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The Effects of National Board Certified Teachers on Student Achievement in Mississippi High Schools

Raymond C. Morgigno

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The effects of national board certified teachers on student achievement in Mississippi
high schools

By

Raymond Clyde Morgigno

A Dissertation
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Elementary, Middle, and Secondary Education Administration
in the Department of Leadership and Foundations

Mississippi State, Mississippi

August 2012

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By

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The purpose of this study was to assess the impact of National Board Certified Teachers on student performance on Mississippi's Subject Area Testing Program (SATP) English II assessment, an end-of-course exam that assesses 10th grade students in Mississippi school districts. The researcher sought to determine if there was a statistically significant difference between the SATP English II scores of two groups of students (those taught by National Board Certified Teachers and those who were not). If there was a difference, the researcher sought to determine how the difference could be explained based on selected teacher demographic data (sex, race, highest degree received, years of experience, and National Board Certification status) and selected student demographic data (sex; race; previous scores on the Mississippi Curriculum Test, Second Edition; and free- or reduced-lunch status).

The results indicated that students who were taught by National Board Certified Teachers were more likely to have higher SATP English II scores than students who were taught by non-National Board Certified Teachers. Though previous researchers have concluded that teachers' years of experience and highest degree received play a vital role

in the difference in student achievement, this study did not confirm those findings. The results of this study, however, indicated that teacher and student demographic data were potentially important predictors of the language arts standardized test scores. Though these data can be used as predictors, the combined effect of teacher gender, teacher race, and years of experience, along with student race, student gender, student lunch status, and prior Mississippi Curriculum Test, Second Edition Language Arts scores were not found to be statistically significant in this study.

Key words: National Board Certified Teachers, Effective Teaching, Highly Qualified Teachers, No Child Left Behind, Teacher Accountability, High-Stakes Testing

DEDICATION

I dedicate this work to my family. Each of you has supported me throughout all of my educational endeavors. My mother and father, Richard and Irene, my sisters, Monica and Cathy, and my brothers, Paul and Heath, have always encouraged me to set high goals and work toward achieving them. My wife Gina and our two children, Kyle and Alyssa Kate, have sacrificed during the many years of my education. Thank you for understanding and supporting me in every step of this process.

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CHAPTER I

INTRODUCTION

Accountability in education has been a topic of discussion for educational leaders, policymakers, and parents for the past 30 years. During this time, the United States has moved from worrying about being *A Nation at Risk* to figuring out how to become *A Nation Prepared*. In response to the claims that public schools in the United States were not achieving at the same level as our international competitors, President Ronald Reagan commissioned *A Nation at Risk: The Imperative for Educational Reform* (National Commission on Excellence in Education [NCEE], 1983). This study focused on student academic achievement in the United States and the concern that low student achievement would harm the country's long-term economic standing in the world. The study focused on student academic achievement in the United States and spawned the perception that it was far too low for our country's economic viability. Results from this study revealed that U.S. schools had not kept up with international advances in mathematics and science and, as a result, U.S. students had fallen behind. The release of this report began a dialogue regarding what was wrong with schools in the United States and how they could be improved. In response to these findings, the following recommendations were made: (a) graduation requirements should be strengthened; (b) schools should adopt higher and more measurable standards; (c) student time in school should be increased; and (d) teacher preparation programs should be strengthened (NCEE, 1983). These

recommendations remain at the heart of conversations concerning today's education reform.

In response to the publication of *A Nation at Risk*, the Carnegie Forum on Education and the Economy assembled the Task Force on Teaching as a Profession to address the issue of improving education in the United States. In 1986, Carnegie's task force published their findings in *A Nation Prepared: Teachers for the 21st Century*, which suggested that the best way to improve our country's educational system was to focus on the quality of the nation's teaching force (Carnegie Forum on Education and the Economy, 1986).

After *A Nation Prepared*, the United States continued to strive for excellence in education. In 1994, Congress passed the Goals 2000: Educate America Act ("Goals 2000," 1998), which provided resources to states and local school districts to ensure that all students reach their full academic potential ("Goals 2000," 1998). The goals of this legislation were based on the premise that students will reach higher levels of achievement when more is expected of them. Goals 2000 established a framework to identify world-class academic standards, to measure student achievement, and to provide the support that students need to meet and exceed academic standards. It also outlined broad objectives for U.S. public schools to reach by the year 2000, including school readiness and completion; student academic achievement; leadership in mathematics and science; teacher education and professional development; school, family, and community partnerships; adult literacy and lifelong learning; and safe, disciplined, drug-free schools ("Goals 2000," 1998).

Another element of Goals was the push for voluntary national standards ("Goals 2000," 1998). As states received federal funds to help them develop their own

improvement plans for reaching higher standards, momentum for statewide exam grew. For instance, by 1998, North Carolina, Tennessee, and Texas were recognized for the percentage of fourth graders scoring “proficient or above” on the mathematics section of the National Assessment of Educational Progress (NAEP; “Goals 2000,” 1998). According to the Mississippi Department of Education (MDE, 2005a), Mississippi is using this same terminology (proficient or advanced) to evaluate student performance on the state’s Subject Area Testing Program (SATP) and the Mississippi Curriculum Test, Second Edition (MCT2).

A Nation at Risk, A Nation Prepared, and Goals 2000 were precursors to the No Child Left Behind Act of 2001 (NCLB), which was signed into law by President George W. Bush in January 2002 (“Executive Summary,” 2004). This far-reaching legislation has had a tremendous impact on educational reform in U.S. public schools. NCLB was designed to provide every child with a fair, equal, and significant opportunity to obtain a high-quality education and reach proficiency on challenging state academic achievement standards and exam (“Executive Summary,” 2004). Title II of this legislation focused on providing every student with a highly qualified teacher (NCLB, 2002). Developed in response to *A Nation at Risk’s* focus on identifying highly qualified teachers, the National Board for Professional Teaching Standards (NBPTS, 2004) provides a nationally recognized certification that designates a teacher as extremely competent.

For decades, educational researchers have conducted studies to determine the relationship between teacher variables and student achievement. Hanushek, Kain, and Rivkin (1998) estimated that a high-quality teacher, in comparison to a low-quality teacher, can provide a full year’s difference in the learning of a class of children. Other researchers, such as Goldhaber (2002) and Ferguson (1998), have echoed this theme.

Though no single agreed-upon list of characteristics for effective teaching has emerged, it is generally agreed that credentials alone (graduation from a particular school of education, undertaking advanced coursework in education, or holding a master's in education) do not provide assurance about the qualifications of teachers. According to Goldhaber and Brewer (1996, 1998, 2000), other factors are at work. Goldhaber and Brewer (1996) concluded that "in mathematics and science, it is the teacher subject-specific knowledge that is the important factor in determining 10th-grade achievement" (p. 206).

The research on effective teaching is as far reaching and broad as the opinions of most other educational topics. Teaching requires many skills to be effective, including a high level of teacher content knowledge, communication of clear and high expectations, and accountability for student performance (Shulman, 1987). Leblanc (1998) identified 10 requirements for good teaching: being passionate; staying on the cutting edge of your field; being a good listener and remembering that each class is different; being flexible and fluid; being entertaining; being humorous; establishing a caring, nurturing teaching and learning environment; possessing visionary leadership skills; collaborating with peers; and having fun.

Does effective teaching really impact student achievement? This question has been at the forefront of research in education for over 40 years. The Equality of Educational Opportunity study (Coleman, 1966) has been considered one of the most far-reaching studies in educational research. Coleman, the study's principal investigator, who was charged with determining the critical factors that play a role in student achievement, reported his findings to Congress as part of the Civil Rights Act of 1964. From data he collected from 4,000 public schools and nearly 640,000 respondents,

Coleman concluded that only one factor could be significantly traced to student achievement: socioeconomic background.

Refuting Coleman's (1966) findings and agreeing with Edmonds's (1977, 1979a, 1979b, 1982, 1983, 1984, 1986) research on effective schools, Haycock (1998) noted that a number of large-scale studies have provided convincing proof that what we do in education does matter. Schools—and especially teachers, it turns out—really *do* make a difference. Earlier educational researchers just did not have very good ways of measuring the variables. (p. 2)

Haycock (1998) added:

By now, those of you who are familiar with our work at the Education Trust know that we are absolutely convinced—by both research and extensive experience in classrooms all over the country—that poor and minority youngsters will achieve at the same high levels as other students if they are taught at those levels. (p. 2)

Over the past 30 years, other researchers have sought to prove the positive impact that effective teachers have on student achievement (Goldhaber, 2002; Porter & Brophy, 1988; Sanders & Rivers, 1996; Wang, Haertel, & Walberg, 1993). Using students' prior performance to classify teachers as effective or ineffective has yielded interesting data. School districts in Dallas (Jordan, Mendro, & Weerasinghe, 1997) and Tennessee (Sanders & Rivers, 1996) allowed researchers to rank teachers according to their students' past performance. Researchers then evaluated student performance according to the number of years students were taught by effective or ineffective teachers. Students who were taught by effective teachers consistently scored higher on standardized tests. One group of third graders in Dallas was paired with an effective teacher for 3 consecutive years; their mathematics scores rose from the 55th percentile to the 76th

percentile after 3 years. After another group of third graders was paired with an ineffective teacher for 3 years, their mathematics scores dropped from the 57th percentile to the 27th percentile. Further, the researchers noted that the students' performance was negatively impacted after 1 year with an ineffective teacher (Jordan et al., 1997). The Dallas study found that only one out of 18 comparative student groups who had an ineffective teacher the 1st year and effective teachers the following 2 years could equal the performance of those students who had effective teachers all 3 years (Mendro, Jordan, Gomez, Anderson, & Bembry, 1998).

In this era of high-stakes testing, effective teaching and student achievement have never been so important. Educators and education policymakers know that student achievement will not improve unless and until teaching improves (CFEE, 1986; Darling-Hammond & Baratz-Snowden, 2007; Goldhaber, 2002; Hattie, Clinton, Thompson, & Schmidt-Davis, 1995; Haycock, 1998). Higher standards, more testing, smaller classes, and other factors do not by themselves improve teaching. When teachers receive little or no feedback on their instruction, they will not improve significantly; the challenge for educational leaders is to provide teachers with a system for continuous improvement of instruction, supervision, and instructional leadership (Campbell, 1991; Darling-Hammond & Baratz-Snowden, 2007; Kentucky Department of Education, 2011).

The Kentucky Department of Education (2011) conducted a study led by Elmore on factors impacting student achievement. They found that the factors that school districts control that have the most significant impact on student achievement are (a) high-quality instructional practice; (b) a well-designed curriculum with exam and instructional material aligned to standards; and (c) strong school leadership. Elmore maintained that there are only three basic ways to increase student learning and

performance. First, increase the knowledge and skill of teachers. Second, change the content, which includes raising the curriculum rigor while providing students with additional academic supports. Lastly, alter the relationship of the student to the teacher and the content. Elmore pointed out that changing one aspect of improving student learning and performance without changing the others will not yield the greatest results. For example, improving teachers' skill and knowledge while implementing a low-level curriculum will not increase student achievement.

Identifying and rewarding effective teachers continues to be a goal of school leaders and policymakers. As a result of *A Nation at Risk* and *A Nation Prepared*, National Board Certification (NBC), an extensive certification process that allows teachers to be recognized as exemplary in the field of education, was formed. The number of teachers achieving NBC status has increased tremendously over the past several years. NBPTS's voluntary certification process has recognized excellent teachers since 1987. Teachers who undergo this rigorous certification process are considered experts in their curriculum and teaching methodology (NBPTS, 2004).

In 1999, Mississippi's state legislature and the state board of education began an incentive program for National Board Certified Teachers (NBCTs) in Mississippi. This policy rewards NBCTs with an annual salary increase of \$6,000. The state also pays NBPTS's \$2,500 test administration fee (MDE, 2011). Millions of dollars are spent each year rewarding teachers in Mississippi and across the United States for achieving this milestone. As a result of a weakening economy, however, many states have begun to look at eliminating or reducing NBC stipends as a way to cut educational expenses. According to the MDE (2011), Mississippi has the sixth highest number of NBCTs in the

nation and the third highest number per capita. Mississippi currently spends over \$22 million per year on stipends for NBCTs (MDE, 2011).

Some researchers in the educational community have expressed doubt about the effectiveness of the NBC process. Podgursky (2001), an economics professor at the University of Missouri-Columbia, challenged the expense of the NBC program and the relatively small amount of data showing that students of NBCTs were outperforming students of non-NBCTs. In addition, Stephens (2004) examined assessment data in South Carolina that supported Podgursky's claim that NBC had not proven to be a contributing factor in increasing student achievement. More recently, however, more data have emerged to the contrary.

Test scores of students who were taught by NBCTs and non-NBCTs were compared in three studies: Cavalluzzo (2004) in Florida; Goldhaber, Perry, and Anthony (2004) in North Carolina; and Vandevort, Amrein-Beardsley, and Berliner (2004) in Arizona. These researchers examined the scores on state standardized tests of students in third grade in Florida, third through fifth grade in North Carolina, and third through sixth grades in Arizona. These results indicated a relationship between students who were taught by NBCTs and higher test scores.

Student achievement is the bottom line in education today. Having a better understanding of what effective teaching is and the role that educational initiatives have played in developing policies to measure student achievement can benefit all educators. It is also beneficial to examine certification processes such as NBC to determine whether these processes do, indeed, contribute to higher student achievement. Since the passage of NCLB, Mississippi's public schools have developed a strong accountability system. The Mississippi Public School Accountability System ranks schools based on students'

MCT2 and SATP scores. The school rankings are as follows: (a) Star; (b) High Performing; (c) Successful; (d) Academic Watch; (e) Low Performing; (f) At Risk of Failing; and (g) Failing (MDE, 2009a).

Statement of Problem

Limited research exists regarding the effects of NBCTs on student achievement at the secondary level, both in Mississippi and nationally, and no studies have been conducted on this topic at the high school level in Mississippi. Most previous national studies have focused on elementary students with various teacher and student demographics.

As education reform continues in public schools and accountability for student achievement grows, educators must examine effective teaching. Millions of dollars are spent each year in Mississippi and across the nation to reward teachers for attaining NBC, which has become the standard by which to identify effective teachers. To ensure that these monies are well-spent, it is important to examine the relationship between NBC and higher student achievement on standardized tests.

NCLB and the Mississippi Public School Accountability System have had a tremendous impact on Mississippi schools. The high-stakes accountability system in Mississippi has increased the focus on the effectiveness of each public school and its teachers. School board presidents, superintendents, principals, and teachers can now lose their jobs for failing to make academic gains on state tests in Mississippi. The importance of a highly effective teacher in each classroom has never been greater, and research has shown time and again that a quality teacher in the classroom has the greatest

effect on student performance (Ferguson, 1998; Goldhaber, 2002; Goldhaber & Brewer, 1998; Hanushek et al., 1998).

To date, only two studies in Mississippi have investigated the relationship between NBCTs and student achievement. Both of these studies focused on data from the elementary grades. There has been no research in Mississippi on the effects of NBCTs on student achievement at the secondary level related to SATP results. Current empirical research is needed to study the effects of NBCTs on student achievement in Mississippi at the secondary level.

Purpose of the Study

The purpose of this study was to assess the impact of NBCTs on student performance on Mississippi's SATP English II assessment, an end-of-course exam that assesses students in 10th grade in Mississippi school districts. The study sought to determine if there is a statistically significant difference between the SATP English II scores of two groups of students: those taught by NBCTs and those who were not. Additionally, the study investigated how potential differences in student test scores can be explained based upon selected teacher and student demographic data. The following teacher demographic data were selected as the units of analysis in this study: area of certification, sex, race, highest degree received, years of experience, and NBC attainment. The student demographic data were race, gender, previous eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status.

Research Questions

This study sought to answer the following research questions:

1. Is there a statistically significant difference between the SATP English II scores of Mississippi students taught by an NBCT and those who are not?
2. If differences in student scores exist, can they be explained by selected teacher and student demographic data?

Theoretical Framework

The theoretical framework for this study is that the teacher has the single greatest impact on increasing student achievement. In general, researchers have agreed that the following characteristics are essential to effective teaching: (a) teachers must have a deep knowledge of the content that they are teaching; (b) teachers must have strong classroom management skills; (c) teachers must be able to relate to their students and keep them engaged in the learning process; (d) teachers must understand the pedagogical processes by which students will best learn; (e) teachers must be members of the educational learning community, and they must learn and share with other educators to enhance student learning (Leblanc, 1998; Murray, 1983; Porter & Brophy, 1988; Wang et al., 1993).

As researchers and practitioners have searched for ways to improve public school systems in the United States through the years, much has been said about the effect the teacher has on student achievement. Time and again, research has revealed the teacher as having the single greatest impact on increasing student achievement (Goldhaber, 2002; Haycock, 1998; Wang et al., 1993). It is, therefore, imperative that teachers have avenues of support to help them become more effective. One such avenue is the NBC process.

According to NBPTS, effective teaching and NBC go hand in hand, with NBPTS rooted in the belief that the most effective way to improve schools and student learning is to strengthen teaching. Theoretically, students who are taught by effective teachers should have higher scores on standardized tests (Stronge et al., 2007; Wang et al., 1993; Wenglinsky, 2000).

NBPTS's five core propositions outline characteristics that result in positive student achievement: (a) teachers are committed to students and students' learning; (b) teachers know the subjects they teach and how to teach those subjects to students; (c) teachers are responsible for managing and monitoring student learning; (d) teachers think systematically about their practice and learn from experience; and (e) teachers are members of learning communities (NBPTS, 2002).

NBPTS's five core propositions mirror many of the components of effective teaching. Teachers who complete the NBC process are likely exhibiting behaviors associated with effective teaching. Through the NBC process, NBPTS maintains that passing teachers are, in fact, effective teachers. By extension, NBCTs should have a positive effect on student achievement.

Although studies have been conducted to assess the effects that NBCTs have on student achievement, the variables employed have differed tremendously. For example, in Stone's (2002) Tennessee study, no student demographic data was used, leading researchers such as Fuhrman (2003) to question the impact of the study. Goldhaber et al. (2004) conducted a large scale, multiyear study in North Carolina that included teacher and student demographic data. However, their study did not include local school district accountability levels. Vandevort et al.'s 2004 study compared Stanford Achievement Test scores of Arizona elementary students who were taught by NBCTs to those who

were not. However, the sample sizes have consisted often of only one school district and a sample of only elementary students.

Though each of the previously mentioned studies found NBCTs to have a positive effect on student achievement, each was funded in part by NBPTS. Studies not funded by NBPTS (Benigno, 2005; J. W. Holland, 2006; Stephens, 2004; Stone, 2002; Vitale, 2008) have yielded mixed results. Very few studies not funded by NBPTS have looked at the effect of NBCTs on student achievement at the high school level. Independent studies that include teacher and student demographic data, local district accountability levels, and pretest and posttest information will provide essential data related to the effects of NBCTs on student achievement.

Justification of the Study

School districts across the country continue to struggle to fund education budgets and to find ways to reward those teachers who achieve the highest standard of excellence. With many states paying large stipends to recognize NBCTs, it is appropriate to examine whether these teachers are successful in raising student performance on standardized tests.

Reports such as *A Nation at Risk* and *A Nation Prepared* as well as the Goals 2000 and NCLB acts have highlighted the need for increased accountability in public education. The accountability movement in the 21st century focuses on student performance on standardized tests as its primary mode of assuring accountability for teacher performance and student learning. With schools and teachers evaluated by student performance on standardized tests, it is imperative that educational researchers

examine teacher improvement models such as NBC and its relationship to increased student performance.

This study will add to the increasing body of literature examining the NBCTs' effectiveness at improving the achievement results of their students in greater proportion than their counterparts without this designation. No previous studies have addressed the effect of NBCTs on 10th grade SATP English II scores. Some studies have examined small sample groups that included teachers and students from only one or two school districts. In larger studies conducted by researchers such as Wenglinsky (2000), Vandervoort et al. (2004), and Hay McBer (2000), various teacher and student variables were examined. Teacher race, however, was not investigated as a variable in any of these studies. In addition, student variables have differed in the various studies. This study encompasses school districts from across the state of Mississippi and accounts for various key teacher and student variables.

There is little empirical evidence that NBCTs and various teacher characteristics are predictors of increased student achievement. However, NBPTS claims to certify highly accomplished teachers who impact student achievement (NBPTS, 2004). NBPTS officials (2004) have maintained that teachers who meet their standards are superior in promoting academic achievement. Since NBPTS's creation, researchers have conducted studies to examine the link between NBCTs and student achievement (Benigno, 2005; J. W. Holland, 2002; R. Holland, 2006; Vandervoort et al., 2004).

In Mississippi, millions of dollars are spent each year rewarding teachers for achieving NBC. Little research has been conducted on the effects of NBC on student achievement in the state. No prior research has been done on this topic in Mississippi with regards to high school students' achievement and NBC.

This study will add to the state and national literature related to NBPTS. Goldhaber et al. (2004) stated that “the available literature on NBPTS has been striking in its absence of rigorous quantitative studies” (p. 6). This study seeks to determine if there is a statistically significant difference between the SATP English II standardized scores of Mississippi 10th grade students taught by NBCTs and those who were not. This study will benefit Mississippi school leaders by providing research data from across the state rather than just a few districts. The subject group includes teachers and students from urban, suburban, and rural districts.

Delimitations

Though NBPTS offers 24 areas of certification, this study is limited to English NBCTs at the secondary level. This level was chosen because no previous research has been done at the secondary level in Mississippi. The findings of this study are limited to this certificate area and are not able to be generalized to other certificate areas. Likewise, results of this study are specific to NBCTs of English and non-NBCTs of English in Mississippi school districts. This study will focus on English students in 10th grade only and will not account for the impact that previous teachers have had on the students included in the sample. The SATP English II exam was chosen because all 10th graders in Mississippi’s public schools are required to pass it to graduate. This test was also chosen because it has proven to be the most difficult end-of-course exam for Mississippi high school students to pass.

Definitions of Terms

1. Goals 2000: Educate America Act—passed by Congress in 1994, this bill outlined broad educational goals for the United States to strive for by the

year 2000; specific mandated tests in Grades 4, 8, and 12 increased the U.S. government's role in state standardized testing ("Goals 2000," 1998).

2. Mississippi Curriculum Test (MCT)—developed in 2000, and required by Mississippi's accountability system, this test is administered in May of each year and includes exam in reading and language for students in third through eighth grades (MDE, 2009a).
3. Mississippi school achievement levels:
 - Star (school)—highest level (MDE, 2009a).
 - High performing (school)—second highest Mississippi school achievement level (2009a).
 - Successful (school)—third Mississippi school achievement level (MDE, 2009a).
 - Academic watch (school)—fourth Mississippi school achievement level (2009a).
 - Low performing (school)—fifth Mississippi school achievement level; failure to meet growth at this level could result in a school being designated as a priority school (2009a).
 - At risk of failing (school)—sixth Mississippi school achievement level; failure to meet growth at this level could result in a school being taken over by the state (2009a).
 - Failing (school)—seventh Mississippi school achievement level; school is failing to perform and is placed under the conservatorship of the state board of education (2009a).

4. NBPTS/National Board for Professional Teaching Standards—an independent, nonprofit organization established in 1987 and composed primarily of classroom teachers with a mission to set high and rigorous standards for what teachers should know, understand, and be able to do (NBPTS, 2004).
5. NBC/National Board Certification—a distinction given by the National Board for Professional Teaching Standards; a process that involves teachers’ demonstrating their knowledge and skills through a series of performance-based exam that include videotaping and analysis of their classroom teaching and student learning; this certification is valid for 10 years (NBPTS, 2004).
6. NBCT/National Board Certified Teacher—a teacher who has met all the requirements set forth by the National Board for Professional Teaching Standards; the teacher must hold a bachelor’s degree, have a minimum of 3 years’ teaching experience, and have had a valid state teaching license for those 3 years (NBPTS, 2004).
7. NCLB/No Child Left Behind Act of 2001—federal legislation requiring highly qualified teachers and increased accountability in schools (NCLB, 2002).
8. Non-NBCT/Non-National Board Certified Teacher—for the purpose of this study, a teacher who has not been certified by the National Board for Professional Teaching Standards.

9. Proficiency Levels—scores for each level of the Mississippi SATP exam that indicate levels of student achievement; these levels are minimal, basic, proficient, and advanced (MDE, 2009a).
10. SATP/Mississippi Subject Area Testing Program—consists of four academic end-of-course exams: Algebra I, Biology I, English II, and U.S. History from 1877 to the present (MDE, 2011b).
11. Student Achievement—for the purpose of this study, student performance on a standardized test such as the Mississippi SATP English II exam.
12. Value-Added Model—statistical method of evaluating teachers by examining their students' prior year performance on a standardized test (Sanders & Rivers, 1996).

CHAPTER II

REVIEW OF LITERATURE

The purpose of this literature review is to provide information on research relative to the effects of NBCTs on student achievement in Mississippi. The first section focuses on effective teaching. The second section includes a brief history of NBPTS's development and focuses on NBCT-related research. The third section focuses on the SATP, and the fourth section is devoted to the current accreditation system for public high schools in Mississippi. The chapter concludes with a summary.

Effective Teaching

Some teachers have the unique ability to impact their students both academically and personally. Educators, education policymakers, and researchers should consider the common characteristics of these effective teachers. Common characteristics often include teacher preparation, personality traits, age, and experience (Benigno, 2005).

From their study, Hay McBer (2000) concluded that “teachers really do make a difference. Within their classrooms, effective teachers create learning environments which foster pupil progress by deploying their teaching skills as well as a wide range of professional characteristics” (p. 9). The research findings on effective teaching continually change. Bond, Smith, Baker, and Hattie (2000) noted that “an operational definition of expertise in teaching has been difficult to devise, and expertise in teaching is difficult to assess” (p. 16).

Recent research on teacher effectiveness evolved from the 1966 Coleman Report, which suggested that schools and teachers do not make much of a difference when it comes to student achievement (Wong & Nicotera, 2004), to almost three decades later when researchers began to contend that teachers are the primary difference in student performance (Goldhaber, 2002; Haycock, 1998; Porter & Brophy, 1988; Sanders & Rivers, 1996; Wang et al., 1993). Porter and Brophy (1988) evaluated research on “good teaching” from the mid-1970s through the mid-1980s, offering that an effective teacher is one who (a) sets clear goals; (b) communicates what is expected and why; (c) is knowledgeable about content and strategies; (d) adapts instruction to the needs of learners; (e) makes expert use of materials; (f) monitors understanding and gives regular feedback; (g) accepts responsibility for student outcomes; (h) knows his or her students; (i) teaches cognitive strategies; (j) addresses both higher and lower cognitive objectives; and (k) is thoughtful and reflective about his or her practice.

In the Synthesis of Research section of the December 1993 edition of *Educational Leadership*, Wang et al. (1993) published their findings from an evaluation of 50 years of student learning research. In this study, they examined over 11,000 statistical findings and created a list of 28 categories that contributed to student achievement. An estimated effect score between 1 and 70 was yielded for each category. Classroom management was considered the most influential factor, achieving an effect score of 64.8 in comparison to the state-level policies score of 37.0. In Wang et al.’s analysis, direct influences such as teacher time on topic and teacher interaction with students had a greater impact on student learning than indirect influences such as policy and governance issues. These results show the importance of the classroom teacher’s behavior in comparison to the less significant role of education policymakers.

In a research study commissioned by England's Department of Education and Employment, Hay McBer (2000) developed a model for teacher effectiveness. This model was based on a variety of data collection techniques used with 170 teachers and 80 schools throughout England. Test data from both the beginning and the end of the school year were used as measuring points for effective teaching (Benigno, 2005). Using data from both elementary and secondary school settings, Hay McBer (2000) determined that the three main factors that contribute most significantly to student achievement are teachers' skills, teachers' professional characteristics, and the classroom climate. The findings suggested that over 30% of student progress could be attributed to these three areas of teacher contribution. Hay McBer also reported that students are mostly looking for a teacher to create a safe, orderly classroom that is interesting and allows an opportunity for active participation. Additionally, Hay McBer discovered three other factors that significantly contribute to a student's ability to learn: high expectations from the teacher, a lack of classroom disruptions, and encouragement to engage in the lesson. From their study, Hay McBer concluded that teachers' age, gender, and experience do not impact their effectiveness.

In his report to the Educational Testing Service (ETS), Wenglinsky (2000) confirmed the minimal impact that teaching experience and the educational level of the teacher have on student achievement. However, Wenglinsky did report that whether teachers majored or minored in the area in which they taught did have a significant effect on student achievement. Wenglinsky found that students who were taught by teachers who majored or minored in their particular course area outperformed their peers who were taught by teachers who did not major or minor in their particular course area by 40% of a grade level as evidenced by NAEP scores. This finding coincides with the

research of Goldhaber and Brewer (1998) who used the National Educational Longitudinal Study (NELS), which tracked eighth grade students in 1988 to determine if a statistically significant relationship existed between teacher degree level and student achievement. The researchers noted that in “math and science, subject-specific training for teachers was found to have a statistically significant impact on student test scores” (Goldhaber & Brewer, 1998, p. 137). Adding to the inconsistency of teacher data input and its effect on student achievement, Wenglinsky (2000) reported that out of 400 studies conducted, only 10% linked teacher degree level to statically significantly increased student performance.

Studies focusing on linking classroom practices to student achievement have led to several interesting points. With NAEP data, Wenglinsky (2000) used a multilevel structural equation model to examine two national student samples and the teachers who taught the students. These groups consisted of 7,146 eighth graders who took the NAEP mathematics assessment in 1996 and 7,776 eighth graders who took the NAEP science assessment in 1996. Using class sizes and socioeconomic status as variables, Wenglinsky considered teacher input data (years of teaching experience, educational level, and subject majored or minored in), then professional development, and last, classroom practices. By examining the data in a multivariate way, Wenglinsky determined that in the area of mathematics the following had a positive impact on student performance: teacher input data (subject majored or minored in); classroom practices (exposure to higher order thinking skills and hands on learning experience); and professional development (training in higher order thinking skills and training for special populations). In the area of science, a positive impact on student performance was evidenced by the

same teacher input data (subject majored or minored in), classroom practices (hands-on learning and point-in-time exam), and a professional development skill (lab skills).

Wenglinsky (2000) examined the impact on test scores and determined that a student's socioeconomic status was the single most influential factor, with a score (percent of grade level increase) of .76 in mathematics and .75 in science. Also, teacher classroom practices, such as hands-on learning, higher order thinking skills, and exam, clearly exceeded teacher input data (subject majored/minored in) and professional development when examining impact on student achievement. Classroom practices had a combined relative score of .56 in mathematics and .39 in science compared to .09 in mathematics and science for teacher input data and .33 in mathematics and .26 in science for professional development. This study showed that teachers' classroom practices and these practices' relationship to higher student achievement on standardized tests is an area worthy of future study and potential benefit.

Although Wenglinsky (2000) had a large sample size and his study examined data for junior high school students in mathematics and science, it did not include data for high school students. Teacher race was also not included in the study. Therefore, a study on the effect of NBCTs on student achievement is needed, especially one that includes more teacher demographic information, such as race, in the variables.

During 1998, researchers for the National Bureau of Economic Research concluded that teacher quality had the single greatest impact on student achievement. Using test data and teacher descriptors from the state of Texas, Hanushek et al. (1998) examined over 3,000 schools and over 500,000 students. From focusing on students in third through sixth grades and following cohorts of specific groups, they determined that

teacher quality has a much greater impact on student achievement than teacher experience, teacher education, and class size.

According to Goldhaber (2002), measurable teacher characteristics such as experience, educational level, and performance on vocabulary tests make up only 3% of the impact that teacher influence has on student achievement. This leaves 97% of the impact to intangible characteristics such as skill in conveying knowledge and enthusiasm for teaching (Goldhaber, 2002).

As education reform continues and high-stakes testing becomes more common, education policymakers will continue to try to improve teacher quality. In the quest for higher test scores, education policymakers have tried smaller class sizes, encouraged advanced degrees, offered higher salaries, and implemented numerous other recruitment efforts.

National Board for Professional Teaching Standards (NBPTS)

NBPTS's History

In 1983, the National Commission on Excellence in Education published *A Nation at Risk: The Imperative for Education Reform*. After this study, the public's concern about the state of U.S. education was tremendously heightened. In response, the Carnegie Forum on Education and the Economy issued a 1986 report titled *A Nation Prepared: Teachers for the 21st Century*. The report's leading recommendation called for the establishment of a national board for professional teaching standards (NBPTS, 2004). NBPTS was established in 1987 as a nonprofit, nonpartisan organization governed by a board of directors consisting primarily of classroom teachers. Other members of the board include school administrators, school board members, governors,

state legislatures, and business and community leaders. According to NBPTS, the single most effective action this country can take to improve schools and student achievement is to strengthen teaching. NBPTS has raised the standards for teachers, strengthened their educational preparation through the standards, and created performance-based exam that demonstrate accomplished application of the standards (NBPTS, 1991).

One major goal of the NBPTS is to create a professional standard similar to other professional fields (e.g., accounting or medical) in which being board certified equates to recognized excellence. To achieve this distinction, a teacher must demonstrate their knowledge and skills through a series of performance-based exam that include student work samples, videotapes, and rigorous analysis of their classroom teaching and student learning (NBPTS, 2004). It is meant to be a complement to the educational licenses that are issued by each state. NBC is valid for 10 years, and the teacher must have taught for a minimum of 3 years to apply.

The mission of the NBPTS is to advance the quality of teaching and learning by:

- (a) maintaining high and rigorous standards for what accomplished teachers should know and be able to do;
- (b) providing a national voluntary system that certifies teachers who meet these standards; and
- (c) advocating related education reforms to integrate National Board Certification in American education and to capitalize on the expertise of National Board Certified Teachers. (NBPTS, 1991, p. 2)

NBPTS's Five Core Propositions

In 1989, NBPTS issued its policy statement titled *What Teachers Should Know and Be Able to Do*. This work has served as a basis for all of the standards development work that NBPTS conducts. The five core propositions are as follows:

Teachers are committed to students and their learning. . . . Teachers know the subjects they teach and how to teach those subjects to students. . . . Teachers are responsible for managing and monitoring student learning. . . . Teachers think systematically about their practice and learn from experience. . . . Teachers are members of learning communities. (NBPTS, 2002, pp. 3-4)

Following is a look at each proposition and the skills expected of NBPTSs.

Proposition #1: Teachers are committed to students and their learning. According to NBPTS, accomplished teachers act on the belief that all students can learn. They treat students equitably, recognizing the individual differences among students, and they account for these differences in their practices.

Under Proposition #1, the National Board asks several questions when assessing teaching practices.

Does the teacher recognize individual differences in their students and adjust their practices accordingly?

Does the teacher anticipate what concepts certain students might find problematic?

Does the teacher treat students equitably?

Does the teacher's mission extend beyond developing the cognitive capacity of their students? (NBPTS, 2002, pp. 8-9)

Proposition #2: Teachers know the subjects they teach and how to teach those subjects to students. Accomplished teachers should be experts in their field and have the keen ability to apply their subject matter to real-world settings. They should command a variety of teaching methods in order to reach various types of learners. Questions under this proposition include the following:

Does the teacher appreciate how knowledge in their subject is created, organized, and linked to other disciplines?

Does the teacher understand what aspects of the subject area to emphasize and how to pace instruction?

Does the teacher generate multiple paths to knowledge? (NBPTS, 2002, p. 10-11)

Proposition #3: Teachers are responsible for managing and monitoring student learning. Accomplished teachers are facilitators of student learning. They should provide an engaging, relevant, and disciplined learning environment that incorporates cooperative learning environments. Hunter (1982) once wrote, “To say that you have taught when students haven’t learned is to say you have sold when no one has bought” (p. 59).

Hunter (1982) emphasized the importance of constant evaluation of student progress toward desired objectives. Bond et al. (2000) stated that feedback is one of the most powerful tools in enhancing student achievement. This kind of evaluation may not always involve graded assignments; it often involves observing the body language of the class. By NBPTS standards, an accomplished teacher has the ability to “understand that the purpose, timing, and focus of an evaluation affects its form” (NBPTS, 2002, p. 15).

One perceived strength of the NBC process is that it is a performance-based assessment. Candidates must videotape classes and critique the lesson and their teaching

performance, similar to athletic coaches' review of film. NBCT candidates must assess their technique and be able to explain why they made the choices that they made (Bohen, 2001). One NBCT candidate said that "for the first time I had to prove what I do, why I do it, and how" (Bohen, 2000, p. 90).

Questions under this proposition include the following:

Does the teacher call on multiple methods to meet their goals?

Does the teacher orchestrate learning in group settings?

Does the teacher place a premium on student engagement?

Does the teacher regularly assess student progress?

Is the teacher mindful of their principal objectives? (NBPTS, 2002, pp. 13-14)

Proposition #4: Teachers think systematically about their practice and learn from experience. Accomplished teachers must be able to draw on their experiences and be lifelong learners. They should examine their practice and constantly update their teaching repertoire. Shulman (1987) included reflection as an essential part of the successful pedagogical reasoning and action of expert teaching. The NBC process involves a lengthy period in which reflective journaling is a major part of a candidate's portfolio.

NBPTS conducted a survey to evaluate how NBCTs compare the NBC process to other staff development activities. Out of the 5,641 NBCTs who responded, 92% said they believed that the process made them a more effective teacher (NBPTS, 2001). Of the NBCTs surveyed in 2001 by the Education Resource Group, 80% said that the certification process was better than any professional development that they had previously received. This survey also revealed that 69% believed they were able to better engage their students due to the NBC experience, and 83% found that they were more

reflective (NBPTS, 2001). A key question asked in reference to this proposition is “Do teachers seek advice of others and draw on education research and scholarship to improve practice?” (NBPTS, 2002, p. 16).

Proposition #5: Teachers are members of learning communities. Accomplished teachers continue their learning and positively contribute to society by collaborating with their peers and community members. They share ideas, provide resources for fellow teachers, and are not afraid of criticism. In addition, accomplished teachers find creative ways to engage both their students and the community (NBPTS, 2002). One of NBPTS’s stated objectives is to assist teachers in providing leadership in the redesign of schools and in helping their colleagues grow professionally. NBCTs get an opportunity to lead their colleagues in professional learning communities at schools. Questions linked to this proposition include the following: “Does the teacher contribute to school effectiveness by collaborating with other professionals? Does the teacher work collaboratively with parents? Does the teacher take advantage of community resources?” (NBPTS, 2002, pp. 18-20).

There is an interesting correlation between NBPTS’s five core propositions and several of the teacher attributes discovered by Campbell (1991) in his study of strategies used by expert teachers to sustain outstanding performance in a professionally inadequate work environment. Five of Campbell’s findings can be associated with NBCTS’s core values. According to Campbell, experienced, expert teachers (a) continually seek avenues to improve their teaching performance; (b) exhibit a strong sense of mission; (c) possess a holistic view of teaching; (d) exhibit a high degree of personal and professional efficacy; and (e) seek and maintain a peer support system.

NBPTS's Certification Process

Created to be a supplement to state teacher certification systems, NBC is a voluntary certification system for educators who wish to complete a thorough performance-based assessment of their instructional practices. As of November 2004, NBPTS offered 24 areas of certification, including early childhood generalist, middle childhood generalist, and adolescence and young adulthood. A candidate for NBC must hold a baccalaureate degree, have taught for a minimum of 3 years, and have had a valid state teaching license for those 3 years (NBPTS, 2004).

NBC is a rigorous and expensive process. Teachers are required to videotape their classroom practices and to create a portfolio that reflects the use of theory in the classroom. In addition, teachers are tested in their particular content knowledge through specific activities and written responses (Vandevoort, et al., 2004). The average success rate of NBC was about 35% during the program's first 3 years. In 1998, 4 years later, the rate increased to 45% (Rotberg, Futrell, & Lieberman, 1998). By 2003, the average success rate was approximately 49% (Goldhaber et al., 2004).

Since 1987, more than 47,000 teachers have achieved NBC. One reason for such large participation in the certification process is that each of the 50 states have adopted policies that provide incentives that both reduce the cost to teachers of seeking certification and provide long-term financial rewards for becoming certified. Many state and local education agencies pay some or all of the \$2,500 application fee charged by NBPTS and provide a permanent increase in salary for those who successfully complete the process. Nationally, the salary enhancements for achieving NBC have reached nearly \$1 billion annually (Podgursky, 2001). As of 2010, Mississippi had more than 2,600 NBCTs in its public schools. In Mississippi, teachers are given a \$6,000 per year stipend

for achieving NBC. Mississippi ranked sixth among the states in the nation in its total number of NBCTs and third per capita (MDE, 2011).

The large expense of the \$6,000 per year stipend for NBC teachers, counselors, and speech pathologist in schools has come under scrutiny by legislators over the past few years as the cost has grown tremendously. The program cost for Mississippi rose from \$6,954 in 1997 to \$22,776,466 in 2010 and is expected to rise continually (MDE, 2011).

NBPTS has been partially funded by the U.S. Department of Education (USDOE). By 2003, \$300 million in federal funds had been spent in support of this program (Goldhaber et al., 2004). With the current economic crisis and budget cuts to critical government programs, federal dollars are at a premium. Taxpayer support of NBPTS makes examining how NBCTs affects student achievement even more significant.

Highly Qualified Teachers and NBC

In January 2002, President George W. Bush signed NCLB (“Executive Summary,” 2004). This was the first major education reform to have been passed by the federal government in over 30 years. The purpose of NCLB as stated in the preamble was “to close the achievement gap with accountability, flexibility, and choice, so that no child is left behind” (NCLB, 2002). NCLB requires that, as of the 2005-2006 school year, highly qualified teachers instruct each child and that each child has an equal educational opportunity through high-quality teachers and exam (NCLB, 2002).

A highly qualified teacher is described in NCLB as one who holds a bachelor’s degree or higher from a 4-year college, is fully certified by the state, and can demonstrate

competence in his/her subject area (NCLB, 2002). The National Commission on Teaching and America's Future (1996) proposed that every student in the United States should have access to a competent, caring, qualified teacher. NBCT candidates must demonstrate that they are meeting NBPTS's rigorous standards, which are aligned with NCLB standards, within their classrooms so that student learning will be increased as a result of having a highly qualified and accomplished teacher (NBPTS, 2004).

To define teacher quality, Goldhaber et al. (2004) used standards created by three organizations: Interstate New Teacher Assessment and Support Consortium (INTASC), NBPTS, and the National Council for the Accreditation of Teacher Education (NCATE). Like many other researchers (Goldhaber, 2002; Haycock, 1998; Stronge et al., 2007; Wang et al., 1993; Wenglinsky, 2000), Goldhaber et al. (2004) have contended that teachers are the most influential factor in predicting student achievement.

Under NCLB (2002), a highly qualified teacher does not have to have had any training in teaching methodology. More than 313,000 initial teaching licenses or certificates were issued throughout the states for the 2008-2009 academic year (USDOE, 2011). According to Darling-Hammond and Baratz-Snowden (2007), many teachers end up in classrooms unprepared for what awaits them for multiple reasons. One reason is that "many people do not understand what successful teaching requires and do not see teaching as a difficult job that requires rigorous training" (p. 112).

Most school administrators, parents, and students support the notion that teacher quality is vital to student achievement (Ferguson, 1998; Goldhaber, 2002; Goldhaber & Brewer, 1998; Hanushek et al., 1998). Though definitions found in the literature for a highly qualified teacher vary, some traits that describe highly qualified teachers are consistent. Highly qualified teachers should be experts in their field, reflect upon

instructional practices, and positively impact student learning (Goldhaber, 2002; Haycock, 1998; Porter & Brophy, 1988; Sanders & Rivers 1996; Wang et al., 1993).

NBCTs' Impact on Student Achievement

Though several studies have been conducted on the effects of NBCTs on student achievement, most have been NBPTS funded. There is a great need for independent research due to a lack of quantitative research on NBC and student achievement measured by external validity measures. Standardized state assessment instruments serve as one avenue to achieve this.

In one of the earliest studies comparing NBCTs to non-NBCTs, Bond et al. (2000) studied the performance of 31 early childhood teachers who had successfully achieved NBC and 34 early childhood teachers who were unsuccessful in attaining NBC. By evaluating students' writing samples and classroom assignments and by comparing classroom practices, the researchers determined that NBCTs' students outperformed non-NBCTs' students in all areas at a statistically significant level in 11 of the 13 key teaching dimensions (Bond et al., 2000).

Podgursky (2001), a professor of economics at the University of Missouri-Columbia, challenged the results of Bond et al.'s (2000) study, expressing concerns with the sampling method and the study's lack of control for socioeconomic and parental factors. Podgursky asserted that after 3 years of research and \$500,000 (funded by the USDOE), a fundamental question remained unanswered: "Is the National Board's certification process a valid and cost-effective way of identifying the nation's best teachers?" (para. 3). Podgursky also expressed concern about the high price tag associated with NBC and the awarding of certification to teachers who have not exhibited

content expertise. He questioned the amount of federal money that was being allocated to NBC even though “no rigorous study has ever been undertaken to determine whether the students of board-certified teachers actually learn more than students of an average teacher in the workforce (or teachers who have failed the board assessment)” (para. 13).

Stone’s 2002 study did not discount Podgursky’s (2001) findings. To determine the effects of NBCTs on student achievement in Tennessee, Stone utilized teacher-effect scores, which are reported on a scale of 0 to 50 and represent the estimated mean achievement gains of the students taught by each teacher. The teacher-effect scores of 16 NBCTs who taught third through eighth grades were obtained from the Tennessee Value-Added Assessment System database. According to the Tennessee Value-Added Assessment System, teachers whose students demonstrate a growth of 115% annually in three core subjects were awarded a \$5,000 bonus and a grade of A. Teachers who showed an annual growth of 85% or less received a grade of F. Of the 16 NBCTs whose teacher-effect scores were analyzed, none was eligible to receive the \$5,000 bonus. NBCTs in this study were similar to their colleagues in regard to how their teaching affected student achievement. Responding to Stone’s study, noted educational researcher Hanushek (as cited in R. Holland, 2002) of the Hoover institute stated: “The NBPTS certification process has become an important element of policy in several states, and large financial rewards flow to successful applicants. But all of this has happened without a thorough analysis of its effectiveness” (“Study ‘Well Conceived’” section, para. 3).

Concerned about the lack of teacher demographics in Stone’s (2002) study, Fuhrman (2003) suggested demographic data that could have been considered in Stone’s (2002) study as well as future studies, which include general demographic data,

educational background, years of experience, type of NBC and data received, how participating NBCTs compare to Tennessee's population of NBCTs, how participating NBCTs compare to candidates who did not achieve certification, and how participating NBCTs compare to other teachers in Tennessee, their school district, school, and current grade level. Another limit to Stone's study was that only 16 NBCTs were researched.

As critics continued to challenge NBPTS for empirical proof of increased student achievement, Goldhaber et al. (2004) conducted an independent, multiyear study that compared test scores of over 600,000 third to fifth graders in North Carolina. Student demographic data included race, sex, learning disabilities, English proficiency, current grade, school enrollment, student/teacher ratio, percentage of minority students, percentage of students with free- or reduced-lunch status, and expenditure per student annually. Teacher demographic data included race, sex, age, area of licensure, degrees received, years of teaching experience, and Praxis or National Teacher Exam scores. School demographic data included whether the school was urban, suburban, or rural and the starting salary of teachers. To track their progress, students were linked to their teachers. The scores of students taught by NBCTs were compared to scores of students taught by non-NBCTs. The findings indicated that if teachers were qualified in their content area of instruction, more gains were observed in student achievement test scores. The results also indicated that students taught by NBCTs scored higher on student achievement tests and state standardized tests. This study was funded by the USDOE (Goldhaber et al., 2004).

Also, Vandevort et al. (2004) investigated the academic performance of elementary students in 14 Arizona school districts, comparing the performance on the Stanford Achievement Test of students taught by NBCTs to those who were not. Four

years of data (1999-2000, 2000-2001, 2001-2002, and 2002-2003) for third through sixth grade students were obtained from the Arizona Department of Education. According to the researchers, NBCTs have greater effects on student achievement than their non-board-certified counterparts. This study was partially funded by NBPTS. Vandervoort et al. suggested that student data are not needed to conclude that a teacher is highly qualified. Patients of physicians who attain Board Certification are not examined to determine if their doctors are highly qualified. The point is that a Board Certified physician, or in this case, teacher, is likely to achieve better results than their non-Board Certified counterparts (Vandervoort et al., 2004).

Like Goldhaber et al. (2004) and Vandervoort et al. (2004), Cavalluzzo (2004) found a positive relationship between NBC and higher student achievement on standardized tests. Cavalluzzo (2004), a senior researcher at CNA, a nonprofit research and analysis institution, and her colleagues examined nearly 108,000 student records from Miami-Dade County Public Schools. They analyzed test scores from the Florida Comprehensive Assessment Test (FCAT) in mathematics of students in Grades 9 and 10 for the years 2000-2003. In the study, the researchers used a multiple regression model to control for teacher attributes such as teacher experience, certification in mathematics, and advanced degrees. Student characteristics such as absenteeism, gifted status, number of suspensions, and retention were controlled. School variables such as per-pupil spending, school size, and student mobility were also accounted for in the design model (Cavalluzzo, 2004). Cavalluzzo determined that students who were taught by an NBCT performed higher than those not taught by an NBCT. After considering teacher, student, and school factors, the data revealed that being an NBCT and having state mathematics certification were statistically significant. However, the NBC effect size was the largest

and, therefore, had the most influence on test scores. This finding led Cavalluzzo to declare that there is robust evidence that NBC is an effective indicator of teacher quality (Cavalluzzo, 2004). Although Cavalluzzo had a large sample group and analyzed mathematics data at the high school level, there are still areas for further investigation. Demographic information such as the sex, race, and socioeconomic status of teachers and students were not included in the study. Further research that examines student performance data at the high school level and includes this demographic information is warranted.

Adding to the inconsistent findings on NBCTs and their impact on student achievement, Stephens (2004) found little significant relationship between the standardized test performance of NBCTs' students and non-NBCTs' students. Stephens examined test data from South Carolina's 2001 and 2002 Palmetto Achievement Test of fourth and fifth grade students of NBCTs and non-NBCTs in mathematics. These data included 154 students taught by an NBCT and 669 students taught by a non-NBCT. Stephens created eight matched pairs of NBCTs with non-NBCTs. Only one of the eight pairs had a statistically significant difference between the two teacher groups. With less than 13% of the pairs statistically significant, Stephens questioned whether South Carolina's effort to increase the number of NBCTs was prudent (Stephens, 2004). Stephens's study did have some limitations. Only two school districts were included in the study. Additionally, teacher and student sex and race were not accounted for. Further study is warranted to include a larger sample size and teacher and student sex and race.

The inconsistency of research related to NBCTs' affect on student achievement does raise the question of economic prudence. However, it is clear that NBC has arrived on the educational scene and will be here for many years. As noted previously, one NBC

weakness is that the majority of studies that have been conducted have been funded by NBPTS or one of its affiliates. Few independent researchers have studied the effects of NBCTs on student achievement. Haycock (1998), director of The Education Trust, proclaimed that the totality of research clearly supported that the teacher is the single most important factor in student achievement. If Haycock is correct, it is prudent that we continue to encourage professional development opportunities such as NBC for our teachers.

Mississippi Subject Area Testing Program (SATP)

Mississippi revamped its statewide accountability system in 1999. The system was designed to comply with the requirements in federal legislation related to Title I (USDOE, 1995) and to students with disabilities. This legislation included specific requirements for calculating adequate yearly progress (AYP) for schools and school districts. Each school district in Mississippi receives an annual ranking based on its students' performance on state tests and demonstrated academic growth (MDE, 2009a).

Mississippi's SATP consists of four end-of-course tests: Algebra I, Biology I, English II, and United States History from 1877 to the Present. Since the 2001-2002 school year, high school students have been required to pass each subject area test as a requirement for graduation (MDE, 2009a). As part of NCLB and Title I requirements, all students enrolled in these courses must be tested. The scores of all of the first-time test takers are included in the annual report card and AYP calculations. The scores are also used to determine the state accreditation rankings of public high schools in Mississippi (MDE, 2009a).

The SATP was developed by an advisory committee of Mississippi subject area teachers and educators under the direction of MDE. The committee used the Mississippi Curriculum Frameworks (state-mandated standards) to determine the content and types of questions to be assessed and the amount of emphasis to be placed on each of the content areas being measured. Advisory committees participated in all parts of the test-development process. Each year a group of professional test-item writers prepares drafts of new questions according to MDE specifications. Committees of Mississippi teachers then review the test items and are allowed the opportunity to make recommendations for changes. Based on their performance on each subject area test, Mississippi public high school students are assigned one of four rankings: minimal, basic, proficient, or advanced. Scores range from 100 to 500 on the U.S. History and Biology I tests and from 600-700 on the Algebra I and English II tests (MDE, 2009b).

The SATP English II assessment has proven to be the most difficult high-stakes test for Mississippi students. During the 2009-2010 school year, only 67% of Mississippi 10th graders passed the SATP English II assessment on their first attempt (MDE, n.d.).

Mississippi Department of Education Accreditation Levels

Significant accountability changes have been mandated over the past 2 decades in Mississippi relative to education. The first was the Education Reform Act of 1982, which has been instrumental in creating the current public school and accreditation model in Mississippi (MDE, 2009a). In 1999, Senate Bill 2156 called for MDE to create a state-of-the-art school evaluation and improvement system. This bill, known as the Student Achievement Improvement Act of 1999, required the creation of the current

performance-based accreditation system that addresses both individual schools and school districts (MDE, 2009a).

According to Senate Bill 2488 of the 2000 Mississippi Legislative Session, MDE must identify schools that do not meet expectations in regards to student achievement. These schools are labeled as “Priority Schools.” Senate Bill 2488 led to the establishment of the Growth and Achievement Model that is currently used in Mississippi. The following criteria are used in individual school rankings:

1. the percentage of students proficient at grade level, and
2. the percentage of students who meet an annual growth expectation in student achievement (MDE, 2009a).

Annually, MDE assigns each individual school a ranking or performance classification based on its student achievement (MDE, 2009a). In addition, each school district is awarded an accreditation status based on compliance with process standards. Mississippi’s school performance classification rankings are as follows:

1. Star—Highest Mississippi school achievement level;
2. High Performing—Second highest Mississippi school achievement level;
3. Successful—Third-ranked Mississippi school achievement level;
4. Academic Watch—Fourth-ranked Mississippi school achievement level;
5. Low Performing—Fifth-ranked Mississippi school achievement level;
may be designated as priority schools;
6. At Risk of Failing—Sixth-ranked Mississippi school achievement level;
failure to meet growth at this level could result in a school being taken over by the state; and

7. Failing—Seventh-ranked Mississippi school achievement level; school is failing to perform and is placed under the conservatorship of the state board of education (MDE, 2009a).

Summary

Educators and education policymakers are constantly trying to find ways to improve student achievement. The literature in this review revealed a continued effort by the educational establishment to explore how teaching, training, and assessment can help students to become successful participants in this global, ever-changing workforce. Having a better understanding of what is effective teaching and the role past and present educational initiatives have played in developing policies to measure student success can benefit all educators. It is also helpful to examine certification processes like NBC to determine whether this process is contributing to the goal of higher student achievement.

Researchers (Hattie et al., 1995; Hay McBer, 2000; Porter & Brophy, 1988; Shulman, 1987) have outlined several traits that are commonly attributed to effective teaching. These traits range from exhibiting a high level of content knowledge, to communicating expectations, to eventually taking responsibility for student performance. Hay McBer (2000) and Wenglinsky (2000) were able to rule out teacher inputs such as age, gender, and experience and instead found majoring in the area of content as a much more significant factor. Some researchers (Ballou & Podgursky, 1997; Ehrenberg & Brewer, 1995) have found a significant relationship between teachers' strong verbal and math skills and higher student performance.

In several studies cited in this review, classroom management was a significant factor in student learning. Wang et al. (1993) evaluated 50 years of research and over

11,000 statistical findings and determined that classroom management was the most influential factor for student learning to take place. Hay McBer (2000) echoed this finding when including classroom climate as one of the three factors they found to be most important in this area. Most telling was in a summary statement of Hay McBer's findings of what students want from a teacher: "They are mostly looking to the teacher to create a sense of security and order in the classroom, an opportunity to participate actively in the class and for it to be an interesting and exciting place" (p. 27).

Using prior student performance as a means for classifying teachers as effective or ineffective has gleaned several interesting findings. Two school districts in Tennessee (Sanders & Rivers, 1996) and the public school district in Dallas (Jordan et al., 1997) allowed researchers to rank teachers by their past student performance and then assess student performance by examining those who had access to predetermined effective teachers or ineffective teachers. Findings included consistently higher scores for students who had access to effective teachers. In one case, a group of third graders in Dallas who were performing at the 55th percentile in math were compared with a similar group of third graders who were performing slightly higher (57th percentile) in math. After 3 consecutive years with an effective teacher, the first group went from the 55th to the 76th percentile. The slightly higher group had an ineffective teacher for 3 consecutive years and went from the 57th to the 27th percentile. The researchers noted that just 1 year with an ineffective teacher made a lasting impact on students.

A review of the major educational movements and reports over the past 25 years gives a clearer picture of how we arrived at the current educational state of increased accountability and its associated high-stakes testing programs. A large amount of data have become available through standardized tests administered to students across

America. A detailed outline of the current Mississippi Accountability Program is provided to show its relationship to NCLB and measurement systems such as the SATP used to chart student progress.

A description of NBPTS's process and procedures follows. This professional opportunity to achieve recognition from a national board has grown tremendously over the past 15 years. In Mississippi, the numbers have risen from just two NBCTs in 1997 to over 2,600 in 2010 (MDE, 2011). The cost of compensating these teachers has increased as the numbers have grown. In Mississippi, the cost has risen from \$6,954 in 1997 to \$22,776,466 in 2010 (MDE, 2011). This growth has caused some educational researchers (Goldhaber et al., 2004; Podgursky, 2001; Stephens, 2004) to question the cost effectiveness of NBC attainment. Goldhaber et al. (2004) go on to state that even though the NBPTS process appears to effectively identify those who are most effective in the classroom, there has to be a more cost efficient way to determine teacher effectiveness.

To gain NBC, teachers embark on an intense 7-month process of analyzing, reflecting, and showcasing their teaching skills through performance-based exam. A set of five core principles is used as the basis to evaluate the teacher's work. The first time passing rate for those seeking NBC is approximately 50% (Goldhaber et al., 2004). A 12-18 month process has been designed over the last 20 years to develop the current 27 areas of certification. As evidence of the educational community's support of NBPTS, two leading accrediting organizations for teacher education programs, NCATE and INTASC, have aligned their standards with NBPTS's (Gordon, 2002).

Several researchers have expressed doubt about the effectiveness and efficiency of the NBC process. Podgursky (2001), a professor of economics at the University of

Missouri-Columbia, led a charge to challenge the expense of the program (over \$300 million in federal support) and the relatively small amount of data showing that NBCTs' students are outperforming non-NBCTs' students. Stephens (2004) conducted research using test scores from South Carolina that supports Podgursky's assertion that NBCTs have not proven to be contributing factors in student achievement and in turn do not warrant the state-funded financial incentives that NBCTs have received.

However, using student test data, three studies compared the test results of students who had NBCTs to those who did not: Cavalluzzo (2004) in Florida; Goldhaber et al. (2004) in North Carolina; and Vandevort et al. (2004) in Arizona. These results indicated a relationship between NBCTs' students and higher test scores. However, each of these studies was partially funded by NBPTS.

The review of this literature provides a look at the research surrounding effective teaching, NBPTS's history, the NBC process, the effects of NBCTs on student achievement, Mississippi's SATP, and MDE's accreditation levels. It also is an effort to establish an assumption that if effective teaching has the potential to impact student performance on standardized tests, and NBCTs are considered effective teachers, then the students of NBCTs should perform better on Mississippi's SATP English II assessment than those instructed by non-NBCTs.

CHAPTER III

METHODOLOGY

The purpose of this study was to examine the SATP English II scores of 10th grade students in Mississippi public school districts to determine if there is a statistically significant difference between the SATP scores of two groups of students (those taught by an NBCT and those taught by a non-NBCT) and to determine if a potential difference can be explained based upon selected teacher demographic data: area of certification, sex, race, highest degree received, years of experience, and NBC status. Student variables were sex, race, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status. This chapter will discuss the limited literature on the effectiveness of NBCTs on student achievement. Few studies have been conducted that were not funded by NBPTS. In addition, Mississippi has very little research on the effects of NBCTs on students' SATP scores.

Research Design

This study employed a causal-comparative research design to determine whether the mean scores of students taught NBCTs and those who were not are statistically different from each other. According to Fraenkel and Wallen (2003), causal-comparative studies identify two groups with “at least one categorical variable (group membership) in which group performances (average scores) are used” (p. 370). The two groups in this study were the students, and the performance was the SATP English II scores of the students taught by NBCTs and the scores of students taught by non-NBCTs.

Teacher characteristics such as years of experience, race, sex, and educational level were coded as categorical data to comply with the requirements for running a hierarchical linear model (HLM). HLM was used to determine the association between teachers' NBC status and students' grades after controlling for the following student variables: gender, race, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status.

HLM is the preferred analysis because the aforementioned variables are measured at different levels. HLM is utilized when statistical data have complex hierarchical or multilevel structures in which individuals are grouped together (Goldstein, 2002). Gender, ethnicity, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status were measured at the student level, and certification and experience were measured at the teacher level. HLM takes into account the fact that there are correlated error terms between students who have the same teacher. For example, "unusually good" teachers positively affect the scores of their students. Given that there is a potential correlation between students with the same teacher, HLM is needed. Moreover, HLM is fairly standard in educational research when analyzing the effects of teacher characteristics on student-level variables, as in this case.

Data were obtained from the MDE. One group of students for this study was taught by NBCTs. The other group of students was taught by non-NBCTs. Students' SATP English II scores and their eighth grade MCT2 Language Arts scores were analyzed along with teachers' credentials and characteristics to determine if significant differences existed between the groups. Mean test scores from the SATP English II were analyzed to explain differences between the two groups.

Selection and Description of the Sample

SATP English II scores of 10th grade students were compiled by MDE's Office of Research and Statistics for the school year 2008-2009 along with the eighth grade MCT2 Language Arts scores for these students. Upon receipt of these data, the researcher chose public school districts in Mississippi that have a minimum of one English II NBCT.

The participants in this study were from 38 of Mississippi's 152 public school districts. The teachers selected for this study included 51 NBCTs and 247 non-NBCTs. Only English NBCTs who taught their students at least 70% of the school year were examined. Non-NBCTs were selected to provide the nearest match to their NBC counterparts. The selection process included first looking for an English II teacher in the same school with similar years of experience and highest degree received of the same gender and race.

Instrumentation

The teacher demographic data included sex, race, highest degree received, years of experience, and NBC status. Student demographic data included sex, race, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status. Previous research (Goldhaber et al., 2004; Stone, 2002) related to student achievement and their teachers' NBC status focused on these main variables as factors that possibly affect student achievement.

The data were collected using scores on the SATP English II assessment, a 66-question test given to all English II students in Mississippi's public high schools. Students must pass this test in order to graduate from a public high school in Mississippi. The test measures four competencies: vocabulary, reading comprehension, writing, and

grammar (MDE, 2011b). This study used the spring 2008-2009 SATP English II assessment as the source of test data.

MDE developed the SATP English II assessment in conjunction with Harcourt Testing and Mississippi English teachers (MDE, 2009a). Teachers from Mississippi school districts reviewed potential test questions and evaluated the questions based on the curriculum objectives outlined in the Mississippi Curriculum Frameworks. Select Mississippi English teachers have met each summer as an item-review committee to evaluate potential questions. SATP English II assessment's have been carefully developed and reviewed by Mississippi teachers and Harcourt consultants to ensure that the test accurately reflects the current English II curriculum. The SATP English II has been utilized for over 10 years and is updated yearly (MDE, 2009a).

In 2005, Mississippi administrators and teachers convened to update Mississippi's English curriculum and to create standards that define the levels of progress that students achieve through the curriculum. The committee determined that four categories are appropriate: minimal, basic, proficient, and advanced (MDE, 2005a). According to MDE, when students have not demonstrated mastery of the skills required in their current grade level, they are expected to receive instructional interventions. Students at the basic level demonstrate partial mastery of the content area knowledge and skills required for success at the next grade. Interventions and remediation may be necessary for these students. Students who perform at the proficient level demonstrate solid academic performance and mastery of the content area knowledge and skills required for success at the next grade. Students who perform at the advanced level have a firm understanding of the skills required for the current grade and consistently perform in a manner beyond that required to be successful at the next grade (MDE, 2005a, 2005b).

Procedures

First, the researcher called MDE's Office of Research and Statistics to determine their level of interest in this study. MDE granted permission to provide students' MCT2 Language Arts scores and SATP English II scores (from the Office of Research and Statistics) as well as teacher demographic data and a link between teacher and student data in the form of Mississippi Student Information System (MSIS) numbers.

To obtain students' SATP English II scores for the 2008-2009 school year and MCT2 Language Arts scores for the 2006-2007 school year, the researcher complied with the Federal Education Rights and Privacy Act (FERPA) regulations. The researcher wrote a letter to the MDE that informed them of the purpose of the study and how the data would be handled as outlined in FERPA regulations. These federal regulations were implemented to protect the identities of children who participate in educational research (see Mississippi State University Institutional Review Board approval in Appendix A). These data were also used for predictive statistical tests.

Once data were obtained from MDE, the researcher selected 38 school districts from across Mississippi to participate in the analysis. This included 298 teachers and 15,446 students. MSIS numbers, which identify students, were utilized to link the selected students to their teachers for each of the years under investigation.

Once the sample of student records were linked to the teachers for the year, data were coded so that all identifiers were removed. Numerical labels were assigned to the teachers and students to maintain confidentiality. Demographic data were also assigned numerical codes so that the data could be analyzed statistically. All of the original data were destroyed so that the data could not be linked to a specific teacher or student.

Data Analysis

Data obtained from MDE's Office of Research and Statistics and MIS Office were compiled and analyzed using SPSS 18.0. The researcher sought to answer the following research questions using the HLM technique:

1. Is there a statistically significant difference between the SATP English II scores of Mississippi students taught by an NBCT and those who are not?
2. If differences in student scores exist, can they be explained by selected teacher and student demographic data?

The following are the independent variables that were used in the model: teacher variables included NBC certification, sex, race, degree type, and experience. Student independent variables included race, sex, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status.

HLM was used to examine the academic achievement of a group of students from a set number of schools where students were matched (such that students from the same schools were similar in their traits). With this type of data, HLM is used because it takes the issue of correlated errors into consideration and provides more realistic and conservative statistical testing. With HLM, standard errors are larger than those using other methods of analysis because HLM considers sources of errors more rigorously than other statistical methods.

The two groups in this study were students who were taught by teachers with two different certification classifications: NBC or non-NBC. The students' performance on the SATP English II exam served as the unit of measurement. Teacher characteristics such as years of experience, race, sex, and educational level were coded as categorical data to comply with the requirements for running a HLM. These characteristics were

used to determine the association between teachers' NBC status and students' grades after controlling for the following student variables: gender, race, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status.

HLM is the preferred analysis because the aforementioned variables are measured at different levels. Gender, ethnicity, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status were measured at the student level, and certification and experience were measured at the teacher level. In addition the students' performance on the eighth grade MCT2 Language Arts assessment was examined as a possible contributor to their performance on the SATP English II exam. Descriptive statistics were computed using frequencies and percentages as well as cross tabulations.

CHAPTER IV

RESULTS AND DISCUSSION

Chapter IV presents the results of the analyses in response to the research questions that addressed the problem of this study. The purpose of this study was to assess the impact of NBCTs on 10th grade students' performance on Mississippi's SATP English II exam. The study sought to determine if there is a statistically significant difference between the SATP English II scores of two groups of students: those taught by NBCTs and those taught by non-NBCTs. Additionally, the study investigated how potential differences in student test scores can be explained based upon selected teacher and student demographic data. Teacher sex, race, highest degree received, years of experience, and NBC status and student sex, race, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status were selected as units of analysis in this study.

Research Questions

This study sought to answer the following research questions:

1. Is there a statistically significant difference between the SATP English II scores of Mississippi students taught by an NBCT and those who are not?
2. If differences in student scores exist, can they be explained by selected teacher and student demographic data?

Data Analysis of Research Questions

HLM was used to examine the academic achievement of a group of students from a set number of schools where students were matched (such that students from the same schools were similar in their traits). With this type of data, HLM is used because it takes the issue of correlated errors into consideration and provides more realistic and conservative statistical testing. With HLM, standard errors are larger than those using other methods of analysis because HLM considers sources of errors more rigorously than other statistical methods.

The two groups in this study were students who were taught by teachers with two different certification classifications: NBC or non-NBC. The students' performance on the SATP English II exam served as the unit of measurement. Teacher characteristics such as years of experience, race, sex, and educational level were coded as categorical data to comply with the requirements for running a HLM. These characteristics were used to determine the association between teachers' NBC status and students' grades after controlling for the following student variables: gender, race, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status.

HLM is the preferred analysis because the aforementioned variables are measured at different levels. Gender, ethnicity, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status were measured at the student level, and certification and experience were measured at the teacher level. In addition the students' performance on the MCT2 Language Arts was examined as a possible contributor to their performance on the SATP English II exam. The tables that follow present the findings from the analyses that were computed.

Table 1 is a presentation of the race of the students examined in this study. As displayed in Table 1, 57.0% of the students were White, and 40.0% were Black. The rest of the student body was Asian and Native American.

Table 1 Students' Race

| | Frequency | Percent |
|-----------------|-----------|---------|
| Asian | 185 | 1.2 |
| Black | 6,186 | 40.0 |
| Hispanic | 253 | 1.6 |
| Native American | 20 | .1 |
| White | 8,803 | 57.0 |
| Total | 15,447 | 99.9 |

Table 2 presents the gender of the students examined in this study. As exhibited in the table, 52.6% of the students were female, and 47.4% were male.

Table 2 Students' Gender

| | Frequency | Percent |
|--------|-----------|---------|
| Female | 8,122 | 52.6 |
| Male | 7,325 | 47.4 |
| Total | 15,447 | 100.0 |

Table 3 is a presentation of the free- or reduced-lunch status of the students examined in this study. As seen in the table, 40.9% of the students had free-lunch status, and 48.9% had paid-lunch status. The other 10.2% of the students had reduced-lunch status.

Table 3 Students' Lunch Status

| | Frequency | Percent |
|---------|-----------|---------|
| Free | 6,309 | 40.9 |
| Reduced | 1,583 | 10.2 |
| Paid | 7,555 | 48.9 |
| Total | 15,447 | 100.0 |

Table 4 is a presentation of the gender of the teachers examined in this study. As reflected in the table, 93.6% of the teachers were female, and 6.4% were male.

Table 4 Teachers' Gender

| | Student Frequency ^a | Percent |
|--------|--------------------------------|---------|
| Female | 14,461 | 93.6 |
| Male | 986 | 6.4 |
| Total | 15,447 | 100.0 |

^aThis column represents the number of students taught by teachers with these demographic characteristics.

Table 5 represents the level of education of the teachers examined in this study. As displayed in the table, 57.8% of the teachers had a bachelor's degree, and 37.2% had a master's degree. The other 0.3% of the teachers had a doctoral degree.

Table 5 Teachers' Level of Education

| | Student Frequency ^a | Percentage |
|-------------------|--------------------------------|------------|
| Bachelor's degree | 8,924 | 57.8 |
| Master's degree | 5,751 | 37.2 |
| Doctoral degree | 50 | .3 |
| Total | 14,725 | 95.3 |
| No Response | 722 | 4.7 |
| Total | 15,447 | 100.0 |

^aThis column represents the number of students taught by teachers with these demographic characteristics.

Table 6 displays the years of experience of the teachers examined in this study. As presented in the table, 30.1% of the teachers had 0-5 years of experience; 24.7% of them had 6-10 years of experience; 17.5% of them had had 11-15 years of experience; and 12.0% of them had 16-20 years of experience. The remaining 15.7% of the teachers had more than 20 years of experience.

Table 6 Teachers' Years of Experience

| | <i>Student Frequency^a</i> | <i>Percentage</i> |
|--------------------------|--------------------------------------|-------------------|
| <i>0-5 Years</i> | <i>4,654</i> | <i>30.1</i> |
| <i>6-10 Years</i> | <i>3,811</i> | <i>24.7</i> |
| <i>11-15 Years</i> | <i>2,706</i> | <i>17.5</i> |
| <i>16-20 Years</i> | <i>1,857</i> | <i>12.0</i> |
| <i>21 Years and Over</i> | <i>2,419</i> | <i>15.7</i> |
| <i>Total</i> | <i>15,447</i> | <i>100.0</i> |

^aThis column represents the number of students taught by teachers with these demographic characteristics.

Table 7 presents the NBC status of the teachers examined in this study. As seen in the table, 17.1% of the teachers had NBC status. The majority of the teachers (82.3%) did not have NBC status.

Table 7 Teachers' Board Certification Status

| | <i>Student Frequency^a</i> | <i>Percent</i> |
|----------|--------------------------------------|----------------|
| NBCT | 2,729 | 17.7 |
| Non-NBCT | 12,718 | 82.3 |
| Total | 15,447 | 100.0 |

^aThis column represents the number of students taught by teachers with these demographic characteristics

Table 8 reflects the MCT2 Language Arts scores of the students examined in this study. As exhibited in the table, 18.8% of the students were performing at the minimal level, and 18.7% of them were performing at the basic level. The largest group of

students (44.6%) performed at the proficient level, and 17.9% performed at the advanced level.

Table 8 MCT2 Category

| | Frequency | Percentage |
|------------|-----------|-----------------|
| Minimal | 2,909 | 18.8 |
| Basic | 2,885 | 18.7 |
| Proficient | 6,884 | 44.6 |
| Advanced | 2,768 | 17.9 |
| Total | 15,446 | 100.0 (rounded) |
| Missing | 1 | .0 (rounded) |
| Total | 15,447 | 100.0 |

Table 9 is a presentation of the overall performance of the students on the two tests that are examined in this study as well as the years of experience of the teachers in this study. As seen in the table, the students' mean SATP English II score was 651.53. The mean MCT2 Language Arts score was 519.70. The mean number of years of teaching experience of the teachers was 11.6.

Table 9 Descriptive Statistics of Participants

| | <i>N</i> | Min. | Max. | Mean | <i>SD</i> |
|--------------------------|----------|------|------|--------|-----------|
| SATP English II Score | 15,447 | 627 | 689 | 651.53 | 8.540 |
| MCT2 Language Arts Score | 15,446 | -1 | 775 | 519.70 | 175.625 |
| Years of Experience | 15,447 | 0 | 39 | 11.60 | 8.791 |

Table 10 is a presentation of the distribution of students to NBCTs and non-NBCTs based on their MCT2 status. As evidenced in the table, a slightly higher percentage of students who scored advanced on their eighth grade MCT2 Language Arts assessment were assigned to NBCTs in 10th grade. As also displayed in the table, 16.6%

of the 2,729 students in the study who were taught by NBCTs scored at the minimal level on the eighth grade MCT2 Language Arts exam compared to 19.3% of the students who were taught by non-NBCTs. Of the students who performed at the basic level, 16.8% were taught by NBCTs, and 19.1% were taught by non-NBCTs. Of the students who performed at the proficient level, 43.6% were taught by NBCTs, and 44.8% were taught by non-NBCTs. Of the students who performed at the advanced level, 22.9% were taught by NBCTs, and 16.8% were taught by non-NBCTs.

Table 10 Crosstabulation—MCT2 Category Board Certification

| MCT2 Category | | Board Certification Status | | |
|---------------|--------------------|----------------------------|----------|--------|
| | | NBCT | Non-NBCT | Total |
| Minimal | Student Count | 454 | 2,455 | 2,909 |
| | Student Percentage | 16.6% | 19.3% | 18.8% |
| Basic | Student Count | 458 | 2,427 | 2,885 |
| | Student Percentage | 16.8% | 19.1% | 18.7% |
| Proficient | Student Count | 1,191 | 5,693 | 6,884 |
| | Student Percentage | 43.6% | 44.8% | 44.6% |
| Advanced | Student Count | 626 | 2,142 | 2,768 |
| | Student Percentage | 22.9% | 16.8% | 17.9% |
| Total | | 2,729 | 12,717 | 15,446 |
| | | 100.0% | 100.0% | 100.0% |

The remaining tables present the results of the HLM analysis that were computed to respond to the research questions. Table 11 is a presentation of the Case Processing Summary. The Case Processing Summary shows that the cases were not all balanced among the categories of the categorical variables, and, as a result, 723 cases were

excluded. The excluded students were students who did not take the eighth grade MCT2 Language Arts exam. Many of these students were transfers from private schools, home schools, or out-of-state.

Table 11 Case Processing Summary

| | | Label | Count | Marginal Percentage |
|---------------------|------|----------|--------|---------------------|
| Board Certification | 1.00 | NBCT | 2,693 | 18.3% |
| | 2.00 | Non-NBCT | 12,031 | 81.7% |
| Valid | | | 14,724 | 100.0% |
| Excluded | | | 723 | |
| Total | | | 15,447 | |

The first research question asked: “Is there a statistically significant difference between the SATP English II scores of Mississippi students taught by an NBCT and those who are not?” Table 12 presents the mean scores of students on the SATP English II exam. The table data show that students taught by NBCTs had higher SATP English II scores than students taught by non-NBCTs. The mean SATP English II scores for students taught by NBCTs was 652.56 compared to 651.31 for those taught by non-NBCTs.

Table 12 SATP English II Scores by Teacher Certification

| | <i>M</i> | <i>SD</i> | Minimum | Maximum |
|----------|----------|-----------|---------|---------|
| NBCT | 652.56 | 9.109 | 627 | 689 |
| Non-NBCT | 651.31 | 8.396 | 627 | 689 |

The second research question asked: “If differences in student scores exist, can they be explained by selected teacher and student demographic data?” The HLM analysis that was computed to address these research questions produced Type III Tests of Fixed Effects (see Table 13).

Table 13 Type III Tests of Fixed Effects

| Source | Numerator <i>df</i> | Denominator <i>df</i> | <i>F</i> | Sig. |
|--|---------------------|-----------------------|-------------|------|
| Intercept | 1 | 307.877 | 1043901.146 | .000 |
| Certification | 1 | 14711.981 | 11.928 | .001 |
| <i>s</i> Race | 1 | 33.038 | 422.728 | .000 |
| <i>s</i> Gender | 1 | 569.642 | 49.102 | .000 |
| LunchStatus | 1 | 230.061 | 126.720 | .000 |
| Trace | 1 | 1320.579 | 5.761 | .017 |
| <i>t</i> Gender | 1 | 6260.054 | 1.711 | .191 |
| DegreeType | 1 | 749.370 | 4.612 | .032 |
| Teacher experience | 1 | 191.446 | 3.008 | .084 |
| MCT2 group | 1 | 385.070 | 4690.386 | .000 |
| Certification * <i>s</i> Race * <i>s</i> Gender * LunchStatus * <i>t</i> Race * <i>t</i> Gender * Degree Type * teacher experience * MCT2group | 2 | 5.530 | .124 | .885 |

Note. Dependent variable is SATP English II Score.

The goal of this analysis was to discover whether teacher certification status is an important predictor of academic achievement as measured by the SATP English II exam. To do so, the variable teacher certification was used as a fixed effect for this analysis. The possible sampling variation was adjusted to account for different teacher and student characteristics. Teacher race, teacher gender, years of experience, and level of education were used as covariates, along with student race, student gender, student lunch status, and students’ score categories on the MCT2 Language Arts exam. These variables served to

adjust for possible differences, which provide additional flexibility in modeling data. The model also examined the combined effect of teacher certification, teacher gender, teacher race, and years of experience, along with students' race, students' gender, and students' lunch status.

In the Type III Tests of Fixed Effects (see Table 13), it is shown that teacher certification does have an impact on student performance ($p < .05$). With the parameter estimates of student race, student gender, lunch status, teacher race, degree type, and student scores on the MCT2 Language Arts, the effect is also significant in the model at the .05 level. This means that teachers' NBC status and student race, student gender, lunch status, teacher race, teacher degree type, and student scores on the MCT2 Language Arts exam are potentially important predictors of the dependent variable, academic achievement as measured by the SATP English II exam. The combined effect of teacher certification, teacher gender, teacher race, and years of experience along with student race, student gender, lunch status, and MCT2 Language Arts scores on the SATP English II exam is not significant ($p > .05$).

In Table 13, the results of the Fixed Effects Tests indicate that the intercept ($p = .000$) and variables teacher certification ($p = .000$), student race ($p = .000$), student gender ($p = .000$), and student lunch status ($p = .000$), teacher race ($p = .017$), degree type ($p = .032$), and MCT2 Language Arts scores ($p = .000$) appear to be the main contributors to the students' SATP English II scores. In addition, teacher gender ($p = .191$), teacher experience ($p = .084$), and the interaction ($p = .885$) between teacher certification, student race, student gender, student lunch status, teacher race, teacher gender, teacher degree type, teacher experience and students' MCT2 scores did not contribute to the SATP English II scores. Even though teacher certification was shown to have an independent

impact on SATP English II scores of students, the impact was reduced when combined with the other variables.

Table 14 shows the parameter estimates for the Fixed Effects specified in the model. The table displays estimates of individual parameters as well as their standard errors and confidence intervals. Data from Table 14 support the information provided in Table 13, but add some additional details about the effects of the predictor variables. The categorical predictor certification = 1 has a coefficient of .643777, which means that the mean SATP English II score of students taught by NBCTs is .643777 higher than the mean SATP English II score of students taught by non-NBCTs. The variable “Teachers without National Board Certification” (certification = 2) was automatically coded as the reference category. It is evident that the mean test scores of students taught by NBCTs is higher than the mean scores of students taught by non-NBCTs, providing evidence that students who are taught by NBCTs perform better than students who are taught by non-NBCTs on the SATP English II exam. However, no statistically significant difference was found among the following combined effects on student performance on the SATP English II exam: teachers’ NBC status, teachers’ gender, teachers’ race, and teachers’ years of experience along with students’ race, students’ gender, students’ lunch status, and students’ MCT2 Language Arts scores.

Table 14 Estimates of Fixed Effects

| Parameter | Estimate | SE | df | t | Sig. | 95% Confidence Interval | |
|--|----------------|-------------|-------------|-------------|-------------|-------------------------|-------------|
| | Lower Bound | Upper Bound | Lower Bound | Upper Bound | Lower Bound | Lower Bound | Upper Bound |
| Intercept | 634.420711 | .609516 | 291.990 | 1040.860 | .000 | 633.221109 | 635.620313 |
| [certification=1.00] | .643777 | .186404 | 14711.981 | 3.454 | .001 | .278403 | 1.009151 |
| [certification=2.00] | 0 ^a | 0 | . | . | . | . | . |
| sRace | 1.066733 | .051883 | 33.038 | 20.560 | .000 | .961181 | 1.172286 |
| sGender | -.859643 | .122679 | 569.642 | -7.007 | .000 | -1.100602 | -.618685 |
| Lunch Status | 1.123327 | .099789 | 230.061 | 11.257 | .000 | .926709 | 1.319945 |
| tRace | .405218 | .168822 | 1320.579 | 2.400 | .017 | .074029 | .736408 |
| tGender | .306162 | .234031 | 6260.054 | 1.308 | .191 | -.152620 | .764944 |
| Degree Type | -.278500 | .129683 | 749.370 | -2.148 | .032 | -.533086 | -.023914 |
| Teacher Experience | -.090511 | .052184 | 191.446 | -1.734 | .084 | -.193440 | .012418 |
| MCT2 Group | 4.472567 | .065306 | 385.070 | 68.486 | .000 | 4.344166 | 4.600968 |
| [certification=1.00] * sRace * sGender * LunchStatus * tRace * tGender * Degree Type * Teacher Experience * MCT2group | -.000145 | .000697 | 4.614 | -.208 | .844 | -.001982 | .001692 |
| [certification=2.00] * sRace * sGender * LunchStatus * tRace * tGender * Degree Type * Teacher Experience * MCT2 Group | 3.98582E-005 | .000670 | 4.154 | .059 | .955 | -.001794 | .001874 |

Note. Dependent variable is SATP Eng II Score.

^aThis parameter is set to zero because it is redundant.

Discussion of the Results

This analysis provided evidence that students who were taught by NBCTs scored higher on the SATP English II assessment than students who were taught by non-NBCTs. The results of Goldhaber et al.'s (2004) study indicated that NBCTs are more effective than non-NBCTs, based upon student achievement. Specifically, students who were taught by NBCTs received higher overall scores on state standardized test. During this

high-stakes testing era, there is a push to leave no child behind. The results of this study are consistent with previous studies (Bond, et al., 2000; Holland, 2006; Vandervoort, et al., 2004).

The analyses also provided evidence that students' scores on the MCT2 Language Arts assessment could be used as a predictor of their performance on the SATP English II assessment. It is important to note that a slightly higher number of students who performed at the advanced level on the MCT2 Language Arts exam were assigned to NBCTs of English II (see Table 10). In addition, the analyses indicated that the following variables are potentially important predictors of the dependent variable, academic achievement, as measured by the SATP English II assessment: teachers' NBC status, race, and degree type and students' race, gender, eighth grade MCT2 Language Arts scores, and lunch status. However, no statistically significant difference was found among the following combined effects and student performance on the SATP English II assessment: teachers' NBC status certification, teachers' gender, teachers' race, and teachers' years of experience along with students' race, students' gender, students' lunch status and students' MCT2 Language Arts scores.

The literature does not reflect an abundance of research on education in Mississippi relating to the subject of this study. Only two studies in Mississippi have investigated the relationship between NBCTs and student achievement, both of which focused on data from the elementary grades. Prior to this study, there were no studies on the effects of NBCTs on student achievement at the secondary level in Mississippi. This study included 38 school districts from across the state of Mississippi. The scores of 298 teachers and 15,447 students were analyzed. Teacher race and previous student test scores were independent variables in this study, which differentiates it from most

previous studies. This research did confirm that many factors can have an impact on student achievement. There was definitely a need to study the effect of NBCTs on students in Mississippi at the secondary level. This study was therefore structured to conduct a comparison of SATP English II scores of the students of NBCTs and non-NBCTs in Mississippi's public high schools.

Without a doubt, NCLB and the Mississippi Public School Accountability System have made demands on Mississippi schools and forced school leaders to review practices and the entire academic climate in an attempt to provide improved services to students and to influence student academic performance. The effectiveness of public schools and teachers has become the focus of the drive to create successful schools. The students' academic achievement and factors contributing to such achievement have become an area of concern in Mississippi as school leaders struggle to understand what was wrong with schools and how they could be improved. The question that has been asked is "Does effective teaching really impact student achievement?" The answer to this question would assist school districts in their attempts to institute positive and productive education reform.

CHAPTER V
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

In summary, students taught by NBCTs were more likely to have higher SATP English II scores than students taught by non-NBCTs. The analysis of the second research question (If differences in student scores exist, can they be explained by selected teacher and student demographic data?) revealed that when combined, teacher race, gender, highest degree received, and years of experience along with student race, gender, eighth grade MCT2 Language Arts scores, and lunch status produced no statistically significant difference between the SATP English II scores of students who were taught by NBCTs and those taught by non-NBCTs.

Educational reform is seemingly always on the minds of educators, researchers, and policymakers in the United States. Researchers are continually trying to locate variables that result in student achievement. NBC is a voluntary certification system that claims to identify highly accomplished teachers. Some research has validated that claim, but there is still concern whether NBC has increased student achievement. Standardized tests are the most consistent method to measure student achievement, though they remain controversial.

The purpose of this study was to assess the impact of NBCTs on student performance on Mississippi's SATP English II exam of students in 10th grade in Mississippi school districts. This study sought to determine if there was a statistically

significant difference between the SATP scores of two groups of students: those taught by NBCTs and those taught by non-NBCTs. The study also investigated how potential differences in student test scores can be explained by the presence of selected teacher and student demographic data. The following teacher demographic data were selected as the units of analysis in this study: sex, race, highest degree received, years of experience, and NBC status. The student data were race, sex, eighth grade MCT2 Language Arts scores, and free- or reduced-lunch status.

The research questions developed for this study were the following:

1. Is there a statistically significant difference between the SATP English II scores of Mississippi students taught by an NBCT and those who are not?
2. If differences in student scores exist, can they be explained by selected teacher and student demographic data?

Students taught by NBCTs were more likely to have higher SATP English II scores than those students taught by non-NBCTs. It was concluded from the analysis of the second research question that when combined, teacher race, gender, highest degree received, and years of experience along with student race, gender, eighth grade MCT2 Language Arts scores, and lunch status produced no statistically significant difference between the SATP English II scores of students who were taught by NBCTs and those taught by non-NBCTs. As a result, NBC does make a difference in student achievement; however, when combined with these other variables, the effect is not statistically significant. The study also provided evidence that the students' scores on the MCT2 Language Arts exam could be used as a predictor of their performance on the SATP English II assessment.

Without a doubt, NCLB and the Mississippi Public School Accountability System have made demands on Mississippi schools and forced school leaders to review practices and the entire academic climate in an attempt to provide improved services to students and to influence student academic performance. The effectiveness of public schools and teachers has become the focus of the drive to create successful schools. The students' academic achievement and factors contributing to such achievement have become an area of concern in Mississippi as school leaders struggle to understand what was wrong with schools and how they could be improved. The question that has been asked is "Does effective teaching really impact student achievement?" The answer to this question would assist school districts in their attempts to institute positive and productive education reform.

Conclusions

This study sought to determine the effects of NBC on student achievement in Mississippi high schools so that school districts can improve services and provide the support that students need to meet and exceed academic standards. One of these qualities relates to the identification of highly qualified teachers. Since the NBPTS provides a nationally recognized certification that designates a teacher as extremely competent (NBPTS, 2004), additional training that would ensure that teachers received this additional certification seems to be a logical step in the preparation of teachers. As reported by several educational researchers, a high-quality teacher, in comparison to a low quality teacher, can provide a full year's difference in the learning of a class of children (Ferguson, 1998; Goldhaber, 2002; Hanushek et al., 1998). The results of this

study have demonstrated that students taught by NBCTs have higher scores on the SATP English II exam than those taught by non-NBCTs.

The difference in student academic performance, as shown in this study, is consistent with reports put forth by Goldhaber and Brewer (1998, 2000). This study supports Haycock's (1998) theory that the teacher is the most important factor in ensuring academic success. The results demonstrate that students who were taught by NBCTs scored higher on the SATP English II assessment, though a slightly higher number of students who performed at the advanced level on the MCT2 Language Arts exam were assigned to English II NBCTs. As schools strive to meet the demands of NCLB and the Mississippi Accountability System, effective teaching has become synonymous with student achievement.

The results of this study showed that students of NBCTs are outperforming students of non-NBCTs. These findings are starkly in contrast with the reports by Stephens (2004) who conducted research from exam in South Carolina and supported earlier claims that NBC was not a contributing factor in increasing student achievement. One reason proposed for the better academic performance of students taught by an NBCT is that those teachers become trained in five core propositions that encompass many of the components of effective teaching. Teachers who complete the NBC process would develop the skills to successfully guide students through the academic process. These NBCTs can be considered effective teachers.

Recommendations

The biggest challenge for educators is to provide teachers with a system for continuous improvement of instruction, supervision, and instructional leadership

(Campbell, 1991; Kentucky Department of Education, 2011; Darling-Hammond & Baratz-Snowden, 2007). It is well known that some factors are uncontrollable by the school districts. However, if they are going to be held accountable for student academic performance, school leaders need to control the factors over which they have significant impact. From this outcome, it appears that school districts should look beyond mere credentials, such as graduation from a particular school of education, additional coursework in education, or even a higher level of education as an assurance that the faculty members have the capability to effectively educate students and guide them successfully through their academic agenda.

As Elmore suggested, the most important means of increasing learning and performance is to increase the knowledge and skill of teachers (Kentucky Department of Education, 2011). Teachers should, therefore, be encouraged to pursue NBC. Teachers who undergo this rigorous certification process are considered experts in their curricula and methodology (NBPTS, 2004). Because student achievement is the most important outcome in education today, having a better understanding of what effective teaching is and the role that additional certification and training could play in assuring student success can benefit all educators.

A similar study can be developed to examine differences in student academic performances in different subject areas to determine how the certification of the teachers impacts the rate of student success. MDE could conduct research related to students taught by NBCTs for 2 or more years to determine the impact that those teachers have on student achievement. NBCTs could also be tracked as they approach their 10-year renewal to determine their effectiveness at that stage. Finally, research could be conducted to determine the effectiveness of NBCTs over time as measured by student

achievement test scores. Replication of this research could be used to determine regional differences in academic performances based on geographical location throughout the state.

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APPENDIX A
INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

December 8, 2011

Raymond Morgigno
4 Oak Glenn
Pearl, MS 39208

RE: IRB Study #11-337: The Effects of National Board Certification on Student Achievement in Mississippi

Dear Mr. Morgigno:

This email serves as official documentation that the above referenced project was reviewed and approved via administrative review on 12/8/2011 in accordance with 45 CFR 46.101(b)(4). Continuing review is not necessary for this project. However, any modification to the project must be reviewed and approved by the IRB prior to implementation. Any failure to adhere to the approved protocol could result in suspension or termination of your project. The IRB reserves the right, at anytime during the project period, to observe you and the additional researchers on this project.

Please note that the MSU IRB is in the process of seeking accreditation for our human subjects protection program. As a result of these efforts, you will likely not see many changes in the IRB's policies and procedures in the coming months. These changes will be posted online at <http://www.orc.msstate.edu/human/aahrpp.php>.

Please refer to your IRB number (#11-337) when contacting our office regarding this application.

Thank you for your cooperation and good luck to you in conducting this research project. If you have questions or concerns, please contact me at nmorse@research.msstate.edu or call [662-325-3994](tel:662-325-3994).

Sincerely,

Nicole Morse
Assistant Compliance Administrator

cc: Linda Coats (Advisor)