student achievement, these teachers are less likely to teach in high poverty schools (Clotfelter, Ladd, Vigdor, & Wheeler, 2007; Goldhaber & Anthony, 2004; Rotherham, 2005).

#### Purpose

As of December, 2008, Oklahoma ranked eighth in the nation in the total number of NBCTs with a total of 2,307, and fifth in the nation for the highest percentage of Board Certified teachers. Unlike the distribution of NBCTs across the United States, in Oklahoma nearly 60 percent of the National Board Certified Teachers work in high poverty schools. Oklahoma, relative to other states, is successful at attracting and retaining NBCT in high poverty schools, but little evidence exists to know if these teachers have a greater effect on student achievement than non-NBCTs. The assumption is that the placement of NBCTs in high poverty schools will improve student and school achievement, but this assumption has not been tested with teachers in Oklahoma. In spite of limited evidence on NBCT effects, the state continues to use NBPTS as a policy

intervention to improve student achievement. The purpose of this research was to examine the relationship between student achievement and National Board Certification in Title I schools from an urban fringe school district in Oklahoma.

#### Research Question and Exploratory Hypothesis

Evidence on the instructional effectiveness of NBCT was used as the basis for this study. Extant literature supports a generalized achievement effect attributed to National Board Certification. With an established relationship between NBCT and student achievement, the researcher sought to determine if this relationship exists in high poverty, Title I schools. The proposed research was guided by the question: Is there a difference in the achievement trend over an academic year between students with a NBCT and those with a non-NBCT? A review of the literature led to a research hypothesis. It was predicted that: *There would be a positive relationship between NBCTs in Title I schools and reading and math achievement.* The null hypothesis was that there will be no relationship between NBCTs in Title I schools and reading and math achievement.

#### Assumptions

The following assumptions are made regarding this study:

- District and school-level data were collected and measured without error.
- Level one errors are independent and normally distributed with a common variance.



- Residuals across testing periods are uncorrelated with residuals across students.
- Observations across students are independent.

### Limitations

All research has limitations and this study is no exception. One limitation was that the population for this study was limited to teachers and students in Title I schools from an urban fringe school district. Results should only be generalized to comparable schools and school districts.

A second limitation was based on the benchmark tests. Even though these tests are valid and reliable measures of student achievement, the same test was not used at each time point. All students completed the same tests, but tests at each time period were based on content covered for the quarter. Because of the nature of the test, the focus was on predicting variation around changes in achievement during the academic year. Another limitation was the unitary focus of the dependent variable, reading and math achievement. There are likely many outcomes associated with NBCTs than just achievement as measured by performance on benchmark exams. Additionally, there are indicators of student learning such as: trust, motivation, past experiences, etc., that are important to measure but were not captured in this study.

A further limitation was that, while we know that National Board Certified Teachers obtained certification, we do not know how many attempts were

required for their certification. In addition, we do not know if certification was obtained while teaching in a Title I school or non-Title I school. Finally, the lack of qualitative evidence limited the explanation of findings to theoretical and empirical evidence.

### Definitions of Terms

For the purposes of this study, the following definitions will be used:

Urban Fringe: A territory surrounding a large urban district that blends urban aspects of poverty and diversity with suburban or rural characteristics.

Hierarchical Linear Growth Modeling: A type of regression model that estimates change over time and the variability around the average change.

Edusoft Benchmark Assessment: A standards-based assessment management system used by districts to collect and analyze student performance data.

Student Achievement: The increase in student performance in Reading and Mathematics on Edusoft Benchmark Assessment data throughout one academic school year.

SES: Socio-economic status which is utilized to determine Title I status.

National Board for Professional Teaching Standards (NBPTS): An independent, nonprofit, nonpartisan organization governed by a board of directors comprised mainly of teachers, as well as administrators, school board leaders, and business and community leaders.

National Board Certified Teacher (NBCT): Teachers who have completed the

National Board certification process and have been awarded the advanced certification.

#### Overview of Dissertation

This study is organized and reported in five chapters. Chapter I introduces the research topic: National Board Certification and Student Achievement and includes an introduction, purpose, research question and exploratory hypothesis, assumptions, limitations, and definitions of terms. Chapter 2 provides a comprehensive review of the related literature. Chapter 3 details a description of the research design. The data findings are presented in Chapter 4, and the discussion of findings, implications for policy, and recommendations are presented in Chapter 5.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### Introduction

The following literature review explores the theoretical and empirical evidence on teacher quality to explain why a relationship between NBCT and student achievement in high poverty elementary schools is plausible. The review begins with a compilation of research on teacher quality that was used to support the development of the NBPTS. It continues with a comprehensive outline of the National Board Certification process and research on the effectiveness of NBCT. Finally, the review concludes with an examination of NBCTs in the state of Oklahoma, as well as state and district policies that are designed to attract more NBCTs to high poverty schools, thereby laying the foundation and further exemplifying the need for a future study.

#### Teacher Quality

A growing body of research (Ferguson, 2003; Goldhaber, Brewer & Anderson 1999; Goldhaber 2002; Hanushek 1999; Wright, Horn & Sanders 1997) suggests that the quality of the teacher in the classroom is an important factor of student achievement. The effect of having a quality teacher can be profound. Hanushek (1992), for instance, found that all else being equal students in his sample of 66 minority students with a very high quality teacher achieved an average learning gain of 1.5 grade level equivalence, while students in his study

with a low quality teacher achieved an average a gain of 0.5 grade level equivalents. Teacher quality was measured, in this study, by reading and vocabulary achievement. The conclusion was that the achievement differential attributed to quality teaching was one academic year.

Further support for the achievement benefits attributed to a quality teacher can be found in the report *Why Teachers Matter* by the National School Boards Association (NSBA, 2006). According to the report, “Teacher quality more heavily influences differences in student performance than does race, class, or school of the student; disadvantaged students benefit more from good teachers than advantaged students” (NSBA, 2006, p. 58). The National School Boards Association report and others like it (Ferguson, 2003; Goldhaber, 2002) suggest that access to a quality teacher can be a determining factor in student achievement. With evidence supporting a teacher effect, it is important to parse out characteristics of teacher quality.

Early descriptions of teacher quality left much to be desired for capturing instructional practices and characteristics of effective teachers. What was known about the quality of a teacher, historically, was limited to physical characteristics and was often negative in nature. In 1932, Willard Waller (1965) characterized what he took to be the prevailing stereotypes of teaching as an occupation that was largely composed of unmarriageable women and unmarketable men. Koerner’s *Miseducation of American Teachers* (1963) was another negative

critique of teachers. It was not only an indictment of teacher education, it also contained strong criticism of the qualities and characteristics of those who taught in American schools. Much of the reform movement in American education in the 1960s was predicated on the assumption that the qualities and qualifications of those who occupied classrooms were less than desirable (Schlechty, 1983).

More recently, research and findings on teacher quality have evolved from groundless stereotypes and warrantless critiques to more substantive definitions and measures. No Child Left Behind (NCLB) was designed with student achievement as the main indicator of quality teaching and effective school performance. The legislation made teacher quality one of the key components to reforming America's educational system; however, NCLB limits the definition of teacher quality to three teacher qualifications: a bachelor's degree, content knowledge, and a traditional or alternative teaching certificate. These qualifications were established as an indicator of *highly qualified*. Although this legislation is the driving force behind the hiring practices of many school districts, there are problems inherent in such a narrow definition of teacher quality. Paper qualifications that vaguely identify who should be allowed to teach are at best minimum qualifications for teaching, and they are not valid measures of teacher quality.

A consistent definition and measure of teacher quality is hard to find in the literature. Goldhaber and Anthony (2003) suggest that variation between teacher

characteristics and student outcomes explains why there is so much controversy over a definition of teacher quality and the effectiveness of policies to influence it. Goe (2007) reports that teacher quality may require alternative definitions based on the purpose or context. She suggests that different teacher characteristics, such as qualifications and instructional practices, may be used to assess quality. For example, the indicators of quality being used to grant tenure may vary from the indicators used for identifying and supporting struggling teachers. In short, several factors and indicators are regularly used to define and measure teacher quality.

#### *Teacher Aptitude and Traits*

In an annual report on teacher quality published by the U.S. Secretary of Education (Office of Postsecondary Education, 2002) the following claims were made about teacher quality: (1) teachers matter for student achievement, but teacher education and certification are not related to teacher effectiveness; (2) verbal ability and subject matter knowledge are the most important components of teacher effectiveness; (3) teachers who have completed teacher education programs are academically weak and underprepared for their jobs; and (4) alternative certification programs have academically stronger recruits who are highly effective and have high rates of retention. Darling-Hammond and Youngs (2002) found evidence contrary to the claims of the Secretary of Education Report. Teacher qualifications and teacher characteristics do matter for effective

teaching. Specifically, their research confirmed that some teacher qualifications may matter more than others, but these qualifications often are mediated by grade level and subject matter being taught (Darling-Hammond & Youngs, 2002).

Building on the evidence provided by Darling-Hammond and Youngs (2002), Goe (2007) argues that teacher quality may be evidenced by teachers' instructional practices and interactions with students. In particular she identified several practices characteristic of effective teachers: setting high expectations for students, particularly those at risk for poor outcomes; creating classroom environments that encourage all students to participate in worthwhile learning activities; helping students achieve at high levels; motivating at-risk students to come to school and participate in class; mentoring new teachers and acting as stabilizing forces in high-turnover schools; working diligently with students with special needs, whose test scores may not reflect teacher contributions (p. 1).

Wayne and Youngs (2003), in their synthesis of studies on teacher effects, concluded that students benefited from teachers with strong aptitudes, creativity, and higher verbal ability. They reported that some teachers were more adept and better able to impart knowledge because of their communication skills, intuition, and creativity (Wayne & Youngs, 2003). Goldhaber and Anthony (2003) also found in their review of teacher quality studies that teacher quality historically represented teachers with high moral characteristics and personal traits. Strauss and Vogt (2001) found a modicum of evidence linking teacher academic



proficiency, defined by tests of verbal ability, license exams, and college entrance exams, to student achievement. In short, the teacher quality literature consists of different conceptualizations and measures of quality teaching, some of which include personal traits (personality), aptitude (verbal ability), and communication skills.

Because the above mentioned teacher characteristics do not encompass a one size fits all definition of teacher quality, other factors of teacher quality must continue to be examined as we move toward a comprehensive definition and measure of this complex phenomenon. Two additional factors found in the literature are teacher experience and educational attainment. These variables are frequently used to predict student achievement. These characteristics will be reviewed next to assess their utility as measures of teacher quality.

#### *Teacher Experience and Educational Attainment*

Kennedy (2006) offers a broader definition and measures of teacher quality that includes years of teaching experience, degrees and certification obtained, and professional development completed. These quantifiable characteristics are believed to positively influence teaching. An advanced degree provides more training and knowledge for teachers. Likewise, the more years the teacher teaches, the more time they have spent honing their craft (Darling-Hammond, 2000; Hanushek et al., 2002; Kain, 1995).

Amerin-Beardsley (2006) found that the effects of teacher experience on student achievement are most frequently studied for two reasons. Teacher experience is easily accessible given the fact that years of experience are used as a key determinant of teacher salaries. And, teacher experience can be measured as a continuous variable and linked to student achievement gains. What we know from the research on teacher experience is that students in general learn more from teachers with more relative experience teaching in the classroom (Darling-Hammond, 2000; Hanushek et al., 2002; Kain, 1995). As one may expect, there is more to this general relationship that needs to be explored.

Rice (2003) focused her synthesis of teacher quality studies on five teacher attributes: experience, preparation programs and degrees, certification, coursework, and teacher test scores. She points out that a lack of evidence for a relationship between some attributes and student achievement may mean the empirical evidence was not readily available, rather than that no relationship existed. Rice (2003) found five significant relationships: 1) Teacher experience matters, particularly in the first few years of teaching. 2) Teacher preparation studies provide limited evidence of how teacher preparation programs improve teacher competency or student achievement. 3) Teacher certification seems to matter for high school mathematics, but there is little evidence of its relationship to student achievement in lower grades. 4) Teacher coursework, whether specific or in pedagogy, appears to have a positive impact on student learning at all grade

levels, but specific coursework matters most in secondary education. 5) Tests that measure teacher literacy or verbal ability appear to correlate with both teacher performance and student outcomes.

Based on the evidence, Rice (2003) concluded, “More refined measures of what teachers know and can do (e.g., subject specific credentials, special coursework taken) are better predictors of teacher and student performance than are more conventional measures (e.g., highest degree earned, undifferentiated course credits earned)” (p.50). With respect to the lack of available empirical data and the limited scope of the research, Rice’s synthesis is a valuable contribution to the understanding of which teacher qualifications matter most in terms of student achievement.

Nye, Konstantopoulos, and Hedges (2004) found that difference in gains posted by students in classrooms between less experienced teachers and experienced teachers was over one-third of a standard deviation (0.35) in reading and almost one-half of a standard deviation (0.48) in math. These differences were more dramatic in schools with less affluent students. Grissmer, Flanagan, Kawata and Williamson (2000) found that teachers with more relative experience produced greater gains in academic achievement than teachers with advanced degrees. Greenwald, Hedges, and Laine (1996) found that if resources were earmarked to select teachers based on their levels of experience, this would produce results in increased academic achievement of nearly one-sixth of a

standard deviation. Students learned more from teachers with more relative experience teaching in the classroom in Grissmer, Flanagan, Kawata and Williamson's (2000) sample. Finding a similar relationship between teaching experience and student achievement across different samples and student populations provides some evidence to suggest that teaching experience does matter.

The aforementioned studies provide evidence on the achievement effects of teacher experience; however, the amount and type of teaching experience must also be considered. Teaching experience may only matter up to a certain point. As noted above, Rice (2003) concluded that teaching experience mattered for the first few years of teaching, but further study revealed that more experience may be of greater importance for high school teachers than for teachers in earlier grades. Hanushek (1986) completed a meta-analysis of 109 studies that researched teaching experience and found that only 33 studies showed that increased years of teaching had a statistically significant effect on student achievement.

Researchers have also studied the influence of educational attainment as an indicator of teacher quality that may have an effect on student achievement. Amerin-Beardsley (2006) noted that in NCLB a highly qualified teacher is defined as having at least a bachelor's degree. Because all teachers across the country have at least a bachelor's degree, it is impossible to assess the effects that

teachers with and without bachelor's degrees might have on student achievement absent any type of a control group. Therefore, the only way in which we can test whether a teacher's degree matters in producing greater achievement gains is by examining the effects teachers with and without advanced degrees might have on student achievement.

The relationship between whether a teacher has earned an advanced degree and student achievement is frequently examined because the data are easily accessible - a teacher's degree is used as part of school districts' salary calculations. Goldhaber (2002) found that having advanced degrees outside of the subject area(s) in which a teacher teaches is not significantly related to gains in student achievement. Grissmer, Flanagan, Kawata and Williamson (2000) also found that teachers with a master's degree did not produce achievement gains greater than teachers without a master's degree. Acquiring a master's degree, particularly if it is not related to a teacher's content area(s), was not associated with student achievement. What we know from the research is that the relationship between whether a teacher has earned a master's degree and student achievement is inconclusive because the type of degree mediates the relationship. In short, advanced degrees do seem to matter if advanced degrees are specific to a teacher's content or specialty area.

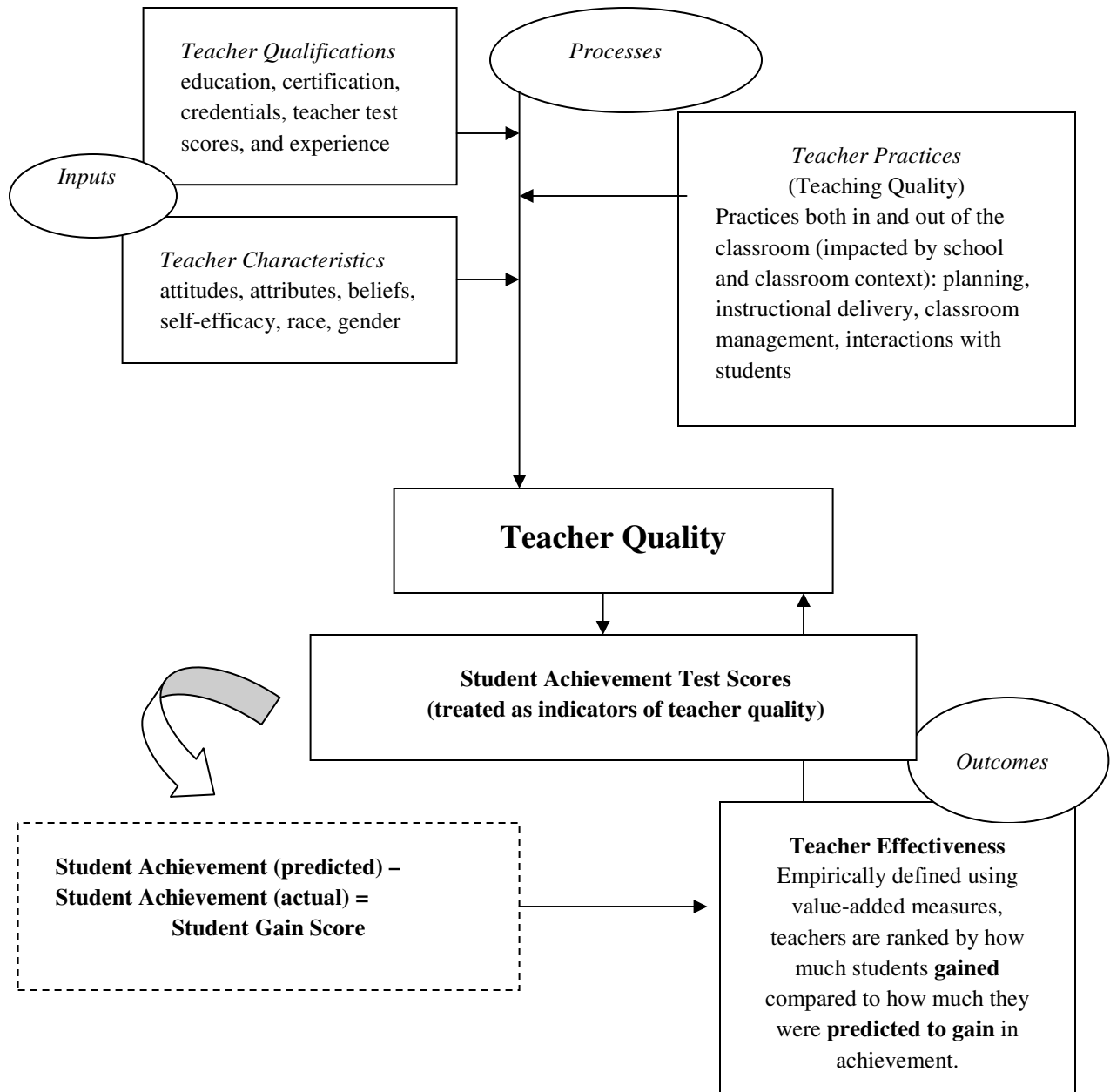
To summarize, teacher quality has been defined and measured in many ways, from personal and teacher traits to educational experience and attainment.

There is universal agreement that teacher quality matters in terms of student achievement, but there has been no clear consensus on which aspects of teacher quality matter most or even what a useful definition of teacher quality might be (Goe, 2007). A proposed definition and framework derived from a synthesis of research are presented in an attempt to define teacher quality and make sense of the way researchers have measured it over the years.

### Goe's Framework on Teacher Quality

Goe's (2007) framework on teacher quality integrates the previously mentioned literature on teacher qualifications and characteristics with evidence on instructional practice to arrive at a comprehensive conceptualization of teacher quality. Her framework presented in figure one was developed from the extant literature to make sense out of the many ways in which researchers have measured teacher quality. There are four distinct but related ways of looking at teacher quality that Goe grouped into three categories: Inputs (teacher qualifications and teacher characteristics), Processes (teacher practices), and Outcomes (teacher effectiveness). Teacher qualifications, characteristics, and practices are all used to define teacher quality and exist independently of student achievement, whereas teacher effectiveness is wholly dependent on student achievement. Each of the components of the model are important in forming a detailed explanation of teacher quality that is pulled from the research literature. The elements of Goe's framework are explained next.

Figure 1. Graphic Representation of a Framework for Teacher Quality (Goe, 2007)



### *Teacher Qualifications and Characteristics*

The first strand of the framework for defining teacher quality focuses on teacher qualifications and characteristics, identified as teacher inputs. Teacher characteristics are inputs such as race, gender, beliefs, self-efficacy, attitudes and attributes. Teacher qualifications include teachers' coursework, grades, subject matter education, degrees, test scores, experience, certification, and credentials. Teacher qualifications also include evidence of participation in continued learning such as internships, induction, supplemental training, and professional development (Goe, 2007). Experience is included in this category of teacher qualifications because it is counted as a qualification for NCLB requirements and because empirical evidence suggest that it matters for student achievement.

Betts, Zau, and Rice (2003) found in their study of student and teacher data in elementary through high school in the San Diego Unified School District utilizing 1998 – 2000 data that the contributions of various paper qualifications vary widely among subject areas and between grade levels. They concluded that what matters for mathematics achievement may not matter for reading achievement. Likewise, what matters in the primary grades may not matter in the secondary grades. Therefore, the effectiveness of teacher qualifications will vary according to school contexts.

Carr's (2006) study linked Ohio teachers' experience, degree level, and designation as highly qualified by NCLB requirements with student achievement



as measured by Ohio's standardized proficiency tests. He used archival data from students and teachers in traditional and charter schools. Carr's findings suggested that for traditional public schools, teacher quality (i.e., highly qualified teacher status) was significant, but not large in 18 out of 21 models tested, but teacher experience and advanced degrees did not significantly contribute to student achievement in these same models. This finding suggests that NCLB-authorized paper qualification alone account for only a small percentage of teacher contributions to student learning as measured by student achievement test scores.

The advantage of focusing on teacher qualifications as a measure of teacher quality is that data is easily available. The major disadvantage of the paper qualifications of teacher quality is that a teacher can be deemed to be of high quality on paper yet perform poorly in the classroom (Goe, 2007). Advanced certifications and degrees maintain that there is potential for a teacher to be effective; however they do not provide sufficient evidence to confirm teacher effectiveness. For this reason, it is also necessary to examine teacher practices as a more substantial indicator for teacher quality.

### *Teacher Practices*

The next strand of the teacher quality framework addresses teachers' actual classroom practices and correlating practices with student outcomes (Goe, 2007). The research on effective teacher practices varies in its findings as related to teacher quality. Teacher practices include items such as planning, instructional

delivery, classroom management, and interactions with students both in and out of the classroom. Many studies regarding teacher practice used observation protocols to document and evaluate instructional practices and teacher interactions with students. Observable data were then correlated with measures of student achievement. Researchers frequently used Charlotte Danielson's (1996) *Framework for Teaching* as their foundation for measuring effective teaching practice. Danielson's framework is based on the work of Carol Dwyer (1994) and was explicitly created to provide a mechanism for assessing experienced teachers. The framework defines 22 components of practice within four domains: planning and preparation, the classroom environment, instruction and professional responsibilities (Danielson, 1996).

Holtzapple (2003) used a standards-based teacher evaluation system based on Danielson's (1996) framework to compare student achievement with teachers' evaluation scores. In a sample of 246 comprehensively evaluated Cincinnati Public School teachers in grades 3 – 8, teachers who received low ratings on the instructional domain of the teacher evaluation system had students with lower achievement scores than would have been predicted by prior achievement (Holtzapple, 2003). Milanowski (2004) analyzed the relationship between teacher evaluation scores and student achievement in a large Midwestern district using value-added measures. The evaluation system used was also based on Danielson's (1996) *Framework for Teaching*, with 212 teachers in grades 3 – 8. He found

small to moderate correlations between teacher evaluation scores and student growth (Milanowski, 2004).

Cohen and Hill (1988) did not use the Danielson framework to measure teaching practice; instead, they measured instructional practices through a 14-item survey consisting of questions about conventional strategies and teaching practices relating to the 1985 *Mathematics Framework for California Public Schools*. They found evidence that the instructional practices of teachers mattered for math achievement. Additionally, findings indicate that teachers' participation in professional development activities designed to change instructional practice may also affect student achievement (Cohen & Hill, 1998). Cohen and Hill's study is important because of the large sample size and the direct links among professional development, teacher practices, and student outcomes that were studied.

In summary, the evidence supports including instructional practices as a property of teacher quality. Teacher practices, both inside and outside of the classroom, are the foundation of the NBPTS. The NBPTS utilized similar research in developing their core propositions of what teachers should know and be able to do, as well as, effective ways of assessing these practices. The above research findings provide compelling evidence to support the claim that teacher practices are attributed to teacher quality while also establishing the rationale for the NBPTS to examine teacher practices in their determination of effective

teachers who meet the criteria for National Board Certification. Other criteria for teacher quality, based on the framework, are discussed below.

### *Teacher Effectiveness*

The final strand of the framework for defining teacher quality is teacher effectiveness or outcomes. Teacher effectiveness, as measured by growth in student learning, is determined by linking teacher and student data. A number of policymakers and researchers have suggested that effectiveness, as measured by teachers' contributions to their students' learning, should be an important component of assessing teacher quality (Goe, 2007). Much of the research on teacher effectiveness utilized value-added measures to assess effectiveness.

Noell (2006) used value-added scores for Louisiana students to examine the efficacy of the teacher preparation programs. Value-added scores were calculated for students in grades 4 – 9 in 66 of 68 Louisiana Public School Districts, and then linked with teachers. Databases were constructed to allow separation of subject tests so that teacher effectiveness could be examined based on scores in specific subjects (English/language arts, mathematics, sciences and social studies). From these data, the largest predictor of student achievement was the student's prior test scores in the content area (Noell, 2006).

Nye, Konstantopoulos, and Hedges (2004) defined teacher effects as the portion of student achievement gain that remains unaccounted for after controlling for student demographics, class size, and school fixed and random effects. Their

sample included 79 elementary schools in Tennessee. Data were used from a four-year experiment called Project STAR (Student Teacher Achievement Ratio) in which teachers and students were randomly assigned to classes to estimate teacher effects on student achievement. Findings suggested much larger teacher effect variance in lower socioeconomic schools than in high socioeconomic schools (Nye, Konstantopoulos & Hedges, 2004).

Another study by Rivkin, Hanushek and Kain (2005) used matched panel data from Texas to sort out the effects of teachers (and schools) on achievement. They examined observable components (teacher education and experience) and unobservable components (residuals) and their relationship to student achievement gains on the Texas Assessment of Academic Skills in reading and mathematics. The authors found that observable teacher characteristics had small, but significant effects on student achievement gains but that most of teacher effectiveness is due to unobserved differences in instructional quality (Rivkin, Hanushek & Kain, 2005). These studies on teacher effectiveness generally sought to determine whether or not differences in teacher effectiveness exist and they were successful in determining that differences do exist. However, these studies were unable to arrive at convincing conclusions about which teacher qualifications, practices or characteristics contributed to the differences in teacher effectiveness.

## Teacher Quality Propositions

While the research analysis supports the claim that teacher effects are large enough to be important, it is less successful in identifying teacher characteristics that could be used to predict which teachers will be more effective. Therefore, it is necessary to continue identifying effective observable and non-observable teacher characteristics that increase the ability of teachers to produce achievement gains in their students.

Propositions for teacher quality can be developed based on the empirical evidenced. Based on that evidence, one proposition of teacher quality is that although teachers may have advanced degrees, student learning increases when the teacher has specific, advanced knowledge about the subject matter they are required to teach and how to teach it to students. A second proposition reflected in the literature is that teachers may have many years of teaching experience; however they must grow from that experience through reflection and professional development opportunities in order to maintain effectiveness. A third proposition is that unobserved teacher characteristics are likely more positively related to student learning. These unobserved characteristics are attributed to quality of relationships and social interactions in the school community. A fourth proposition is the importance of effective instructional practices of the classroom teacher that are based on reflecting on instruction, monitoring student learning and adjusting instruction to meet the needs of students. A final proposition relates

to the importance of establishing and reinforcing high expectations for students regardless of race, ethnicity, or socio-economic status.

Research is clear that teaching practices employed by classroom teachers have the potential to positively influence student performance (Ferguson 2003; Goldhaber 2002; Goldhaber et al. 1999; Hanushek et al. 1999; Wright et al. 1997). Less clear is the effectiveness of specific practices under different conditions and within different contexts. As will be demonstrated later, the aforementioned propositions extracted from the empirical evidence closely align with the National Board's five core propositions that undergird its certification process.

#### Development of National Board for Professional Teaching Standards

The 1983 report of *A Nation at Risk* (US Department of Education, 1983) heightened the awareness of teacher quality and spawned a wave of educational initiatives that the Carnegie Task Force on Teaching as a Profession built upon in its report, *A Nation Prepared: Teachers for the 21<sup>st</sup> Century* (Carnegie Foundation, 1986). NBPTS followed in 1987 with a three-fold mission (2005):

- Advancing the quality of teaching and learning by maintaining high and rigorous standards for what accomplished teachers should know and be able to do,
- Providing a national voluntary system certifying teachers who meet these standards, and
- Advocating related education reforms to integrate National Board Certification in American education and to capitalize on the expertise of National Board Certified Teachers (p.5).

The National Board focused its educational reform efforts on the teacher with the belief that strengthening teaching was the most effective action the nation could take as it worked to improve student learning. In the early years of the National Board, a commonly held and expressed hope was that National Board Certification would help create a nationwide group of teachers who could re-energize, motivate, and invigorate the teaching profession as a whole by setting a standard of excellence for the profession. It was expected that these teachers would be working across the country giving back to the profession as leaders and mentors in their schools (Vandevoort, 2004). Two key components of this vision were: (1) adoption of standards that represented accomplished teaching and (2) creation of a reliable and valid system of assessment.

When NBPTS was founded in 1987, it was understood that a critical first task was the development of a policy that would explicate the vision of accomplished practice. With assistance from researchers in teaching, members of the Board began debating the concept of what constituted an accomplished teacher. That task, as well as the development of the Board's standards and assessments, took over six years to complete and involved extensive time commitments by expert teachers, school administrators and scholars. The standards were initially presented as drafts that were reviewed by individuals within education, members of the non-teaching community, and members of the NBPTS Board of Directors (Vandevoort, 2004). In 1989, the board of directors issued its policy statement,



*What Teachers Should Know and Be Able to Do*, which has served as a basis for the teaching standards developed by NBPTS. The standards reflect the five core propositions of effective teaching developed by NBPTS.

### *Five Core Propositions*

To this day, the initial policy paper remains the cornerstone of the system of National Board Certification and has served as a guide to school districts, states, colleges, universities and others with a strong interest in strengthening the initial and ongoing education of America's teachers (NBPTS, 2002). The five core NBPTS propositions add an important element to the definition of teacher quality. Unlike teacher characteristics or teacher qualifications, National Board attempts to measure instructional practice. The NBPTS seeks to identify and recognize teachers who effectively enhance student learning and demonstrate the high level of knowledge, skills, abilities and commitments reflected in the following five core propositions (NBPTS, 2002).

1. Teachers are committed to students and their learning.

The NBPTS believes that 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 (NBPTS, 2002).

Teachers committed to students and their learning 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, 2002).

The research utilized by the NBPTS to support the development of the first core proposition of teachers being committed to students and their learning lays the foundation for effective teaching practices. Research conducted by Housner (1985) found that expert teachers know the abilities, experiences and backgrounds of the students they teach. Berliner (1987) found that expert teachers know their students personally in order to know what variations are needed in teaching. Expert teachers have “extensive, accessible knowledge that is organized for use in teaching; and knowledge of the political and social context in which teaching occurs” (Sternberg & Horavath, 1995, p.10). These implications for understanding and fostering expertise among teachers were instrumental in the development of the first core proposition.

2. Teachers know the subjects they teach and how to teach those subjects to students.

The NBPTS also believes 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. 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 (NBPTS, 2002).

Teachers who know the subjects they teach and how to teach those subjects to students 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, 2002).

The establishment of the second core proposition by the NBPTS is founded on research conducted by Sabers, Cushing and Berliner (1991) which found that expert teachers are more able to deal with the multidimensionality of the classroom. Leinhardt (1983) found that expert teachers have more

understanding of the how and why of student success and identify and use the most relevant information on decision-making. Locke and Latham (1992) found that expert teachers set challenging student goals and structure situations so students can achieve them. Taken together, a thorough understanding of subject-matter and the effective dissemination of information to students is the basis for this proposition. Knowledge of content and effective teaching strategies continues throughout the next proposition as it relates to the responsibility of teacher to student.

### 3. Teachers are responsible for managing and monitoring student learning.

The NBPTS believes 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 (NBPTS, 2002).

Further, 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 (NBPTS, 2002).

Teachers who are responsible for managing and monitoring student learning 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, 2002).

Research by the NBPTS that supports the establishment of the third core proposition began with cognitive research conducted by Houser and Griffey (1985) which found that expert teacher's problem solve with respect to each student's performance in class. Clarridge (1989) found that expert teachers engage all students in tasks and feedback, and monitor their progress. Expert teachers can also detect when students lose interest and do not understand (Berliner, 1988). This research identified for the third proposition establishes the importance of effective teachers to have an efficient way of monitoring their students in order to meet individual learning needs. Not only are effective teachers responsible for student learning, but they are responsible for their own learning as well.

4. Teachers think systematically about their practice and learn from experience.

The NBPTS believes that 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 (NBPTS, 2002).

Also, 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, 2002).

The development of the fourth core proposition by the NBPTS was based on research from Biggs (1987) who found that expert teachers adopt a deep approach to learning that has consequential effects on what and how students learn. Leinhardt and Green (1986) found that expert teachers evaluate possible strategies while getting further data and knowledge on student performance, thus prioritizing and reprioritizing intervention strategies. Berliner (1988) found that expert teachers display a passion for teaching and a sense of responsibility; they inspire students to become more excited about learning. Based on much of the research, accomplished teachers should demonstrate a routine of continuous

learning. This pursuit of knowledge to better oneself in the teaching profession is intended for the teacher as well as other education professionals as outlined in the fifth proposition.

5. Teachers are members of learning communities.

The NBPTS believes that 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. Teacher who are members of learning communities find ways to work collaboratively and creatively with parents, engaging them productively in the work of the school (NBPTS, 2002). The fifth core proposition aligns with research conducted by Hughes, Bailey and Mechur (2001) which found that business and community involvement increases student achievement.

The teacher practices identified as the five core propositions for National Board Certification encompass the processes aligned with instructional effectiveness as identified in Goe's (2007) conceptual framework for teacher quality. The propositions also parallel research evidence on successful teaching

and learning. Taken together, the propositions function as the foundation for the National Board assessment process (NBPTS, 2002).

#### National Board Assessment Process

As stated in their mission statement, the National Board seeks to set the standard for teacher quality by establishing “high and rigorous standards for what accomplished teachers should know and be able to do” (NBPTS, 2005, p.5). In order to receive certification candidates must complete a portfolio, which contains detailed evidence of teaching methodology, planning, practice, and written papers. As part of the portfolio assessment, teachers videotape and analyze their teaching, provide evidence of student learning, and display artifacts used in their teaching. The portfolio portion of the assessment was designed to examine the ways in which teachers put theory into practice in their classrooms.

The Board’s assessment process is performance-based and includes the evaluation of portfolio entries as well as the completion of a set of tasks that take place at an assessment center, usually over the course of a full day. Testing at the assessment center requires teachers to provide written responses to questions that are specific to their field of teaching. The Board’s goal in developing these activities was not only to complement and expand upon the portfolio, but also to allow the candidates the opportunity to demonstrate the scope of their content-specific knowledge.



Performance tests such as those chosen by the NBPTS are expensive to develop and to score. Thus, for teachers, the costs to take the examination are high, currently running about \$2,300.00. To successfully complete the certification process, the candidate is required to earn a minimum score on all of the sub-sections of the portfolio assessment and on various sub-tests taken at the assessment center. The process of National Board Certification requires a solid knowledge base in the teaching area of the candidate; therefore provisions were established by the NBPTS to ensure appropriate candidates applied.

### *Eligibility*

National Board Certification is not intended for novice teachers. It is designed for accomplished teachers. According to Bailey and Helms (2000) there is a difference between who is eligible to apply and who should apply. Eligibility is based on three basic criteria. First, teachers must have been teaching for at least three years while holding a state teaching license. Second, teachers must teach in the area in which they are certified. Third, teachers must teach at least eight students in the field for which they wish to apply for certification.

Entering into National Board Certification candidacy should not be taken lightly. A prospective candidate must evaluate where they are in their careers when considering entering into candidacy. Burden (1990) reported teachers' careers could be broken down into three stages that generally correlate with years of experience. The first stage, survival, is associated with a beginning teacher in

his or her first four years. The second stage, competency-building, is associated with a teacher whose experience ranges from five to twelve years. The final stage, stability, is associated with a teacher of more than twelve years.

Bailey and Helms (2000) suggest teachers in a competency-building stage are ideally suited for candidacy. Teachers at this point in their careers have established themselves in their classrooms. They are in control of classroom management and have solid teaching skills; they also refine their practice and perceptions of teaching and learning on a consistent basis. Teachers in the competency building stage are often more reflective in their teaching because they seek to continuously improve teaching making them ideal candidates because of the reflective nature of certification requirements. Bailey and Helms (2000) also suggest that teachers in the stability stage of their careers can make good candidates; however, many teachers in this stage often have increased professional responsibilities that can prevent them from applying for candidacy. The certification process is an intense yearlong experience. Before educators decide to apply for certification they should determine if they have the time required for completion of the process (NBPTS, 1998). In addition, many teachers never reach the level of accomplishment required by the National Board in order to achieve certification. Many individuals decide to leave the profession, others may stay but never leave the survival stage regardless of years of

experience. Before applying for National Board candidacy it is important for individual educators to assess where they are in their careers (NBPTS, 1998).

### *Portfolio Requirements and Assessment Exercises*

Teachers who enter candidacy take part in assessments that judge their level of teaching proficiency (Barker & Robinson, 2001). As stated earlier, the National Board wanted to make assessments as authentic as possible, therefore candidates must complete a portfolio demonstrating competency of National Board Standards and must also demonstrate written competence at an assessment center. The assessments were developed in part with classroom teachers.

The portfolio requires candidates to generate six 10 – 15 page papers, which are descriptive, reflective, and use student work samples. The portfolio requires evidence such as videotapes, written assignments, and testimonials (Mack-Kirschner, 2003). The exact specifications of each portfolio depend on the area of certification applied. The common thread among requirements for any certification area is that the candidate must make specific references to teaching actual children (Bailey & Helms, 2000). Many candidates choose to utilize support groups comprised of other candidates or facilitators who are experts in the certification process to help produce the highest quality product to submit to the National Board (Steeves & Browne, 2000).

The portfolio requirement is extensive and the average candidate reports spending over 200 hours for completion (Bailey & Helms, 2000). Success in the

portfolio process lies in an in-depth understanding of the specific standards that are being addressed for the certificate area. The major reason for not passing is the lack of willingness to devote the necessary time to the process (Bailey & Helms, 2000). Along with the six written papers, two uninterrupted videotapes that demonstrate actual lessons engaging students are required.

All scoring is based on the evidence candidates submit—video recordings, student work samples, candidate’s analyses, and the response to assessment center prompts. Each source offers an opportunity to see the candidates at work and to evaluate their practice in light of conscious, deliberate, analytical, and reflective criteria. No one approach to teaching or school counseling is mandated by the National Board Standards or rewarded by the scoring process. Indeed, several different pedagogical approaches characterize the teachers and school counselors who have achieved National Board Certification. However, in every case, National Board Certified Teachers demonstrate the analytical and reflective abilities defined in the Standards (NBPTS, 2008).

The assessment center portion of the National Board Certification process asks candidates to demonstrate their content knowledge in response to six exercises developed and designed by practicing professionals in their certificate area. Candidates are given up to 30 minutes to respond to each of the six exercises. These exercises are administered at more than 400 computer-based testing centers across the United States (NBPTS, 2008). Assessment center exercises are

designed to assess a candidate's content knowledge, not the textbooks or resource materials that he or she might have or acquire, or a candidate's ability to use the word processor. Due to the nature of the assessment center exercises and in the interest of equity for all, candidates are only allowed to bring certain materials into the assessment center on the day of testing. The option to handwrite responses to the computer-based assessment center exercises was eliminated for most certificates in 2003 (NBPTS, 2008).

### *Credibility*

The National Board continues to maintain credibility by continuous efforts to control for unethical practices within the assessment process. Ballou and Podgursky (1998) argue that a major downfall of the National Board assessment process is the inability to control cheating. The candidate constructs his or her portfolio on their own; therefore, it would be easy for someone else to help with the portfolio or write the papers for the candidate. One way the National Board attempts to control cheating is by requiring the written assessment component at a centralized location where candidates must offer proof of identity in order to attend. Bailey and Helms (2000) state it would be extremely difficult, if not impossible, for someone who has not written the portfolio papers to write the assessment center essays to satisfactory quality because the assessment essays require the knowledge of the standards and classroom practices used to complete the portfolio.

In addition to distinguishing the most highly qualified teachers, controlling for unethical procedures is another reason a candidate's scores on the assessment is an essential part of the certification process. This aligns with the conceptual framework (Figure 1) which identifies teacher qualities and characteristics independent of teacher practices. Because the National Board assessment process measures behaviors and practices characteristic of effective teaching, NBCT can be used as an indicator of teacher quality. Based on the conceptual framework of teacher quality (Figure 1), the assessment process of National Board certification is a way to measure the processes that teachers utilize in their classrooms. Applicants are provided the opportunity to demonstrate these practices through portfolios, assessment exercises and videos. These processes can serve as indicators of teacher quality when combined with the inputs of teacher qualifications and characteristics, but how predictive is NBCT for student achievement?

#### National Board Certification and Student Achievement

There appears to be a positive consensus regarding the utilization of the National Board for Professional Teaching Standards to identify teacher quality based on the processes utilized by National Board Certified teachers. However, according to the conceptual framework introduced earlier (Figure 1) these qualifications, characteristics and practices of quality teachers can exist whether or not they are measured with student test scores to identify teacher effectiveness.

The next section of this review will continue to examine inputs and processes associated with teacher quality in order to understand the relationship between NBCT and student achievement.

NBPTS invites scrutiny on the National Board Certification process and its relationship to effective teaching and quality learning. The president of NBPTS stated, “in the 20 years since NBPTS was founded, National Board Certification has become one of the most heavily researched areas in the teaching field” (2007, p.1). The extensive evidence on the relationship between National Board Certified Teachers and student achievement is mixed. Some studies found positive achievement effects while others did not find any significant difference in student achievement that was attributed to NBCT. The evidence is reviewed next to make sense of what is known and not known from the findings. It is divided into Internal Research and Third Party Research.

#### *Internal Research*

The NBPTS has conducted its own investigation of the relationship between NBCTs and student achievement. It should be noted that there are some limitations to internal research. For instance, most internal research does not undergo a peer review process. Also, there is always the notion of a conflict of interest in internally conducted research. That stated, the results of the internal studies on NBCTs have been mixed. Some evidence indicates that students of NBCTs do not demonstrate significantly better performance in comparison with

students of non-NBCTs (Sanders, Ashton & Wright, 2005; McColskey & Stronge, 2005).

Sanders, Ashton, and Wright (2005), for example, report large variations in the impact of NBCTs, which leads them to assert that generally no significant differences exist between NBCTs and other teachers. Likewise, Harris and Sass (2007) found that when students are compared using results from the standardized test Florida uses for state and federal accountability, students with NBCTs achieved significantly higher gains in reading than their peers without NBCTs. By contrast, when using a norm-referenced test that is not aligned with state standards, students with NBCTs performed worse than other students. The researchers concluded that the choice of test turns out to have significant influence on many of the results.

While the above studies found limited influence on student achievement, as measured by standardized tests, other studies did identify some benefits of National Board Certification not related to performance on achievement tests. McColskey and Stronge (2005) found no significant student achievement gains among students of NBCTs, but they did find strong performance by NBCTs in their practice-related areas, such as graduate coursework, student-assignment design, and quality of planning practices. Further, they found there was more complexity in reading comprehension assignments by NBCTs and sophistication in their classroom management. Although this study was not directly associated



with student achievement on standardized tests, it does add to the argument that National Board Certified Teachers are influencing classroom practices and processes.

In summary, internal research suggests that achievement differences attributed to NBCT is mixed. Statistically significant differences were found in some samples with some tests, but not in all of the studies. The research in general claims that NBCTs have demonstrated a solid knowledge and understanding of what quality teachers should know and be able to do based on the five core propositions of the NBPTS. Based on the established framework mentioned earlier (Figure 1), internal research concludes that National Board process is a reflection of teacher practices that are attributed to teacher quality.

#### *Third Party Research*

Third party objective researchers have also studied NBPTS to better understand the relationship between NBCTs and student achievement. The number of studies about NBCTs and their effects on student learning continues to grow. Some focus on achievement test score outcomes, while others address student performance on classroom-based assessments. While it is important for the NBPTS to conduct their own research, third party research does not have the biases or conflict of interest as do internal investigations. More importantly, this research is more likely to be peer reviewed which adds additional weight to claims made about NBCTs.

Four large-scale analyses are especially instructive for understanding the achievement effects of NBCTs. Goldhaber and Anthony (2004) found that students with NBCTs, and especially recently certified NBCTs, had higher gains in student test scores than students with non-NBCTs. Their analysis of databases of North Carolina student and teacher assessment results revealed that students of NBCTs scored 7 to 15 percentage points higher on year-end exams (The scores vary among grades and according to students' race and income levels). Furthermore, this study found that teachers who were destined to become NBCTs were more effective before they are recognized by NBPTS, raising the question about the instructional value added by the certification process.

Clotfelter, Ladd, and Vigdor (2007) examined the effects of National Board Certified Teachers on student achievement in North Carolina as well. They used a test that had been administered for more than 10 years as part of North Carolina's accountability system and is aligned with the state's Standard Course of Study in reading and mathematics for students in 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> grades. One finding from this study is that although students of NBCTs generally outperformed those of other non-NBCTs at statistically significant levels, teachers may be less effective – where effectiveness is measured by success in raising test scores—after receiving certification than before. Similar to the Goldhaber and Anthony (2004) study, the conclusion drawn from these findings is that the National Board Certification process appears to identify effective teachers but

does not make them more effective. Therefore, additional salary paid to NBCTs is simply a reward for good work but not a way to improve student achievement (Clotfelter et al, 2007).

A third study by Cavalluzzo (2004) examined 108,000 student records from the Miami-Dade County school system to see if the various professional characteristics of teachers were related to student achievement in mathematics. For this study, she focused on ninth grade students who took the state end-of-grade exam in mathematics in school years 2001-2003, and tenth grade students who took the end-of-grade exam in school years 2002 or 2003. She found that on seven of nine teacher indicators NBCTs had a statistically significant effect on the academic outcomes of their students. All else being equal, the mathematics gains were larger for Hispanic and African American students. In addition, she found that compared with students whose teachers had never attempted National Board Certification, those students whose otherwise similar teachers passed the certification process had larger gains than those whose teacher had failed or withdrawn from the certification process. This finding argues for including teacher practices in our conceptual framework (Figure 1) as an indicator for teacher quality.

Likewise, in 14 Phoenix-area elementary schools, researchers gathered data comparing the students of NBCTs to those of their non-NBCT peers (Vandevoort, Amerin-Beardsley & Berliner, 2004). Four years of results from the

Stanford Achievement Tests in reading, mathematics and language arts, in grades three through six, were analyzed. In almost three-quarters of the 48 comparisons (using four years of data and three measures of academic performance across four grades), students of NBCTs surpassed students of non-NBCTs. The learning gains are equivalent, on average, to spending about an extra month in school.

These four studies conclude that National Board Certified Teachers are likely to produce higher levels of student achievement than teachers who are not certified by the National Board. The studies utilized designs that analyzed student assessment scores and compared those scores with NBCTs and non-NBCTs. The evidence, however, should be interpreted cautiously. Even though achievement differential existed between students with NBCTs and those without NBCTs, several findings raised questions about the value added by the assessment process. If teachers who desire to obtain certification are more effective before the certification process, how much additional contribution does National Board make? Although the four large studies reviewed in this section are very valid studies, their design methods did not account for the nested structure of the data which leaves their results open to some questions. Such as, how does the overall school environment influence effectiveness of NBCTs? To what extent does student achievement vary within schools and across schools? In particular, how much does teacher quality add to the analysis of student achievement effects in high poverty schools?

## Quality Teacher Distribution

There is persuasive evidence that quality teachers have a cumulative and positive effect on student achievement, particularly for low-income, minority, and other at-risk populations (Hanushek, 1992; Hanushek, Kain, & Rivkin, 1998; Sanders & Rivers, 1996). Unfortunately, poor and minority children are less likely to be placed with high quality teachers (Clotfelter, Ladd, Vigdor, & Wheeler, 2007; Haycock, 2000; Haycock, 2003; Peske & Haycock, 2006). Amerin-Beardsley (2006) argues that in schools where teacher quality matters most – the schools in which poor and minority children are educated - the state of teacher quality is no better than grim. Teachers who are often younger and less experienced often end up teaching in the most challenging schools until they can get enough experience to transfer into schools with less difficult students (Ingersoll, 2003; Johnson & Birkeland, 2003; Johnson, 2004; Prince, 2002). Students from economically disadvantaged backgrounds often have teachers who have neither a major or minor in the subject areas they teach. Teachers with emergency and alternative teaching certificates are more often found in these schools and the proportion of under-certified teachers in these schools is growing exponentially in some states (Barr, 2004; DeAngelis, Presley & White, 2005; Freeman, Scafidi & Sjoquist, 2002; Kirby, Naftel, & Berends, 1999; Nield, 2003; Peske & Haycock, 2006; Watson, 2001).

Studies in New York City (Barr, 2004), Texas (Kirby, Naftel & Berends, 1999), Georgia (Freeman, Scafidi, & Sjoquist, 2002), Philadelphia (Nield, 2003; Watson, 2001), Illinois (DeAngelis, Presley, & White, 2005; Presley, White, & Gong, 2005), Ohio and Wisconsin (Peske & Haycock, 2006) underscore the disproportionate distribution of quality teachers among hard-to-staff schools. Evidence from these studies suggest that NBCTs are repeatedly underrepresented in high poverty schools. Additional evidence suggests that teachers who teach in schools with higher relative percentages of students from racial minority and economically disadvantaged backgrounds are less likely to hold master's degrees than their teacher peers who teach in more affluent schools (Clotfelter, Ladd, Vigdor, & Wheeler, 2007; Haycock, 2000; Peske & Haycock, 2006). Although some of the best and most hard-working teachers teach in the inner-cities, they teach with some of the most grossly under-qualified teachers in the country. Such evidence raises an important question: How is teacher quality distributed equitably among schools with the greatest need?

NBPTS examined the distribution of NBCTs, in an attempt to understand the effects NBCTs were having on all types of students. Much of the findings suggest that the expertise and leadership capacity of NBCTs have the potential to positively influence low-performing schools and fundamentally change student outcomes. Unfortunately, NBCTs are not evenly distributed among all schools. Nationally, according to 2006 NBPTS data (NBPTS, 2007), a majority of

National Board Certified Teachers work in rural and suburban schools, and approximately one-third work in schools with students from low-income families. Other studies have found a similar disproportionate distribution of NBCTs to the most challenging schools (Goldhaber & Anthony, 2004; Humphrey, Koppich & Hough, 2004; Rotherham, 2005).

Using 2004 data from NBPTS based on a survey of six states Humphrey, Koppich, and Hough (2004) found that poor, minority, and low-performing students were less likely than their more affluent peers to be taught by an NBCT. Only 16 percent of NBCTs in the sample were teaching in high-minority schools (more than 75 percent minority); 12 percent in high-poverty schools (more than 75 percent of students' households in poverty); and 19 percent in low-performing schools. The same study found that 6 percent of North Carolina NBCTs taught in high minority schools and only 6 percent of Ohio NBCTs are in high-poverty schools. Moreover, while 16 percent of Florida NBCTs taught in high-need schools, 43 percent taught in high-performing (test scores in the top three deciles) schools. Based on these data, the researchers ascertained that the majority of NBCTs at the time of the study were working in schools that already demonstrated high performance.

Studies by Clotfelter, Ladd, Vigdor, and Wheeler (2007), Goldhaber and Anthony (2004), and Rotherham (2005) concluded that despite some evidence of NBCTs ability to raise student achievement, teachers were less likely to teach in

high poverty schools. North Carolina provides a clear illustration of this point. Currently, North Carolina is the state with the highest number of NBCTs and one of the largest annual expenditures of state dollars in support of the National Board Certification (NBPTS, 2006). A report by Berry and Ferriter (2006) regarding the status of NBCTs in North Carolina noted their disproportionate distribution. Though 10 percent of North Carolina's teaching population holds NBCT status, half of these educators work in schools with the smallest percentages of poor and minority students. According to the same report, 25 percent of the poorest schools in North Carolina have no NBCTs at all. Studies have investigated NBCTs to more clearly understand the distribution across the country and the apparent reluctance to work in high-poverty schools.

Why are NBCTs less likely to teach in high poverty schools? Linqanti (2001) explored the feasibility of using the NBPTS teacher assessment and certification process as a part of a comprehensive strategy to improve professional culture and teaching quality in low performing schools. He explored the particular challenges and concerns identified by National Board candidates, certified teachers, school and district administrators, and support providers who had been closely involved with the NB process in low-performing schools.

An insight into some of the challenges NBCTs face in high poverty schools were found in Linqanti's (2001) study. These challenges include: instability and unpredictability of students, teachers and administration; multiple,



critical roles NBCTs must play in these schools; inability of the NBCT to demonstrate excellence; status distinctions between NBCTs and non-NBCTs; limited access to parents; and deficient hardware and technical support. He also found that there were external pressures on high-poverty schools that also contributed to the disproportionate distribution. Among these demands were top-down reform initiatives, highly scripted curricula and instructional methods and a focus on high-stakes performance indicators.

Linquanit's (2001) findings parallel evidence from an analysis of the Schools and Staffing Survey (SASS) by *Education Week*. The Education Week study suggests that teachers in high poverty, high minority schools reported much more difficult working conditions; higher transiency and turnover rates among students, teachers and administrators; fewer available resources; less well-maintained facilities; a less collaborative culture; and more difficult community and parent circumstances (Education Week, 2003). Given inadequate teaching conditions in many high poverty schools, Humphrey (2005) found that a potential solution to attracting the best teachers to the most challenging schools would seem to lie in designing an appropriate package of incentives, as well as a process of making these schools more attractive places for highly skilled or Nationally Board Certified Teachers to teach.

A number of states and districts have developed or considered policies designed to reward NBCTs only if they teach in high-needs schools. One of those

states is Georgia, where the governor and legislature approved a law that will gradually eliminate across-the-board salary incentives for NBCTs. The new law will only award the 10 percent salary increase to NBCTs who work in a school that has been on the state's low performing roster for two or more consecutive years. The same policy was considered in South Carolina. Likewise, in Charlotte, North Carolina, a past superintendent considered transferring "high-performing teachers" including NBCTs into schools declared to be in a state of emergency. However, research on NBCTs indicates that these policy solutions to attracting quality teachers to high challenge schools are too simplistic and could be counterproductive (Berry & Ferriter, 2006).

Taken together, the findings from studies on the distribution of NBCT and incentive policies to attract NBCTs to low performing schools are similar in that they all report challenges that the federal government, state agencies and local educational agencies face as they attempt to improve teacher quality in high-poverty schools. The federal government has attempted to address the challenge of high quality teachers in all schools through NCLB, however, as stated earlier, NCLB requirements are limited to paper qualifications of teachers, not indicators of actual teaching practice. Many states have offered monetary incentives for teachers who become nationally certified and although this has encouraged many teachers to attempt certification, there are few states who have established policies for NBCTs to work in high-poverty schools. Oklahoma is one of those states that

does not offer additional incentives for teachers to work in high poverty schools, however a higher percentage of their NBCTs work in these Title I Schools.

### *Oklahoma NBCTs*

Oklahoma's State Superintendent of Education, Ms. Sandy Garret reported in 2008 that based on numbers from the NBPTS, Oklahoma ranks 10th in the nation in the total number (2,307) of its teachers with the certification. Oklahoma had a 12 percent increase in nationally certified teachers from 2008- 2009.

Additionally, National Board teachers now comprise nearly 6 percent of Oklahoma's teaching force. Only seven states have more than 5 percent of their total teaching force Nationally Board Certified. Garrett lauded the National Board incentives program funded by the state Legislature as the engine for fueling Oklahoma's progress with National Board certification. The program provides an annual \$5,000 bonus to any classroom teacher who holds the certification and works full-time in a public school. The certification is valid for 10 years before a teacher needs to reapply. State funds also provide for scholarships to the Education Leadership Oklahoma program, which assists teachers in applying for national certification - a process that takes most teachers a year to complete.

Similar to policies in Georgia, North Carolina and South Carolina the State Department of Oklahoma has made a concerted effort to recruit teachers in Title I schools to apply for National Board Certification through the offering of scholarships and support. This effort by the legislature appears to have a positive

effect. As a result of their efforts, the majority of National Board teachers in Oklahoma - nearly 60 percent - work in high-poverty, Title I-eligible schools (OSDE, 2008). With these statistics, Oklahoma appears to go against the national trend in their distribution of NBCTs in high poverty schools.

### Summary

Increasing student achievement is a major priority for the state of America's public school system. The research has established that the best way to improve student achievement is by improving instructional effectiveness through strengthening teacher quality (Ferguson 1998; Goldhaber et al. 1999; Goldhaber 2002; Hanushek et al. 1999; Wright et al. 1997). As Goe's (2007) framework illustrates, and as the propositions of teacher quality suggest, teacher quality is distinguished by the credentials a teacher has established as well as the practices they demonstrate within the classroom. Relying solely on the qualifications and characteristics of a teacher may speak to the potential of effectiveness for that teacher, but it is the actual instructional performance in the classroom that provides a more substantial view of effective practices and processes necessary to increase student achievement in high poverty schools.

Much research suggests that students who have high quality teachers post higher achievement gains. The research, however, is limited when it comes to NBCTs in high poverty schools because, nationally, there are fewer numbers of NBCTs working in those environments. The NBPTS has reported that this is not

the case in Oklahoma. As stated above, Oklahoma is currently one of only seven states that have over 5 percent of their teaching force Nationally Board Certified with almost 60 percent in high poverty schools. Given the relative high distribution of NBCT in Oklahoma teaching in high poverty schools, this research has the opportunity to explore more thoroughly the achievement consequences of NBCTs on high poverty students. The premise behind this study was that teachers who gain National Board Certification have demonstrated a high level of teacher quality which will enable them to have a positive effect on student progress in all school settings, specifically within high poverty, Title I, schools.

## CHAPTER III

### RESEARCH METHOD

#### Introduction

With a small proportion of NBCTs teaching in high poverty schools, it is not surprising that there is little to no evidence on the achievement effect of NBCTs in Title I schools. In light of this lack of evidence, the purpose of this study was to examine the relationship between National Board Certified Teachers and student achievement in Title I Schools in a southwestern, urban fringe school district. The research question guiding the study was: Is there a difference in learning growth over an academic school year between students with National Board Certified Teachers and students without National Board Certified Teachers in Title I Schools?

Both internal research conducted by NBPTS and objective, third party studies have found evidence to support a differential achievement effect attributed to NBCTs (Cavalluzzo, 2004; Clotfelter, Ladd, & Vigdor, 2007; Goldhaber & Anthony, 2004; McColskey & Stronge, 2005; Sanders, Ashton & Wright, 2005; Vandevort et al., 2004). Questions continue to persist about the contribution of the National Board assessment process to effective teaching, but the strength of the evidence favors the influence of National Board on student achievement. Goe's framework on teacher quality explains why in some contexts NBCTs appear to be more effective. Not only do NBCTs need strong qualifications and

characteristics to qualify for candidacy and to complete the assessment process, but obtaining National Board Certification is based on teachers' ability to demonstrate their competence in differentiating instruction to meet the individual needs of students, carefully assessing and monitoring student achievement, reflecting on and in practice, working cooperatively with other teachers, and managing effectively the classroom environment (NBPTS, 2002). With strong evidence supporting a general relationship between NBCTs and student achievement it was predicted that: *there would be a positive relationship between NBCTs and reading and math achievement in Title I elementary schools.*

#### Research Design

The study used an ex post facto design to examine differences in academic performance of students in Title I schools that could be attributed to having a National Board Certified Teacher (NBCT). An ex post facto design was appropriate because data were based on historical achievement and demographic records. The primary independent variable was dichotomous with two levels: National Board Certification or non-National Board Certified teachers. The dependent variable of student achievement was measured on a continuous scale. In quantitative research it is important to control for threats to the validity of findings. McDavid and Hawthorne (2006) note that controlling for threats to validity involves eliminating alternative hypotheses in the design or analysis phases that could account for differences in the observed outcomes between

groups. The primary validity threats for this study were differences between students and teachers. These threats were controlled by including student and teacher differences, such as socio-economic status (SES), ethnicity, teaching experience and educational attainment, as covariates in the analytical model. By treating the above factors as covariates, the relative weight of each student or teacher condition could be compared against the achievement effect attributed to National Board Certification.

#### Research Population

The district to be studied is an urban fringe school district located in a southwestern state. Urban fringe is a territory surrounding a large urban district that blends urban aspects of poverty and diversity with suburban or rural characteristics (Nechyba & Walsh, 2004). The school district is contiguous to an urban center and its community has similar concentrations of poverty and social deprivation of the larger urban core in which it borders. A unique feature is that the district serves the families of a large military base with approximately 27,000 military and civilian employees. The base is the largest single-site employer in the state.

For the 2009-2010 school year approximately 14,467 students were enrolled in the district with 49 percent of the students classified as Caucasian, 30 percent African American, 12 percent Native American, 6 percent Hispanic and 3 percent Asian. The district is comprised of 17 Elementary Schools, 5 Middle



Schools, 3 High Schools, a Technology Center and an Alternative Academy. Sixteen of the seventeen elementary schools are classified Title I and qualify for federal assistance. Overall, an average of 63 percent of students district-wide qualify for the federal lunch program compared to an average of 56 percent state-wide.

### Data Source and Sample

The No Child Left Behind legislation dramatically increased the role of the federal government in guaranteeing the quality of public education for all children in the United States. This legislation emphasized increased funding for poor school districts, higher achievement for poor and minority students, and new measures to hold schools accountable for their students' progress. In the process of increasing the quality of education, the role of standardized testing in American public education was dramatically expanded. The southwestern school district being studied chose to implement a benchmark testing process to monitor student progress throughout the year in preparation for the end-of-year exams mandated by the state. This monitoring process is intended to allow teachers to reflect on their effectiveness based on the student results on benchmark tests. Data for this study primarily came from these benchmark exams.

The benchmark exams were administered each nine-week period during the 2008-2009 school year with an annual total of four testing periods per grade level in specified subject areas. Students were tested in each subject during a

district mandated assessment window. The benchmark exams were created by district personnel utilizing an online test bank of questions which align with the state standards. Although the district administers benchmark exams to 3<sup>rd</sup> and 4<sup>th</sup> grade students in reading and math and 5<sup>th</sup> through 8<sup>th</sup> grade students in reading, math, social studies and science, this study only used 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> grade reading and mathematics scores. Because these benchmark exams were germane to this school district, other methods of measuring student achievement may be employed in different studies that may produce findings contrary to those identified in this study.

Data for this study were multi-level with testing periods being nested in students. The researcher collected existing student achievement and background data from teachers and students in the Title I schools where National Board Certified Teachers taught. Criterion sampling was used to sample students from the nine Nationally Board Certified teachers and 21 non-National Board Certified teachers teaching the same subject areas in the same schools. Additional criteria established for the Non-Board Certified teachers in the sample was a minimum of three years teaching experience to mirror what is required to apply for NBC and none of the teachers included in this study were attempting certification during the year of this study. Goldhaber and Anthony (2004) found that teacher applicants for NBC are significantly less effective in the year of application than they are in either prior or post-application year.

Student achievement data from the 2008-2009 school year were collected from the 610 students associated with 30 teachers. A power analysis using optimal design 2.0 indicated that with an average of 20 students per teacher and an estimated small effect size ( $d = .20$ ), the above sample had an expected power of .92, a strong probability that a significant relationship between NBCT and student achievement would be found if one exists in the overall population (Aron, Aron, & Coups, 2008).

### Measures

Reading achievement was measured with district benchmark exams that were generated to align with the state curriculum. Tests were developed using Edusoft, a standards-based assessment that allows districts to collect, analyze, and act on student performance data to improve classroom instruction and student performance. Reading benchmark scores were recorded as the percent of questions the student answered correctly. Math achievement was also measured with district benchmark tests developed in Edusoft.

Socioeconomic status was measured by whether or not the student qualified for the federal lunch subsidy. Students not receiving the lunch subsidy were coded as 0 whereas students receiving the subsidy were coded as 1. Gender and minority status used a similar coding scheme. Male students were coded as 0 and female students coded as 1. Minority students were coded as 0 and non-minority students as 1.

Teacher characteristics included in the model were teaching experience, educational attainment, and National Board status. Teaching experience was measured as continuous variable based on the number of years taught. Educational attainment was coded as 1 for a master's degree and above and 0 for a bachelor's degree. Similar coding was used for NBCT. NBCTs were coded as 1 and non-NBCTs as 0.

#### Analytical Technique

Because data for this study were multi-level, testing periods nested within students, changes in students' math and reading achievement were modeled as a function of time and student characteristics. A linear growth model calculated in HLM 6.04 was used to test the hypothesis that NBCTs would be related to reading and math achievement. Linear growth models are a type of Hierarchical Linear Model (HLM) that were developed in the field of educational research to more accurately assess the effects of nested data (Gavin & Hofmann, 2002; Raudenbush & Bryk, 2002). HLM assumes that residuals are normally distributed and constant, that level I and level II residuals are not correlated, and that the observations at the highest level are not correlated (Raudenbush & Bryk, 2002).

Changes in reading and math achievement were modeled across four testing periods as a function of student characteristics (i.e. qualification for the lunch subsidy, minority status, and having a National Board Certified Teacher).

The first analytical step was to examine the variability of reading and math achievement across testing periods with an unconditional random coefficient regression model. This allowed variance in reading achievement to be partitioned between time period and student characteristics. Results of the random coefficient model provide a mean achievement trend for students and an estimate of the level two variability around the mean achievement trend. The random coefficient regression was modeled as:

$$Y_{ti} = \pi_{0i} + \pi_{1i}t + e_{ij}$$

$$\pi_{0i} = \beta_{00} + r_{0i}$$

$$\pi_{1i} = \beta_{10} + r_{1i}$$

Where:

$Y_{ti}$  = Is the observed status at time t for student i

$\pi_{0i}$  = The true ability of student i at time = 0

$\pi_{1i}$  = The growth rate for student i across the testing periods

$\beta_{00}$  = The average achievement score for all 4 testing periods

$\beta_{10}$  = The mean growth rate for the school year

$e_{ij}$  = error

The second step was to test the individual variation around changes in reading and math during the academic year and to examine differences in reading and math achievement at the third testing period by using an intercepts and slopes as outcomes model. The intercept parameter ( $\pi_{0i}$ ) was set at the third testing

period to assess differences in student achievement at the end of the school year.

The purpose of this model was to use student characteristics to predict achievement changes during the academic year. Student-level predictors were socioeconomic status, minority status, teaching experience, educational attainment, and having a National Board Certified Teacher. Using SES and NBCT as an example, the intercepts and slopes as outcomes was modeled as:

$$\pi_{0i} = \beta_{00} + \beta_{01} (\text{SES}) + \beta_{02} (\text{NBCT}) + r_{0i}$$

$$\pi_{1i} = \beta_{10} + \beta_{11} (\text{SES}) + \beta_{12} (\text{NBCT}) + r_{1i}$$

Where:

$\beta_{01}$  = Is the poverty effect on reading/math achievement at time period 3.

$\beta_{02}$  = Is the NBCT effect on reading/math achievement at time period 3.

$\beta_{11}$  = Is the poverty effect on changes in reading/math achievement during the academic year.

$\beta_{12}$  = Is the NBCT effect on changes in reading/math achievement during the academic year.

The final type of model was a random intercepts means-as-outcomes model. The purpose here was to use achievement data from the state mandated criterion referenced exams in reading and math as a type of post-hoc analysis to the linear growth models. Results show how achievement variation on the math and reading tests varied at level one by individual student co-variates and across

level 2 units by teacher factors. Using math achievement as an example, the random intercepts was modeled as:

$$\text{MathAch}_{ij} = \beta_{0j} + \beta_{1j}(\text{SES}) + \beta_{2j}(\text{Minority}) + \beta_{3j}(\text{Gender}) + u_{oj}$$

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(\text{NBCT}) + \gamma_{02}(\text{Experience}) + \gamma_{03}(\text{Ed Attainment}) + r_{ij}$$

Where:

$\beta_{0j}$  = The average class math score

$\beta_{1j}$  = The socioeconomic effect on math achievement

$\beta_{2j}$  = The minority effect on math achievement

$\beta_{3j}$  = The gender effect on math achievement

$u_{oj}$  = Random error

$\gamma_{01}$  = The NBCT effect on math achievement

$\gamma_{02}$  = The teaching experience effect on math achievement

$\gamma_{03}$  = The educational attainment effect on math achievement

$r_{ij}$  = Random error

### Summary

This research design aimed to address the lack of information on the relationship between NBCT and student achievement in Title I elementary schools by modeling changes in reading and math achievement over an academic year as a function of student characteristics. The findings of this research have the potential to add value to our understanding of the effectiveness of NBCTs in high poverty schools by measuring achievement changes during the academic year and

by controlling for confounding student characteristics. This study seeks to add to the body of research on the effectiveness of Board Certified teachers in producing higher levels of student achievement in Title I schools when compared to their non-Board Certified peers.



## CHAPTER IV

### ANALYSIS OF DATA

#### Introduction

This ex post facto study investigated the relationship between National Board Certified Teachers and student performance in Title I Schools from an urban fringe school district. Student benchmark scores in reading and mathematics administered during four testing periods throughout one academic school year were examined. The primary question in the investigation was: Is there a difference in learning growth over an academic year between students who have National Board Certified Teachers and those who do not? The study utilized an unconditional random effects model to analyze student benchmark scores in reading and math and an intercepts as outcomes model to assess differences at testing periods one and three. Findings from the descriptive analysis are reported first followed by results for reading then math. The chapter concludes with a post-hoc analysis of students' end of instruction test results.

#### Quantitative Findings

##### *Descriptive Statistics*

Descriptive statistics were used to report the characteristics of level one and level two variables. Level one data represented in Table 1 reflect the average reading and math achievement score over four testing periods. The average math score was approximately eight percentage points higher than the average reading

score. Level two data presented in Table 2 reflect the average socioeconomic status, minority status, gender, and access to a NBCT for students in the sample. A mean of .54 for SES indicates that approximately half of the students qualified for the federal lunch subsidy. A mean of .57 for minority status indicates that approximately 57 percent of the students were minority (African American, Native American, Hispanic, or Asian) while the remaining students were classified as Caucasian. A mean of .51 for gender indicates that there was an even distribution of males and females represented in the sample. A mean of .32 for NBCT indicates that approximately 30 percent of the students in this sample were exposed to a NBCT while approximately 70 percent were not.

Table 1: *Level One Descriptive Statistics*

	N	Mean	SD	Minimum	Maximum
Reading	2168	65.93	19.50	8.00	100.00
Math	2115	73.08	17.50	10.00	100.00

Table 2: *Level Two Descriptive Statistics*

	N	Mean	SD	Minimum	Maximum
SES	561	0.54	0.50	0.00	1.00
Minority	561	0.57	0.50	0.00	1.00
Gender	561	0.51	0.50	0.00	1.00
NBCT	561	0.32	0.47	0.00	1.00

### *Reading Findings*

Student reading scores from the benchmark exams were first examined by using an unconditional random effects regression model. The purpose of the unconditional random effects regression model was to examine reading achievement at the first testing period, to calculate the time achievement relationship over an academic year and to partition variance in the time effect across students. Table 3 reports the final variance components of the unconditional model. Results suggest that student achievement did differ across the four testing periods, but there were no significant differences in the time-achievement relationship attributed to student characteristics ( $\chi^2 = 533.23$ ,  $p > .01$ ). There was a significant difference in reading achievement across students at the first testing period ( $\chi^2 = 2261.91$ ,  $p < .01$ ).

*Table 3: Final Estimation of Variance Components for Reading*

Random Effect	Standard Deviation	Variance Component	df	Chi-square	P-Value
INTRPCT1, R0	16.37	268.01	560	2261.91	0.000
TIME slope, R1	0.46	0.22	560	533.23	>.500

Because changes in reading scores did significantly vary over the academic year across students there was no level two variation to attribute to NBCT or other student characteristics. Achievement differences did exist at the first testing period. Differences in reading achievement (see table four) at time period one were largely attributed to SES ( $\beta = -7.8$ ,  $p < .01$ ), minority status ( $\beta = -$

3.4,  $p < .05$ ), and NBCT ( $\beta = 4.7$ ,  $p < .01$ ). Initial achievement was on average 8 percentage points less for students qualifying for the federal lunch subsidy, 3 percentage points less for minority students, and nearly 5 percentage points more for students with NBCTs. These results suggest that prior achievement was greater for students assigned to NBCT classrooms.

Table 4: *Final Estimation of Fixed Effects for Reading Achievement at Time 1*

Fixed Effect	Coefficient	Standard Error	T-Ratio	df	Approx P-Value
INTRCPT	67.91	0.79	81.47	556	0.00
SES	-7.83	1.43	-5.47	556	0.00
Minority	-3.40	1.44	-2.34	556	0.02
NBCT	4.75	1.5	3.17	556	0.00
Gender	2.10	1.5	1.50	556	0.14

Although there was no significant variance in reading performance across students over four time periods, the researcher sought to predict differences in reading performance specifically at time period three. The findings of this model in Table 5 suggest that in time period three, students with higher SES, on average, scored 8 percent higher on reading benchmarks than students with lower SES ( $\beta = -7.93$ ,  $p < .01$ ); non-minority students, on average, scored 3 percent higher than minority students ( $\beta = -3.28$ ,  $p > .01$ ); students with NBCT scored, on average, 4 percent better than other students ( $\beta = 4.66$ ,  $p < .01$ ). Even though it appears NBCT and reading achievement at time period three were related, the difference

can be explained by higher baseline achievement for students with NBCT at time period one than significant differences that were attributed to NBCTs. The actual NBCT effect at testing period three was slightly less than testing period one.

Table 5: *Final Estimation of Fixed Effects for Reading Achievement at Time 3*

Fixed Effect	Coefficient	Standard Error	T-Ratio	df	Approx P-Value
INTRCPT1	70.39	1.25	56.23	557	0.000
SES	-7.93	1.41	-5.61	557	0.000
Minority	-3.28	1.40	-2.34	557	0.020
NBCT	4.66	1.60	2.91	557	0.004

### *Math Findings*

In mathematics, findings slightly differ from reading achievement for students across testing periods. The results of the unconditional random effects model presented in Table 6 for math achievement show significant variance across testing periods attributed to differences between students ( $\chi^2 = 707.28$ ,  $p < .01$ ). As reported in Table 7, however, NBCT was not a significant student level predictor of changes in math achievement ( $\beta = -.18$ ,  $p > .05$ ). In fact, changes in math achievement for students with NBCTs were on average slightly worse than for students with non-NBCTs. Socioeconomic status was the most significant predictor ( $\beta = -1.79$ ,  $p < .01$ ). Given the results, there appears to be other unaccounted for factors contributing to differences in math achievement between students.

Table 6: *Final Estimation of Variance Components for Mathematics*

Random Effect	Standard Deviation	Variance Component	df	Chi-square	P-Value
INTRPCT	12.74	162.20	559	1676.67	0.000
TIME slope	2.44	5.97	559	707.28	0.000

Table 7: *Final Estimation of Fixed Effects for Math Achievement*

Fixed Effect	Coefficient	Standard Error	T-Ratio	df	Approx P-Value
SES, B11	-1.79	0.44	-4.06	556	0.000
Minority, B12	-0.38	0.43	-0.87	556	0.383
Gender, B13	0.02	0.43	0.05	556	0.961
NBCT, B14	-0.18	0.47	-0.37	556	0.709

To stay consistent with the pattern of the analysis, the researcher ran an intercepts as outcomes model to examine mathematics benchmark scores for students at testing period three. The results of the analysis in Table 8 indicate that SES ( $\beta = -5.55$ ,  $p < .01$ ) and minority status ( $\beta = -4.04$ ,  $p < .01$ ) were the strongest predictors of student performance on the mathematics benchmark at time period three. Additionally, having a National Board Certified Teacher was not a significant predictor for student mathematics benchmark scores at time period three ( $\beta = -2.15$ ,  $p > .01$ ). Again, the results suggest that students with an NBCT performed, on average, 2 percent worse than other students, although the difference was not significant.

Table 8: *Final Estimation of Fixed Effects for Mathematics at Time 3*

Fixed Effect	Coefficient	Standard Error	T-Ratio	df	Approx P-Value
SES, B01	-5.55	1.23	-4.52	557	0.000
Minority, B02	-4.04	1.24	-3.26	557	0.000
Gender, B13	0.02	0.43	0.05	556	0.961
NBCT, B03	-2.15	1.31	-1.64	557	0.100

*Post-Hoc*

As a result of the non-significant relationship between NBCTs and changes in student achievement, a post-hoc analysis was conducted to confirm or disconfirm the primary findings. Unlike the linear growth models for reading and math, data used for the post-hoc reflected student scores on the state’s end of instruction (EOI) exams in reading and math. The purpose was to determine if achievement on the tests varied significantly across classrooms, and if so, the degree of variability attributed to NBCT. Level one covariates were student characteristics (i.e. SES, minority status, and gender) while level two covariates were teacher characteristics (i.e. NBCT, experience, and educational attainment).

Table 9: *Final Estimation of Variance Components for Reading and Math EOI*

Random Effect	Standard Deviation	Variance Component	df	Chi-square	P-Value
INTRPCT	27.80	773.09	29	120.66	0.000
Reading	67.72	45585.89			
INTRPCT	22.16	490.96	29	81.51	0.000

Table 9 Cont: *Final Estimation of Variance Components for Reading and Math EOI*

Random Effect	Standard Deviation	Variance Component	df	Chi-square	P-Value
Math	72.18	5210			

The final estimation of variance in both reading and math achievement reported in Table 9 indicates that approximately 15 percent of the reading differences existed between classrooms (ICC = .147) and approximately 9 percent of variability in math achievement (ICC = .09) was at the classroom level. Table 10 indicates that NBCT ( $\beta = 3.48$ ,  $p > .01$ ) was not a significant predictor of reading variability on the end of instruction exam. The student level factors that explained the most variability in student achievement were SES ( $\beta = -24.08$ ,  $p < .01$ ) and minority status ( $\beta = -15.45$ ,  $p < .01$ ). Students with higher SES scored on average approximately 24 points higher on the reading exam than students with lower SES. Further, Caucasian students scored, on average, approximately 15 points higher on the reading exam than minority students.

Table 10: *Final Estimation of Fixed Effects for Reading EOI*

Fixed Effect	Coefficient	Standard Error	T-Ratio	df	P-Value
NBCT	3.48	11.87	0.30	28	0.771
SES	-24.08	6.03	-3.99	579	0.000
Minority	-15.45	4.89	-3.17	583	0.002
Gender	10.24	5.77	1.78	583	0.076



Table 11 reflects the results of the analysis for end of instruction scores in math. Again, NBCT ( $\beta = -6.22$ ,  $p > 0.1$ ) was not a significant predictor of math achievement. Similar to reading achievement, the student level factors that explained the most variability in math achievement were SES ( $\beta = -21.61$ ,  $p < .01$ ) and minority ( $\beta = -24.06$ ,  $p < .01$ ). Students from families with higher SES scored, on average, approximately 21 points and Caucasian students scored, on average, 24 points higher than minority students.

Table 11: *Final Estimation of Fixed Effects for Math EOI*

Fixed Effect	Coefficient	Standard Error	T-Ratio	df	P-Value
NBCT	-6.22	8.90	-0.70	26	0.491
SES	-21.61	6.69	-3.23	579	0.002
Minority	-24.06	5.17	-4.65	579	0.000
Gender	2.44	6.28	0.39	579	0.697

#### Summary

In summary, the findings from the data were consistent across the different models and measures used to test the relationship between NBCT and student achievement. The data showed that differences in student achievement, whether in reading or math, over an academic year were not related to NBCT. That is, there was no significant effect on achievement growth attributed NBCTs. There was also no significant effect of NBCT on achievement at the third testing period. In light of the existing evidence that suggests a positive relationship between

student achievement and NBCT, data were also analyzed using state standardized end of instruction exams. Results from the state exams in math and reading confirmed the non-significant findings. In short, students in this sample with NBCT's did not have higher reading or math achievement. A discussion of these findings along with implications for policy and recommendations for future studies is addressed in the next chapter.

## CHAPTER V

### DISCUSSION

#### Introduction

Since the release of *A Nation at Risk* (1983), many federal and state reform efforts have been initiated in an effort to improve American education. The Carnegie Task Force on Teaching as Profession (1986) issued *A Nation Prepared: Teachers for the 21st Century* as a response to *A Nation at Risk*. The Carnegie report recommended the establishment of a National Board for Professional Teaching Standards (NBPTS) to professionalize teaching by setting standards of effective practice and by certifying teachers who meet those standards. The stated goal of the NBPTS is to improve student learning by strengthening teaching and by identifying teachers who meet the established standards that define effective teaching practices. As the logic suggests, teachers who attain National Board Certification should have a stronger effect on student learning, but the results from this study challenge the prevailing assumptions about NBCT.

Teachers who attain National Board Certification have demonstrated accomplished practice in the five core propositions of the NBPTS. A large body of evidence supports the relationship between NBCTs and student achievement (Cavalluzzo, 2004; Clotfelter, Ladd & Vigdor, 2007; Goldhaber & Anthony, 2004; Vandervoort et al, 2004), but most of the research has not considered the

relationship in high poverty schools. Results of this study indicated that achievement differences among students in Title I schools in this sample were not attributed to NBCT. The purpose of the discussion is to better understand why, given existing evidence on the effectiveness of NBCT, achievement differences were not attributed to NBCTs.

Goe's teacher quality framework that was the conceptual model for the study is used in this section to better understand the non-significant findings from the analysis. Additionally, the findings are considered within a larger district context to better understand how instructional designs influence the practice of NBCTs. The discussion concludes with implications for policies that are designed to attract more NBCTs to high poverty schools.

#### Goe's Teacher Quality Framework

In an attempt to define teacher quality, it became clear that there is no one-size-fits-all definition. Goe (2007) argues that teacher quality may require alternative definitions based on the purpose or use of the information. Whether teacher quality is identified by administrators, policy makers, or researchers the definition of teacher quality remains complex. As structured in Goe's framework, there are three important features that frame a functional description of teacher quality: teacher qualifications, teacher characteristics and teacher practices. Teacher qualifications encompass teacher education, certifications, credentials, test scores and experience. These qualifications are often used in many districts

for hiring purposes and some researchers have used indicators of teacher qualifications, such as experience, as predictors of student achievement (Goe, 2007). Teacher characteristics are the attitudes, attributes, beliefs, self-efficacy, race and gender of a teacher. These factors have also been linked to student achievement (Goe, 2007). Taken together, teacher qualifications and characteristics are considered inputs into teacher quality for their potential contribution to teacher effectiveness.

Moving a step further in the model, teacher practices and the instructional processes implemented within a classroom are used to better identify and define teacher quality. Practices employed by classroom teachers more so than qualifications and characteristics are linked to an increase in student achievement (McClosky & Stronge, 2005). Instructional practices include teacher behaviors both inside and outside of the classroom, such as, planning, instructional delivery, classroom management, and teacher interactions with students. Goe (2007) reported that many studies regarding teacher practice used observation protocols to document and evaluate what teachers did with their students and then correlated those findings with student achievement. The benefit of observational measures is that they provide relevant and proximate information on actual teacher performance. The disadvantage is that they are difficult to quantify and compare across a large number of teachers.

Similarly, the National Board Certification process seeks to measure teacher quality based on the evidence of quality teaching that is provided by classroom teachers through portfolios. Portfolios provide documented evidence of actual teacher practices and videos of those effective practices. As with the observational measures mentioned above by Goe (2007), portfolios are a tool to measure the instructional processes used by teachers. The prevailing assertion is that teachers who attain National Board Certification regularly practice the effective instructional processes and behaviors that led to their National Board Certification. Data from this study raises questions about this assertion. For one, why were differences in student achievement not attributed to NBCT if the process is ostensibly to certify exceptional teaching?

One explanation relates to the limited evidence on teaching practice provided by the National Board assessment. The reality is that teachers who are Nationally Board Certified attained their certification by use only of a snapshot of their classroom practices at one point in time where they effectively demonstrated the knowledge of the NBPTS five core propositions. This one-time period approach is like judging the quality of a movie from only seeing the previews. The point is that an assessment of teacher quality without continuous evidence on instructional practice appears to be problematic in the face of findings from this study. In reality, the National Board assessment process does not measure on-going and routine instructional practices of teachers. The limitations of the

portfolios and videos provided by National Board Candidates are not conducive to the need for consistent and immediate measures of effective teaching practices within high poverty classrooms that are directly tied to student achievement. Furthermore, some teachers who obtain National Board Certification and teach in high poverty schools may have actually earned certification when teaching in a non-Title I schools.

A closer examination of routine teaching behaviors than what is provided by the National Board is necessary to better measure teacher quality. Even though National Board is a stronger measure of teacher quality than quantifiable indicators of other teacher qualifications, it does not go far enough to validity and reliability to capture regular instructional practices and processes of teachers in a just-in-time manner. The best measure of teacher quality remains regular and consistent observational indicators of teaching and learning. Regular feedback on teacher performance seems to be more important in high poverty schools where the teaching task tends to be more complex and unpredictable than in schools with lower levels of poverty.

#### Influence of School Context

A second plausible explanation for the non-significant effects of NBCT has to do with the district influence on teachers' instructional practices. As McLaughlin and Talbert (2006) argue, teaching and learning within schools are not protected from the social and political forces coming from school districts. In

short, school districts matter for teacher performance. To illustrate, comprehensive school reform models such as Success for All prescribe a standardized approach to instruction (Rowan, Correnti, Miller & Camburn, 2009). District accountability frameworks and formalized structures (O'Day, 2002) also define how teachers teach and how students learn. The point is that instructional and organizational designs of school districts can affect the instructional practice of National Board teachers in ways that dampen their effectiveness. To better explore the district influences on instruction, several organizational scholars explain the relationship between governance models and teacher performance that are germane to the findings of this study.

O'Day (2002) examined current accountability mechanisms that seek to improve student learning by improving the functioning of the school organization. Her research supports the current trends in school improvement literature which suggest that there are two very different organizational designs for school effectiveness that have emerged within the past two decades. Rowan (1990) defines these two models as either control or commitment designs. Mintzberg (1988) depicts characteristics of the above designs as machine bureaucracies and professional bureaucracies. School organization designs, whether control or commitment, machine or professional, shape teaching and learning in schools. Thus, they also can explain why differential achievement effects were not found between NBCTs and non-NBCTs in this study.



Rowan (1990) describes control designs as one model of school effectiveness that is consistent with forms of management that have dominated some industrial organizations. Control strategies involve the development of a standardized system of input controls that constrain teachers' methods and content decisions, thereby controlling student access to academic content and assuring student exposure to a standardized quality of instruction (Rowan, 1990). This design may indeed make teaching more predictable but, when compared to the nature of the National Board Certification process; it would likely limit the autonomy of NBCTs to implement the effective strategies demonstrated through the certification process. If the control systems in place are too restrictive then NBCTs are more likely to follow the prescribed instructional plan rather than implement the effective instructional strategies that earned National Board Certification.

Commitment models, on the other hand, are alternative approaches to school design that use teachers' expertise and problem solving, rather than elaborate control systems, for the improvement of teaching (Rowan, 1990). This structure of a school organization promotes teacher collaboration and teaming and relies on communal rather than hierarchical forms of organization to achieve organizational integration. Commitment designs also supports teacher participation in decision-making, network structures of professional control, and the development of community within schools (Rowan, 1990). One important

component of National Board Certification that aligns with commitment designs is the reflective practices of NBCTs and the emphasis on teacher collaboration to increase student achievement which aligns more closely with a commitment design.

Rowan (1990) notes that the evidence reviewed suggests that both the commitment and control strategies, when applied intensively, can lead to improved student outcomes, but that neither approach is consistently implemented in most schools. For National Board Certified Teachers, in Title I schools, instructional designs that restrict teacher autonomy would seem to go against the ultimate goal of the National Board for Professional Teaching Standards and their efforts to consistently reinforce the implementation of their five core propositions of what effective teachers should know and be able to do. These limitations may restrict National Board Teachers to the point that little variation in teaching practices can occur and establish inadequate teaching conditions for National Board Certified Teachers to be effective. With little variation in instructional practice across teachers, it is unlikely that variation in student achievement would be attributed to instructional processes as measured by National Board Certification. Achievement variation in this case would more likely be attributed to differences across students.

In contrast to control designs, commitment models coordinate teaching and learning through informal mechanisms, such as cooperation and collaboration.

Commitment designs allow for more professional autonomy but their effectiveness depends on strong social and human capacity within schools. Where capacity is limited, commitment designs are not likely to be effective coordinating approaches to teaching and learning. Additionally, instructional models that suggest too much extension of the teacher role, particularly toward the establishment of relationships with students, can create burnout among the most committed teachers (Swindler, 1979). Increased responsibilities associate with a more collaborative system may instead increase teacher fatigue (Rowan, 1990).

It seems that a combination of control and commitment designs may provide a conducive environment for National Board Teachers to most effectively have a positive impact on student achievement. The implementation of an organizational system that permits NBCTs professional autonomy to implement effective teaching strategies while also sharing their craft at a reasonable level with support from instructional leaders aligns more closely with the goals of NBPTS. Without qualitative evidence on the type of instructional design used in the school district for this study, the point is not to explain how NBCT may or may not be influenced by the instructional design but to simply raise a plausible explanation that requires future study.

Knowledge of the instructional programs of the schools studied, whether they were more control or commitment structures, could provide a deeper understanding of this crucial relationship. Also knowledge of the district's

instructional initiatives for the Title I schools may offer further insight into the results of this study.

### Implications for Policy

Evidence from this study has implications for policy initiatives that leverage National Board Certification as a mechanism to improve the performance of high poverty schools. A review of policies adopted by some states may assist in understanding how the effectiveness of National Board Certified teachers can be maximized. As policymakers develop and implement regulations aimed at improving student achievement, conclusions drawn from the evidence in this study should be considered.

Humphrey et al. (2005) found that teacher incentives played a role in the distribution of NBCTs in high poverty schools. Increased salary compensation and other incentives such as financial support to complete National Board Certification are policies considered by some states and school districts to attract more NBCTs to high poverty schools. Professional support in the form of coaching, working with other candidates, release time, and principal support are found to serve as important non-financial incentives for National Board Certified Teachers to be attracted to high poverty schools. The purpose of non-financial policies is not solely to attract NBCTs but to ultimately improve student achievement by supporting the work of teachers. The results from this study challenge the prevailing assertion that policies aimed at increasing the number of

NBCTs in high poverty schools without addressing the teaching and learning conditions within schools are likely to be ineffective.

To not only attract, but to maximize the effectiveness of NBCTs, high poverty schools must become more desirable workplaces for teachers. As outlined in the above section, the context of the school may play a significant role in the effectiveness of the NBCT. Adjustments in the context of high poverty schools will support the ability of NBCTs to maintain their effectiveness; however attempting to adjust the context of a Title I school requires a collective effort of National Board, states, and school districts. All entities must be willing to assess their roles within Title I schools and take the necessary steps toward a more cohesive plan for high poverty schools.

The purpose of the development of the National Board for Professional Teaching Standards was to develop a process that would assist in an alignment of professional standards in the field of education. Darling-Hammond (2006) noted that “professional policy” holds a profession accountable for developing shared expertise among all of its members, rather than imposing standardized prescriptions for practice that would fail to meet clients’ different needs (Darling-Hammond, 2006). She claims that such efforts of standardizing a certification and recognizing high levels of competence, like the National Board Certification process, represent “professional policy” that is an approach relying on standard-setting by professional bodies rather than direct regulation by the state. She

labeled this “professional policy” because knowledge in the field of education is always growing, and its appropriate application is contingent on many different factors; therefore ensuring its appropriate use is better managed by members of the profession itself.

School districts play an important role in improving instruction by providing vision, focus, support, policy coordination and by building commitment at the school level (Corcoran, Fuhrman & Belcher, 2001). Large school districts, though, have difficulty carrying out these tasks and persisting in a reform long enough to see results (Corcoran et al, 2001). School district reform efforts, especially in Title I schools, require a combination of administrative and professional accountability for the implementation of lasting and meaningful school reform (O’Day, 2002). Changes in leadership, state policies and funding are a few of the major impediments that hinder sustainable policy initiatives. Policies aimed at increasing the representation of NBCTs in high poverty schools can be more effective if aligned with a district context that supports quality teaching and learning.

Based on the evidence from this study, a simple policy solution to improve instruction and increase student achievement is not likely to facilitate school improvement. Policies that attempt to simply attract NBCTs to high poverty schools without provisions in place for supportive instructional design, resources, and the context of the schools do not address the purpose of the NBPTS nor the

five core propositions. NBCT may indeed possess the potential to improve student achievement; however other changes in the overall culture of the school are needed to maximize actual performance in high poverty schools.

### Conclusion

In the past twelve years a new form of quality teaching has evolved through the development on the National Board for Professional Teaching Standards. Rather than studying only student achievement results of quality teachers, researchers have applied their skills to studying the classroom practices of these teachers in an attempt to discern the most effective practices. These investigations have led to insights about the core proposition of what quality teachers should know and be able to do in the classroom and the development of the National Board for Professional Teaching Standards.

At first glance, the attainment of National Board Certification appears to be a teacher qualification or characteristic that equates to high quality instruction and the implementation of effective teacher practices for any and all students. In an attempt to determine whether this advanced certification makes a significant difference in student performance in high poverty schools, the researcher limited this study to National Board Certified Teachers in Title I Schools. The researcher looked carefully at student performance indicators and compared them to student demographic indicators such as SES, minority status, and having a National Board Certified Teacher.

The results from this study suggest that, while attracting and maintaining NBCTs to Title I schools is important, there continues to be a greater importance in acquiring meaningful knowledge of what is happening within Title I schools and classrooms on a consistent basis that is attributed to the effectiveness or lack of effectiveness of the NBCT. The context and complexities of Title I schools continues to hinder the potential of NBCTs in high poverty classrooms and must be addressed in order to fulfill the goals of the NBPTS and maximize the potential of NBCTs.

The lesson from this study is not that National Board Certification is unrelated to student achievement in high poverty schools, but instead the importance of supporting effective teaching with appropriate district support as well as the need to measure instructional processes for a more complete understanding of teacher quality. Indeed, some children do benefit from the knowledge and expertise of NBCT, but NBCT as an isolated policy mechanism will not produce the level of school improvement needed in Title I schools. More focus should be placed on the ability of schools and districts to establish organizational structures conducive to the foundation of school reform efforts and the NBPTS. The real value of this study is grounded in the idea that as educators, we must set assumptions aside regarding advanced degrees, credentials and certifications and rely on the school structures and authentic teacher practices when working with high poverty students.



This study provides a foundation for other investigations into the relationship between NBCT and student achievement in high poverty schools. Future research could address the limitations of this study. Specifically, one limitation was the small sample size of the urban-fringe district used in this study. A future study could be expanded to include more Title I schools in urban and rural settings to determine if the results are similar or different to the findings of this study. Another limitation was that this study only looked at the relationship between NBCTs and achievement indicators. Perhaps, future research could be designed to collect qualitative data of the students in Title I classrooms. This collection of data could include indicators of student trust, student motivation, and student behavior to better understand the NBCT effect on affective conditions.

Two other recommendations for future research address the need for a richer understanding of the relationship between NBCT and student achievement. Qualitative data could be collected on NBCTs in Title I schools that focused on consistent teacher practices within Title I classrooms. While we know that the NBCT obtained certification, we do not know how many attempts were required for their certification. These data would provide insight into the effects of the National Board Certification process on instructional practices employed by NBCTs. Finally, this study was limited in gaining an understanding of the organizational structure of the Title I schools. Future research could be designed to study the context of the Title I schools in order to identify whether the

organizational structure weighs on the control side or the commitment side of school reform efforts.

In conclusion, when considering the enormity of the research that this study was built on, one idea never varied; teachers are important factors in student achievement for all students, regardless of poverty levels. Despite some contradictions between extant literature and findings from this study, the goal of having a deeper understanding of the practices of effective teachers in high poverty schools and a clearer understanding of organizational structures of Title I schools that support instruction is not futile. In fact, it's by studying these apparent contradictions very closely that deeper understanding of effective practices emerges.

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APPENDIX A:  
STUDENT LEVEL CODING

SES (Socio-Economic Status): Students who qualify for federal lunch subsidy.

0 = No                      1 = Yes

Minority Status: Minority (African American, Native American, Asian or  
Hispanic) and Non-Minority (Caucasian)

0 = Minority                1 = Non-Minority

Gender:

0 = Male                    1 = Female

APPENDIX B:  
TEACHER LEVEL CODING

Teaching Experience: Continuous based on number of years taught.

Educational Attainment: Degrees earned

0 = Bachelor's degree

1 = Master's degree and above

National Board Certification:

0 = Non-NBCT

1 = NBCT