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MISSISSIPPI TEACHERS WHO ARE NATIONALLY BOARD CERTIFIED OR THOSE
WITH ADVANCED DEGREES: EFFECTS ON STUDENT ACHIEVEMENT

A Dissertation
presented in partial fulfillment of requirements
for the degree of Doctor of Philosophy
in the Department of Leadership and Counselor Education
The University of Mississippi

by

Amy Tate Barnett

May 2020

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ABSTRACT

The purpose of this research study was to determine the interaction effects national board certified teachers (NBCTs) and teachers with advanced degrees (ADs); while considering school accountability levels, had on student achievement. This study examined whether significant differences existed in student achievement between the eight identified groups of teachers and how the factors of NBCT status, AD status, and accountability contributed. The study examined student achievement in grades three through eight on the end-of-the-year state assessments for the 2017-18 school year. This research endeavor relied upon the recruitment of local Mississippi school districts and their willingness to participate and share teacher and student data sets. Fourteen research questions and hypotheses were tested with two three-way ANOVAs; one for ELA scores on the MAAP (hypotheses and research questions one through seven) and one for mathematic scores on the MAAP (hypotheses and research questions eight through 14). Each three-way ANOVA tested seven hypotheses; which included three main effects and four interactions. The analyses sought statistically significant differences in NBCTs and non-NBCTs, teachers with ADs and those without ADs, the interactions of these teacher groups in high-performing and low-performing districts. There are three overall conclusions drawn from this research endeavor. First, NBCT status alone did not prove to be a significant factor in higher student academic achievement in ELA or mathematics on the MAAP for Mississippi students. As with NBCT status, and the second conclusion of this study, students taught by teachers with advanced degrees had significantly lower scores in ELA and mathematics on the MAAP than those taught by teachers without advanced degrees.

The third conclusion of this body of research revealed, while the status of teachers holding NBCT certification or an advanced degree as isolated factors did not prove significant for student achievement, a combination of the two did. Students achieved higher and statistically significant overall achievement in both ELA and mathematics.

Keywords: NBCTs, ADs, high-performing districts, low-performing districts

DEDICATION

This work is dedicated to my supportive and loving family. Their continuous acts of support throughout this process are too numerous to mention, but have never gone unnoticed, nor have ever been underappreciated. Precious friends have also offered unconditional love and encouragement throughout this process. The completion of this work is also dedicated to my chair, Dr. Dennis Bunch. I am living proof he possesses the virtue of patience. I am better for him requiring me to do the work, extending time and grace when I needed it, yet never allowing me settle for anything less than completion. I further express my sincerest appreciation to my committee for investing their time and devotion for my sake; Dr. Douglas Davis, Dr. Tom Burnham, and Dr. Hunter Taylor.

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CHAPTER I

INTRODUCTION

Politics and religion are two topics usually guaranteed to elicit intense emotion and unsolicited solutions. The responses to these issues can be so passionate they are avoided altogether or even considered taboo. Two topics engulfing current K-12 education in Mississippi guaranteed to ensue as emotional a response as politics or religion and certainly as longstanding are the matters of low academic achievement and funding for public education. The Nation's Report Card (NAEP, 2017) revealed Mississippi fourth and eighth graders scored in the lowest two percent of the nation in reading falling behind an average of 11 points below the level of proficiency. Performance in math fared only slightly better resulting in students falling in the lowest 9% of the nation with a deficit of about nine points below proficiency. The report further revealed no significant difference in lessening the performance gap in more than 20 years in either subject area. Results spanning 23 years with a minimum of 11 continuous data points over this period of time suggests fourth grade students, performing on average of 11% below the nation, and eighth grade students falling 16 points below the nation in math and approximately 10 points below in reading.

While academic underachievement is evident spanning several decades, so is state appropriated spending for public education students in Mississippi. The United States Census Bureau (2012) categorized the state of Mississippi as spending the least per pupil across the nation in 2012. Mississippi expended \$8,164 per student compared to the national average of \$10,608. Not only does Mississippi lag behind the nation in funding commitments for students,

but the intention to fund its own legislation has also become a long-standing source of enmity between political parties in the state.

The Mississippi Adequate Education Program (MAEP), introduced in 1997 by the state legislature proposed a formula, promising to ensure equitable distribution of resources for all Mississippi public schools regardless of the socioeconomic status of their community (Parent's Campaign, n.d.a). According to Leonard and Box (2010), the Mississippi legislature has fully funded MAEP only three years (2004, 2008, and 2009) since its creation nearly 20 years ago. To thicken the plot, in the fall of 2014, 21 local school districts collectively entered a lawsuit against the state of Mississippi led by former governor, Ronnie Musgrove (Clarksdale Municipal School District, et.al v. State of Mississippi, 2015). The plaintiffs pursued monetary damages totaling more than \$240 million. The school districts felt the state had an obligation to provide them with the shortfall due to habitual underfunding. In July 2015, Hinds County Chancery Judge William Singletary ruled against Musgrove and his constituents deciding not only did the legislature not have to pay the requested funds, but further determined the legislators were not obligated to future promises of upholding the requirements of MAEP (Pettus, 2015). Musgrove's commitment to the cause rallied on, resulting in an appeal to the Mississippi Supreme Court (Clarksdale Municipal School District, et.al v. State of Mississippi, 2017). On October 19, 2017, Justice Leslie King revealed the court's unanimous decision to uphold the verdict of the lower court freeing the state of any obligation to refund the school districts or to future commitments in funding (Gates, 2017).

Another attempt to force legislators' hands in fully funding public education in 2015 was led by the Parent's Campaign, a parent-led organization describing themselves as public-school advocates, was known to Mississippi voters as Initiative 42. Dreher (2015) declared the demise

of the proposal came when the legislature countered with an alternative to the initiative known as Initiative 42A, which gave voters two options with similar and confusing wording on the November 3, 2015 ballot during Mississippi's general election. Regardless the intentions of either group, Initiative 42 failed to gain enough voter support to pass leaving Mississippi public schools, as in years' past, at the mercy of elected officials to fund public education.

The debate and struggle over funding Mississippi public schools remains evident and continues as Mississippi legislators recently voted (during the January 2018 legislative session) to scrap the MAEP legislation altogether and worked to rewrite a formula the state will use to fund public education. Dreher (2018) reveals the Mississippi Uniform Per Student Funding Formula (UPS) will provide fewer funds to local school districts than did MAEP. The new formula provides a base of \$4,800 per student. Projections of budget cuts in accordance to UPS indicate an almost 30% reduction as previous estimates of per pupil expenditures in Mississippi were \$8,130 in 2015 (Brown, 2015). The loss of funding for Mississippi's 477,633 students (Mississippi Department of Education, 2018b) equates to more than 1.5 billion dollars from public schools across the state. Bracey Harris (2018), political reporter for the Clarion Ledger, further explains an additional per pupil allowance of 1,440 dollars for each high school student, with extra allocations for students with special needs including special education students and economically disadvantaged students. These gains and losses would fail to become reality for Mississippi's public schools as legislators voted on March 1, 2018 to kill the landmark overhaul of Mississippi's funding legislation for its public schools.

Failure to meet the financial requirement of MAEP by the state legislature and expending (less per pupil than neighboring states) may suggest a lack of support for public education from the Mississippi Legislature. However, the statute of Mississippi Code of 1972 Annotated § 37-

19-7 reveals governing legislation which may suggest otherwise. The contents of this law mandate a base teacher pay scale where monetary provision for those with a master's degree (AA certification) is approximately seven percent (2,390 dollars) more than their peers with equal years of experience with undergraduate degrees (A certification). The step increase from a master's degree to a specialist's degree (AAA certification) earns approximately three and a quarter percent (1,164 dollars) above the initial seven percent increase, with a doctoral degree (AAAA certification) increasing yet another three and a quarter percent (an additional 1,164 dollars). This law contains an allocation for an annual \$6,000 pay increase for teachers who have successfully completed certification qualifying them as a Nationally-Board Certified Teacher (NBCT). Additionally, educators having achieved NBCT status serving in one of 13 identified counties (Adams, Amite, Bolivar, Claiborne, Coahoma, Issaquena, Jefferson, Leflore, Quitman, Sharkey, Sunflower, Washington, and Wilkinson) in Mississippi are eligible to receive further compensation of 4,000 dollars per year above the initial 6,000-dollar stipend.

These monetary incentives clearly suggest value is placed on the type of degrees and advanced certifications teachers receive, at least in where the Mississippi Legislature is willing to put their money. As resources prove to be scarce in providing Mississippi students with the best chances of success (or improvement at the very least) careful consideration should be given to where those dollars are being committed. This quantitative study seeks to satisfy the central question of: Does NBCT certification or advanced degrees held by teachers considering the accountability level of the school yield differences in relation to student achievement?

This chapter illustrates the urgent need of investing scarce resources into the practices and programs, yielding positive outcomes regarding academic achievement for Mississippi students, specifically focusing on teacher training. A statement of purpose and significance of

the study will further develop the need and timeliness of this research project. Assumptions and limitations of the proposed study will be addressed. The chapter will conclude by identifying research questions and hypotheses as well as definitions.

Purpose of the Study

Mississippi students ranking at or near the bottom in academic achievement compared to the nation has become a generational challenge. The National Center for Educational Statistics (n.d.) reports academic performance below the national proficiency average for fourth and eighth grade students in reading, mathematics, science, and writing over past decades. Some gains exist in overall proficiency, yet Mississippi lags behind the nation as evidenced in Table 1 with the same dismal trends continuing over a thirty-year span.

Table 1

Proficiency Percentage of Academic Performance of Mississippi Students on National Assessment of Educational Progress (NAEP) Assessment

<u>Year</u>	<u>Grade Level</u>	<u>Subject Area</u>	<u>National Percentage</u>	<u>Mississippi Percentage</u>	<u>Difference from National Average</u>
1992	4	Reading	27%	14%	-13
2017	4	Reading	35%	27%	-8
1998	8	Reading	31%	19%	-12
2017	8	Reading	35%	25%	-10
1992	4	Mathematics	17%	6%	-11
2017	4	Mathematics	40%	31%	-9
1992	8	Mathematics	20%	6%	-14
2017	8	Mathematics	33%	22%	-11
2002	4	Writing	27%	13%	-14
1998	8	Writing	24%	11%	-13
2007	8	Writing	31%	15%	-16
2009	4	Science	32%	17%	-15
2009	8	Science	29%	15%	-14
2015	8	Science	33%	20%	-13

Table 1. Proficiency percentage of academic performance of Mississippi students on National Assessment of Educational Progress (NAEP) assessment. Information summarized from: National Center for Educational Statistics. (n.d.). *Summary of NAEP results for Mississippi*. Retrieved from <http://nces.ed.gov/nationsreportcard/states/>

Despite decades of opportunity to correct underperformance, a reasonable examiner of the data might conclude Mississippi is indifferent to the chronic condition of low academic standing; however, Mississippi faces other challenges which are monumental in themselves; issues such as the poverty index and incarceration rates significantly contribute to a continuous cycle of underachievement.

Data from the 2010 United States Census Bureau reported Mississippi as having the highest poverty rate among all age groups in the nation resulting in the highest number of children living in poverty in the nation (U.S. Mint, 2010). Coincidentally the median average household income in 2013 was the lowest in the nation at \$37,963 (Noss, 2014). Approximately 75% of all Mississippi students graduate from high school. While this does not fall within the lowest ranges in the nation, it does land amongst the bottom 25% (Governing Data, n.d.). Additionally, Mississippi maintains one of the highest unemployment rates in the nation consistently landing in the lowest quartile (Bureau of Labor Statistics, 2014). Considering these staggering facts one can conclude low student achievement is not a case of apathy but a problem of complexity with no quick fixes or turnaround. Mississippi educators attempting to solve the issue of low academic performance without considering the substantial impact these factors have on the children who comprise our public-school system are producing futile efforts.

The consistent underachievement of Mississippi students in comparison to other students across the nation has prompted a blame game. Mississippi supporters of public education blame legislators for not wanting to contribute monetarily to enhance the quality of education for students (Parent's Campaign, n.d.b). The Mississippi Department of Education's (MDE) response to ensure effective classroom teachers in recent years was the creation and implementation of a complex, teacher evaluation system called the Mississippi Statewide

Teacher Appraisal Rubric (M-STAR) where educators were evaluated based on five domains inclusive of 20 standards (Mississippi Department of Education, 2014.). The evaluation system has evolved into a program known as the Professional Growth System, which aspires to enhance student achievement by providing administrators and teachers with continuous feedback for improvement (Professional Growth System, 2017). This system simplified the M-STAR evaluation into the current Teacher Growth Rubric (TGR) examining teacher performance on nine standards categorized into four domains.

The process of implementing a uniform and stringent teacher evaluation process as cited in the original M-STAR process manual (2014) was based on the following premise; “Research demonstrates that teachers are the most significant school-level influence on student performance. Therefore, obtaining valid and reliable data on educator effectiveness is critical to ensure that every child has access to the best education” (p. 3). The Mississippi legislature has also responded to low academic performance with money for increased teacher salaries to retain quality teachers in the profession as well as offer incentives for high-performing teachers and schools (Amy, 2014a).

Rather than placing blame, Mississippi educators and legislators alike have an urgent and collective responsibility to work together for the future of the state should there be a chance of breaking the cycle of underachievement. Therefore, an obligation to examine and understand what is and is not yielding positive returns regarding student achievement exists. While the legislature withholds funds to fully fund public school budgets, these elected officials clearly support monetary gains for teachers with advanced degrees (ADs) as well as nationally board certified teachers (NBCTs). The purpose of this study was to determine the interaction effects NBCTs and teachers with ADs; while considering school accountability levels, had on student

achievement. This inquiry was satisfied by data sets obtained by the researcher from consenting Mississippi public school districts and examined student achievement in English/language arts (ELA) and mathematics in grades three through eight on the Mississippi Academic Assessment Program (MAAP), end of year state assessment during the 2017-18 school year (SY).

Research Questions and Hypotheses

The researcher recruited participation from public school districts in Mississippi and requested data sets inclusive of student performance results on the MAAP end of year state assessment in the areas of English/language arts (ELA) and mathematics for all assessed grade levels (third through eighth) from the 2017-18 SY. Results from these data sets contributed in multifaceted ways to the accountability model including; proficiency for all students, growth for all students, and growth of the lowest performing sub-group (Drane, 2017).

The following research questions examined if significant interactions occurred when considering student performance by the teacher's NBCT status, AD status, and the school's accountability rating considered either high performing or low performing. The interactions of these variables created eight possible teacher groups for examination. Considering these eight teacher categories in both ELA and mathematics 14 research questions and accompanying null hypotheses emerged.

Research Questions and Hypotheses

ELA

R1: Do students taught by Nationally-Board Certified Teachers (NBCT) have different results in academic performance in ELA on the MAAP than students who were not taught by NBCTs?

H₀₁: There is no significant difference in academic performance in ELA on the MAAP

between students who were taught by NBCTs and students who were not taught by NBCTs.

R2: Do students taught by teachers with advanced degrees have different results in academic performance in ELA on the MAAP than students who were taught by teachers with non-advanced degrees?

H02: There is no significant difference in academic performance in ELA on the MAAP between students who were taught by teachers with advanced degrees and students who were not taught by teachers with advanced degrees.

R3: Do students taught by teachers in high performing school districts have different results in academic performance in ELA on the MAAP than students who were taught by teachers in lower performing schools?

H03: There is no significant difference in academic performance in ELA on the MAAP between students who were taught by teachers in higher performing schools and students who were not taught by teachers in lower performing schools.

R4: Is there a significant interaction between NBCT status and advanced degree status relative to student academic performance in ELA on the MAAP?

H04: There is no significant interaction between NBCT status and advanced degree status relative to student academic performance in ELA on the MAAP.

R5: Is there a significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in ELA on the MAAP?

H05: There is no significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in ELA on the MAAP.

R6: Is there a significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP?

H₀₆: There is no significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP?

R₇: Is there a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP?

H₀₇: There is no significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP.

Mathematics

R₈: Do students taught by Nationally-Board Certified Teachers (NBCT) have different results in academic performance in mathematics on the MAAP than students who were not taught by NBCTs?

H₀₈: There is no significant difference in academic performance in mathematics on the MAAP between students who were taught by NBCTs and students who were not taught by NBCTs.

R₉: Do students taught by teachers with advanced degrees have different results in academic performance in mathematics on the MAAP than students who were taught by teachers with non-advanced degrees?

H₀₉: There is no significant difference in academic performance in mathematics on the MAAP between students who were taught by teachers with advanced degrees and students who were not taught by teachers with advanced degrees.

R₁₀: Do students taught by teachers in high performing school districts have different results in academic performance in ELA on the MAAP than students who were taught by teachers in lower performing schools?

H₀₁₀: There is no significant difference in academic performance in mathematics on the

MAAP between students who were taught by teachers in higher performing schools and students who were not taught by teachers in lower performing schools.

R11: Is there a significant interaction between NBCT status and advanced degree status relative to student academic performance in mathematics on the MAAP?

H₀₁₁: There is no significant interaction between NBCT status and advanced degree status relative to student academic performance in mathematics on the MAAP.

R12: Is there a significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in mathematics on the MAAP?

H₀₁₂: There is no significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in mathematics on the MAAP.

R13: Is there a significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in mathematics on the MAAP?

H₀₁₃: There is no significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in mathematics on the MAAP?

R14: Is there a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in mathematics on the MAAP?

H₀₁₄: There is no significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in mathematics on the MAAP.

Significance of the Problem

Despite decades of low academic achievement trends and years of underfunded

educational budgets, teachers are expected to produce a different outcome for Mississippi students. The last two decades have produced several research studies supporting the notion the teacher plays a critical role in outcomes for students. Wright, Horn, and Sanders (1997) measured teacher influence in 54 school systems in Tennessee and followed student performance from third through fifth grades in math, reading, language, social studies, and science. In addition, the researchers examined several factors thought to possibly influence student performance including; class size, heterogeneity mixture of the classroom, and the school system at large. The study revealed the teacher had the largest effect size than any other examined aspect and was found to be “highly significant in twenty of thirty analyses” (p. 61). The researchers concluded the single most impactful way to enhance education is by working to increase the effectiveness of teachers.

Jordan, Mendro, and Weerasinghe (1997) helped solidify the validity of the conclusions offered by Wright, et al. when they replicated the study in Dallas with fourth through eighth grade students and measured teacher effects on long-term student achievement in mathematics and reading. These researchers concurred teacher effectiveness was strongly related to student performance outcomes. The research suggested students who had teachers falling in the highest efficiency category had a 70% chance of performing in an above-average range, while students who had teachers categorized in the lowest efficiency category had an approximate 66% chance of performing in a below-average range.

These comparable and suggestive studies were cited as evidence to support the requirement for highly qualified teachers mandated by the No Child Left Behind (NCLB) Act of 2001. This national mandate required specialized training for teachers to qualify them to teach a specific grade level and/or subject matter. Individual states were required to determine their own

definitions of highly qualified (United States Department of Education, 2004). Mississippi's interpretation allowed teachers who had completed a bachelor's degree in a teacher education program and passed the PRAXIS II exams in their concentrated area of study to meet the definition of highly qualified. Mississippi guidelines identify teachers as highly qualified who obtain national board certification or a master's degree or higher in an approved teacher education or alternate route program (Mississippi Department of Education, n.d.a).

While the mandates of NCLB are no longer required, the expectation of highly qualified teachers in their related area of service remains a common expectation. The state legislature's willingness to fund larger salaries for teachers with advanced degrees and certifications logically serves as the reason for increased interest in these endorsements. As of February 2019, Mississippi has 4,166 educators who have received NBCT status, ranking sixth in the nation (National Board for Professional Teaching Standards, n.d.; United States Census Bureau, n.d.b). The 6,000-dollar annual stipend for NBCT amounts to more than 24 million dollars. According to the Mississippi Department of Education (J. Christopher, personal communication, January 7, 2015) the number of teachers in the state is approximately 36,757 with more than half of all educators at 50.195% possessing an advanced degree. The yearly compensation increases as outlined in Mississippi Code § 37-19-7 (2018), granted exceeds \$40 million to those qualifying educators. The combined compensations equal an annual funding commitment of more than \$64 million for a state struggling to agree on and then fully fund its own educational legislation. This study examined if teachers with advanced degrees or NBCTs yield different outcomes regarding student achievement for Mississippi students considering the accountability level of the school.

Assumptions

Data sets from the 2017-18 SY were requested from Mississippi public school districts.

The reports contained results of student performance on the administration of the MAAP in Reading/language arts (ELA) and mathematics for third through eighth graders. There is an assumption the data files received from participating districts were complete and free of error. Considering the administration of the assessments occurred statewide, the researcher assumes the examinations were administered while meeting guidelines and expectations set forth by the state and were given in similar, standardized fashion. Utilizing the MAAP instruments to measure student achievement the researcher was not involved in the development, administration, or determination of validity or reliability.

Two three-way ANOVAs were used to examine interaction effects of NBCTs and teachers with ADs while considering the accountability level of the district to determine effects on student achievement in ELA and then in mathematics in grades three through eight. Laerd Statistics (n.d.) revealed three assumptions associated with a three-way ANOVA. The first being the dependent variable remains continuous. This proved true as student achievement scale scores obtained on the 2017-18 SY MAAP served as the dependent variable throughout the examination process. The second assumption was met with three independent variables which were dichotomous in nature each having two categorical groups. The independent variables and their categories are as follows;

- NBCT status – certified or non-certified,
- AD status – obtained an advanced degree or not,
- and accountability rating of school – higher performing or lower performing.

The final assumption of the three-way ANOVA was met as evidenced by an independence of observations with each of the above factors only fitting criteria for one category or another.

Limitations of the Study

The researcher was reliant upon data sets provided by cooperating districts. The extent of the inquiry and the population and sample sizes were limited to the number of districts who agreed to participate as well as the completeness and accuracy of the data sets provided to the researcher. The information available to the researcher regarding the degree or certification type achieved by teachers was crucial as the researcher attempted to draw conclusions.

Summary

This chapter has established the practice of Mississippi legislators to underfund public education while continuing their willingness to fund (or mandate local districts fund) stipends for both advanced degrees and national board certification for teachers without adequate research to support this approach. The purpose of this study was to determine the interaction effects NBCTs and teachers with ADs; while considering school accountability levels, had on student achievement for Mississippi students. This study is timely and relevant considering the willingness of local school districts frustrated to the point of filing suit against the Mississippi government due to underfunding.

Chapter II consisted of a comprehensive review of the literature as it directly relates to the complex challenges facing Mississippi public schools as introduced in this chapter. The researcher will delve further into student achievement and the implications linked with teachers who have obtained NBCT status and those who hold advanced degrees. Chapter III outlined the methods and procedures the researcher used to satisfy the inquires of this quantitative study. The researcher identified or discussed in detail the following; research design, research questions and hypotheses, participants, instruments, statistical tests, and finally data collection and analysis. Chapter IV revealed the specifics of the data analyses using the statistical test of two three-way ANOVAs and the results of testing the hypotheses of this study. This dissertation concluded

with Chapter V drawing final conclusions about the study, discussing implications, and making recommendations for future research related to the topic.

Definition of Terms

The following terms will be used throughout this study. The definitions and explanations provided are intended to assist the reader in clarifying the goals of the study.

Higher Performing School District – This refers to the accountability rating of each participating Mississippi Public School District. For purposes of this study high performing districts are those with an accountability rating of an A, B, or high C according to the Mississippi Department of Education.

Lower Performing School District – This refers to the accountability rating of each participating Mississippi Public School District. For purposes of this study high performing districts are those with an accountability rating of a low C, D, or F according to the Mississippi Department of Education.

Mississippi Adequate Education Program (MAEP) – Legislation, which began in 1997 in Mississippi providing a formula, which governs the funding of public schools in the state (Parent’s Campaign, n.d.b). The formula was based on a per pupil expenditure (equal statewide) which outlined in the mandate was required to adequately educate a student regardless of the economy of their local community. The legislation has been fully funded only twice since its onset (Mississippi Association of Educators, n.d.a).

Nationally Board-Certified Teacher (NBCT), or Nationally Board Certified (NBC) – An “advanced teaching credential that goes beyond state licensure” which is inclusive of a laborious process hinged on national standards (National Education Association, n.d.).

Poverty – State of deprivation or need. The United States Census Bureau determines income

thresholds and labels families as impoverished when their total income is less than the determined family threshold (United States Census Bureau, n.d.a).

Mississippi Statewide Teacher Appraisal Rubric (M-STAR) – Mandated statewide teacher evaluation system intended to improve the skill level of all educators in the state. The system hinges on identified standards important in measuring progress, determining teacher effectiveness, and identifying growth areas. The goal of the process intends to enhance a teacher’s effectiveness over the course of their career (MDE n.d.c).

No Child Left Behind (NCLB) Act of 2001 – United States legislation passed in 2001 which declared all subgroups of students would be proficient by the year 2014. The law mandated each state develop assessment systems whereby student progress was measured, and annual growth goals were established (No Child Left Behind, 2001).

Degree/certification type – For the purposes of this study degree or certification types are categorized into the following:

- Nationally Board-Certified Teachers (requirements met and certification granted based on the Professional Teaching Standards), which will be compared to non-board certified teachers,
- advanced degrees [master’s (AA certification), specialist (AAA certification), doctorate (AAAA certification)], which will be compared to undergraduate degrees [bachelor’s (A certification)].

Mississippi Academic Assessment Program (MAAP) – Current (2018), annual, statewide assessment system for Mississippi students which measures academic achievement in “Students are assessed in grades 3 through 8 in ELA and mathematics, grades 5 and 8 science, Algebra I, Biology I, English II, and U.S. History” (MAAP, 2018).

CHAPTER II

LITERATURE REVIEW

The purpose of Chapter II provides an overview of related and relevant research as it pertains to student achievement and the implications linked with those who have obtained National Board Certification Teacher (NBCT) status and those who hold advanced degrees. This review of the literature begins by establishing the teacher as the most important and influential factor in the classroom, identifying distinguishing factors contributing positively or negatively to student achievement. I then narrowed the focus and examined the body of literature, which pertains to NBCT certification and how teachers who have obtained NBCT status contribute to student achievement. Likewise, the final portion of this chapter explores how teachers with advanced degrees (master's degree or higher) impact achievement levels for students.

The Teacher Matters

The effectiveness of teachers and their attributes have been examined abundantly and in a variety of ways over the past few decades. Hattie (2003) argued in a research project with the University of Auckland in New Zealand there are several factors contributing to the variance in student achievement. The student themselves comprise 50 percent of the equation, with teachers contributing the next highest effect of 30 percent, more so than home, the school as a whole (including administration), or peer effects combined. Therefore, Hattie's argument for continued research in this area suggested, "We should focus on the greatest source of variance that can make the difference – the teacher. We need to ensure that this greatest influence is optimized to have powerful and sensationally positive effects on the learner" (p. 3). A decade and a half later,

we are wise to heed Hattie's example. Shifting and strenuous requirements in curricula with the onset of College and Career Readiness Standards (CCRS) in recent years, various changes in state-wide accountability assessments in Mississippi (three different assessments in a three-year span: SY 2013-14, MCT2; SY 2014-15, PARRC; and SY 2015-16, MAP) combined with ever-mounting pressures and expectations of high student performance warrant re-examination and close consideration of factors contributing or not contributing to the success of our students.

Considerations of these characteristics are of interest to many Mississippi taxpayers and public education stakeholders as legislators have only fully funded public education budgets twice in the past 20 years, one of which was rescinded in the middle of the school year (Harris, 2018). A more recent and controversial attempt to overhaul state funding formulas, commonly known as EdBuild, introduced during the spring 2018 legislative session died in the Senate, leaving Mississippi public schools again at the mercy of the governing body as to the amount of funding public schools would actually receive (Amy, 2018). While funding has been a topic of controversy for decades in Mississippi public schools, the legislature unwaveringly upholds substantial monetary stipends for teachers holding advanced degrees and/or those having obtained NBCT status. These stipulations commit more than 64 million dollars annually as outlined in The Constitution of the State of Mississippi by the statute of Mississippi Code of 1972 Annotated § 37-19-7. This commitment of funding to these special populations of teachers fosters an obligation to ensure these advanced certifications are proving positive gains for our students academically and do not just provide monetary gains for the qualifying teachers. A responsible assessment of these monetary commitments would cause us to examine which certifications, advanced degrees or NBCT status, are contributing to the academic gains for Mississippi public school students.

Value-added research (Di Carlo, 2011) is a statistical technique which examines how teacher characteristics contribute to student academic gains or growth. Student achievement can be measured or predicted based on effects of the teacher. Research conclusions published in the late 1990's by researchers Wright, Horn, and Sanders were cited by then Secretary of Education, Rod Paige (2002) in his Desktop Reference, as significant findings to support the national educational reform, The No Child Left Behind Act (NCLB). This legislation was introduced by the George W. Bush presidential administration and signed into law in 2002. The statute was in response to fear America was no longer globally competitive as evidenced by student performance on academic assessments. In short, the legislation mandated classrooms be taught by highly-qualified teachers, ensured student assessment systems were in place in each state to measure academic performance, and required schools to meet annual growth goals or face the likelihood of being taken over by state officials should they fall short for consecutive years. The most daunting task for public schools was the declaration of NCLB wherein all students would be proficient by SY 2013-14. This educational decree remained intact for nearly a decade and a half until Congress recently passed the Every Student Succeeds Act (ESSA) in December 2015, in an attempt to shift control of k-12 education back to more state control rather than federal control (Klein, 2015).

Researchers Wright, Horn, and Sanders (1997) tapped into Tennessee's student assessment gains from the Tennessee Comprehensive Assessment Program (TCAP) through the Tennessee Value-Added Assessment System (TVAAS). This comprehensive, student achievement database was inclusive of district, school, teacher, and student data. The TVAAS was created and compiled for purposes of examining factors, which contribute positively to student achievement. The researchers completed 30 analyses examining student achievement

and the effects of a students' teacher, student grouping, class-sizes, and performance levels. Student progress was tracked from 1994 to 1995 in third through fifth grade students in reading, mathematics, language, social studies, and science. The study included 54 school districts and more than 310,000 student score results (considering the various subject areas). The two most revealing factors suggestive of positive student gains were teacher effects and the achievement level of the student. Teacher effects were found to be, "highly significant in every analysis" and having "a larger effect size than any other factor in twenty of the thirty analyses" (p. 61). Students' levels of achievement proved significant in twenty-six of the thirty analyses with the largest effect sizes in ten of thirty analyses. The heterogeneous or homogeneous grouping of students and class-size proved to be irrelevant factors contributing to positive student gains. The researchers vigorously conclude, "That the most important factor affecting student learning is the teacher" (p. 63).

The importance of teacher impact was further examined by Sanders and Rivers (1996) utilizing the TVAAS. This investigation included third through fifth grade students comparing two metropolitan school districts/systems in Tennessee in the area of mathematics. The researchers concluded not only is the most important factor in student achievement the teacher, but more specifically the effectiveness of the teacher. They suggested the residual effects of an ineffective teacher are evidenced in the student's academic performance two years after having a less effective teacher. The sequence of teachers a student encounters from year to year and the teacher's level of effectiveness or ineffectiveness has significant implications on the student's future performance. Highly effective teachers produced desirable academic gains for students resulting in an average of 50 percentile points more than others with lowest-performing students benefiting the most. The researchers ultimately suggest school administrators should carefully

consider the longitudinal placement of students and examine the ebb and flow of teacher effectiveness levels to which students are exposed. Furthermore, Wright et.al contend students who are placed with ineffective teachers for two consecutive years places them at a disadvantage and optimally recommend students be placed with an effective teacher the prior and following year after encountering an ineffective teacher to minimize damages.

Nearly a decade later researchers Stronge, Ward, and Grant (2011) agree with Wright, Horn, and Sanders as they draw one major conclusion from their multifaceted study on classroom routines and practices of effective teachers by declaring, “The common denominator in school improvement and student success *is* the teacher” (p. 351). The investigation of 307 fifth grade teachers analyzed the effect on growth gains on more than 4,600 students and examined how instructional practices and behaviors differ between effective and less effective teachers in correlation to those gains. The purpose of the study was not simply to identify effective versus less effective teachers, but to further examine and connect teaching practices with their respective levels of efficiency. More specifically, they concluded students taught by a less effective teacher in reading and mathematics resulted in an end of the year assessment score of more than 30 percentile points less than their peers taught by more effective teachers. They further concluded differences found among these teacher groups “in the areas of classroom management and personal qualities but not in the areas of instruction or assessment” (p. 348).

The second portion of Stronge et. al’s work observed occurrences within the classroom setting regarding the management of students’ disruptive behavior, which were indicative of teachers’ effectiveness. Least effective teachers experienced a disruption to the learning process three times more often than classrooms with more effective teachers. Two areas in classroom control proved to be significant; the management of a classroom by way of “establishing

routines, monitoring student behavior and using time effectively and efficiently” (p. 348) and classroom organization (readiness and availability of supplies needed to complete tasks to students, maximizing classroom space and functionality). Personal teacher traits identified as contributing to positive outcomes for students were fairness, respect, and those evidenced to have positive relationships with students.

The aforementioned research suggests teacher attributes contribute to their effectiveness level as a classroom teacher, which impacts students’ academic progress. Researchers Clotfelter, Ladd, and Vigdor (2007) contribute to these conclusions by coupling teacher characteristics with credentials and examining the relationship on student achievement. This nine-year (1994 – 2004), longitudinal study scrutinized student level performance data of third, fourth, and fifth grade students in reading and mathematics in North Carolina. The researchers are robust in declaring there is, “clear evidence that teachers with more experience are more effective in raising student achievement than those with less experience” (p. 675). They further conclude gains are evident in reading and mathematics, but with stronger gains in mathematics evident by a difference of 0.092 standard deviations in level of performance and 0.119 standard deviations in growth.

Any measure taken by educators with the intention of improving student achievement works declares researcher Hattie (2009). His meta-analysis which synthesized more than 800 studies on what contributes to student improvement discusses effect size of teacher traits and characteristics suggesting practices which yield greater gains for students (Hattie, 2009). In one cluster of inquiry, the researcher considered ten teacher categories and revealed their contribution to student achievement by way of effect size. Effect size is a calculated measure of the magnitude of an occurrence between two groups (Hinkle, Wiersma, & Jurs, 2003). The

researcher determined a 0.1 effect size (difference in standard deviation of the means) to be a low effect, while 0.4 was considered a medium effect, and 0.7 was determined to yield high gains. The categories are detailed in Table 2 and are ordered in relevance from highest effect to least effect studied.

Table 2

Summary of Contributions from the Teacher

Teacher Attribute	Number of Studies	Effect Size	Rank of Significance
Microteaching	402	0.88	1
Teacher Clarity	na	0.75	2
Teacher-student Relationships	229	0.72	3
Professional Development	537	0.62	4
Not Labeling Students	79	0.61	5
Quality of Teaching	141	0.44	6
Expectations	674	0.43	7
Teacher Effects	18	0.32	8
Teacher Training	53	0.11	9
Content Knowledge	92	0.09	10

Table 2. Summary of contributions from teacher. Adapted from “Table 7.1 Summary information from the meta-analyses on the contributions from the teacher,” by John Hattie, 2009, *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*, p. 109. Copyright 2009 by John A. C. Hattie.

Considering seven of the ten categories examined by Hattie resulted in medium to large effects one could conclude and agree with previously mentioned researchers – the teacher matters.

National Board Certification and Student Achievement

The website for National Board for Professional Teaching Standards (NBPTS, n.d.d) states and claims the following:

More than a decade of research from across the country confirms that students taught by National Board Certified Teachers (NBCTs) learn more than students taught by other teachers. Estimates of the increase in learning are on the order of an additional one to two months of instruction and the positive impact is even

greater for high-need students.

The site accompanies this statement by referencing and offering a brief summary (a couple of sentences) of five research projects measuring NBCT effectiveness in Mississippi, Illinois, Kentucky, California, and Georgia. This initial portion of the related review of literature examined the research suggested by NBPTS. The next section will examine studies not offered by NBPTS in an attempt to compare and contrast the claims attributed to NBPTS.

Studies referenced by National Board for Professional Teaching Standards.

The website for National Board for Professional Teaching Standards explains, “National Board Certification is a voluntary, advanced, professional certification for PreK-12 educators that identifies teaching expertise through a performance-based, peer-reviewed assessment” (National Board, n.d.a). Board certification is available in 25 certificate areas. Mississippi ranks seventh in the nation with the number of NBCTs (National Board, n.d.b). Just over four percent of teachers nationally are NBCT compared to 12.93 percent of Mississippi teachers, ranking fourth in the nation. Twenty-six states offer no annual compensation for having achieved NBCT status. Rather these states offer advanced endorsements and renewal connected to state licensure. Mississippi is one of four states offering the highest stipends available across the nation totaling more than 10,000 dollars annually for those in high poverty or high needs areas (National Board, n.d.c). Yet, despite the general claim from the National Board website, “study after study has proven that the students of Board-certified teachers learn more - and the impact is greater for low-income students” (National Board, n.d.d), Mississippi students still lag behind while having four times the national average of NBCTs and offering one of the highest annual compensations.

Mississippi, Arkansas, Hawaii, and Washington state offer the highest monetary compensations for NBCTs in the nation, yet student performance proves inconsistent regardless

of the healthy monetary rewards for NBCT status. Mississippi offers \$6,000 annually for certification with an additional 4,000 dollars to teachers working in specified counties. Arkansas and Hawaii offer a \$5,000 increase, while Washington state offers \$5,000 for certified teachers with an additional \$5,000 for those working in challenging schools (National Conference of State Legislatures, 2011). While the monetary compensations are comparable for these states, student achievement varies. According to The Nation's Report Card (2017) Mississippi students ranked in the bottom 15% in the country in fourth grade reading in 2017, the bottom 23% in fourth grade mathematics, the bottom 6% in eighth grade reading, and the bottom 10% in eighth grade mathematics. Arkansas ranked in the bottom 19% in the same four categories. Hawaii fared better than Mississippi or Arkansas, but still fell below the national average, ranking in the bottom 23% in fourth grade reading, bottom 38% in fourth grade mathematics, bottom 23% in eighth grade reading, and bottom 27% in eighth grade mathematics. In stark contrast, Washington state, offering slightly more than \$10,000 annually as an incentive for NBCTs working in high need areas, but the same \$5,000 base increase for all NBCT, performed substantially better than Mississippi, Arkansas, or Hawaii students. Their fourth grade students ranked in the top 41% of the nation and fourth grade mathematics students ranked in the top 27%. Eighth grade students experienced even more impressive gains ranking in the top 13% in reading and mathematics.

These stark differences in student performance with comparable stipends for NBCT status argues the need for a closer examination of student achievement especially in a state such as Mississippi where stipends are as much as any other state nationally while outcomes remain underperforming on national measures in all categories. The National Strategic Planning and Analysis Research Center (2017), an interdisciplinary unit of Mississippi State University

examined “the association between early-grade Mississippi public school students receiving reading instruction from a National Board Certified Teacher and their performance on standardized literacy assessments” (p. 1). The study considered performance of more than 67,000 kindergarten and third grade students on literacy proficiency from the 2015-16 SY. Literacy outcomes were measured for kindergarten students using the Mississippi K-3 Assessment Support System (MKAS2) which assessed students with a pre and posttest within the same school year on four literacy domains. Proficiency percentages and growth from the pre-test to the post-test for the 2015-16 SY were considered. The study concluded kindergartners taught by a NBCT scored an average of 5.1 percentage points higher at the proficient level compared to peers taught by non-NBCTs. Likewise, students taught by NBCTs were 1.8 percentage points more likely to have showed growth from the pretest to the posttest. Third grade students were assessed using an end of year measure, the Mississippi Assessment Program (MAP), in English Language Arts. Considering the assessment provides no pretest score, researchers focused on proficiency percentages rather than growth. Gains for grade three students appeared to be even greater than the kindergarten group when taught by a NBCT which resulted in 10.7 percentage points more likely to have obtained proficiency on the MAP.

The researchers further investigated the relationship of performance of students taught by a NBCT in reading when they considered multiple variables. These regressions revealed significant increases in assessment proficiency and growth especially for “students who were white, female, not chronically absent, not retained in school, yielded a higher pre-test score level, or attend school that achieved an ‘A’ accountability grade” (p. 9). Kindergarteners had a 30.7 percent higher chance of achieving proficiency and 18.6 percent greater chance of achieving growth. Similarly, third grade students had 10.7 percent greater odds of scoring proficient.

While the gains of this study appear to be large, one must consider the confines of the controlled groups, detailed in Table 3.

Table 3

Summary of Descriptive Statistics: Kindergarten Students and Grade 3 Students

<u>Control Variable</u>	<u>Grade</u>	<u>NBCT</u>	<u>Non-NBCT</u>
White	K	54.67%	43.18%
Female	K	47.71%	48.29%
Not Chronically Absent	K	88.31%	86.76%
Not Retained in School	K	89.95%	90.31%
Higher Pre-Test Score Level	K	5.18%	5.28%
Attend A-Rated School	K	29.14%	14.80%
White	3	58.37%	41.17%
Female	3	49.19%	48.94%
Not Chronically Absent	3	92.93%	92.41%
Not Retained in School	3	95.50%	94.33%
Attend A-Rated School	3	20.97%	13.06%

Table 3. Summary of descriptive statistics: Kindergarten students and grade 3 students. Adapted from “Table A1: Descriptive Statistics: Kindergarten Students” and “Table A2: Descriptive Statistics: Third Grade Students,” by National Strategic Planning & Analysis Research Center, 2017, *The Impact of National Board Certified Teachers on the Literacy Outcomes of Mississippi Kindergarteners and Third Graders*, p. 15-16.

Washington state ranks second, just above Mississippi, in the nation with 18.74 percent of its teachers having obtained NBCT status (National Board, n.d.e). The state also offers one of the highest monetary rewards in the nation with a 5,000-dollar annual stipend with an additional 5,000 dollars annually to those working in challenging schools as determined by the state (National Conference of State Legislatures, 2011). Considering Washington’s high percentage of NBCT and the hefty monetary rewards, researchers Cowan and Goldhaber (2015) studied NBCT effectiveness in mathematics and reading in third through eighth grade students over a seven-year period (2006-2013) across the state. They ultimately concluded, “NBCTs produce annual learning gains that are about 4-5% of normal learning gains at the elementary school level, about 15% of annual learning gains in middle school mathematics, and about 4% of annual

learning gains in middle school reading” (p. 3). The study compared student gains among teachers with similar experience levels and further examined which certification type (as many specialty areas are available through NBPTS) of those NBCTs when compared with non-certified teachers proved most effective. The certification type of Early Adolescence: Mathematics proved to be the most robust in middle school results with those teachers outperforming their peers by 0.065 standard deviations. Middle school reading teachers certified in Early Adolescence: English Language Arts were determined to be more effective by 0.013 standard deviations than their non-certified peers.

The researchers delved further and explored the correlation of NBCTs who failed the certification assessment initially, those who gained certification after the initial attempt (eventually became certified), versus those who were non-NBCTs. During the certification process, candidates are given multiple attempts to be successful and are allowed to bank areas of achievement on the portfolio sections and/or assessment. Candidates are then only required to resubmit portfolio entries or retake portions of the assessment where they were unsuccessful. Cowan and colleagues argue the design of the process makes becoming certified easier as opposed to candidates having to submit an entirely new product (portfolio) deemed satisfactory by NPBTS, as well as retake the assessment and qualify with a high enough score in all categories in a single attempt.

NBCTs who were unsuccessful on their initial attempt and actually certified on an additional attempt or those who are non-certified, were found to held no statistically significant difference between groups, nor were they able to determine whether one group was any more effective than the other. They did find, however, those who passed certification on their first attempt to be marginally more effective than those who earned certification after an initial

attempt. The differences were not statistically significant as the hypothesis was rejected at the .10 alpha level. Middle school mathematics, however, indicated those teachers who were NBCT, regardless of achieving certification initially or in a subsequent attempt, proved more effective by 0.04 standard deviations than teachers not certified. This increase, however, proved to be statistically insignificant with a p value of 0.20. The researchers ultimately conclude NBCTs are more effective than teachers who are not when they have similar years of experience. They suggest, “NBCTs produce additional learning gains of about 1-2 weeks at the elementary school level and for middle school reading and about five weeks for middle school mathematics” (p. 12).

The Strategic Data Project (SDP, 2012a), housed at the Center for Education Policy Research at Harvard University, echoes the conclusions of the aforementioned researchers. SDP partnered with the Los Angeles Unified School District (LAUSD) in California to examine factors of teachers’ effectiveness in mathematics for students in grades three through eight over a seven-year period (2004 to 2011). They concluded NBCTs produced greater student achievement gains compared to their peers with comparable experience levels, “by 0.07 and 0.03 standard deviations in elementary mathematics and English/language arts (ELA) respectively, which is roughly equivalent to two months of additional mathematics instruction and one month of additional ELA instruction” (p.3). The learning gains equivalency was calculated by the researchers on the assumption an effect size of 0.20 generally equated to six months of additional learning based on nationally normed standardized tests. The researchers averaged academic gains from six nationally normed standardized tests across grades three through eight and determined estimates. The authors acknowledged while the California Standards Tests utilized in the study are not nationally normed, the estimates were used as, “a rough approximation to

translate effect sizes into a months of learning measure” (p. 4).

While these research gains are some of the highest found in this review of related literature, it is important to note the National Conference of State Legislatures (2011) revealed California has one of the lowest percentages of NBCTs at 1.6 percent. Subsequently, the state offers a 5,000-dollar increase in yearly compensation for those serving in a low-performing school for four years. The four-year monetary increase in salary is the maximum number of years the monetary benefit is available for qualifying teachers only. With this consideration, researchers of the SDP (2012a) project revealed the population of NBCTs was small across the district, with more representation in high performing schools. One could conclude such robust gains as previously mentioned occurred within the confines of a small population in schools who are naturally predisposed to excel academically. At the time of the project, LAUSD had just less than 1,000 NBCTs representing roughly four percent of the district’s teacher population. The California Department of Education calculated Academic Performance Indexes (API) for public schools based on several measures of school performance and growth. The study revealed more than one and a half times more NBCTs working in schools with an API score above 800 (the highest level) than those working in schools with a score of 650 or below (the lowest level).

In the same year, SDP (2012.b) collaborated with the Gwinnett County Public School District in Georgia to examine many of the same teacher effectiveness factors. The multi-faceted study included teachers in grades two through eight over five years (2005 – 2010). The researchers concluded teacher certification routes proved to have no statistical significance in gains for students, while NBCTs when compared with teachers with like years of experience did. Teachers who were NBCT had a positive teacher effect size (value-added measure which estimates teacher’s impact) of 0.026 ($p < .05$) in reading and an additional positive effect size of

0.072 ($p < .001$) in mathematics, which is statistically significant.

Studies not referenced by National Board for Professional Teaching Standards. The aforementioned studies were referenced directly from the website for NBPTS and those included suggest more learning gains for students with NBCTs in comparison to non-certified teachers. However, not all studies support those conclusions. One study paired 27 NBCTs with 27 non-certified teachers in eastern North Carolina and compared achievement scores of students in kindergarten through eighth grade. Rouse (2008) determined there was no significant difference in students obtaining proficiency on end of the grade tests in mathematics or reading between the two teacher groups.

In other findings, Stronge, Ward, Tucker, Hindman, McColsky, and Howard (2007) also focused on teacher participants in North Carolina. The state leads the nation with 16.4 percent of its teachers having obtained NBCT status. This is five and a half times the national average of three percent. Monetary reward is offered by the state for qualifying teachers with a generous 12 percent salary increase for the life of their certificate (National Conference of State Legislators, 2011). The first portion of the Stronge et al. study examined the relationship between student achievement including 307 fifth grade teachers across three districts within the state. While mean values on end of the year state assessments (gain residuals) were slightly higher for NBCTs, there was no statistical significance proven between NBCTs and non-NBCTs. The study was extended with a qualitative portion with the purpose of determining whether NBCTs were measurably different in selected classroom practices. The sample included 53 teachers from four districts and categorized teacher practices into three categories; pre-instructional and dispositional (planning, providing cognitively challenging assignments, clarity for assignment grading criteria), in class variables (questioning, disruptions, disengagement, classroom

management), and classroom teacher effectiveness. Participating teachers were interviewed, submitted artifacts for review, and were observed in their classroom settings. Stronge et al. utilized the Kruskal-Wallis test to determine if statistically significant differences existed between NBCT groups compared to non-NBCT groups considering 15 teacher characteristics. To the surprise of the researchers, only four of the indicators proved statistically significant; classroom management ($p = .02$), classroom organization ($p = .02$), encouragement of responsibility ($p = 0.3$), and positive relationship ($p = .04$).

A broader view of student performance is provided by researchers Belson and Husted (2015) where they utilized student performance results from the National Assessment of Educational Progress (NAEP) rather than from district or state-level assessments in reading and mathematics. The researchers claim the use of a national assessment diverts attention away from the pressurized testing commonly existing with state exams where teachers and administrators often feel intense pressure for their students to perform at high levels as mandated by state governances. Additionally, the national exam provides some insight and parameters for scholars to make probable generalizations concerning NBCT effectiveness in states where little or no research exists. Results in reading and mathematics proved statistically significant when correlating the percentage of teachers who were board certified to student performance. Reading measures resulted in standard deviation differences of 0.497, which was statistically significant at the .01 level. Mathematics differed by 0.664 standard deviations and again was significant at the .01 level. The researchers revealed the higher percentage of NBCTs administering the NAEP led to a higher state average. The effect of NBCT concentration in schools across a state revealed a negative and significant correlation. The researchers reported these findings as a potential statistical problem and recommended a Pearson correlation, which equated -0.512 at the

.01 level. Ultimately, the researchers suggested distributing board-certified teachers as evenly as possible throughout the state ensuring students benefit optimally from exposure to NBCTs. Belson and Husted further encourage states to avoid concentrated pockets of schools or districts saturated with NBCTs. This “spillover effect (p. 4),” as described by the researchers, creates inequity where areas of the state with higher populations of NBCTs are at an advantage over those districts or schools with no representation.

Another study utilized results from NAEP and selected a group representative of the nation in fourth grade. Participants included students and their teachers who participated in taking/administering the NAEP in reading in the years 2007, 2009, 2011, and 2013. The results of this study conducted by Curry, Reeves, McIntyre, and Capps (2018) conflict with the results of the previously mentioned NAEP study. They found no statistically significant evidence students taught by NBCTs achieved greater reading achievement in fourth grade. Curry, et al. recognized the limitation of the study by only focusing on one grade level and one subject area. An interesting finding of the work was, “Results of this study indicated statistically significant results where students with teachers working toward NBPTS performed significantly lower ($p < .001$) than students with teachers who have earned or have not earned NBPTS status” (p. 16). This revelation has not been referenced in any other study reviewed by the researcher.

Obviously, there are varying assumptions as to whether NBCTs produce greater academic gains for students. Some researchers observe more than performance results in isolation and examine other factors within the classroom environment considered to yield positive gains for students. Holding and Fraser (2013) utilized student perceptions of their classrooms, their attitudes toward the subject matter, and performance to determine the effectiveness of students taught by NBCTs in comparison to non-certified teachers. Twenty-one

eighth and tenth grade science classes taught by NBCTs in South Florida were matched and compared to 17 classes taught by teachers who had not obtained NBCT status. The researchers utilized data from state science examinations and explored student attitudes regarding science concerning seven learning environment factors. The correlations revealed positive and statistically significant relationships ($p < .05$) in the following categories at the individual student level (results between .47 and .28) and at the class level (results between .73 and .49) regarding the following factors; student cohesiveness, teacher support, involvement, investigation, task orientation, cooperation, and equity. Not as many positive or significant correlations were made concerning student achievement, however. Involvement proved significant at .07, investigation at .10, and equity at .11 ($p < .05$).

To this point, this empirical review of the literature has revealed mixed interpretations on whether NBCT status contributes positively to student achievement gains. The research reviewed demonstrates other factors combined with certification status are important in academic gains as well. Interestingly enough, however, one trio of scholars reveal while NBCT status does not always produce statistically significant gains in student achievement, the perception of administrators and their peers would suggest otherwise. Okpala, James, and Hopson (2009) examined perceptions held by school administrators and teachers from three school districts in southeastern North Carolina. North Carolina participants were chosen again as subjects of focus due to the states' high percentage of NBCTs. Themes emerged in teachers' perceptions of certified teachers and revealed 89 percent revered them as reflective professionals, 68.1 percent of teachers believed NBCTs were as effective as other teachers, 65 percent deemed they had effective classroom skills, while 58 percent believe NBCTs have high behavioral expectations for their students. "The public school principals in this study overwhelmingly perceive NB

certified teachers as being highly effective in terms of instructional skills, classroom skills, and personal skills than teachers” (p. 32). An interesting caveat as it pertains to this study is 71 percent of the teachers regarded the process of becoming a NBCT as a means toward higher earnings.

Another study suggested, “In addition to direct student achievement effects, National Board Certified Teachers (NBCTs) may also have indirect effects through their influence on other teachers or on schoolwide policy” (Cannata, McCrory, Sykes, Anagnostopoulos, & Frank, 2010, p. 465). Two hypotheses were considered; whether NBCTs participate in more leadership activities throughout their schools and districts, and whether they had more involvement or influence over school governing policies. Participants included entire elementary teaching staffs in 47 schools in two states (one Southern state, one Midwestern state). The inquiry concluded NBCTs overall, participate in more leadership activities within their schools and districts with 70 percent mentoring other teachers compared to 39 percent of mentors who are not NBCTs. Similarly, 53 percent of NBCTs provide professional development at the school, district, and state level compared to 36 percent of those who are not certified. The researchers claimed NBCTs are more involved in leadership at the school level than the district level at 0.318 and 0.190 respectfully when $p < .05$. One interesting aspect of the study was the measurement of perception by teachers as to how NBCTs contribute to leadership activities in relation to actual contributions by NBCTs. Teacher perceptions captured through surveys revealed NBCTs are perceived to have higher mean influences of examined categories [establishing curriculum, determining content of professional development, evaluating teachers, hiring teachers, setting school-wide discipline policy, allocating resources, assigning students to classes], with the exception of assigning teachers to classes. While perceptions were higher for NBCTs only two

factors proved statistically significant; establishing content curriculum (52.3) and evaluating teachers (28.0; $p < .05$). While the results maintain NBCT perception outweighs statistically proven contributions, Cannata et al. insist positive perceptions and other factors such as participation in leadership activities, having high expectations for students, and mentoring colleagues contribute positively to student achievement and should be considered when measuring impacts of NBCTs.

Student gains from financial incentives. Other researchers turn their investigative lenses to whether financial incentive programs for NBCTs yield increases in student achievement. Nine states (Arkansas, Colorado, Hawaii, Maryland, Mississippi, Utah, Washington, Wisconsin, and West Virginia) provide NBCTs an additional monetary incentive above an existing increase in pay for those working in high-needs schools (National Board, n.d.c). Ironically, these states with the exception of Wisconsin, Colorado, and Utah have healthy representation in the percentage of NBCTs with higher averages than the national average of three percent (National Board, n.d.d). The average total compensation in these states for NBCTs is 6,650 dollars with an average of 3,244 dollars in addition to the base salary increase for their commitment to work in high needs schools (National Board, n.d.c).

In their more recent work, Cowan and Goldhaber (2018), examined if evidence existed between financial incentives for NBCTs in high poverty areas in the state of Washington and achievement. The researchers assess the state's incentive policy known as the Challenging Schools Bonus (CSB) where qualifying teachers receive a 5,000-dollar annual incentive for teaching in schools with high percentages of free or reduced lunch rates. Ultimately, the researchers found positive aspects related to increases in teacher recruitment to the NBCT process, increase in applicants to these challenged schools, and better teacher retention rates.

Despite apparent improvement in teacher staffing, the same positive gains could not be found in student achievement. In fact, a stark correlation of the two factors revealed an increase of 0.7 to 1.6 percentage points of newly certified NBCTs each year for the first six years of the incentive program while there proved to be no statistical evidence of student achievement improving as a result.

NBCT summary. Unfortunately, more specific inquiries seeking to determine if stipends for NBCTs are generating dividends on the investment by way of student performance gains have not been adequately investigated in the state of Mississippi. One can glean from this portion of the review of literature on NBCTs and student performance; states such as Washington and North Carolina have been investigated numerous times and in a variety of ways due to their high percentage of NBCTs and the large monetary incentives offered by the states for these teachers. Mississippi, on the other hand, has rarely been considered (evidence of inclusion found only in one study) despite ranking fourth in the nation with the percentage of NBCTs, which exceeds the national average of 4.2 percent by more than three times (National Board, n.d.b). Another glaring indicator overlooked is the fact Mississippi offers the highest base compensation for achieving NBCT status in the nation at six thousand dollars annually. Mississippi also leads the nation (along with Arkansas, Hawaii, and Washington state) in total compensations of 10 thousand dollars annually after adding an additional four-thousand-dollar stipend for those serving in one of 13 identified counties deemed high needs or high poverty counties (National Board, n.d.c). Table 4 identifies the counties and the number of NBCTs in each county according to the National Board for Professional Teaching Standards directory (n.d.f).

Table 4

Mississippi Counties Offering Additional \$4,000 Stipend for NBCTs

<u>County</u>	<u>School District</u>	<u>Number of NBCTs</u>	<u>Graduation Rate</u>	<u>District Accountability Rating 2018</u>
Adams	Natchez-Adams	14	80.4	D
Amite	Amite County	1	73.3	F
Bolivar	Cleveland	19	82	C
	North Bolivar	1	81.7	F
Claiborne	Claiborne County	3	87.2	D
Coahoma	Clarksdale Municipal	9	74.4	F
	Coahoma County	2	68.6	F
Issaquena	*South Delta	0	82.5	F
Jefferson	Jefferson County	1	86.2	F
Leflore	Greenwood Public	6	72.7	D
	Leflore County	1	75.3	C
Quitman	Quitman County	4	83.7	C
	Quitman	3	76.1	D
Sharkey	*South Delta	0	82.5	F
Sunflower	Sunflower County	3	76.7	F
Washington	Hollandale	0	86.8	C
	Leland	1	80.8	C
	Western Line	3	84.2	C
Wilkinson	Wilkinson County	0	78.5	D

Table 4. Mississippi counties offering additional \$4,000 stipend for NBCTs. Information summarized from: National Board for Professional Teaching Standards. (n.d.f). *NBCT directory search*. Retrieved from <http://www.nbpts.org/nbct-search>. Mississippi Department of Education, 2018a, *2018 Accountability*. Retrieved from <https://www.mdek12.org/OPR/Reporting/Accountability/2018>.

*South Delta School District serves students from Issaquena County and Sharkey County in Mississippi.

While some headway has been made in exploring effectiveness and implications for NBCTs, much more is certainly possible especially for the state of Mississippi.

Advanced Degrees and Student Achievement

Funding for public education in Mississippi has been a topic of debate for decades.

While legislators have failed to fully fund MAEP, the same legislature insists on unwaveringly supporting healthy stipends for teachers with advanced degrees (not only NBCTs) as outlined in

The Constitution of the State of Mississippi by the statute of Mississippi Code of 1972 Annotated § 37-19-7. This decree renders qualifying teachers holding master's degrees are entitled to a seven percent increase in salary, while those advancing to a specialist or doctoral degree earn an additional 3.25 percent for each subsequent degree. According to the Mississippi Department of Education (J. Christopher, personal communication, January 7, 2015) the number of teachers in the state of Mississippi equals 36,757 with more than half of all educators (50.195 percent precisely) holding at least one advanced degree. Salary increases granted to these qualifying educators equates to a 40-million-dollar commitment for our state annually. The final portion of this review of literature will focus on research projects seeking to identify the implications of teachers holding advanced degrees (ADs) on student achievement.

The National Education Association reports more than half of all teachers (56 percent) in the nation hold master's degrees, with 83 percent earning ADs directly related to the field of education. Additionally, the NEA's survey results revealed the major advantage of having an AD is the increase in salary which was an approximate 13,000 dollars more than those with a bachelor's (as cited in Johnston, 2007, p. 1).

The work of Miller and Roza (2012) robustly declared 90 percent of the master's degrees earned by teachers while related to the educational field (not subject matter specific) are ultimately insignificant in ensuring instructional effectiveness for teachers or ensuring academic gains for students. The researchers echo some of the findings from this review of the literature of NBCTs. Earning content-specific ADs, such as in the areas of mathematics or science, yield more academic gains for students (as cited in Goldhaber & Brewer, 1998, and Ladd & Sorensen, 2015). The authors speak of the national surge of teachers obtaining ADs within a four-year period, from 2004 – 2008, spiking by 78 percent, equating to a 14.8-billion-dollar annual

commitment nationally. This source indicates in the year 2007, Mississippi had approximately 15,400 teachers earning a salary increase for a master's degree committing the state to nearly 74 million dollars for the school year.

The researchers blame antiquated teacher salary scales as the most compelling reason for the drastic increase in the number of teachers seeking to acquire higher degrees. Most salary schedules offer incremental step increases for years of experience and ADs, with no other possibilities for a teacher to increase their salary over the entirety of their career outside these two parameters. However, states offering higher compensations for an AD do not always generate high percentages of teachers holding the higher degrees. States with the highest percentages of teachers with ADs, [New York, Connecticut, Kentucky, Massachusetts, and Washington] earned mid-range (in comparison to other states) annual increases between 4,649 dollars and 6,352 dollars, while states offering the highest stipends between 9,161 dollars and 10,077 dollars have some of the lowest percentage of teachers with ADs such as Montana and North Dakota. State-level policies are blamed for the high number of teachers with master's degrees over and beyond the monetary gains. A master's degree is required in eight states (New York, Connecticut, Kentucky, Oregon, Michigan, Maryland, Mississippi, and Montana) in order for teachers to acquire a professional level status with their educator licenses. An additional 16 states mandate salary increases for those with graduate degrees through legislative governances (Miller & Roza, 2012, p. 7-8).

The Strategic Data Project (2012a), introduced in an earlier section of this chapter, partnered with the Los Angeles Unified School District in California to examine factors of teachers' effectiveness in mathematics for students in grades three through eight over a seven-year period (2004 to 2011). The large, urbanized school district studied revealed more than 25

percent of its teachers held master's or doctoral degrees. They concluded teachers in elementary and middle school mathematics and reading with master's degrees over bachelor's degrees did not have higher effects in general on average for elementary classes or middle school reading or mathematics classes.

As previously introduced, in the same year Strategic Data Project (2012b) collaborated with the Gwinnett County Public School District in Georgia to examine many of the same teacher effectiveness factors as the Los Angeles Unified School District study. The multi-faceted study in Georgia included teachers assigned to grades two through eight over five years (2005–2010). Georgia compensates teachers for earning ADs, yet the Gwinnett study's findings mirrored the effects found in the Los Angeles district – teachers with ADs were not proven any more effective in elementary and middle school classrooms.

Another study examined the effects of teacher certifications in the middle grades in a large urban district. Neild, Farley-Ripple, and Byrnes (2009) reveal middle school certification proved to be challenging considering fewer than 20 states required specific certification to qualify to teach at the middle school level. The researchers argued the middle ground of these in-between grade levels are oftentimes difficult to staff and sometimes represent a hodgepodge of teachers, along with teachers who have secondary qualifications and/or teachers who have elementary qualifications only. The study utilized data consisting of student score records on fall to spring benchmarks in mathematics and science in fifth through eighth grades in public schools during the 2002-03 SY. Population samples included 22,853 students and 539 teachers in the math portion, with 21,980 students and 495 teachers in the science analyses. Mathematics gains were evident with the average student gaining 4.5 Normal Curve Equivalent (NCE) from the pretest to the posttest. When examining the gains of students taught by middle, math-certified

teachers, the coefficients were positive suggesting more learning gains for these students, while the effect proved small in magnitude at just over .2 NCEs. Other teacher groups assigned to teach math were considered by the researchers and revealed special education certified teachers underperformed their peers by about two points below the NCE compared to elementary certified teachers, and 1.6 points lower than uncertified teachers.

Science gains proved more robust with the average student improving five NCEs on the fall to spring benchmarks in grades five through eight. Neild et al. (2009) reported substantial differences regarding teachers certified with a science degree and their students learning gains over math. They revealed increases of, “an estimated 3.3 NCEs, for an effect size of about .20. Since the average student in our data set gained about five NCEs during the year, this effect translates into more than half a year’s worth of additional learning” (p. 753). As with math, teachers certified in special education or elementary had smaller gains with a negative effect size of .20 than those taught by secondary certified science teachers. An interesting finding from the study regarding high-needs areas being more difficult to properly staff with highly qualified teachers became evident in school communities with a 90 percent poverty or disadvantaged student rate. In these circumstances, the rate of students being taught in math by a non-qualified (uncertified) teacher increased to 24 percent, which is double the amount found (12 percent) in less disadvantaged schools. The same pattern emerged in science with the amount of students being served by a non-certified increasing by half in the neediest schools (Neild, Farley-Ripple, & Byrnes, 2009).

More evidence to support academic gains in mathematics for secondary students when taught by a teacher with high levels of understanding in mathematics was examined by researchers Shuls and Trivitt (2015). Utilizing a value-added approach, an analysis of eleventh

grade standardized test results in English Language Arts, algebra, and geometry was analyzed when correlated to teacher characteristics. Traditionally, certified teachers were found to score higher on the math portion of the PRAXIS (teacher certification exams) than alternate route certified teachers at a significant level ($p < 0.01$). Higher levels of experience and higher numbers of ADs were common among the traditional certification teachers. Geometry teachers, both traditional and alternate route, scored higher on all areas of the PRAXIS than their peers, and those who were alternately certified outperformed traditional route teachers. The English portion of the analyses determined there were no statistically significant differences found in any of the teacher attributes analyzed. Most of these conclusions add to the body of literature supporting the notion more specialized training in a content area yields larger academic gains for students.

A study by Badgett, Decman, and Carman (2014) echoed similar sentiments as the SDP studies. The researchers investigated the influence of graduate degrees on reading achievement for students. Badgett et al. point out while compensation for additional degrees is customary in many states, ever-increasing demands of student performance and funding constraints are causing states to take a closer look and possibly reconsider. The study included all schools in Texas which served pre-kindergarten through twelfth grade students during the 2008-09 SY and sought to satisfy whether higher levels of teacher education resulted in higher levels of student achievement. Student score reports from the Texas Assessment of Knowledge and Skills Reading test across more than 1,000 school districts were analyzed. The regressions indicated, “The change in reading achievement at the minimum passing level for students of teachers holding master’s and doctoral degrees and the change at the commended level for students of teachers who held doctoral degrees was insignificant” (p. 12), adding to the body of evidence

teachers with ADs are not proving to enhance student achievement.

Another analysis (Guo, Connor, Yang, Roehrig, & Morrison, 2012) explored the literacy skills of 1,043 fifth grade students and the implications of teacher experience, the teacher's belief they can make a difference (self-efficacy), and their qualifications (master's degree level or not and years of experience). The Early Child Care and Youth Development utilized longitudinal data from a parallel study where data was collected from volunteering students' parents from ten cities across the United States. The data sets included descriptive information about the grade five students such as ethnicity, gender, average family income, and mother's educational level. A significant portion of this study relied on qualitative feedback from surveys and trained observers as it measured teacher self-efficacy, and depended on classroom observations to determine teacher effectiveness by subjective measures such as; the warmth of the classroom, time on task, teacher behaviors, and student responses. Teachers' qualifications including years of experience and whether the teacher had a master's degree or not were considered. The descriptive statistics revealed the teacher's self-efficacy was statistically significant, and had direct and indirect impacts on students' literacy skills. Teaching experience indicated a negative relation ($p = -.047$) to the amount of time spent on academics, while the teacher's degree level ($p = -.061$) was not significantly related to teacher support of learning.

Earlier research by Goldhaber and Brewer (1998) utilized the national database of The National Education Longitudinal Study and included 18,609 records of student performance in eighth and tenth grades from public schools in the areas of math, science, English, and history. Results concluded more years in the teaching field did not necessarily yield more positive student outcomes. Teacher certification was found to be statistically insignificant, except in English where the results were significant, but had a negative effect. The researchers further

examined the relationship between teachers with ADs in the content area they are teaching and found no statistical implications. Goldhaber and Brewer recognized, however, content specific training in the areas of mathematics and science had an impact on student achievement outcomes. The mean tenth grade score in science was about 22 with a standard deviation of 7.5. An increase of about 0.7 points were noted when the student was taught by a teacher with bachelor's degree in science. Further evidence is provided in math prediction scores where a tenth grade student's average score was improved by about 1.4 points (about 0.1 of a standard deviation) when taught by a teacher with a bachelor's and master's degree in math versus a teacher whose bachelor's degree is not in mathematics. The researchers recommend school districts only reward pay increases for ADs in the areas proven statistically to increase student performance, and to consider incentivizing teacher training specifically tailored to the subject matter or content directly taught by the teacher.

Researchers Ladd and Sorensen (2015) contribute to the mounting evidence ADs alone do little to contribute to student academic gains. The researchers utilized the rich and extensive database from the North Carolina Education Research Data Center and were able to track student and teacher information longitudinally from 2005 – 2011. The study focused on sixth through eighth grade students on end of the year state assessments in reading comprehension and mathematics as well as high school students' end of the year standardized assessment in English, civics, U.S. history, algebra II, geometry, biology, physical science, and chemistry. Other factors considered and controlled for were extensive and included; student attendance, free and reduced lunch rates, demographic data, English learner status, gifted, discipline, retention, and education status of parents. The massive population sample involved 2.5 million student outcomes for middle and high school students.

As impressive as the number of participants, the availability of data, and the numerous variables considered in this study, the results are less impressive in supporting the fact teachers with ADs contribute positively to student performance. Ladd and Sorensen's (2015) inquiry found no significant effect on reading scores for middle school student (grades 6-8) having been taught by teachers with master's degrees. Mathematics fared only slightly better, but with a weak implication of 0.01 standard deviations ($p < .05$) improvement for those taught by teachers with master's degrees. These small increases disappear when the researchers controlled for student characteristics, and ultimately lead to the conclusion, "Earning a master's degree does not lead to any test score improvements at the middle school level" (p. 15). Similar effects are noted at the high school level with results not differing statistically from zero in English I, U.S. history, civics, or geometry. Algebra II (-0.0688 with $p < .01$) and biology (-0.0308 with $p < .05$) proved no better and actually had negative correlations. The type of degree programs teachers earned master's degrees from, as examined by the researchers, determined teachers who completed their program through for-profit programs decreased student achievement in middle school mathematics by -0.06 standard deviations and in high school science by -0.11 standard deviations.

After this extensive review, one positive attribute of master's degree level teachers was found in relation to student absenteeism for middle school students. Those with master's degree level teachers were two percent less likely to be absent from school than their peers. The researchers acknowledge the importance of student attendance and its contribution to overall success in school. Ladd and Sorensen also recognize the research, which correlates school attendance and a students' likelihood to graduate. Ultimately, the scholars concluded while the data does not support the theory teachers with ADs enhance student achievement, perhaps there

are other investments in students, characteristics, or attributes of teachers with master's degrees contribute to the classroom.

Another study by Croninger, Rice, Rathbu, and Nishio (2005) suggested certain teacher qualifications have positive effects on student achievement, but ultimately reveal a teacher's degree level is not among those qualifications. The researchers examined correlations in reading and mathematics results utilizing a database collected by the Early Childhood Longitudinal Study (ECLS). The relationship between elementary teachers' qualifications and reading achievement for first-grade students was analyzed. Teacher attributes which were found to positively and statistically contribute to reading achievement were teacher experience, explicit instruction or preparation for the content area or subject matter they were teaching, and degrees earned in the area of emphasis the teacher is working within (elementary education). The acquisition of ADs was not determined as a significant factor contributing positively to student performance, and subsequently, the relationship between teachers with ADs and student performance in mathematics was actually negative. Teachers with elementary education degrees and those with at least two years of teaching experience are the best predictors of student achievement in reading. These same parameters did not hold true for mathematics achievement, however. The researchers rationalized these findings by recognizing the amount of time spent on reading instruction in a first-grade classroom is sometimes double the daily amount of time spent on mathematics.

Other findings echoed the implication of content specific ADs producing more student gains than do broader education field related degrees. In their work, Wayne and Youngs (2003), synthesize research studies in four areas, with two of those being teacher degrees and certification. The goal of their research was to accurately interpret the findings from a collection

of studies to better inform policymakers especially in light of numerous states providing financial increases for teachers with ADs. The review of works dealing directly with ADs utilized the results of 12 studies ranging from the mid-1970s to the mid-1990s. Inconsistencies were found concerning student performance increasing when taught by a teacher with AD status. Three of the four-benchmark studies actually revealed negative influences on student achievement, while one study suggested positive gains. While the authors were unable to declare ADs either lead to greater achievement for students or not, the researchers were able to take a bolder stance in the area of math. “Mathematics students whose teachers had master’s degrees in mathematics had higher achievement gains than those whose teachers had either no advanced degrees or advanced degrees in non-mathematics subjects” p. 102. Wayne and Youngs’ overwhelming suggestion to policymakers was ADs only prove significant gains for students when they are content area specific.

Researchers Boyd, Goldhaber, Lankford, and Wyckoff (2007) advocated for policymakers and researchers to work together when creating and enforcing rigid requirements for advanced degrees or certifications for teachers within their own districts. The authors surmised, “Given the enormous investment in teacher preparation and certification and given the possibility that these requirements may worsen student outcomes, the lack of convincing evidence is disturbing” (p. 45). They agreed with other scholars about teacher degree levels alone contributing to improved student performance. Additionally, they suggested many traditional practices such as required teacher field experience (student teaching, or observations) have no impact on student achievement and argued pedagogy in general has not been studied in depth to support the claims content area studies produce desired performance outcomes. Lastly, the authors warned the costs of ill-informed decisions concerning teacher requirements and policies

could be tremendous.

Conversely, the effects of teachers with ADs in fourth grade reading revealed positive implications. The study introduced earlier in the chapter by Curry, Reeves, McIntyre, and Capps (2018) which utilized NAEP results over four reporting periods examined the effects of teachers with ADs on academic achievement. Curry et al. found students outperformed their peers significantly ($p < .01$) when their teacher had earned a master's degree versus a bachelor's degree. One research brief offered by Vandersall, Vruwink, and LaVenita (2015) resonated the same positive results as Curry, et al. (2018). In this study, Walden University contracted Arroyo Research Services, which collaborated with two large school districts to measure the effects of teachers with ADs on student performance. The authors again point out the large number of teachers who have obtained ADs, the pay increases and tuition incentives offered by many districts, and the requirement by some districts by which teachers are forced to obtain a higher degree in order to obtain full teacher licensure or to remain employed with their district. The data used for the study included results (205,226) of student performance in reading and language arts portions of the Georgia Criterion-Referenced Competency Tests (CRCT) for years 2004 – 2010 in second through fifth grades. Contrary to the aforementioned studies, Vandersall, et al. concluded, "Students whose teachers held a master's degree performed .02 standard deviations higher in both language arts and reading. This is statistically significant at $p < .01$ for both" (p. 3).

The work of Xu and Gulosino (2006) concluded what was introduced at the beginning of the chapter – the teacher is the most important factor in the classroom. The researchers confidently suggested it is what teachers do in their classrooms which positively impacts early childhood learning rather than the status of degree or licensure obtained by the teacher.

However, they addressed these factors at the onset of their research query to satisfy these questions before more telling characteristics were considered such as teacher behaviors. Mathematics and reading results from the Early Childhood Longitudinal Program from the class of 1999 were used which included 19,173 kindergarten students from public and private schools. In an attempt to replicate previous studies on the matter of teacher credentials (considering so much attention is paid to these teacher attributes of credentials), the researchers examined the teacher's highest, the amount of college-related courses in their field, and teaching certificates. These descriptors did not prove statistical importance in varying student scores in either type of school. The researchers ultimately concluded teacher qualifications are not rendered as unimportant, they simply verified these levels of status referred to as a teacher being qualified for the position they held. Being qualified did not ensure a teacher was effective.

Summary

This review of literature explored a body of relevant research in relation to student achievement and the effects of teachers who have ADs or those who have obtained NBCT status. The referenced studies exposed inconsistent results for both teacher categories. Based upon the body of existing literature some conclusions are drawn. Neither NBCTs nor those with ADs alone ensure student achievement gains. There is more research offering evidence NBCTs are more effective in influencing achievement gains than teachers with ADs. Most studies indicated no statistical significance or benefit. Finally, the research overwhelmingly suggested content-specific training produces more gains for students, especially in the areas of middle school math and science.

These findings provide inconclusive evidence as to whether teacher degree levels or national board certification status guarantee gains by way of student achievement. Meanwhile,

Mississippi's governmental officials support steep stipends to teachers who have earned either, or both. After the revelation 198 teachers in the state reached NBCT status during the 2013 – 2014 school year, Governor Phil Bryant (Bryant, 2014) boasted,

We know that teacher quality is a critical component of student achievement, and increasing the number of Board Certified teachers in Mississippi classrooms in an important way to improve education outcomes in our state. I fully support the National Board Certification Teacher Program and look forward to continuing to increase the number of certified teachers in Mississippi. (p. 1)

Additionally, the governor offered in a 32-page publication, an outline of his administration's goals during his term of service. Educational improvements were addressed with evidences listed, which would serve as markers for success. One of those markers included support for NBCTs. "We will continue to fund and expand the National Board Certified Teacher program and increase the number of Board Certified teachers in Mississippi 25 percent by 2018 and enhance their leadership roles in Mississippi schools" (p. 19).

Governor Bryant's statements confirm a resilient alliance to the certification process as well as endorses his commitment to encourage more teachers to complete the process. The belief educational outcomes will improve in our state as a direct result of increasing the number of NBCTs is a misguided notion and arguably irresponsible, according to the research provided in this review. While the commitment is high for rewarding teachers and strengthening our public schools through national board certification, only one study referenced Mississippi in the review of NBCTs, with no study having included Mississippi when examining the effects of teachers with graduate level degrees. The inconsistent results of previous studies and the lack of representation of Mississippi subjects confirms the need for more extensive research in these

areas within the state.

Chapter III outlines the methodology of this study including the research design, population, sample, participants, instrumentation, hypotheses, statistical test, as well as describe the procedure for data collection and analysis.

CHAPTER III

METHODOLOGY

Restatement of the Purpose

Mississippi educational constituents have seemingly become accustomed to shrinking budgets. The Hechinger Report's author, Marquita Brown (2016) declares, "when talking about school funding, principals, superintendents and parents give grim descriptions of the status quo. Bare bones. Survival mode. Treading water" (para. 14). The Barksdale Reading Institute is a non-profit, education organization created by Jim and Sally Barksdale in 2000 through a one hundred-million-dollar endowment. The institution partners with public school districts, public universities, and the Mississippi Department of Education (MDE) to enhance the quality of reading education throughout the state (Barksdale, n.d.). In the same report, Dr. Michael Cormack, Jr., the then chief executive officer of the Barksdale Reading Institute and former principal in the state, declares underfunding as, "a very familiar story" (para. 4). He further explains, "We've become accustomed to not receiving funding" (para. 4). While seeming apathy to this statewide obstacle may exist among stakeholders, the magnitude of the underfunded amounts remains staggering.

The Mississippi Association of Educators (n.d.b) reports underfunding of public school districts from fiscal years 2009 to 2015 amounted to a shortchange of more than 1.5 billion dollars. The organization equates this deficit to more than 5,400 teacher units across the state or more than 1.5 million computers, which could have been used by the students in Mississippi public schools. The Associated Press' author, Jeff Amy (2014b), confirms the monumental loss

of 1.5 billion dollars in appropriations over a seven-year stretch (2009 - 2015) considering 2008 was the last year education was fully funded by the state. The article implies consequences as a result of chronic underfunding. The number of teachers in the state shrank by six percent (about 2,000 teachers) and eighty percent of districts in the state have raised property taxes since 2008. Meanwhile, in Durant, the smallest district in the state, gave up purchasing new textbooks for students in order to keep teaching positions and chose to hire novice teachers rather than those with experience because they are cheaper, according to then superintendent, Louise Sanders-Tate.

Undeniably, the state government has ignored its own legislation to fully fund local districts through the Mississippi Adequate Education Program (MAEP). Mississippi legislators have, however, given significant attention to and provided full support for other decrees, especially those pertaining to increases in salaries for teachers who have earned advanced degrees or those earning the credentials of a nationally board-certified teacher (NBCT) as outlined in The Constitution of the State of Mississippi by the statute of Mississippi Code of 1972 Annotated § 37-19-7. The provisions in this mandate guarantee funding to annual stipends of 6,000 dollars per year for NBCT, unless teachers work in one of 11 identified counties in Mississippi, wherein the stipend increases to 10,000 dollars. Teachers holding master's degrees are entitled to a seven percent increase in salary, while those advancing to a specialist and doctoral degree earn an additional 3.25 percent for each degree. Mississippi has 4,166 educators who have received NBCT status (National Board for Professional Teaching Standards, n.d.). The 6,000-dollar annual stipend for NBCT equates to more than 24 million dollars. According to the Mississippi Department of Education (J. Christopher, personal communication, January 7, 2015) the number of teachers in the state is approximately 36,757 with more than half of all

educators (50.195 percent precisely) holding an advanced degree. The annual increases granted to these qualifying educators exceeds 40 million dollars. The combined compensations for NBCT and advanced degrees equal an annual funding commitment of more than 64 million dollars.

While funding for public education in Mississippi has been a topic of scrutiny for decades, the legislature insists on staunchly supporting healthy stipends for teachers with advanced degrees or NBCT. This quantitative research study examines the interaction effects NBCTs and teachers with ADs; while considering school accountability levels, had on student achievement.

The remainder of this chapter outlines the methodology of this study including: population, participants, and sampling; measures, including instrumentation, reliability, and validity as well as the research design, procedures, and data analysis.

Population, Participants, and Sampling

The targeted population for this study included third through eighth grade students in Mississippi public schools who participated in the MAAP end of year state assessments in ELA and mathematics for the 2017-18 SY. While the research endeavor attempted to include all Mississippi students and their teachers, the researcher was limited to Mississippi public school districts consenting to participate. The researcher was reliant on the participating districts for the data sets necessary to ensure a robust and statistically sound study.

Requests were made to the consenting public school districts for data sets to be coded with identifiable teacher information including NBCT status and AD status, but with teachers' names or educator identification numbers removed. Student names or identification numbers were to be removed from the reports as well. The researcher relied on a report from MDE for the

overall accountability rating of each participating school district for the 2017-18 SY.

Considering the statistical test of a three-way ANOVA with three independent variables, each with two categorical levels, resulted in eight teacher groups for consideration in each examination of student achievement in ELA and mathematics. The examined groups consisted of the following:

- NBCT, with an AD teaching in a high-performing district
- NBCT, with an AD teaching in a low-performing district
- non-NBCT, without an AD teaching in a high-performing district
- non-NBCT, without an AD teaching in a low-performing district
- NBCT, without an AD teaching in a high-performing district
- NBCT, without an AD teaching in a low-performing district
- non-NBCT, with an AD teaching in a high-performing district
- non-NBCT, with an AD teaching in a low-performing district.

Probability sampling was utilized as the researcher intended the categories to be representative of the populations at large. This is important as the researcher attempted to draw conclusions and made suggestions based on the findings of the teacher sample groups. This sampling technique relied on a fixed assumption whereby each participant had an equal chance of being included in the chosen sample. A systematic sampling technique determined the final sample for the study (Gall, Gall, & Borg, 2007). A simple random sample was determined using the random sample function in Microsoft Excel.

Power Analysis

An a priori power analysis was conducted with G*Power 3.1.9.4 (Faul, Erdfelder, Lang, & Buchner, 2007). Based upon the anticipation of a sufficiently large sample size, a small effect

size ($f = .10$) was selected. A power level of .95 was also selected. There will be one degree of freedom for the numerator and six groups for the 3-Way ANOVA. Based on these parameters, the required sample size will be 1,302, which is 163 cases per group assuming the numbers were equally distributed. See Figure 1.

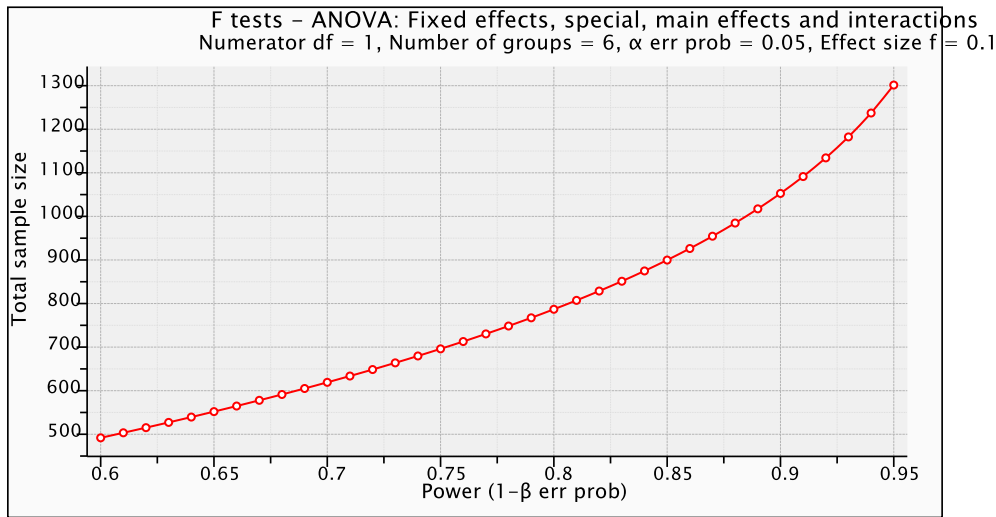


Figure 1. Required Sample Size for Three-Way ANOVA with Small Effect Size

Alpha Level

The alpha level for a study is the value at which the null hypothesis is rejected under the assumption the null hypothesis true. In social sciences, the alpha level is $p < .05$ (Brace, Kemp, & Snelgar, 2013). This means the results will be considered statistically significant if the probability (p-value) is less than .05 or five times out of 100.

Measures

Instrumentation. The assessment instruments utilized to measure annual proficiency and growth of academic achievement in reading-language arts (ELA) and mathematics for third through eighth grade students in Mississippi are derived from end of year, statewide assessments

given through the MAAP. The contracted agency through the state department of education responsible for the development of each assessment is Questar. The Clarion Ledger's reporter, Bracey Harris (2018), confirmed Mississippi's continued commitment to its 10-year contract (initiated in 2015) with the assessment company, which is renewed at the onset of each new fiscal year.

Reliability. Test reliability refers to assessment items which are consistent and comparable over time. Test reliability must be established for the researcher to draw viable conclusions about the inquiry (Creswell, 2012). Gall et al., (2007) simply refer to test reliability as "the consistency, stability, and precision of test scores" (p. 151). The identified hypotheses of this study will rely on archived data from standardized, end-of-year assessments in ELA and mathematics for grades three through eight. The predesigned testing instruments created by Questar will force the researcher to rely on reliability of instruments already established as credible sources. While the construct of each instrument is beyond the researcher's control, Questar provides a technical report, which accompanies the assessments. These reports include the following evidences; internal consistency, standard error of measurement, conditional standard error of measurement for scale scores, classification accuracy and classification consistency, and rater agreement for hand-scored items (MAAP Technical Report, 2017, p. 109).

Internal Consistency. The MAAP Technical Report (2017) describes internal consistency as a measurement of several assessment items which measure the same standard or skill and how consistently the items produce similar outcomes. "The higher the value of a reliability coefficient (closer to 1.0), the greater the reliability of the test scores" (p. 111). Score reliabilities are detailed in Table 5 and include the total score reliabilities for each subject area assessment at each grade level.

Table 5

Total Score Reliabilities – Grades 3-8

<u>Content Area</u>	<u>Grade</u>	<u>Reliability</u>
ELA	3	0.89
	4	0.82
	5	0.89
	6	0.91
	7	0.90
	8	0.91
Mathematics	3	0.92
	4	0.92
	5	0.91
	6	0.93
	7	0.93
	8	0.94

Table 5. Total Score Reliabilities. Adapted from “Table 12.1 Total Score Reliabilities – Grades 3-8,” from Questar, 2017, Mississippi Academic Assessment Program (MAAP) 2017 Technical Report, p. 111-112. Copyright 2017 by Questar.

Standard Error of Measurement. The MAAP Technical Report (2017) recognizes no instrument can be perfect and a standard measure of error exists naturally. The standard error of measurement (SEM) signifies the difference one could expect in a student’s score result to the uncontrollable fallacy of the assessment. This can explain a student obtaining a slightly higher or lower score if they were to retake the same assessment. “The smaller the SEM (close to 0), the greater the accuracy of the scores will be and, thus, the greater reliability of the scores and the more precise the estimate of the student’s true ability” (p. 112). Total score SEMs are provided in Table 6 and include each SEM at each grade level for each content area.

Table 6

Total Score Standard Error of Measurement – Grades 3-8

<u>Content Area</u>	<u>Grade</u>	<u>Reliability</u>
ELA	3	3.29
	4	3.33
	5	3.18
	6	3.77
	7	3.74
	8	3.84
Mathematics	3	3.06
	4	3.18
	5	3.42
	6	3.75
	7	3.83
	8	3.76

Table 6. Total Score Standard Error of Measurement. Adapted from “Table 12.3 Total Score SEMs – Grades 3-8,” from Questar, 2017, Mississippi Academic Assessment Program (MAAP) 2017 Technical Report, p. 113. Copyright 2017 by Questar.

Conditional Standard Error of Measurement. Conditional Standard Errors of Measurement (CSEM) are suggestive of the student’s ability identifying different points of reliability along a scale used in determining cut scores. These cuts are listed in Table 7 and define levels of passing and proficiency at each grade level and in each content area.

Table 7

CSEM for Passing and Proficiency Cut Scores – Grades 3-8

<u>Content Area</u>	<u>Grade</u>	<u>Passing</u>		<u>Proficiency</u>		
		<u>Cut Score</u>	<u>CSEM</u>	<u>Cut Score</u>	<u>CSEM</u>	
ELA	3	350	6	365	6	
	4	450	7	465	7	
	5	550	5	565	5	
	6	650	5	665	5	
	7	750	4	765	4	
	8	850	4	865	4	
	Mathematics	3	350	4	365	5
		4	450	4	465	5
5		550	4	565	4	
6		650	4	665	4	
7		750	5	765	5	
8		850	5	865	4	

Table 7. Conditional Standard Error of Measure for Passing and Proficiency Cut Scores – Grades 3-8. Adapted from “Table 12.5 CSEM at the Passing and Proficient Cut Scores – Grades 3-8,” from Questar, 2017, Mississippi Academic Assessment Program (MAAP) 2017 Technical Report, p. 114. Copyright 2017 by Questar.

Classification Accuracy and Consistency. For the purposes of the MAAP classification accuracy and consistency refers to the performance levels students are assigned based on their score. The classification accuracy refers to students consistently being assigned the same performance level when making the same score on the assessments, while classification consistency examines if students would be placed at the same performance level if they took a comparable assessment. Table 8 details these classifications (accuracy and consistency) including all performance levels for grades 3-8 which ultimately declares each grade level assessment in ELA and mathematics as reliable (MAAP Technical Report, 2017).

Table 8

Classification Accuracy and Consistency – Grades 3-8

<u>Content Area</u>	<u>Grade</u>	<u>Statistic</u>	<u>All</u>	<u>PL2</u>	<u>PL3</u>	<u>PL4</u>	<u>PL5</u>	
ELA	3	Consistency	0.62	0.92	0.86	0.87	0.95	
		Accuracy	0.72	0.95	0.90	0.91	0.97	
	4	Consistency	0.57	0.93	0.82	0.84	0.96	
		Accuracy	0.68	0.95	0.87	0.88	0.97	
	5	Consistency	0.62	0.92	0.87	0.87	0.95	
		Accuracy	0.72	0.95	0.91	0.90	0.96	
	6	Consistency	0.61	0.92	0.88	0.88	0.92	
		Accuracy	0.72	0.95	0.91	0.91	0.94	
	7	Consistency	0.63	0.94	0.87	0.88	0.94	
		Accuracy	0.74	0.96	0.91	0.91	0.96	
	8	Consistency	0.64	0.91	0.88	0.88	0.95	
		Accuracy	0.73	0.94	0.91	0.92	0.96	
	Mathematics	3	Consistency	0.68	0.95	0.89	0.89	0.95
			Accuracy	0.77	0.96	0.93	0.92	0.97
4		Consistency	0.65	0.92	0.89	0.90	0.95	
		Accuracy	0.75	0.94	0.92	0.93	0.97	
5		Consistency	0.64	0.91	0.86	0.91	0.96	
		Accuracy	0.73	0.93	0.90	0.93	0.97	
6		Consistency	0.70	0.94	0.88	0.91	0.96	
		Accuracy	0.78	0.95	0.92	0.94	0.97	
7		Consistency	0.68	0.93	0.86	0.92	0.96	
		Accuracy	0.76	0.96	0.90	0.95	0.97	
8		Consistency	0.66	0.89	0.88	0.93	0.96	
		Accuracy	0.74	0.92	0.91	0.95	0.97	

Table 8. Classification Accuracy and Consistency – Grades 3-8. Adapted from “Table 12.9 Classification Accuracy and Consistency – Grades 3-8,” from Questar, 2017, Mississippi Academic Assessment Program (MAAP) 2017 Technical Report, p. 116-117. Copyright 2017 by Questar.

Validity. The validity of quantitative measures on assessments refers to the “appropriateness, meaningfulness, and usefulness of specific inferences made from test scores” (Gall, Gall, & Borg, 2007, p. 151). The MAAP Technical Report (2017) considers evidence of validity on MAAP assessments in three categories: content validity; internal structure; and differential item functioning.

Content validity refers to establishing evidence the test items created were directly

connected to and fairly measure the content of the Mississippi College-and-Career Readiness Standards (MS-CCRS). Questar reports in the MAAP Technical Manual (2017), content validity was achieved through seven procedures. First, Webb’s Depth of Knowledge model was utilized to examine how closely test items align and represent the skill knowledge described in the MS-CCRS. Next, a cross-reference alignment of assessment items to standards was conducted to evaluate representation of item types, and to ensure a fair number of items were present. Third, Questar trained and selected item writers to ensure high-quality questions were produced. A panel of content experts was then chosen to ensure the MAAP assessment items were aligned to the standards. Next, items were submitted to review committees comprised of Mississippi educators by content. Another committee then vetted items in a fairness review looking for sensitivity issues or bias related to subpopulations. Finally, statistical analyses were conducted and their results considered before items were chosen for use on assessments.

Another way Questar ensures validity is by considering evidence of internal structures which, “Refers to the degree to which relationships between test items and test components conform to the construct to intended test uses and on which interpretations are based” (p. 121). One way of accomplishing this is by examining the correlation between the strands, which comprise the assessment. Additionally, the assessment writers in an effort to keep item difficulty levels within reason, utilize item-test correlations and item-response theory models are used to scale the assessments. Such models are necessary according to the MAAP Technical Manual (2017), when scale scores interpret student performance levels. Additionally, Questar ensured internal structure by way of a correlation revealing the relationship between the strands assessed by the MAAP. Considering multiple strands were assessed at once, each correlation needed to and did contribute positively to the strength of the assessment.

A final way Questar assesses validity is by way of a statistical procedure known as differential item functioning (DIF). This measure flags items when students from different subgroups perform significantly different signifying the item needs further investigation to ensure fairness and non-biased assessment items. As described by Questar, validity is a complex measure whereby layers of evidence contribute to a more reliable instrument than when considering validity constraints in isolation (MAAP Technical Manual, 2017, p. 137).

Research Design

The purpose of this study was to determine differences NBCTs and teachers with ADs; while considering school accountability levels, had on student achievement. This study examined whether significant differences existed in student achievement between the eight identified groups of teachers and how the factors of NBCT status, AD status, and accountability contributed. This quantitative study examined differences between the teacher groups by means of an ex post facto, quasi-experimental design. Ex post facto research examines how independent variables (NBCT status, AD status, and accountability rating) effect the dependent variable (student performance) with the variable of teacher credentials having been determined prior to the study (Gall, Gall, & Borg, 2007). Quasi-experimental describes the study since participants are not randomly chosen as teachers' certifications naturally assigned participants to a determined group (Creswell, 2012).

Data Analysis

Research Questions and Hypotheses.

ELA.

R1: Do students taught by Nationally-Board Certified Teachers (NBCT) have different results in academic performance in ELA on the MAAP than students who were not taught by

NBCTs?

H₀₁: There is no significant difference in academic performance in ELA on the MAAP between students who were taught by NBCTs and students who were not taught by NBCTs.

R₂: Do students taught by teachers with advanced degrees have different results in academic performance in ELA on the MAAP than students who were taught by teachers with non-advanced degrees?

H₀₂: There is no significant difference in academic performance in ELA on the MAAP between students who were taught by teachers with advanced degrees and students who were not taught by teachers with advanced degrees.

R₃: Do students taught by teachers in high performing school districts have different results in academic performance in ELA on the MAAP than students who were taught by teachers in lower performing schools?

H₀₃: There is no significant difference in academic performance in ELA on the MAAP between students who were taught by teachers in higher performing schools and students who were not taught by teachers in lower performing schools.

R₄: Is there a significant interaction between NBCT status and advanced degree status relative to student academic performance in ELA on the MAAP?

H₀₄: There is no significant interaction between NBCT status and advanced degree status relative to student academic performance in ELA on the MAAP.

R₅: Is there a significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in ELA on the MAAP?

H₀₅: There is no significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in ELA on the MAAP.

R6: Is there a significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP?

H06: There is no significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP?

R7: Is there a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP?

H07: There is no significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP.

Mathematics.

R8: Do students taught by Nationally-Board Certified Teachers (NBCT) have different results in academic performance in mathematics on the MAAP than students who were not taught by NBCTs?

H08: There is no significant difference in academic performance in mathematics on the MAAP between students who were taught by NBCTs and students who were not taught by NBCTs.

R9: Do students taught by teachers with advanced degrees have different results in academic performance in mathematics on the MAAP than students who were taught by teachers with non-advanced degrees?

H09: There is no significant difference in academic performance in mathematics on the MAAP between students who were taught by teachers with advanced degrees and students who were not taught by teachers with advanced degrees.

R10: Do students taught by teachers in high performing school districts have different results in academic performance in ELA on the MAAP than students who were taught by

teachers in lower performing schools?

H₀₁₀: There is no significant difference in academic performance in mathematics on the MAAP between students who were taught by teachers in higher performing schools and students who were not taught by teachers in lower performing schools.

R₁₁: Is there a significant interaction between NBCT status and advanced degree status relative to student academic performance in mathematics on the MAAP?

H₀₁₁: There is no significant interaction between NBCT status and advanced degree status relative to student academic performance in mathematics on the MAAP.

R₁₂: Is there a significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in mathematics on the MAAP?

H₀₁₂: There is no significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in mathematics on the MAAP.

R₁₃: Is there a significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in mathematics on the MAAP?

H₀₁₃: There is no significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in mathematics on the MAAP?

R₁₄: Is there a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in mathematics on the MAAP?

H₀₁₄: There is no significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in mathematics on the MAAP.

Statistical Test. Student scores in grades three through eight in ELA and mathematics on the MAAP for the 2017-18 SY from participating school districts were categorized and compared to determine if statistically significant differences existed in student achievement means when examining the interaction factors of teachers' NBCT status, teachers' AD status, and whether the school district is high-performing or low-performing. Therefore, a three-way analysis of variance (ANOVA) was utilized to satisfy hypotheses one through eight pertaining to ELA, and likewise a three-way ANOVA was used to satisfy hypotheses nine through sixteen pertaining to interaction effects in mathematics.

Laerd Statistics (n.d.) verified a three-way ANOVA has three assumptions with the first being there is one continuous dependent variable (scale score on MAAP). The second assumption required three independent variables (NBCT status, AD status, and accountability level) which each having at least two categories detailed as follows;

- NBCT status (certified or non-certified),
- AD status (obtained an advanced degree or not),
- and accountability rating of school (higher performing or lower performing).

The third assumption was met with independence of observations considering a participant could only be categorized into one category regarding each independent variable. Therefore, the study naturally met the assumptions of the chosen statistical test. Three independent variables, each having two categories created an investigation of eight interactions of variables as outlined below;

- NBCT, with an AD teaching in a high-performing district,
- NBCT, with an AD teaching in a low-performing district,
- non-NBCT, without an AD teaching in a high-performing district,

- non-NBCT, without an AD teaching in a low-performing district,
- NBCT, without an AD teaching in a high-performing district,
- NBCT, without an AD teaching in a low-performing district,
- non-NBCT, with an AD teaching in a high-performing district,
- and non-NBCT, with an AD teaching in a low-performing district.

Procedures

An application was completed, and approval was granted from The University of Mississippi's Institutional Review Board (IRB) (M. Core, personal communication, May 9, 2019) in support of the research endeavor. Mississippi public school districts by way of their superintendents were then contacted by the researcher to recruit participation in the study. Recruitment became necessary when the request for the data sets from MDE was denied to the researcher (D. Hales, personal communication, April 11, 2019). Consenting districts were asked to share preexisting data sets from the 2017-18 administration of the MAAP Assessments in grades three through eight in ELA and mathematics.

The researcher requested teacher names be included (for classification purposes only) or for the information to be coded as to whether or not the teacher was a NBCT or had obtained an AD. The researcher assured districts any identifiable teacher information would be coded as quickly as the data sets were received. In the event the researcher had to code the data sets the information was obtained by utilizing the National Board for Professional Teaching Standards' website (NBPTS, n.d.) which provided a directory of teachers who have achieved this advanced certification. The listings provided information including the educator's name, district assignment, certificate area, date certification was achieved, and the expiration date of the certification. The researcher then worked to establish the degree type held by each teacher. The

MDE provides an online, searchable database called the Educator Licensure Management System (ELMS) (n.d.). The educator's name was located and a virtual copy of the teacher's license became visible. This virtual copy revealed the endorsements held by the teacher, but more specifically beneficial to this study disclosed the highest degree held by the teacher as well as the year in which the highest degree was obtained. The spreadsheets (data sets) provided by Questar included student performance results and identified the grade level, content area, and assigned teacher. Once the researcher identified the certification and degree status of each educator, teacher names in the Questar reports were replaced and coded accordingly by grouping the teachers into the appropriate, qualifying categories.

Additionally, participating districts were encouraged to remove student names from the data sets. The researcher assured superintendents the study would not include any identifiable information including district, school, teacher, or student information in reporting findings as the study attempted to draw conclusions about broad teacher categories, not individuals. Districts were assured the data sets would be saved on a secure, password-protected laptop and any hardcopies shared would be kept in a locked filing cabinet and assured the records would be received, managed, coded, and protected solely by the researcher.

Excel spreadsheets were utilized to store, organize, code, and manage data sets inclusive of their descriptors. Descriptive statistics was utilized to analyze data sets, satisfy hypotheses, and ultimately draw conclusions. The Statistical Package for the Social Sciences (SPSS) software was utilized for statistical testing (outlined in greater detail and more extensively in Chapter IV) to determine the interaction effects NBCTs and teachers with ADs; while considering district accountability levels, had on student achievement in ELA and mathematics on the 2017-18 administration of MAAP assessments.

Limitations and Delimitations

Limitations of the study included the denial of data sets inclusive of all Mississippi students in grade three through eight who participated in the 2017-18 administration of MAAP assessments by MDE, thus limiting the reach of the study and the conclusions the researcher originally intended. This denial rendered the researcher dependent on the recruitment of participation from superintendents of Mississippi public school districts overall limiting the population and sample size available for study.

The inquiry of this study relied solely on archival data. Authors Rudestam and Newton (2015) warn researchers about three pitfalls when utilizing archived data. The first weakness is developing hypotheses based on the data on hand rather than finding data sets, which support and seek to answer the developed hypotheses. For purposes of this study all research questions and hypotheses were determined prior to consideration about what data sets would be necessary to satisfy the hypotheses. The second and third threats to the validity of this study are the reliance of data sets and the fact the researcher is not the owner of the data. These two threats rendered the researcher vulnerable to the possibility of missing data or reporting errors, which were hidden from the researcher but could have skewed outcomes.

Summary

The purpose of this study was to determine the interaction effects NBCTs and teachers with ADs; while considering school accountability levels, had on student achievement which resulted in the examination of eight teacher groups. The history of underfunding Mississippi public schools and the state legislators' unwavering support in providing healthy stipends for NBCTs and those who obtain ADs was well established in Chapter I. Mississippi's commitment to enhanced salaries for teachers with enhanced degrees or board certification expanded in

Chapter II as the researcher reviewed related literature which revealed mixed findings to support ADs or board certification guarantee academic gains for students. Chapter III has described the methodology of this quantitative, ex post facto, quasi-experimental study including the study's participants, measures, data analysis, procedures, and limitations. Chapter IV outlines the specifics of the data analyses using the statistical test of two three-way factorial ANOVAs and the results of testing the hypotheses of the study. This dissertation concludes with Chapter V with renderings of final conclusions about the study, a discussion of the study's implications, and recommendations for future research related to the topic.

CHAPTER IV
DATA ANALYSIS

Chapter four is organized by an introduction, discussion of data preparation procedures, sample demographics, descriptive statistics, data screening, research question/hypothesis testing, and a summary of the results.

Introduction

The purpose of this study was to determine the effects National Board Certified Teachers (NBCTs) and teachers with Advanced Degree (ADs); while considering school accountability levels, had on student achievement. District accountability was categorized into high-performing and low-performing. The researcher utilized the state generated list of school districts' overall accountability points for the 2017-18 school year (SY) to determine performance levels. The ranges of accountability grades are outlined in Table 9.

Table 9

2017-18 Accountability Grades/Rating Ranges

Rating	Range
A	699-761
B	499-667
C	536-598
D	494-534
F	418-488

The range of C-rated districts was split evenly by the researcher determining those earning

accountability points in the range of 567 – 598 were considered a high-C rating, with those falling in the range of 536 – 566 considered a low-C rating. Therefore, participating school districts who were graded an A, B, or high-C were considered high-performing in this research endeavor with those falling in the low-C, D, or F range identified as low-performing.

Statistical Tests and Hypotheses Formatting

The research questions and hypotheses were tested with two three-way ANOVAs; one for ELA scores on the MAAP (hypotheses one through seven) and one for mathematic scores on the MAAP (hypotheses eight through 14). Each three-way ANOVA tested seven hypotheses; which included three main effects and four interactions as indicated in Table 10.

Table 10

Hypothesis Format for Three-Way ANOVA

Hypothesis	Variables	Main Effect/Interaction
H ₁	A (NBCT status)	Main Effect
H ₂	B (AD Status)	Main Effect
H ₃	C (Accountability Rating)	Main Effect
H ₄	A X B	Two-Way Interaction
H ₅	B X C	Two-Way Interaction
H ₆	A X C	Two-Way Interaction
H ₇	A X B X C	Three-Way Interaction

Research Questions/Hypotheses

This inquiry was satisfied by data sets obtained by the researcher from consenting Mississippi public school districts and examined student achievement in English/language arts

(ELA) and mathematics in grades three through eight on the Mississippi Academic Assessment Program (MAAP), end of year state assessment during the 2017-18 SY. Fourteen research questions and related hypotheses were formulated for investigation. The questions and accompanying null hypotheses are as follows:

ELA.

R1: Do students taught by Nationally-Board Certified Teachers (NBCT) have different results in academic performance in ELA on the MAAP than students who were not taught by NBCTs?

H₀₁: There is no significant difference in academic performance in ELA on the MAAP between students who were taught by NBCTs and students who were not taught by NBCTs.

R2: Do students taught by teachers with advanced degrees have different results in academic performance in ELA on the MAAP than students who were taught by teachers with non-advanced degrees?

H₀₂: There is no significant difference in academic performance in ELA on the MAAP between students who were taught by teachers with advanced degrees and students who were not taught by teachers with advanced degrees.

R3: Do students taught by teachers in high-performing school districts have different results in academic performance in ELA on the MAAP than students who were taught by teachers in lower performing schools?

H₀₃: There is no significant difference in academic performance in ELA on the MAAP between students who were taught by teachers in higher performing schools and students who were not taught by teachers in lower performing schools.

R4: Is there a significant interaction between NBCT status and advanced degree status

relative to student academic performance in ELA on the MAAP?

H₀₄: There is no significant interaction between NBCT status and advanced degree status relative to student academic performance in ELA on the MAAP.

R₅: Is there a significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in ELA on the MAAP?

H₀₅: There is no significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in ELA on the MAAP.

R₆: Is there a significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP?

H₀₆: There is no significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP.

R₇: Is there a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP?

H₀₇: There is no significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP.

Mathematics.

R₈: Do students taught by Nationally-Board Certified Teachers (NBCT) have different results in academic performance in mathematics on the MAAP than students who were not taught by NBCTs?

H₀₈: There is no significant difference in academic performance in mathematics on the MAAP between students who were taught by NBCTs and students who were not taught by NBCTs.

R₉: Do students taught by teachers with advanced degrees have different results in

academic performance in mathematics on the MAAP than students who were taught by teachers with non-advanced degrees?

H₀₉: There is no significant difference in academic performance in mathematics on the MAAP between students who were taught by teachers with advanced degrees and students who were not taught by teachers with advanced degrees.

R₁₀: Do students taught by teachers in high performing school districts have different results in academic performance in ELA on the MAAP than students who were taught by teachers in lower performing schools?

H₀₁₀: There is no significant difference in academic performance in mathematics on the MAAP between students who were taught by teachers in higher performing schools and students who were not taught by teachers in lower performing schools.

R₁₁: Is there a significant interaction between NBCT status and advanced degree status relative to student academic performance in mathematics on the MAAP?

H₀₁₁: There is no significant interaction between NBCT status and advanced degree status relative to student academic performance in mathematics on the MAAP.

R₁₂: Is there a significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in mathematics on the MAAP?

H₀₁₂: There is no significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in mathematics on the MAAP.

R₁₃: Is there a significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in mathematics on the MAAP?

H₀₁₃: There is no significant interaction between teacher NBCT status and school

accountability rating relative to student academic performance in mathematics on the MAAP.

R14: Is there a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in mathematics on the MAAP?

H₀₁₄: There is no significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in mathematics on the MAAP.

Data Preparation

Data sets were provided from consenting Mississippi public school districts. The researcher first organized the information into 16 Microsoft Excel Spreadsheets, eight for ELA scores and eight for mathematic scores, which were imported into SPSS. Text data were converted to numerical variables as warranted. The cases did not possess case identification numbers associated with them in the datasets. Therefore, data cases were assigned sequential numbers to order and anchor the data. The data were subsequently merged into two SPSS data sets; one contained ELA scores (Merged Data ELA) and the other containing mathematic scores (Merged Data Math) resulting in 18 total data sets. Table 11 provides a list of the file names for each subject area data set.

Table 11

File Names for Data Sets

ELA data sets	Mathematics data sets
NBCT_AD_HighPerforming ELA	NBCT_AD_HighPerforming ELA
NBCT_AD_LowPerformingELA	NBCT_AD_LowPerformingELA
NBCT_nonAD_HighPerformingELA	NBCT_nonAD_HighPerformingELA
NBCT_nonAD_LowPerformingELA	NBCT_nonAD_LowPerformingELA
nonNBCT_AD_HighPerformingELA	nonNBCT_AD_HighPerformingELA
nonNBCT_AD_LowPerformingELA	nonNBCT_AD_LowPerformingELA
nonNBCT_nonAD_HighPerformingELA	nonNBCT_nonAD_HighPerformingELA
nonNBCT_nonAD_LowPerformingELA	nonNBCT_nonAD_LowPerformingELA
Merged Data ELA.sav	Merged Data ELA.sav

The scale scores for grades 3-8 were not on the same scale. For instance, scores for 3rd grade are in the 300s. Scores for 4th grade are in the 400s, and so on. The first number in the three-digit score represented the grade level. The remaining two numbers represented the scale score. To remove the first digit from the value, the following formula was used to compute another variable: $\text{Score} = \text{scaled score} - (\text{grade level} \times 100)$. If one student had a score of 428 in the dataset, for example, the actual scaled score is 28. Substituting values in the above equation produces the following: $\text{Score} = 428 - (4 \times 100) = 28$.

Sample Demographics

The merged ELA dataset contained data on 25,110 students. The merged mathematics data set contained data on 25,795 students. The ELA data set contained data on 4,560 (18.2%) third graders. Eighteen percent ($n = 4,516$) were fourth graders; and 17.3% ($n = 4,341$) were fifth graders. The smallest group of students (14.9%, $n = 3,741$) was in the sixth grade. The number of students in each grade level for ELA data is presented in Table 12.

Table 12

ELA: Number of Students in Each Grade

Grade	<i>n</i>	%	<i>Cumulative Mississippi</i>	
			%	<i>n count</i>
3	4,560	18.2	18.2	37,825
4	4,516	18.0	36.1	38,696
5	4,341	17.3	53.4	38,592
6	3,741	14.9	68.3	35,460
7	4,006	16.0	84.3	35,294
8	3,946	15.7	100.0	34,978
Total	25,110	100.0		220,845

The mathematics data set contained data on 4,516 (17.5%) third graders. Eighteen percent ($n = 4,718$) were fourth graders; and 17.1% ($n = 4,415$) were fifth graders. The smallest group of students (15.2%, $n = 3,922$) was in the sixth grade. The number of students in each grade level for the mathematics data is presented in Table 13.

Table 13

Mathematics: Number of Students in Each Grade

Grade	<i>n</i>	%	<i>Cumulative Mississippi</i>	
			%	<i>n count</i>
3	4,516	17.5	17.5	37,818
4	4,718	18.3	35.8	38,689
5	4,415	17.1	52.9	38,585
6	3,922	15.2	68.1	35,437
7	4,087	15.8	84.0	35,275
8	4,137	16.0	100.0	34,960
Total	25,795	100.0		220,764

ELA teacher demographics. For the ELA data set, 4.3% ($n = 1,085$) of teachers were nationally board-certified teachers (NBCT) while 95.7% ($n = 24,025$) were not nationally certified. Sixty-six percent ($n = 16,657$) of teachers taught in low-performing schools, whereas 33.7% ($n = 8,453$) taught in high-performing schools. Most teachers (53.2%, $n = 13,362$) held advanced degrees, whereas 46.8% ($n = 11,748$) held non-advanced degrees. NBCT status, accountability rating, and degree level for the ELA data are presented in Table 14.

Table 14

ELA: NBCT Status, Accountability Rating, and Degree Type

Variable	Description	<i>n</i>	%
NBCT	No	24,025	95.7
	Yes	1,085	4.3
	Total	25,110	100.0
Accountability Rating	Low Performing	16,657	66.3
	High Performing	8,453	33.7
	Total	25,110	100.0
Degree Level	Non-Advanced	11,748	46.8
	Advanced	13,362	53.2
	Total	25,110	100.0

Mathematics teacher demographics. For the mathematics data set, 5.1% ($n = 24,485$) of teachers were nationally board-certified teachers (NBCTs) and 94.9% ($n = 24,485$) were not nationally certified. Sixty-four percent ($n = 16,514$) of teachers taught in low-performing schools, whereas 36.0% ($n = 9,281$) taught in high-performing schools. Most teachers (52.5%, $n = 13,530$) held advanced degrees, whereas 47.5% ($n = 12,265$) held non-advanced degrees. NBCT status, accountability rating, and degree level for the mathematics data are presented in

Table 15.

Table 15

Mathematics: NBCT Status, Accountability Rating, and Degree Type

Variable	Description	<i>n</i>	%
NBCT Status	No	24,485	94.9
	Yes	1,310	5.1
Accountability Rating	Low Performing	16,514	64.0
	High Performing	9,281	36.0
Degree Level	Non-Advanced	12,265	47.5
	Advanced	13,530	52.5
	Total	25,795	100.0

Descriptive Statistics and Data Screening

ELA

Research questions and hypotheses one through seven were tested with a three-way ANOVA. Specifically, a 2 X 2 X 2 ANOVA was conducted. The independent variables were NBCT status (NBCT or non-NBCT), accountability rating (high or low performing), and degree type (AD or non-AD). The dependent variable was ELA scale score on the MAAP. Group means for ELA score by NBCT status, accountability rating, and degree type are presented in Table 16.

Table 16

Group Means for ELA Score by NBCT Status, Accountability Rating, and Degree Type

NBCT	Accountability Rating	Degree Type	<i>M</i>	<i>SD</i>	<i>n</i>
No	Low Performing	Non-Advanced	55.01	15.77	6,346
		Advanced	53.72	15.91	9,946
		Difference	1.29		
	High Performing	Non-Advanced	62.54	15.69	5,165
		Advanced	62.83	16.27	2,568
		Difference	0.29		
	Total	Non-Advanced	58.39	16.17	11,511
		Advanced	55.59	16.41	12,514
		Difference	2.8		
Yes	Low Performing	Non-Advanced	47.16	16.65	126
		Advanced	60.44	17.90	239
		Difference	13.28		
	High Performing	Non-Advanced	61.04	17.01	111
		Advanced	66.32	17.10	609
		Difference	5.28		
	Total	Non-Advanced	53.66	18.17	237
		Advanced	64.66	17.52	848
		Difference	11.0		

Assumption of Distribution.

ELA scale scores ranged from one to 99 throughout all datasets inclusive of student score reports ranging from third through eighth grade on end-of-the-year MAAP assessments. In order to satisfy the assumption of normality, histograms were generated to assess the normality of distributions in each data set category (independent variables) with ELA scale scores (dependent variable) remaining constant throughout. All distributions were univariate in nature and approximately symmetrical. A summary of the results of normality are outlined in Table 17.

Table 17

ELA: Summary of Histograms from SPSS Determining Normality of Distributions

Category	<i>Standard</i>				<i>Distribution</i>
	<i>Mean</i>	<i>Median</i>	<i>Deviation</i>	<i>Skew</i>	
NBCT	62.26	64	18.232	-.216	Normal
Non-NBCT	56.93	57	16.355	.087	Normal
High-Performing	62.88	63	16.020	-.109	Normal
Low-Performing	54.26	53	15.936	.166	Normal
Advanced Degrees	56.16	56	16.626	.118	Normal
Non-Advanced Degree	58.29	58	16.229	.045	Normal

Assumption of Statistical Outliers.

Another assumption of a three-way ANOVA is the determination of outliers in data sets, which can skew outcomes. Distributions of student ELA scale scores (dependent variable) were inspected for statistical outliers in all considered categories (independent variables). Identified outliers remained in the data sets. Box and whisker plots were created in SPSS and are summarized in Table 18.

Table 18

ELA: Summary of Box Plot Results Identifying Outliers

Category	<i>Number of Statistical Outliers</i>	<i>Parameters</i>
NBCT	No outliers	--
Non-NBCT	51	Less than or equal to 10
High-Performing	26	Less than or equal to 17
Low-Performing	39	Less than or equal to 9
Advanced Degrees	34	Less than or equal to 9
Non-Advanced Degree	27	Less than or equal to 13

Assumption of Homogeneity of Variances.

The use of a three-way ANOVA to satisfy the proposed hypotheses employed the examination of variances in the population groups. Therefore, Levene’s Test was utilized and indicated the assumption of equality of error variances had been violated, ($F(7, 25102) = 2.58, p = .012$). Consequently, the results should be interpreted with caution. The ANOVA Summary Table for hypotheses one through seven is presented in Table 19.

Table 19

ANOVA Summary for ELA Score by NBCT Status, Accountability Rating, and Degree Type

Source	<i>df</i>	<i>F</i>	<i>p</i>	Partial η^2	Observed Power
NBCT	1	0.12	.727	.00	.06
Rating	1	221.13	<.001	.01	1.00
Degree	1	51.43	<.001	.00	1.00
NBCT * Rating	1	1.63	.202	.00	.25
NBCT * Degree	1	63.87	<.001	.00	1.00
Rating * Degree	1	6.87	.009	.00	.75
NBCT * Rating * Degree	1	15.30	<.001	.00	.97
Error	25102	(253.71)			
Total	25109				

Note. Dependent variable = ELA Score. Value in parentheses represents mean square error.

Research Questions/Hypothesis Testing.

Research Question One.

Research question one inquired whether students taught by Nationally-Board Certified Teachers (NBCTs) had different results in academic performance in ELA on the MAAP than students who were not taught by NBCTs. The analysis of the three-way ANOVA revealed there was no main effect for NBCT status, ($F[1, 25102] = 0.12, p = .727, \text{partial } \eta^2 = 0, \text{observed power} = .06$). Students taught by NBCTs ($M = 62.26, SD = 18.23$) did not have statistically significant different results in academic performance in ELA on the MAAP than students who were not taught by NBCTs ($M = 56.93, SD = 16.35$).

Hypothesis One.

H₀₁ stated there is no significant difference in academic performance in ELA on the MAAP between students who were taught by NBCTs and students who were not taught by NBCTs. Considering there was no statistically significant difference determined in student groups, the null hypothesis was accepted.

Research Question Two.

Research question two asked if students taught by teachers with advanced degrees have significantly different results in academic performance in ELA on the MAAP than students who were taught by teachers with non-advanced degrees. The analysis of the three-way ANOVA revealed there was a statistically significant main effect for degree type ($F[1, 25102] = 51.43, p < .001$, partial $\eta^2 = 0$, observed power = 1.00). Students taught by teachers with advanced degrees ($M = 56.16, SD = 16.63$) had significantly lower scores in ELA on the MAAP than students who were taught by teachers with non-advanced degrees ($M = 58.29, SD = 16.23$).

Hypothesis Two.

H₀₂ stated there is no significant difference in academic performance in ELA on the MAAP between students who were taught by teachers with advanced degrees and students who were not taught by teachers with advanced degrees. Considering there was a statistically significant difference determined in student groups, the null hypothesis was rejected.

Research Question Three.

Research question three inquired if students taught by teachers in high-performing school districts have different results in academic performance in ELA on the MAAP than students who were taught by teachers in lower-performing districts. The analysis of the three-way ANOVA revealed there was a significant main effect for accountability rating, ($F[1, 25102] = 221.13, p <$

.001, partial $\eta^2 = .01$, observed power = 1.00). Students taught by teachers in high-performing school districts ($M = 62.88$, $SD = 16.02$) had significantly higher results in academic performance in ELA on the MAAP than students who were taught by teachers in lower performing schools ($M = 54.26$, $SD = 15.94$).

Hypothesis Three.

H_{03} stated there is no significant difference in academic performance in ELA on the MAAP between students who were taught by teachers in higher-performing districts and students who were not taught by teachers in lower-performing districts. Considering there was a statistically significant difference determined in student groups, the null hypothesis was rejected.

Research Question Four.

Research question four inquired if there is a significant interaction between NBCT status and advanced degree status relative to student academic performance in ELA on the MAAP. The analysis of the three-way ANOVA concluded there was a significant, two-way, interaction between NBCT status and advanced degree status relative to student academic performance in ELA on the MAAP, ($F[1, 25102] = 63.87$, $p < .001$, partial $\eta^2 = 0$, observed power = 1.00). A post-hoc analysis consisting of an independent samples t -test revealed among non-NBCT teachers, teachers with advanced degrees ($M = 55.59$, $SD = 16.41$) had significantly lower results in academic performance in ELA on the MAAP in comparison to teachers with non-advanced degrees ($[M = 58.39$, $SD = 16.17]$, $t[24023] = -13.31$, $p < .001$, two-tailed). However, this trend was reversed among NBCT teachers. A post hoc analysis consisting of an independent samples t -test revealed NBCT teachers, teachers with advanced degrees ($M = 64.66$, $SD = 17.52$), had significantly higher results in academic performance in ELA on the MAAP than teachers with non-advanced degrees ($[M = 53.66$, $SD = 18.17]$, $t[1083] = 8.48$, $p < .001$, two-tailed). Figure 2

illustrates the interaction of NBCT status and degree type.

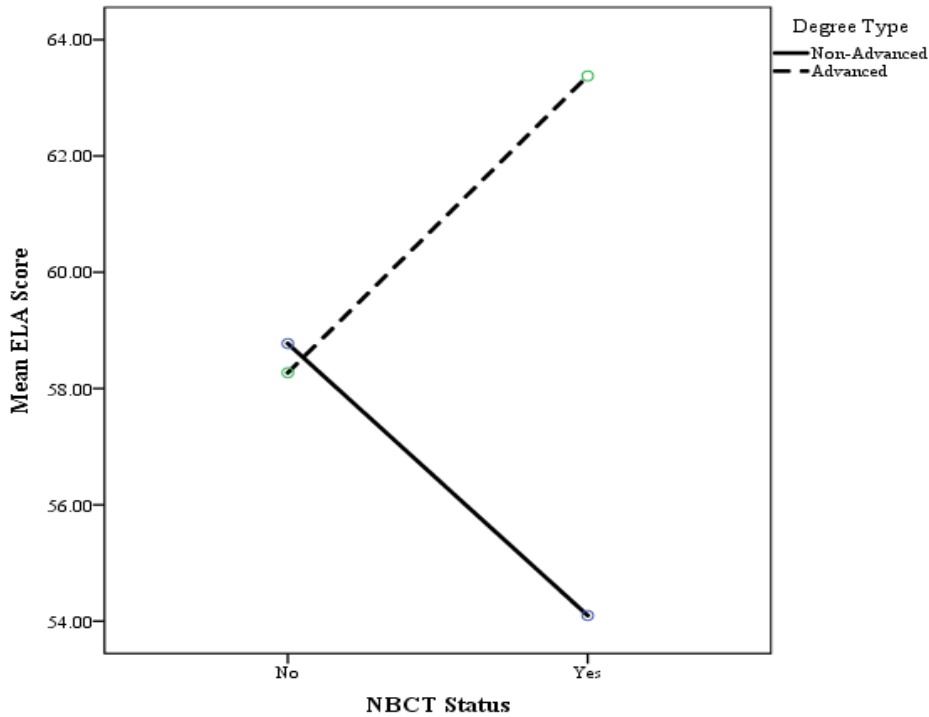


Figure 2. The Interaction of NBCT Status and Degree Type

Hypothesis Four.

H₀₄ stated there is no significant interaction between NBCT status and advanced degree status relative to student academic performance in ELA on the MAAP. Considering there was a statistically significant interaction between NBCT status and advanced degree status relative to student academic performance, the null hypothesis was rejected.

Research Question Five.

Research question five inquired if there is a significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in ELA on the MAAP. The analysis of the three-way ANOVA concluded there was a significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in ELA on the MAAP, ($F[1, 25102] = 6.87, p =$

.009, partial $\eta^2 = 0$, observed power = .75). A post hoc analysis consisting of an independent samples t-test revealed performance in low-performing districts was statistically significantly lower when taught by those with advanced degrees ($M = 53.88$, $SD = 15.99$) in comparison to those taught by teachers without advanced degrees ($[M = 54.86$, $SD = 15.82]$, $t[16655] = -3.87$, $p < .001$, two-tailed). Degree status proved opposite findings in high-performing districts. The post hoc analysis revealed a statistically significant interaction with those taught by teachers with advanced degrees having greater academic achievement ($M = 63.50$, $SD = 16.49$) in comparison to those taught by teachers without advanced degrees ($[M = 62.51$, $SD = 15.72]$, $t[8451] = 2.75$, $p = .006$, two-tailed). The interaction of accountability rating and teacher degree type are illustrated in Figure 3.

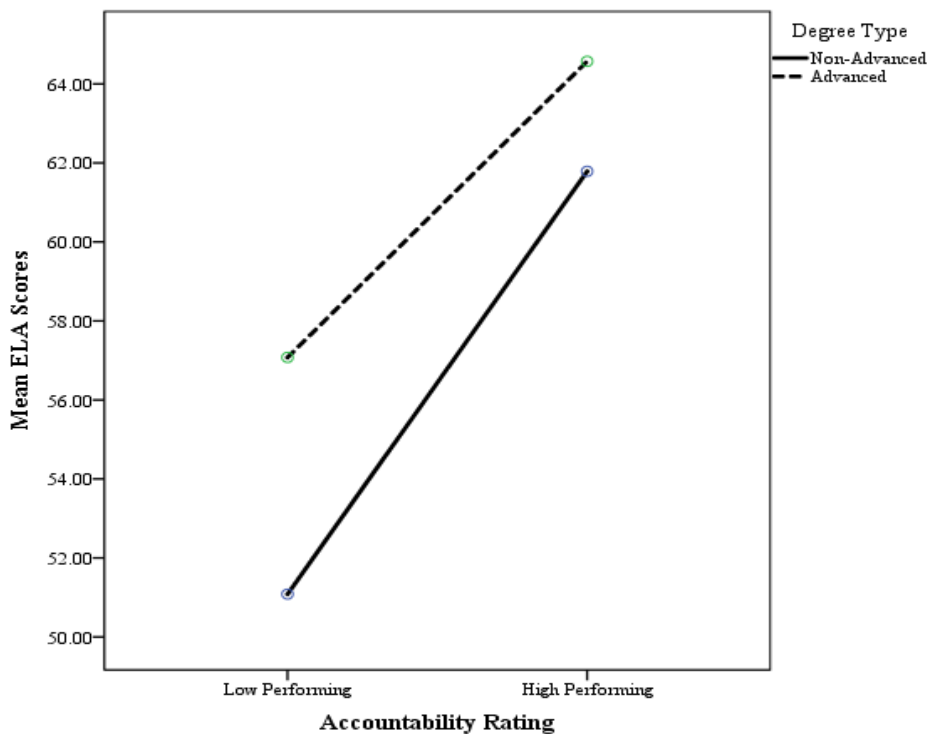


Figure 3. The Interaction of Accountability Rating and Degree Type

Hypothesis Five.

H₀₅ stated there is no significant interaction between teacher advanced degree status and

school accountability rating relative to student academic performance in ELA on the MAAP. Considering there was a statistically significant interaction between NBCT status and advanced degree status relative to student academic performance in ELA, the null hypothesis was rejected.

Research Question Six.

Research question six asked if there is a significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP. The three-way ANOVA analysis revealed there was no statistically significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP, ($F[1, 25102] = 1.63, p = .202, \text{partial } \eta^2 = 0, \text{observed power} = .25$). While not statistically significant, the analysis revealed higher means in student achievement for NBCTs ($M = 65.50, SD = 17.18$) compared to those not nationally board certified ($M = 62.63, SD = 15.89$) in high-performing districts, with the same proved true in low-performing districts with NBCTs having higher means ($M = 55.85, SD = 18.56$) than those without ($M = 54.22, SD = 15.87$). Figure 4 illustrates the interaction of NBCT status and accountability rating.

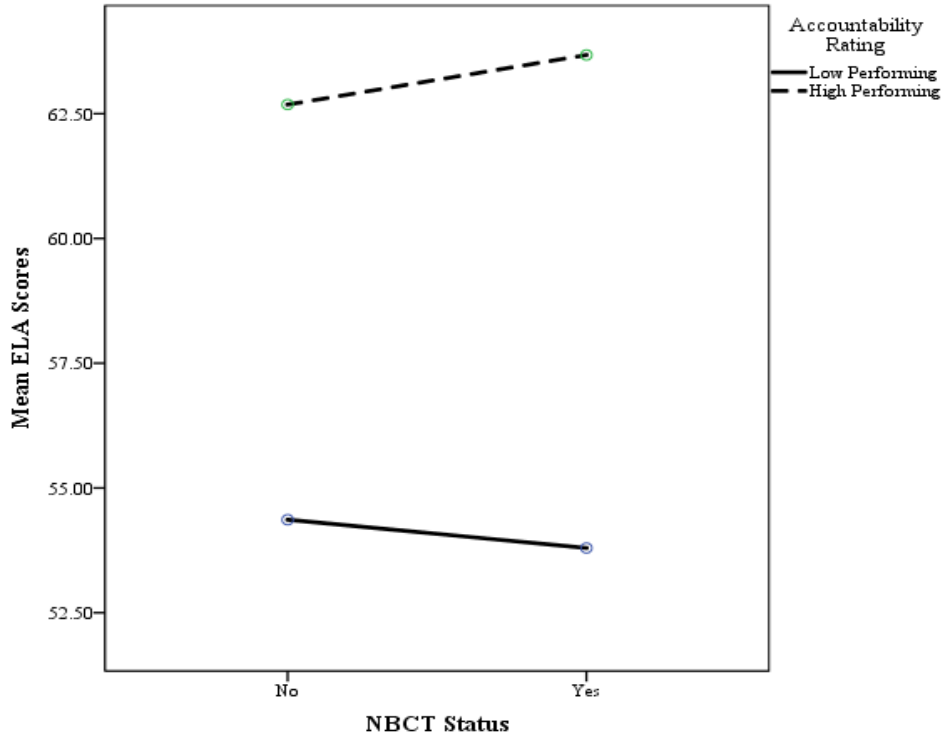


Figure 4. The Non-Interaction of NBCT Status and Accountability Rating

Hypothesis Six.

H₀₆ stated there is no significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP.

Considering there was no statistically significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP, the null hypothesis was accepted.

Research Question Seven.

Research question seven inquired if there is a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP. The three-way ANOVA analysis revealed there was a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP, ($F[1, 25102] = 15.30, p <$

.001, partial $\eta^2 = 0$, observed power = .97). A post hoc analysis consisting of an independent samples *t*-test revealed for non-NBCTs, there was no significant difference in academic performance in ELA on the MAAP in high-performing districts for teachers with advanced degrees ($M = 62.83$, $SD = 16.27$) and teachers with non-advanced degrees ($M = 62.54$, $SD = 15.69$), $t[7731] = 0.75$, $p = .454$, two-tailed). However, for low-performing districts, teachers with non-advanced degrees ($M = 55.01$, $SD = 15.77$) had significantly higher results in academic performance in ELA than teachers with advanced degrees ($M = 53.72$, $SD = 15.91$), $t[16290] = -5.07$, $p < .001$, two-tailed). Figure 5 illustrates the interaction of non-NBCTs with advanced degree status in low and high-performing districts.

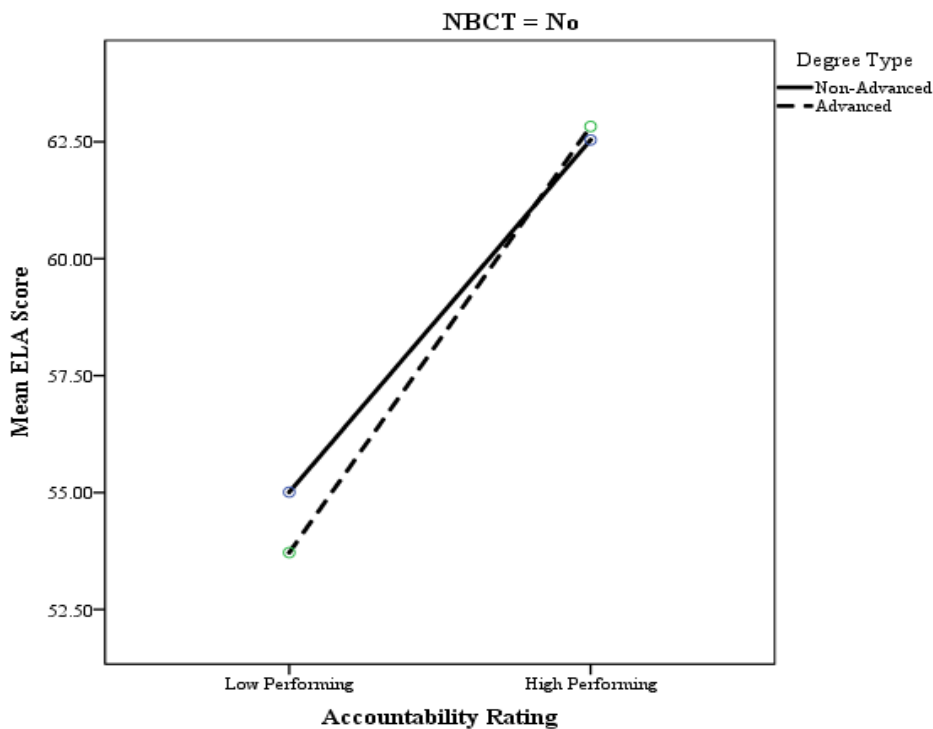


Figure 5. ELA Score by Accountability Rating and Degree Type for non-NBCTs

A post hoc analysis consisting of an independent samples *t*-test revealed for NBCTs, there was a statistically significant difference in academic performance in ELA on the MAAP in high-performing districts for teachers with advanced degrees ($M = 63.50$, $SD = 16.49$) and

teachers with non-advanced degrees ($M = 62.51, SD = 15.72, t[8451] = 2.75, p = .006$, two-tailed). The same trend of no statistical significance in academic performance in ELA on the MAAP was consistent for NBCTs in low-performing districts, for teachers with advanced degrees ($M = 53.88, SD = 15.60$) and teachers with non-advanced degrees ($M = 54.86, SD = 15.82, t[16655] = -3.87, p < .001$, two-tailed). Figure 6 illustrates the interaction of ELA score by accountability rating and degree type for NBCTs.

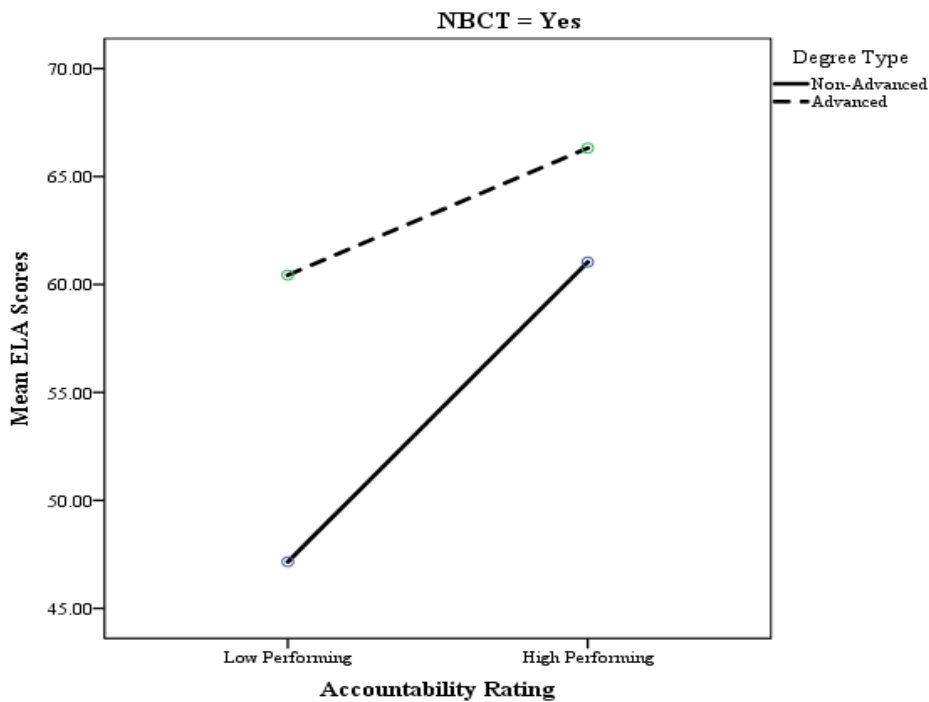


Figure 6. ELA Score by Accountability Rating and Degree Type for NBCTs

Hypothesis Seven.

H₀₇ stated there is no significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP. After analysis by a three-way ANOVA it was determined there was a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP, ($F[1, 25102] = 15.30, p < .001$). Therefore, the null hypothesis was rejected.

Mathematics

Research questions and hypotheses eight through 14 were tested with a three-way ANOVA. Specifically, a 2 X 2 X 2 ANOVA was conducted. The independent variables were NBCT status, accountability rating, and degree type. The dependent variable was math score on the MAAP. Group means for math score by NBCT status, accountability rating, and degree type are presented in Table 20.

Table 20

Group Means for Math Score by NBCT Status, Accountability Rating, and Degree Type

NBCT Status	Accountability Rating	Degree Type	<i>M</i>	<i>SD</i>	<i>n</i>
No	Low Performing	Non-Advanced	54.18	16.78	7,101
		Advanced	53.46	16.62	9,051
		Difference	0.72		
	High Performing	Non-Advanced	69.04	18.12	4,771
		Advanced	67.96	19.00	3,562
		Difference	1.06		
	Total	Non-Advanced	60.15	18.80	11,872
		Advanced	57.56	18.51	12,613
		Difference	2.59		
Yes	Low Performing	Non-Advanced	46.30	14.77	182
		Advanced	66.31	20.95	180
		Difference	20.01		
	High Performing	Non-Advanced	68.35	17.53	211
		Advanced	64.33	17.91	737
		Difference	4.02		
	Total	Non-Advanced	58.13	19.66	393
		Advanced	64.72	18.55	917
		Total	6.59		

Assumption of Distribution.

Math scale scores ranged from one to 99 throughout all datasets inclusive of student score reports ranging from third through eighth grade on end-of-the-year MAAP assessments. In order

to satisfy the assumption of normality, histograms were generated to assess the normality of distributions in each data set category (independent variables) with math scale scores (dependent variable) remaining constant throughout. All distributions were univariate in nature and approximately symmetrical in all categories with the exception of one. The category of low-performing districts produced a moderately, positively skewed distribution. A summary of the results of normality are outlined in Table 21.

Table 21

Math: Summary of Histograms from SPSS Determining Normality of Distributions

Category	<i>Standard</i>				<i>Distribution</i>
	<i>Mean</i>	<i>Median</i>	<i>Deviation</i>	<i>Skew</i>	
NBCT	62.74	62	19.125	.139	Normal
Non-NBCT	58.81	57	18.696	.383	Normal
High-Performing	68.23	67	18.473	-.011	Normal
Low-Performing	53.83	52	16.794	.553	Moderate, Positive
Advanced Degrees	58.04	56	18.602	.416	Normal
Non-Advanced Degree	60.09	58	18.828	.321	Normal

Assumption of Statistical Outliers.

Another assumption of a three-way ANOVA is the determination of outliers in data sets, which can skew outcomes. Distributions of student math scale scores (dependent variable) were inspected for statistical outliers in all considered categories (independent variables). Identified outliers remained in the data sets. Box and whisker plots were created in SPSS and are summarized in Table 22.

Table 22

Math: Summary of Box Plot Results Identifying Outliers

Category	<i>Number of Statistical</i>	
	<i>Outliers</i>	<i>Parameters</i>
NBCT	No outliers	--
Non-NBCT	3	Less than or equal to 3
High-Performing	1	Less than or equal to 13
Low-Performing	3	Less than or equal to 3
Advanced Degrees	3	Less than or equal to 3
Non-Advanced Degree	No outliers	--

Assumption of Homogeneity of Variances.

The use of a three-way ANOVA to satisfy hypotheses employed the examination of variances in the population groups. Therefore, Levene's Test was utilized and indicated the assumption of equality of error variances had been violated, ($F[7, 25787] = 35.13, p < .001$). Therefore, the results should be interpreted with caution. The ANOVA Summary Table for hypotheses eight through 14 is presented in Table 23.

Table 23

ANOVA Summary Table for Math Score by NBCT Status, Accountability Rating, and Degree Type

Source	<i>df</i>	<i>F</i>	<i>p</i>	Partial η^2	Observed Power
NBCT	1	.08	.783	.00	.06
Rating	1	453.15	<.001	.02	1.00
Degree	1	37.36	<.001	.00	1.00
NBCT * Rating	1	15.97	<.001	.00	.98
NBCT * Degree	1	58.72	<.001	.00	1.00
Rating * Degree	1	110.34	<.001	.00	1.00
NBCT * Rating * Degree	1	103.95	<.001	.00	1.00
Error	25,787	(301.29)			
Total	25,794				

Note. Dependent variable = Mathematics Score. Value in parentheses represents mean square error.

Research Question Eight.

Research question eight inquired if students taught by Nationally-Board Certified Teachers (NBCTs) have significantly different results in academic performance in math on the MAAP than students who were not taught by NBCTs. Data analysis revealed there was no main effect for NBCT status, ($F[1, 25787] = 0.08, p = .783, \text{partial } \eta^2 = 0, \text{observed power} = .06$). Students taught by NBCTs ($M = 62.74, SD = 19.13$) did not have statistically significant different results in academic performance in math on the MAAP than students who were not taught by NBCTs ($M = 58.81, SD = 18.70$).

Hypothesis Eight.

H_{08} stated there is no significant difference in academic performance in math on the MAAP between students who were taught by NBCTs and students who were not taught by NBCTs. Considering there was not a statistically significant difference in the student groups, the null hypothesis was accepted.

Research Question Nine.

Research question nine asked whether students taught by teachers with advanced degrees have different results in academic performance in math on the MAAP than students who were taught by teachers with non-advanced degrees. A three-way ANOVA analysis revealed there was a statistically significant main effect for degree type, ($F[1, 25787] = 37.36, p < .001$, partial $\eta^2 = 0$, observed power = 1.00). Students taught by teachers with advanced degrees ($M = 58.04$, $SD = 18.60$) had significantly lower scores in math on the MAAP than students who were taught by teachers with non-advanced degrees ($M = 60.09$, $SD = 18.83$).

Hypothesis Nine.

H₀₉ stated there is no significant difference in academic performance in mathematics on the MAAP between students who were taught by teachers with advanced degrees and students who were not taught by teachers with advanced degrees. The descriptive statistics analysis revealed there was a statistically significant difference in academic performance between the student groups. Therefore, the null hypothesis was rejected.

Research Question Ten.

Research question ten inquired if students taught by teachers in high-performing school districts have different results in academic performance in math on the MAAP than students who were taught by teachers in lower-performing districts. An analysis of a three-way ANOVA revealed there was a statistically significant main effect for accountability rating, ($F[1, 25787] = 453.15, p < .001$, partial $\eta^2 = .02$, observed power = 1.00). Students taught by teachers in high-performing school districts ($M = 68.23$, $SD = 18.47$) had significantly higher results in academic performance in math on the MAAP than students who were taught by teachers in lower-performing districts ($M = 53.83$, $SD = 16.79$).

Hypothesis Ten.

H0₁₀ stated there is no significant difference in academic performance in math on the MAAP between students who were taught by teachers in high-performing districts and students who were not taught by teachers in lower-performing districts. Considering there was a statistically significant difference determined in student groups, the null hypothesis was rejected.

Research Question Eleven.

Research question eleven inquired if there is a significant interaction between NBCT status and advanced degree status relative to student academic performance in math on the MAAP. Analysis by way of a three-way ANOVA concluded there was a significant interaction between NBCT status and advanced degree status relative to student academic performance in math on the MAAP, ($F[1, 25787] = 58.72, p < .001, \text{partial } \eta^2 = 0, \text{observed power} = 1.00$). A post-hoc analysis consisting of an independent samples t -test revealed among non-NBCTs and those teachers with advanced degrees ($M = 57.56, SD = 18.51$) had significantly lower results in academic performance in math on the MAAP than teachers with non-advanced degrees ($[M = 60.15, SD = 18.80], t[24483] = -10.89, p < .001, \text{two-tailed}$). However, this trend was reversed among NBCT teachers. A post hoc analysis consisting of an independent samples t -test revealed NBCTs and those with advanced degrees ($M = 64.72, SD = 18.56$) had significantly higher results in academic performance in math on the MAAP than teachers with non-advanced degrees ($[M = 53.13, SD = 19.66], t[1308] = 5.78, p < .001, \text{two-tailed}$). Figure 7 illustrates the interaction of NBCT status and degree type.

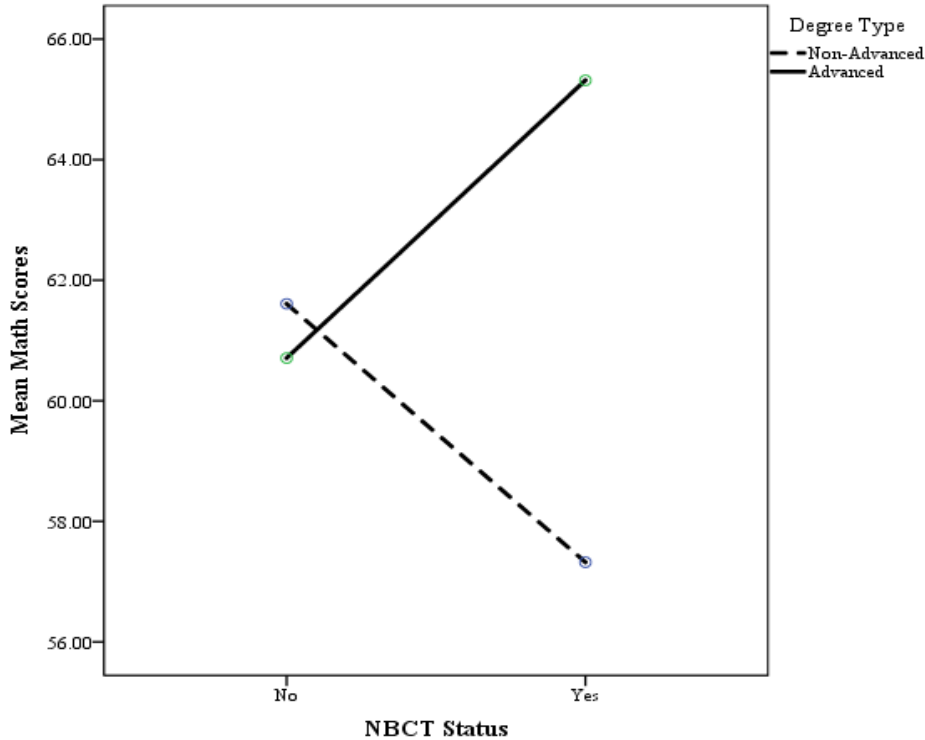


Figure 7. The Interaction of NBCT Status and Degree Type

Hypothesis Eleven.

H₀₁₁ stated there is no significant interaction between NBCT status and advanced degree status relative to student academic performance in mathematics on the MAAP. Considering there was a significant interaction between NBCT and degree status related to student performance, the null hypothesis was rejected.

Research Question Twelve.

Research question twelve inquired if there is a significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in mathematics on the MAAP. Analysis by way of a three-way ANOVA determined there was a significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in math on the MAAP, obviously with high-performing districts out performing low-performing districts, ($F[1, 25787] = 110.34, p$

$< .001$, partial $\eta^2 = 0$, observed power = 1.00). A post hoc analysis consisting of an independent samples t -test revealed higher student achievement, which was statistically significant, in high-performing districts for students taught by teachers without advanced degrees ($M = 69.01$, $SD = 18.10$) in comparison to those taught by teachers with advanced degrees ($[M=67.33$, $SD = 18.86]$, $t[9279] = -4.35$, $p < .001$, two-tailed). Post hoc analysis further revealed marginally higher student performance in low-performing school districts, but was not statistically significant when taught by those with advanced degrees ($M = 53.71$, $SD = 16.81$) in comparison to those taught by teachers without advanced degrees ($[M = 53.99$, $SD = 16.77]$, $t[16512] = -1.04$, $p = .300$, two-tailed). The interaction of district accountability rating and teacher degree type is illustrated in Figure 8.

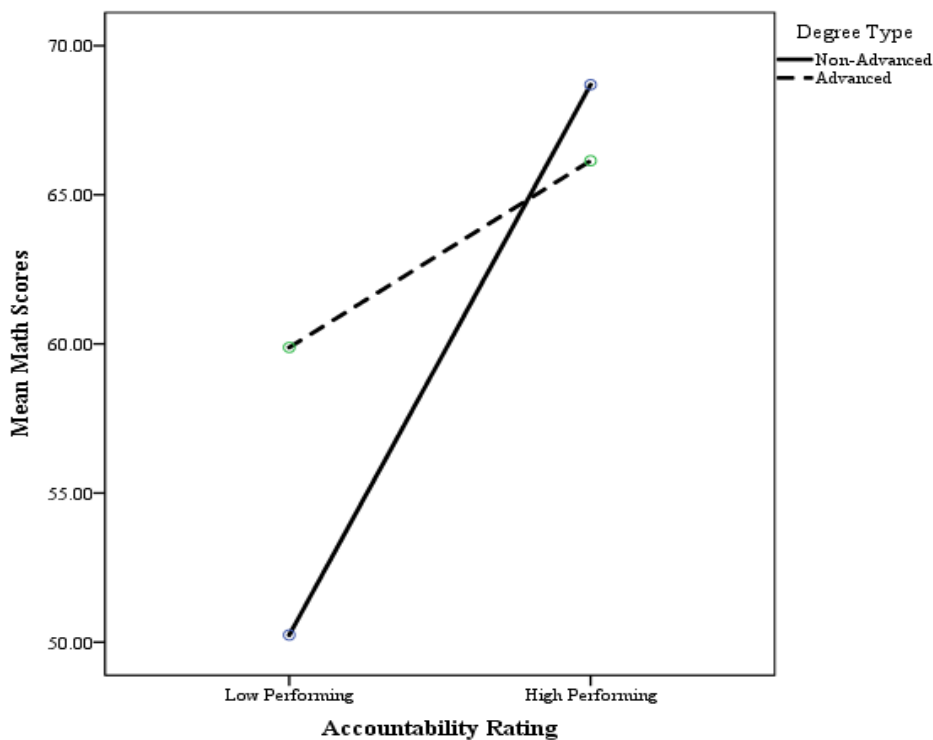


Figure 8. The Interaction of Accountability Rating and Degree Type

Hypothesis Twelve.

H_{012} stated there is no significant interaction between teacher advanced degree status and

school accountability rating relative to student academic performance in mathematics on the MAAP. Considering there was a statistically significant interaction, the null hypothesis was rejected.

Research Question Thirteen.

Research question thirteen asked whether there was a significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in mathematics on the MAAP. Analysis of a three-way ANOVA revealed there was a significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in mathematics on the MAAP, ($F[1, 25787] = 15.97, p < .001, \text{partial } \eta^2 = 0, \text{observed power} = .98$). Teachers from lower-performing school districts trended higher in math scores for NBCTs ($M = 56.25, SD = 20.67$) than non-NBCTs ($M = 53.78, SD = 16.69$). However, teachers from higher-performing districts trended higher in math scores for non-NBCTs ($M = 68.57, SD = 18.51$) than for NBCTs ($M = 65.22, SD = 17.90$). The interaction of NBCT status and accountability rating are illustrated in Figure 9.

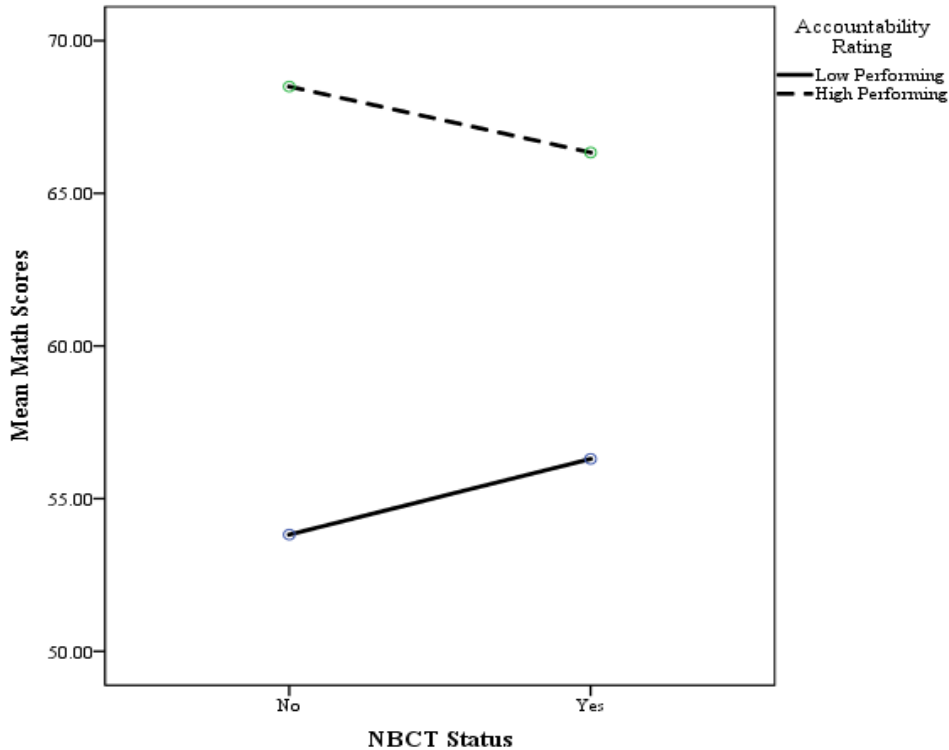


Figure 9. The Interaction of NBCT Status and Accountability Rating

Hypothesis Thirteen.

H0₁₃ stated there is no significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in mathematics on the MAAP. Considering there was a statistically significant interaction, the null hypothesis was rejected.

Research Question Fourteen.

Research question fourteen inquired if there was a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in mathematics on the MAAP. Three-way ANOVA analysis revealed there was a significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in math on the MAAP, ($F[1, 25787] = 103.95, p < .001, \text{partial } \eta^2 = 0, \text{observed power} = 1.00$). A post hoc analysis consisting of an independent

samples *t*-test revealed for non-NBCTs, academic performance in math on the MAAP at high performing schools for teachers with advanced degrees ($M = 67.96$, $SD = 19.00$) was significantly lower than teachers with non-advanced degrees ($[M = 69.04$, $SD = 18.12]$, $t[8331] = 2.63$, $p = .008$, two-tailed). In addition, for low-performing districts, teachers with non-advanced degrees ($M = 54.18$, $SD = 16.78$) had significantly higher results in academic performance in math than teachers with advanced degrees ($[M = 53.46$, $SD = 16.62]$, $t[16150] = 2.72$, $p = .006$, two-tailed). Figure 10 illustrates the interaction of student achievement scores by accountability rating and degree type for non-NBCTs.

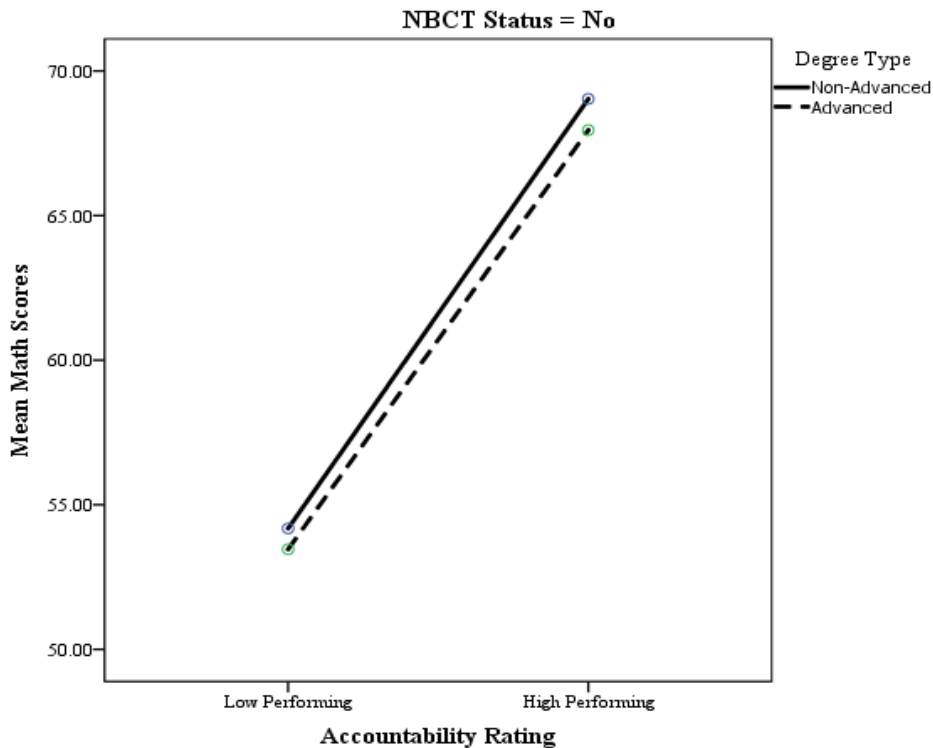


Figure 10. Math Score by Accountability Rating and Degree Type for non-NBCTs

A post hoc analysis consisting of an independent samples *t*-test revealed with NBCTs, academic performance in math on the MAAP at low performing schools for teachers with advanced degrees ($M = 66.31$, $SD = 20.95$) was significantly higher (mean difference = 19.99 points higher) than teachers with non-advanced degrees ($[M = 46.30$, $SD = 14.77]$, $t[360] = -$

10.51, $p < .001$, two-tailed). However, this trend was reversed for NBCTs in high-performing districts. Teachers with non-advanced degrees ($M = 68.35$, $SD = 17.53$) had significantly higher results in academic performance in math than teachers with advanced degrees ($[M = 64.33$, $SD = 17.91]$, $t[946] = 2.89$, $p = .004$, two-tailed). The interaction of math scores by accountability rating and degree type for NBCTs is illustrated in Figure 11.

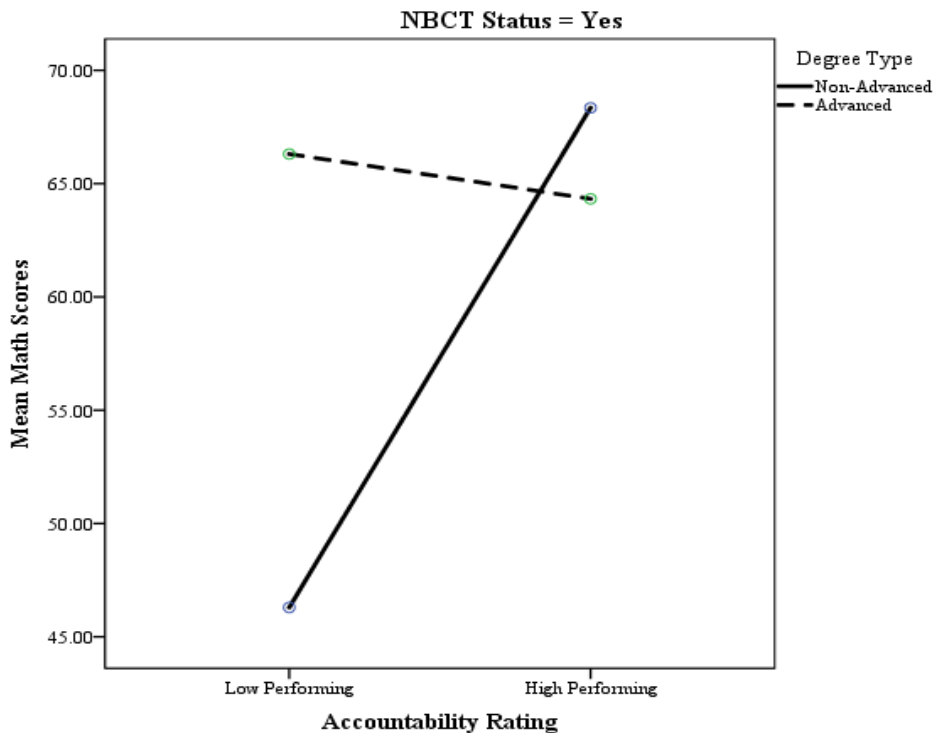


Figure 11. Math Score by Accountability Rating and Degree Type for NBCTs

Hypothesis Fourteen.

H₀₁₄ stated there is no significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in mathematics on the MAAP. Considering there was a significant interaction, the null hypothesis was rejected.

Summary.

The fourteen research questions and related hypotheses devised for this study are outlined in Table 24. The table provides a summary of the hypotheses and outcomes in

conclusion of Chapter IV. Chapter V provides an overarching summary of the tested results as well as discusses implications of the results as well as recommendations for further research.

Table 24

Hypothesis Summary and Outcomes

Hypothesis	Significance	Outcome
H ₀₁ : There is no significant difference in academic performance in ELA on the MAAP between students who were taught by NBCTs and students who were not taught by NBCTs.	$p = .727$	Null Accepted
H ₀₂ : There is no significant difference in academic performance in ELA on the MAAP between students who were taught by teachers with advanced degrees and students who were not taught by teachers with advanced degrees.	$*p < .001$	Null Rejected
H ₀₃ : There is no significant difference in academic performance in ELA on the MAAP between students who were taught by teachers in higher performing schools and students who were not taught by teachers in lower performing schools.	$*p < .001$	Null Rejected
H ₀₄ : There is no significant interaction between NBCT status and advanced degree status relative to student academic performance in ELA on the MAAP.	$*p < .001$	Null Rejected
H ₀₅ : There is no significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in ELA on the MAAP.	$*p = .009$	Null Rejected
H ₀₆ : There is no significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in ELA on the MAAP.	$*p < .001$	Null Rejected
H ₀₇ : There is no significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in ELA on the MAAP.	$p = .202$	Null Accepted
H ₀₈ : There is no significant difference in academic performance in mathematics on the MAAP between students		

Hypothesis	Significance	Outcome
who were taught by NBCTs and students who were not taught by NBCTs.	$p = .783$	Null Accepted
H ₀₉ : There is no significant difference in academic performance in mathematics on the MAAP between students who were taught by teachers with advanced degrees and students who were not taught by teachers with advanced degrees.	$*p < .001$	Null Rejected
H ₁₀ : There is no significant difference in academic performance in mathematics on the MAAP between students who were taught by teachers in higher performing schools and students who were not taught by teachers in lower performing schools.	$*p < .001$	Null Rejected
H ₀₁₁ : There is no significant interaction between NBCT status and advanced degree status relative to student academic performance in mathematics on the MAAP.	$*p < .001$	Null Rejected
H ₀₁₂ : There is no significant interaction between teacher advanced degree status and school accountability rating relative to student academic performance in mathematics on the MAAP.	$*p < .001$	Null Rejected
H ₀₁₃ : There is no significant interaction between teacher NBCT status and school accountability rating relative to student academic performance in mathematics on the MAAP.	$*p < .001$	Null Rejected
H ₀₁₄ : There is no significant interaction between NBCT status, advanced degree status, and school accountability rating relative to student academic performance in mathematics on the MAAP.	$*p < .001$	Null Rejected

*Statistical significance = p value less than or equal to .05

CHAPTER V
CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS OF THE RESEARCH
STUDY

The purpose of this research study was to determine the interaction effects national board certified teachers (NBCTs) and teachers with advanced degrees (ADs); while considering school accountability levels, had on student achievement. This study examined whether significant differences existed in student achievement between the eight identified groups of teachers and how the factors of NBCT status, AD status, and accountability contributed. Chapter I provided an introduction and rationale for the research questions and hypotheses used in this study. Chapter II expanded the review of research as it relates to the study. In Chapter III the methods, theoretical framework, and statistical tests to be used were defined. Chapter IV explained the experimental portion of the study and the detailed results of the statistical tests used in this post hoc, quasi-experimental study. Chapter V will include a summary of the results after data analyses, conclusions drawn from the results, implications of those results, and recommendations for further research to expand the knowledge around how NBCTs and instructional personnel with ADs contribute to the academic gains of Mississippi students.

Review of the Findings and Conclusions

Nationally Board Certified Teachers

Descriptive statistics comparisons revealed, third through eighth grade students did not score significantly higher statistically on the Mississippi Academic Assessment Program (MAAP) in ELA or math when taught by NBCTs than those taught by non-NBCTs. Therefore,

NBCT status alone did not prove to be a remarkable factor in higher student academic achievement in ELA or mathematics on the MAAP for Mississippi students. These findings echo the results of at least three studies cited in Chapter II: (Rouse, 2008; Stronge et al., 2007; and Curry et al., 2018).

Advanced Degrees

When comparing students taught by teachers with and without advanced degrees, data analyses revealed significant differences and statistically lower scores in ELA and mathematics on the MAAP than students taught by teachers without advanced degrees. The related review of literature revealed several studies suggesting similar results: (Miller & Roza, 2012; Goldhaber & Brewer, 1998; The Strategic Data Project, 2012a, 2012b; Badget, Decman, & Carman, 2014; and Ladd & Sorensen, 2015). Therefore, as with NBCT status, advanced degrees as an isolated factor did not prove to ensure greater academic gains for Mississippi students.

District Accountability

This study examined the effects of teachers considering national board certification status and/or advanced degree status on student performance in high-performing districts (A, B, C+ rating) compared to those in low-performing districts (C-, D, F rating). Table 9 revealed the 2017-18 accountability grades and rating ranges for school districts. The range of C-rated districts was split evenly by the researcher determining those earning accountability points in the range of 567 – 598 were considered a high-C rating, with those falling in the range of 536 – 566 considered a low-C rating. Therefore, participating school districts who were graded an A, B, or C+ were considered high-performing with those falling in the C-, D, or F range identified as low-performing.

The inclusion of the accountability factor allowed for a deeper examination of the effects

of NBCTs and those with advanced degrees on student achievement at different levels. An obvious conclusion was drawn after data analyses with high-performing districts significantly and statistically outperforming students in low-performing districts in both ELA and mathematics.

National Board Certified Teachers and Advanced Degrees

National Board Certified Teachers

The variables of NBCTs and advanced degree status were analyzed by way of a three-way ANOVA. Analysis revealed higher academic performance which was statistically significant when taught by teachers who were nationally board certified as well as holders of an advanced degree. The trend was consistent in both ELA and mathematics concluding the combination of national board certification and advanced degrees yielded higher academic gains for Mississippi students.

Non-National Board Certified Teachers

Educators without national board certification, but with advanced degrees had significantly and statistically lower achievement in both subject areas. This finding is consistent with the analysis mentioned earlier concluding the obtainment of an advanced degree does not necessarily equate to enhanced academic achievement for students.

Advanced Degrees and District Accountability

High-Performing Districts

The variables of advanced degree status and district accountability (high-performing and low-performing) were analyzed by way of a three-way ANOVA. The conclusions differed when comparing results in ELA and mathematics. In ELA students in high-performing districts taught by teachers with advanced degrees had statistically and significantly higher student academic

achievement on the MAAP than did students taught by teachers without advanced degrees. Interestingly, the opposite was concluded in mathematics as teachers without advanced degrees in high-performing districts had statistically and significantly higher academic results than those with advanced degrees. These results conclude advanced degrees provide evidence of positive student gains in ELA in high-performing districts, while advanced degrees in mathematics in the same districts, did not provide statistically significant differences.

Low-Performing Districts

The variable of advanced degree status (teachers with or without) proved to be of no statistical significance in low-performing districts in ELA or mathematics. These results conclude more than the advanced degree status of teachers is necessary to ensure academic gains in low-performing districts.

National Board Certified Teachers and District Accountability

ELA

The variables of NBCT status and district accountability (high-performing and low-performing) were analyzed by way of a three-way ANOVA. The analyses indicated student performance was not statistically or significantly higher when taught by NBCTs than non-NBCT in ELA whether in a high or low-performing district. These results echo the findings of studies cited in the review of related literature and mentioned earlier in this chapter: (Rouse, 2008; Stronge et al., 2007; and Curry et al., 2018).

Mathematics

NBCT status did, however, prove to result in statistically significant differences in mathematics. NBCTs in low-performing districts had higher academic student achievement than those without NBCT status. Akin to the ELA findings, non-NBCTs had greater student

achievement than did NBCTs in high-performing districts. These conclusions suggest national board certification in low-performing districts in mathematics may lead to greater academic gains over teachers with advanced degrees as indicated by data analyses results. These findings also support the suggestion introduced in the literature review by Belson and Husted (2015) where the researchers suggested distributing board-certified teachers as evenly as possible throughout the state, thereby ensuring students benefit optimally from exposure to NBCTs avoiding concentrated pockets of schools or districts saturated with NBCTs.

National Board Certified Teachers, Advanced Degree Status, and District Accountability

ELA

The variables of NBCT status (NBCT, non-NBCT), advanced degree status (ADs, non-ADs), and district accountability (high-performing and low-performing) were analyzed by way of a three-way ANOVA and independent samples *t*-tests as needed. Data analyses provided evidence of statistically significant interaction when considering the three variables, with differing results as each variable and its categorical levels were considered in comparison to additional variables and categories. Statistical significance was found among NBCTs in high-performing districts who had advanced degrees, but with no statistical significance in low-performing districts among NBCTs with or without advanced degrees. There was no statistical significance for non-NBCTs in high-performing districts with or without advanced degrees; while non-NBCTs in low-performing districts had significantly and statistically higher student achievement among teachers without advanced degrees.

Conclusion. Teachers with national board certification proved to have significant impacts on ELA student achievement only in high-performing districts when coupled with advanced degrees. Non-NBCTs fared no better statistically by way of student achievement

whether they held advanced degrees or not in high-performing districts. Subsequently, non-NBCTs in low-performing districts scored significantly and statistically lower when students were taught by teachers who held an advanced degree. Table 25 summarizes the ELA hypotheses results after data analyses.

Table 25

ELA Hypotheses Results by way of Three-Way ANOVA and Independent T-Tests

<u>Hypothesis</u>	<u>Effect/ Interaction</u>	<u>Variable</u>	<u>Statistically Significant</u>	<u>Descriptive Statistics</u>
H1	Main	NBCT	No	$p = .727$
H2	Main	AD	Yes, Negatively	$p < .001$
H3	Main	Accountability	Yes, Positively	$p < .001$
H4	Two-Way	NBCT and AD	Yes, Positively	$p < .001$
H5	Two-Way	AD and Accountability	Yes, Positively	$p < .001$
H6	Two-Way	NBCT and Accountability	No	$p = .202$
H7	Three-Way	NBCT, AD, and Accountability	Yes, Positively	$p < .001$

Three-Way Interaction Conclusions

- NBCTs significantly higher in HP districts with ADs
AD: ($M = 63.50, SD = 16.49$)
nonAD: ($M = 62.51, SD = 15.72$)
- NBCTs not significant in LP districts with or without ADs
AD: ($M = 53.88, SD = 15.60$)
nonAD: ($M = 54.86, SD = 15.82$)
- nonNBCTs no significance in HP districts with or without ADs
AD: ($M = 62.54, SD = 15.69$)
nonAD: ($M = 62.51, SD = 15.72$)
- nonNBCTs significantly higher in LP districts for nonADs
AD: ($M = 53.72, SD = 15.91$)
nonAD: ($M = 55.01, SD = 15.77$)

Mathematics

The same variables and their levels were examined with descriptive statistics in the area of mathematics. As with ELA, data analyses illustrated a statistically significant interaction, with differing results as each variable and its categorical levels were considered in comparison to additional variables and categories. Statistical significance of higher academic achievement was found among NBCTs in high-performing districts without advanced degrees. This finding for mathematics was contradictory to that of ELA as achievement was higher with advanced degrees. While NBCTs having advanced degrees were not found to improve student achievement positively in high-performing districts, the combination of the two certifications did impact student achievement outcomes in low-performing districts. NBCTs with advanced degrees in low-performing districts had statistically significant higher academic achievement.

Advanced degree status for non-NBCTs in high-performing districts was not significant for ELA achievement, the same results were not consistent in the area of mathematics. Non-NBCTs with advanced degrees had significantly and statistically lower achievement than those without advanced degrees. However, as with ELA, non-NBCTs in low-performing districts had significantly and statistically higher student achievement among teachers without advanced degrees.

Conclusion. NBCTs had statistically significant greater academic gains in mathematics in high-performing districts but only for those without advanced degrees; while NBCTs with advanced degrees had greater academic achievement in low-performing districts. Non-NBCTs in high-performing districts with advanced degrees had lower achievement while non-NBCTs in low-performing districts had higher student achievement when taught by teachers without advanced degrees. These results suggest NBCTs only proved statistically beneficial in low-

performing districts coupled with advanced degrees. This finding is the only circumstance where advanced degrees proved beneficial to academic achievement in the area of mathematics. Table 26 summarizes the mathematics hypotheses results after data analyses.

Table 26

Math Hypotheses Results by way of Three-Way ANOVA and Independent T-Tests

<u>Hypothesis</u>	<u>Effect/ Interaction</u>	<u>Variable(s)</u>	<u>Statistically Significant</u>	<u>Descriptive Statistics</u>
H8	Main	NBCT	No	$p = .783$
H9	Main	AD	Yes, Negatively	$p < .001$
H10	Main	Accountability	Yes, Positively	$p < .001$
H11	Two-Way Interaction	NBCT and AD	Yes, Positively	$p < .001$
H12	Two-Way Interaction	AD and Accountability	Yes, Positively	$p < .001$
H13	Two-Way Interaction	NBCT and Accountability	Yes, Positively	$p < .001$
H14	Three-Way Interaction	NBCT, AD, and Accountability	Yes, Positively	$p < .001$
<hr/> Three-Way Interaction Conclusions <ul style="list-style-type: none"> • NBCTs significantly higher in HP districts with nonADs AD: ($M = 64.33, SD = 17.91$) nonAD: ($M = 68.35, SD = 17.53$) • NBCTs significantly higher in LP districts with ADs AD: ($M = 66.31, SD = 20.95$) nonAD: ($M = 46.30, SD = 14.77$) • nonNBCTs significantly lower in HP districts with ADs AD: ($M = 67.96, SD = 19.00$) nonAD: ($M = 69.04, SD = 18.12$) • nonNBCTs significantly higher in LP districts for nonADs AD: ($M = 53.46, SD = 16.62$) nonAD: ($M = 54.18, SD = 16.78$) <hr/>				

Implications and Recommendations

There are three overall conclusions drawn from this research endeavor. First, NBCT status alone did not prove to be a significant factor in higher student academic achievement in ELA or mathematics on the MAAP for Mississippi students. These findings echoed the results of at least three studies cited in the review of literature: (Rouse, 2008; Stronge et al., 2007; and Curry et al., 2018). Data analyzes revealed NBCTs had no impact on student outcomes in ELA in either high-performing or low-performing districts, but NBCTs in low-performing districts achieved greater student outcomes in mathematics.

The second conclusion of this study shows students taught by teachers with advanced degrees had significantly lower scores in ELA and mathematics on the MAAP than students taught by teachers without advanced degrees. The related review of literature revealed several studies suggesting similar results: (Miller & Roza, 2012; Goldhaber & Brewer, 1998; The Strategic Data Project, 2012a, 2012b; Badget, Decman, & Carman, 2014; and Ladd & Sorensen, 2015). Student achievement comparisons revealed teachers with advanced degrees delivered significantly higher results in high-performing districts in ELA, but had no statistical impact in low-performing districts; while advanced degrees did not contribute to achievement in mathematics in either high-performing or low-performing districts.

The third conclusion of this research revealed, while the status of teachers holding NBCT certification or an advanced degree as isolated factors did not prove significant for student achievement, a combination of the two did. Students taught by NBCTs with advanced degrees achieved higher and statistically significant overall achievement in both ELA and mathematics. More specifically, the combination in teaching credentials was more significant in high-performing districts in the area of ELA and for low-performing districts in the area of

mathematics.

These conclusions as to how NBCT status, advanced degree status, and a combination of the two impact student achievement have implications for Mississippi school districts, state universities, and state government and the department of education.

District Level Implications

School administration should consider these findings in regard to hiring practices considering there are preconceived notions in regard to NBCTs or those with advanced degrees will lend themselves to increased achievement. Therefore, district and school-level administrators should foster an environment and create initiatives which support teachers with advanced degrees to become NBCTs and likewise to encourage those with NBCT certification to obtain advanced degrees, thus increasing the desired effect of improved student achievement by employing both means of enhanced certification.

This study revealed those with advanced degrees had lower achievement means in all areas of mathematics when examined with NBCT status or high-performing or low-performing status. The same conclusion was drawn in ELA with the exception of those with advanced degrees in high-performing districts. This finding supports the research trend identified in the literature review (Miller & Roza, 2012; Neild, Farley-Ripple, & Byrnes, 2009; and Goldhaber & Brewer, 1998) which concluded content-specific degrees, especially in mathematics and science, yielded greater student achievement. Therefore, consideration should be given to encouraging teachers to obtain content-specific advanced degrees. Local districts should also examine or enhance their recruiting efforts and offer incentives for those educators who possess content-specific advanced degrees. This is another opportunity for partnerships with local universities.

University Level Implications

This study revealed students taught by teachers who had earned NBCT certification as well as an advanced degree had higher and statistically significant overall performance in both ELA and mathematics. Consequently, consideration should be given to the development of partnerships with institutes of higher learning (IHL) and Mississippi school districts to create flexible programming, such as online or virtual classes, which optimize opportunities for teachers to earn degrees. University-level programming could consider a hybrid degree option of blending requirements where candidates earn an advanced degree (content-specific being ideal) as well as obtain NBCT certification simultaneously.

Considering teachers holding advanced degrees did not transfer into achievement gains for students and resulted in lower overall means with the exception of high-performing districts in ELA, universities should consider offering more content-driven graduate degrees. Consideration should be given to early childhood and elementary level degrees as most content driven degrees are concentrated at the secondary level. Teacher prep courses (at any degree level) should familiarize and prepare novice teachers to teach to the Mississippi College and Career-Ready Standards, which are content specific. Universities could also ensure these desired content-rich degrees or areas of emphasis are taught by high-qualified individuals in those particular content areas. These suggestions for IHLs support a substantial body of previous research outlined in the literature review: (Miller & Roza, 2012; Neild, Farley-Ripple, & Barnes, 2009; Goldhaber & Brewer, 1998; Shuls & Trivitt, 2015; and Wayne & Youngs, 2003). This body of research concluded higher academic achievement for students especially in the areas of mathematics and science when taught by teachers holding advanced degrees in those content-specific areas. Therefore, instructors working to prepare college students through teacher prep programs who are highly qualified in content areas are more likely to understand and better

prepare student teachers to teach content-specific standards more effectively.

Other steps to ensure student achievement for Mississippi students looks at teacher-preparation programs in general. Universities should audit program offerings and examine curricula and evaluate what percentage of programs directly prepare teacher candidates for content-related classrooms. Another consideration would be for universities to compare and contrast their teacher preparation programs to those of the highest performing (K12) states academically. Finally, in order to aid in this internal evaluation process, institutions should consider monitoring the success of their graduates based on student achievement data.

Ultimately, every school district and IHL should develop partnerships with expectations from both parties. Districts should expect IHLs to maintain a developmental relationship with graduates. Meanwhile IHLs should expect school districts to open their doors for professional development and content-specific training provided by the university.

State Level Implications

This research study concluded teachers who have obtained NBCT status and similarly those who have earned an advanced degree (in isolation) did not translate into higher academic achievement levels for Mississippi students. Therefore, Mississippi state legislators should consider these collective results when deciding on the funding of stipends for teachers with NBCT status and/or advanced degrees on the premise of an increased number of advanced certifications across the state will improve student achievement.

This research endeavor concludes the combination of teachers earning NBCT status and the obtainment of an advanced degree enhances the return on student achievement in both ELA and mathematics. The statute found in Mississippi Code of 1972 Annotated § 37-19-7 reveals governing legislation mandating annual stipends, continuous throughout the teachers' career, of

6,000 dollars per year for NBCT, unless teachers work in one of 11 identified counties, wherein the stipend increases to 10,000 dollars. Teachers holding master's degrees are entitled to a seven percent increase in salary, while those advancing to a specialist and doctoral degree earn an additional 3.25 percent for each degree. These funding commitments roughly equate to 24 million dollars for NBCTs and 40 million for teachers with advanced degrees annually in the state of Mississippi. Ironically, while the state mandates these statutes, they appropriate and provide funding to local districts for NBCTs, but do not appropriate the same funds for those with advanced degrees. Teachers with advanced degrees are a much larger financial obligation overall, but this study has illustrated each of the certification enhancements alone are insufficient. The lack of commitment by legislators to fully fund their mandates places more of a burden financially on districts to pay teachers with advanced degrees. The implications of this could mean some district leaders may not recruit or seek to hire those with advanced degrees, or encourage teachers to obtain graduate degrees due to the financial burden of compensation. This research endeavor suggests Mississippi legislators would have more return on their investment by encouraging and promoting teachers to obtain both NBCT status as well as an advanced degree which is content specific, but should fully fund both not to discourage districts from promoting both advancements. Initiatives and partnerships among local districts and universities should be extended to partnerships at the state level as well.

The conclusions of this study not only have implications for state legislators, but also the Mississippi Department of Education (MDE) and its constituents as well. With the suggestion from this study whereby teachers earning NBCT status, coupled with a content-driven advanced degree yields more gains academically for Mississippi students, the state department recently communicated a change in licensure contrary to these recommendations. According to the MDE

(C. Murphy, personal communication, February 25, 2020), the State Board of Education approved a request from the state department to modify the number of coursework credit hours for an additional licensure endorsement (content-specific) from 21 to 18 coursework credit hours. MDE should track those earning endorsements with the new criteria in relation to outcomes in student achievement and compare the impact of reducing the requirement, which is contrary to the findings and recommendations of this study.

Limitations

There are four limitations to this study including access to data sets, not being able to determine the certificate area for those classified as NBCTs, no consideration of other teacher factors, and no consideration of any other student factors as they pertain to student achievement. First, requests for data sets from MDE to include data on all MAAP results for third through eighth grade from SY 2017-18 with regard to NBCT stats was denied. Therefore, recruitment of Mississippi public school districts by way of their superintendents became necessary. Superintendents were contacted for permission for district participation and the development of the requested data sets. Therefore, the number of participants was limited to recruitment consent only. This resulted in ELA and mathematics participants being grouped into the two general categories, rather than separated out into grade levels.

A second limitation was not being able to identify the certificate area for those classified as NBCTs. Again, being reliant on the cooperation of local school districts to provide data sets resulted in records oftentimes coded by districts excluding teacher identification such as their name or educator identification number. Participating districts simply coded the teacher as a NBCT or non-NBCT, preventing the ability to track the certificate area obtained through the NBCT process. The participation of several districts was completely voluntary.

A third limitation to this study was the fact no other teacher factors were considered other than NBCT status, advanced degree status, or district accountability (high-performing or low-performing). Factors such as years of experience, teacher demographics, educational history, access to resources, or professional development could easily have altered outcomes particularly in the comparison of high-performing and low-performing districts.

The final limitation pertaining to this study was the fact no other student factors were considered other than the NBCT status of their teachers, advanced degree status of their teachers, or whether they attended a high-performing or low-performing school district. Other factors such as student demographics, students' readiness for school, whether students attended kindergarten, or socioeconomic status could certainly have an impact on student achievement.

Recommendations for Future Research

This research endeavor led to recommendations for future research. The study suggested a combination of teachers having both advanced degrees and NBCT certification had greater and more positive results in regard to student achievement in ELA and mathematics. Subsequently, researchers should employ a qualitative study seeking to explain which factors are preventing Mississippi educators from obtaining both certification levels and what recommendations they have for making certification or degree completion more obtainable for teachers.

Further research, specific to Mississippi public schools, should include correlational examination of the percentage of NBCTs and those with advanced degrees in each district in relation to overall district accountability rankings. This line of inquiry should also include a qualitative endeavor of identifying qualities or factors (which may or may not be inclusive of NBCT status and/or advanced degrees) yielding the greatest academic gains in Mississippi schools.

The study revealed NBCTs performed lower in ELA in low-performing districts than any other area. Future research should be conducted to investigate what variables may be impeding performance. This finding should be of particular interest to legislators who are providing educators with a total NBCT stipend of 10,000 dollars for those working in one of 11 identified counties (low-performing school districts). The suggested research could help legislators understand if the stipend is contributing positively to student achievement, if an increase in the concentration of NBCTs in those districts would suggest improvement, or if there are other factors impeding progress.

This study also revealed advanced degree status did not transfer into achievement gains for students and actually resulted in lower overall means in every examined category with the exception of high-performing districts. This finding indicates advanced degree obtainment does not transfer into student achievement. Thus, researchers should investigate other variables at play hampering student achievement such as ineffective school leadership, a lack of professional development, availability of resources, etc.

Considering the limitation of the availability of data from the Mississippi Department of Education, overarching conclusions were drawn in ELA and mathematics for the limited population of third through eighth grade students reported. Provided this barrier could be removed, this study should be replicated to satisfy the research questions and hypotheses in both subject areas, but at each grade level. An extension of this should be to examine the effects of NBCT status and advanced degree status in each area of the Mississippi Accountability Model which determines local schools and districts accountability ratings (A-F).

The final recommendation for future research is to examine the certificate area earned by NBCTs. There are 26 available certifications through the NBCT process including art, physical

education, history, etc. Research should be conducted to determine what percentage of Mississippi teachers with NBCT status falls into the various certificate categories and further examine how those certificate areas are contributing to academic gains for Mississippi students.

I consider it a privilege to have had the opportunity to develop, guide and conduct this research endeavor adding to the research body of NBCTs or those with advanced degrees. The findings of how Mississippi teachers who are nationally board certified or those with advanced degrees effect student achievement provide opportunities for local school districts, universities, and state legislators to consider as each entity has a responsibility and should share in the ultimate goal of providing the students of Mississippi with the best possible chances for academic success. Considering the conclusions of this study are general, there is immense opportunity for continued and more refined research in this area and specifically in the state of Mississippi.

LIST OF REFERENCES

- Amy, J. (2014a, April 22). Pay increases, merit raises for Mississippi teachers. *The Clarion Ledger*. Retrieved from <http://www.clarionledger.com/story/news/2014/04/22/pay-increases-merit-raises-miss-teachers/8031825/>
- Amy, J. (2014b, December 13). In Mississippi, education money gap grows to \$1.5 billion. *The Clarion Ledger*. Retrieved from <https://www.clarionledger.com/story/news/2014/12/13/mississippi-education-money-gap-grows/20378079/>
- Amy, J. (2018, March 1). Senators reject change to Mississippi school funding formula. *The Associated Press*. Retrieved from <https://www.usnews.com/news/best-states/mississippi/articles/2018-03-01/senators-reject-change-to-mississippi-school-funding-formuula>
- Badgett, K., Decman, J., & Carman, C. (2014). The influence of teacher graduate degrees on student reading achievement. *AASA Journal of Scholarship and Practice*, 11(1), 4-25.
- Barksdale Reading Institute. (n.d.). *About the institute* [Webpage]. Retrieved from <http://msreads.org/about-the-institute/>
- Belson, S. I., & Husted, T. A. (2015). Impact of National Board for the professional teaching standards certification on student achievement. *Education Policy Analysis Archives*, 23(91), 1-21.
- Boyd, D., Goldhaber, D., Lankford, H., & Wyckoff, J. (2007). The effect of certification and preparation on teacher quality. *The Future of Children*, 17(1), 45-68.
- Brace, N., Kemp, R., & Snelgar, R. (2013). *SPSS for psychologists*. New York, NY: Routledge Taylor & Francis Group.

- Bracey, H. (2018). Mississippi renews Questar testing contract for more than \$10 million. *The Clarion Ledger*. Retrieved from <https://www.clarionledger.com/story/news/2018/04/20/mississippi-renews-questar-testing-contract-more-than-10-m/536735002/>
- Brown, E. (2015). The states that spend the most (and the least) on education, in one map. *The Washington Post*. Retrieved from https://www.washingtonpost.com/news/local/wp/2015/06/02/the-states-that-spend-the-most-and-the-least-on-education-in-one-map/?utm_term=.22c1e383ea24
- Brown, M. (2016). *Can Mississippi schools get ahead after a new round of budget cuts?* PBS News Hour. Retrieved from <http://www.pbs.org/newshour/rundown/can-mississippi-schools-get-ahead-after-a-new-round-of-budget-cuts/>
- Bryant, P. (2014, December 22). *Mississippi ranks #7 nationally in National Board Certified Teachers* [Webpage]. Retrieved from <https://www.governorbryant.ms.gov/Pages/Mississippi-Ranks-7-Nationally-in-National-Board-Certified-Teachers;-198-added-in-2013-2014.aspx>
- Bryant, P. (n.d.). *Detailing the roadmap to success. Opportunity Mississippi* [Report]. Retrieved from https://www.governorbryant.ms.gov/Documents/Governor-Phil-Bryant_Opportunity-Mississippi1.pdf
- Bureau of Labor Statistics. (2014). *Local area unemployment statistics* [Data report]. Retrieved from <http://www.bls.gov/lau/>
- Cannata, M., McCrory, R., Sykes, G., Anagnostopoulos, D., & Frank, K. A. (2010). Exploring the influence of National Board Certified Teachers in their schools and beyond. *Educational Administration Quarterly* 46(4), 463-490.

- Clarksdale Municipal School District et. al v. State of Mississippi (Hinds County Chancery Court). July 17, 2015. Retrieved from <https://lawme.edu/judicial/case.php?id=1126345>
- Clarksdale Municipal School District, et. al v. State of Mississippi (Mississippi Supreme Court) October 19, 2017. Retrieved from <https://law.mc.edu/judicial/case.php?id=1126345>
- Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007). Teacher credentials and student achievement: Longitudinal analysis with student fixed effects. *Economics of Education Review, 26*, 673–682.
- Cowan, J., & Goldhaber, D. (2015). *National Board Certification: Evidence from Washington state*. CEDR Working Paper 2015-3. Seattle, WA: University of Washington.
- Cowan, J., & Goldhaber, D. (2018). Do bonuses affect teacher staffing and student achievement in high poverty schools? Evidence from an incentive for National Board Certified Teachers in Washington state. *Economics of Education Review, 65*(2018), 138-152.
- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Lincoln, NE: Pearson.
- Croninger, R. G., Rice, J. K., Rathbun, A., & Nishio, M. (2007). Teacher qualifications and early learning: Effects of certification, degree, and experience on first-grade student achievement. *Economics of Education Review, 26*, 312-324.
- Curry, D. L., Reeves, E., McIntyre, C. J., & Capps, M. (2018). Do teacher credentials matter? An examination of teacher quality. *Curriculum and Teaching Dialogue, 20*(1&2),

9-18.

Di Carlo, M. (2011). *What value-added research does and does not show* [Blog].

Retrieved from <http://www.shankerinstitute.org/blog/what-value-added-research-does-and-does-not-show>

Drane, W. (2017). *Assessment and Accountability Overview*. Retrieved from http://www.mde.k12.ms.us/docs/school-improvement-library/assessment-and-accountability-for-school-improvement-march-2017_20170306121812_147528_v1.pdf?sfvrsn=2

Dreher, A. (2015, November 11). The demise of Initiative 42. *Jackson Free Press*.

Retrieved from <http://www.jacksonfreepress.com/news/2015/nov/11/demise-initiative-42/>

Dreher, A. (2018, January 18). House votes to scrap MAEP, rewrite ed formula by 12 vote margin. *Jackson Free Press*. Retrieved from <http://www.jacksonfreepress.com/news/2018/jan/18/house-votes-scrap-maep-rewrite-ed-formula-12-vote/>

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed.). Boston, MA: Pearson Education, Inc.

Gates, J. E. (2017, October 19). State Supreme Court says there is no state mandate to fully fund K-12 education. *The Clarion Ledger*. Retrieved from <https://www.clarionledger.com/story/news/politics/2017/10/19/state-supreme-court-says-there-no-state-mandate-fully-fund-k-12-education/781165001/>

Goldhaber, D. D., & Brewer, D. J. (1998). When should we reward degrees for teachers?

Phi Delta Kappan, 10, 134-138.

Governing Data. (n.d.). *High school graduation rates by state* [Data report]. Retrieved from <http://www.governing.com/gov-data/high-school-graduation-rates-by-state.html>

Guo, Y., Connor, C. M., Yang, Y., Roehrig, A. D., & Morrison, F. J. (2012). The effects of teacher qualification, teacher self-efficacy, and classroom practices on fifth graders' literacy outcomes. *The Elementary School Journal*, 113(1), 1-22.

Harris, B. (2018, March 1). Senate Republicans break ranks to kill historic school funding overhaul. *The Clarion Ledger*. Retrieved from <https://www.clarionledger.com/story/news/politics/2018/03/01/historic-school-funding-overhaul-appears-dead-2018session/384637002/>

Hattie, J. A. (2003). Teachers make a difference, what is the research evidence? *Australian Council for Educational Research*. [Conference Paper]. Retrieved from https://research.acer.edu.au/cgi/viewcontent.cgi?article=1003&context=research_conference_2003

Hattie, J. A. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York, NY: Routledge.

Helding, K. A., & Fraser, B. J. (2013). Effectiveness of National Board Certified (NBC) teachers in terms of classroom environment, attitudes and achievement among secondary science students. *Learning Environments Research*, 16(1), 1-21.

Hinkle, D. E., Wiersma, W., & Jurs, S. G. (2003). *Applied statistics for the behavioral sciences* (5th ed.). Boston, MA: Houghton Mifflin Company.

Johnston, G. (2007). Minority representation and advanced degrees in k-12. *The Hispanic*

Outlook in Higher Education 17(13), 29-32.

- Jordan, H. R., Mendro, R. L., & Weerasinghe, D. (1997). *Teacher effects on longitudinal student achievement: A report on research in progress*. Retrieved from <http://www.dallasisd.org/cms/lib/TX01001475/Centricity/Shared/evalacct/research/article/s/Jordan-Teacher-Effects-on-Longitudinal-Student-Achievement-1997.pdf>
- Klein, A. (2015). *No Child Left Behind: An overview*. Education Week. Retrieved from <https://www.edweek.org/we/section/multimedia/no-child-left-behind-overview-definition-summary.html?override=web>
- Ladd, H. F., & Sorensen, L. C. (2015). *Do master's degrees matter? Advanced degrees, career paths, and the effectiveness of teachers*. National Center for Analysis of Longitudinal Data in Education Research [Working paper 136]. American Institutes for Research: Washington, D.C.
- Leard Statistics. (n.d.). *Three-way ANOVA in SPSS statistics: Assumptions I*. Retrieved from <https://statistics.laerd.com/premium/spss/owa/one-way-anova-in-spss-7.php>
- Leonard, E., & Box, J. (2010). *The impact of increased funding for the Mississippi Adequate Education Program (MAEP) on state assigned school accreditation levels* [Research paper]. Retrieved from <http://files.eric.ed.gov/fulltext/ED509171.pdf>
- Miller, R., & Rosa, M. (2012). The sheepskin effect and student achievement: De-emphasizing the role of master's degrees in teacher compensation. *Center for American Progress*. 1-13.
- Mississippi Academic Assessment Program (MAAP). (2017). *Technical report*. Retrieved from <https://drive.google.com/open?id=1V8tnXRv5DOcT17gwBby8Cd-r0s-h5IFw>

Mississippi Association of Educators. (n.d.a). *MAEP: Mississippi's public school funding formula* [Newsletter]. Retrieved from http://maetoday.org/what_we_do/maep/

Mississippi Association of Educators. (n.d.b). *State underfunding of Mississippi school districts* [Webpage]. Retrieved from <https://www.maetoday.org/index.php/SOS-Project/state-underfunding-of-mississippi-school-districts>

Mississippi Code of 1972 Annotated, § 37-19-7 (n.d.). Retrieved from https://advance.lexis.com/documentpage/?pdmfid=1000516&crld=5a047c40-4c1b-4dab-8086-10548edf82ab&action=pawlinkdoc&pdcomponentid=&pddocfullpath=%2Fshared%2Fdocument%2Fstatuteslegislation%2Furn#3AcontentItem%3A5PCF-DTMO-0035-R240-00008-00&pdtocnodeidentifier=AATAAQAAC&config=00JABhZDIzMTViZS04NjcxLTQ1MDItOTIiOS-3MDg-ZTQxYzU4ZTQKAFBvZENhdGFsb2f8inKxYiqNVSihJeNKR1Up&ecomp=_5vtkkk&prid=ade83eca-9c2f-4bd7-8c35-3b4e67268617

Mississippi Department of Education. (2014). *Mississippi Statewide Teacher Appraisal Rubric M-STAR process manual*. Retrieved from <http://www.mde.k12.ms.us/docs/teacher-center/revised-m-star-process-manual-july-2014.pdf?sfvrsn=2>

Mississippi Department of Education. (2018a). *2018 Accountability*. Retrieved from <https://www.mdek12.org/OPR/Reporting/>

Mississippi Department of Education. (2018b). *Enrollment*. Retrieved from <http://mdereports.mdek12.org/data/>

Mississippi Department of Education. (n.d.a). *Highly qualified teacher criteria: The No Child Left Behind Act of 2001* [Guidebook]. Retrieved from <http://www.mde.k12.ms.us/docs/educator-licensure/highly-qualified-definition-clarification-oe11.pdf>

Mississippi Department of Education. (n.d.b). *Mississippi Academic Assessment Program (MAAP)* [Webpage]. Retrieved from <http://www.mde.k12.ms.us/OSA/MAAP>

Mississippi Department of Education. (n.d.c). *Reaching professional excellence MSTAR* [Manual]. Retrieved from <http://www.mde.k12.ms.us/OEE/m-star>

Mississippi Department of Education. (n.d.d). *Educator Licensure Management System (ELMS)* [Webpage]. Retrieved from <https://elms.med.k12.ms.usPublic/PublicEducatorSearch.as>

M-STAR. (2014). *Mississippi statewide teacher appraisal rubric: Process manual* [Manual]. Retrieved from [https://www.nctq.org/dmsView/revised-m-star-process-manual-july-2014_\(1\)](https://www.nctq.org/dmsView/revised-m-star-process-manual-july-2014_(1))

National Assessment of Educational Progress. (2017). *The nation's report card: How did U.S. students perform on the most recent assessments?* Retrieved from <https://www.nationsreportcard.gov/>

National Board for Professional Teaching Standards. (2016). *New MS law provides incentive for National Board Certified Teachers: Encourages high quality teaching in needy areas.* Retrieved from <https://www.nbpts.org/newsroom/new-ms-law-provides-incentive-for-national-board-certified-teachers-encourages-high-quality-teaching-in-needy-areas/>

National Board for Professional Teaching Standards. (n.d.a). *Impact brief* [Webpage]. Retrieved from https://www.nbpts.org/wp-content/uploads/impact_brief_final.pdf

National Board for Professional Teaching Standards. (n.d.b). *In your state* [Interactive map]. Retrieved from <https://www.nbpts.org/in-your-state/>

National Board for Professional Teaching Standards. (n.d.c). *Compensation* [Chart].

- Retrieved from https://www.nbpts.org/wpcontent/uploads/state_incentive_chart.pdf
- National Board for Professional Teaching Standards. (n.d.d). *Research: Elevating teaching, empowering teachers* [Research brief]. Retrieved from <https://www.nbpts.org/research/>
- National Board for Professional Teaching Standards. (n.d.e). *2017 state rankings by percentages of National Board Certified Teachers* [Report]. Retrieved from https://www.nbpts.org/wp-content/uploads/2016_StateRankings_All_NBCTs_Percent-of-Teaching-Population.pdf
- National Board for Professional Teaching Standards. (n.d.f). *NBCT directory search*. Retrieved from <http://www.nbpts.org/nbct-search>
- National Center for Educational Statistics. (n.d.). *Summary of NAEP results for Mississippi*. Retrieved from <http://nces.ed.gov/nationsreportcard/states/>
- National Conference of State Legislatures. (2011). *Turning schools around with National Board Certification: April 2011* [Webpage]. Retrieved from <http://www.ncsl.org/research/education/turning-schools-around-with-national-board-certifi.aspx>
- National Education Association. (n.d.). *National Board Certification of Teachers* [Webpage]. Retrieved from <http://www.nea.org/home/31738.htm>
- Neild, R. C., Farley-Ripple, E. N., & Byrnes, V. (2009). The effect of teacher certification on middle grades achievement in an urban district. *Educational Policy*, 23(5), 732-760.
- No Child Left Behind. (n.d.). *Executive summary*. Retrieved from <http://www2.ed.gov/nclb/overview/intro/execsumm.pdf>
- Noss, A. (2014). *Household income: 2013. American community survey briefs*. United

- States Census Bureau. Retrieved from <https://www.census.gov/content/dam/Census/library/Publications/2014/acs/acsbr13-02.pdf>
- Okpala, C. O., James, I., & Hopson, L. (2009). The effectiveness of National Board Certified Teachers: Policy implications. *Journal of Instructional Psychology*, 36(1), 29-34.
- Paige, R. (2002). *No Child Left Behind: A desktop reference*. U.S. Department of Education. Retrieved from <https://www2.ed.gov/admins/lead/account/nclbreference/reference.pdf>
- Parent's Campaign. (n.d.a). *Mississippi Adequate Education Program* [Webpage]. Retrieved from http://www.msparentscampaign.org/educationfunding/index.php?option=com_content&view=article&id=34
- Parent's Campaign. (n.d.b). *Mississippi Adequate Education Program: History*. Retrieved from <http://www.msparentscampaign.org/education-funding/maep>
- Pettus, E. W. (2015, July 15). Judge: Mississippi not obligated to fully fund schools. *The Clarion Ledger*. Retrieved from <https://www.clarionledger.com/story/news/politics/2015/07/15/judge-mississippi-not-obligated-fully-fund-schools/30221369/>
- Professional Growth System. (2017). *Professional growth system: Teacher growth rubric. Observation and feedback guidebook*. Retrieved from http://www.mde.k12.ms.us/docs/cte/pgs-teacher-growth-rubric-guidebook-2017-2018_20171114.pdf?sfvrsn=2
- Rouse, W. A. (2008). National Board Certified Teachers are making a difference in student achievement: Myth or fact? *Leadership and Policy in Schools*, (7), 64-86.
- Rudestam, K. E., & Newton, R. R. (2015). *Surviving your dissertation: A comprehensive guide to content and process* (4th ed.). Thousand Oaks, CA: SAGE Publications,

Inc.

Sanders, W. L., & Rivers, J. C. (1996). *Cumulative and residual effects of teachers on future student academic achievement*. The University of Tennessee Value-Added Research and Assessment Center. Retrieved from <https://www.beteronderwijsnederland.nl/files/cumulative%20and%20residual%20effects%20of%20teachers.pdf>

Shuls, J. V., & Trivitt, J. R. (2015). Teacher qualifications and productivity in secondary schools. *Journal of School Choice*, 9(1), 49-70.

Strategic Data Project. (2012a). *Human capital diagnostic: Los Angeles Unified School District*. Retrieved from: <http://www.thesupportnetwork.net/HarvardReport.pdf>

Strategic Data Project. (2012b). *Learning about teacher effectiveness: SDP human capital diagnostic. Gwinnett County Public Schools, Georgia*. Retrieved from <https://sdp.cepr.harvard.edu/files/sdp/files/sdp-gcps-hc.pdf>

Stronge, J. H., Ward, T. J., & Grant, L. W. (2011). What makes good teachers good? A cross-case analysis of the connection between teacher effectiveness and student achievement. *Journal of Teacher Education*, 62(4), 339-355.

Stronge, J. H., Ward, T. J., Tucker, P. D., Hindman, J. L., McColsky, W., & Howard, B. (2007). National Board Certified Teachers and non-National Board Certified Teachers: Is there a difference in teacher effectiveness and student achievement? *Journal of Personnel Evaluation in Education*, 20(3), 185-210.

The National Strategic Planning & Analysis Research Center. (2017). *The impact of National Board Certified Teachers on the literacy outcomes of Mississippi kindergarteners and third graders* [Report]. Retrieved from https://www.nbpts.org/wp-content/uploads/NBCT_MS_Report.pdf

- The Nation's Report Card (2017). *State performance compared to the nation*. Retrieved from <https://www.nationsreportcard.gov/profiles/stateprofile?chort=1&sub=MAT&sj=&sfj=NP&st=MN&year=2015R3>
- United States Census Bureau. (2012). *2012 census of governments: Survey of school system finances*. Retrieved from https://www2.census.gov/govs/school/current_spending.pdf
- United States Census Bureau. (n.d.a). *Poverty: How the census bureau measures poverty*. Retrieved from <https://www.census.gov/hhes/www/poverty/about/overview/measure.html>
- United States Census Bureau. (n.d.b). *State facts for students*. Retrieved from <https://www.census.gov/schools/facts/mississippi.html>
- United States Department of Education. (2004). *Fact sheet: New No Child Left Behind flexibility - highly qualified teachers*. Retrieved from <http://www2.ed.gov/nclb/methods/teachers/hqtflexibility.pdf>
- United States Mint. (2010). *America's poor: A regional look at poverty* [Interactive map]. Retrieved from http://www.mint.com/blog/wp-content/uploads/2010/10/Mint_Poverty.swf
- Vandersall, K., Vruwink, M., & LaVenja, K. (2011). *Master's degrees and teacher effectiveness: New evidence from state assessments* [Research brief]. Arroyo Research Services. Retrieved from [http://hlc.waldenu.edu/Research_Study_\(Longitudinal\)_Masters_Degrees_and_Teacher_Effectiveness_Study_\(2012\).pdf](http://hlc.waldenu.edu/Research_Study_(Longitudinal)_Masters_Degrees_and_Teacher_Effectiveness_Study_(2012).pdf)
- Wayne, A. J., & Youngs, P. (2003). Teacher characteristics and student achievement gains: A review. *Review of Educational Research*, 73(1), 89-122.

- Wilemon, J. P. (2014). *Senate bill 2413: Teacher opportunity program*. Retrieved from <http://billstatus.ls.state.ms.us/documents/2014/html/SB/2400-2499/SB2413IN.htm>
- Wright, S. P., Horn, S. P., & Sanders, W. L. (1997). Teacher and classroom context effects on student achievement: Implications for teacher evaluation. *Journal of Personnel Evaluation in Education*, *11*(1), 57-67.
- Xu, Z., & Gulosino, C. A. (2006). How does teacher quality matter? The effect of teacher-parent partnership on early childhood performance in public and private schools. *Education Economics* *14*(3), p. 345-367.

APPENDIX

Research Consent Form

Dissertation Title:

Mississippi Teachers who are Nationally Board Certified or Those with Advanced Degrees:
Effects on Student Achievement

Investigator

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Overview:

You are being asked to take part in a research study which seeks to determine if teachers with National Board Certification and/or those with advanced degrees are contributing positively to student achievement considering our state legislators support healthy stipends for these advanced certifications.

Data Request:

Each participating Mississippi public school district will be asked to share data sets with the researcher from the 2017-18 administration of the MAAP Assessments in grades 3 through 8 in ELA and mathematics. The Questar score reports satisfy this request. The teacher name or educator identification number is important only for classification purposes. ***Student names are not necessary and are not requested.*** It is important that student reports are able to be linked to a specific teacher's credentials. Districts may take the liberty of coding their own data sets to maintain confidentiality. The researcher respects the decision of each district, yet acknowledges this to a time-consuming and labor-intensive process. The researcher is willing to code the information and understands they are held liable by the moral and ethical standards required by the university's internal review board.

Confidentiality:

The requested data sets provided to the researcher by Mississippi public school districts will be saved on a secure, password-protected laptop. Any hardcopy reports that may be shared will be kept in a locked filing cabinet. The records will be received, managed, coded, and protected solely by the researcher. This study seeks to draw conclusions about broad categories of teachers. The researcher ensures absolute confidentiality of the collected information. ***The conclusions of this study WILL NOT INCLUDE any identifiable information whatsoever including district, school, teacher, or student information.***

IRB Approval

This study has been reviewed by The University of Mississippi’s Institutional Review Board (IRB). The IRB has determined that this study fulfills the human research subject protections obligations required by state and federal law and University policies. If you have any questions or concerns regarding your rights as a research participant, please contact the IRB at (662) 915-7482 or irb@olemiss.edu.

Voluntary Participation:

Participation in this study is completely voluntary. The researcher appreciates the consideration of participation, yet ultimately respects the decision rendered by each district.

Contact:

Please contact the researcher via phone or email with the provided information should there be any question or need for clarification.

Researcher Agreement:

I, Amy Tate Barnett, verify the information stated above is true and that confidentiality agreements will be strictly adhered to and no identifiable information (district, school, teacher, or student) will be referenced in any fashion throughout any phases of the research project.

Signature: _____

Date: _____

Statement of Consent:

I have read the above information and hereby give consent for participation in this study. The district additionally agrees to provide the researcher with the requested data sets in order for the research query to be satisfied.

School District: _____

Official Title: _____

Printed Name: _____

Signature: _____

Date: _____

VITA

Amy Tate Barnett

Education

Ed.S. Educational Leadership	The University of Mississippi	2007
M.Ed. Curriculum & Instruction	The University of Mississippi	2003
B.A. Elementary Education	The University of Mississippi	2000

Professional Employment

Tupelo Public School District – Tupelo, MS

2017-Present	Principal	Pierce Street Elementary	Grades 3-5
2014-2017	Principal	Rankin Elementary	Grades 3-5
2009-2014	Assistant Principal	Pierce Street Elementary	Grades 3-5
2008-2009	Gifted Teacher	Carver Elementary	Grades 4 & 6
2002-2008	Elementary Teacher	Milam Elementary	Grade 4
2000-2002	Elementary Teacher	Lawhon Elementary	Grades 2 & 4
1997-2000	Assistant Teacher	Lawhon Elementary	Grades K & 1

Awards & Distinctions

2019	Mississippi Administrator of the Year Alternate
2019	Mississippi Administrator of the Year First Congressional District Winner
2018	Tupelo Public School District Administrator of the Year
2017	Mississippi Principal's Academy II
2009	Teacher of Distinction Nominee
2008	Awarded Grant for Famous Mississippians totaling nearly \$500
2005	Teacher of Distinction Nominee
2004	Awarded Grant for Accelerated Math Program exceeding \$10,000
2003	Teacher of Distinction Nominee
2000	Assistant Teacher of Distinction Winner
1997	AmeriCorps Scholarship Winner \$6,000