

WHAT IS THE RELATIONSHIP BETWEEN NATIONAL BOARD CERTIFICATION  
AND THE ACHIEVEMENT RESULTS OF THIRD GRADE STUDENTS IN A  
LOCAL CENTRAL FLORIDA SCHOOL DISTRICT?

by

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A dissertation submitted in partial fulfillment of the requirements  
for the degree of Doctor of Education  
in the Department of Educational Studies  
in the College of Education  
at the University of Central Florida  
Orlando, Florida

Spring Term  
2008

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## **ABSTRACT**

There has been much excitement over the National Board of Professional Teaching Standards; especially with regard to improving student achievement. Are Nationally Board Certified Teachers (NBCT) performing better than their non board certified counterparts? Does achieving National Board Certification mean that a teacher is “highly qualified?” What are the tangible effects on the achievement levels of students of Nationally Board Certified teachers?

Much research has been conducted in the past few years to try to answer these questions. Currently, the results of much of this research are ambiguous at best. Most studies report little in the way of significant impact on student achievement by NBCTs. However, many studies show teachers self-reporting a strong positive impact on their own teaching and their feelings of efficacy.

The state of Florida and the federal government have spent hundreds of millions of dollars over the past decade in pursuit of expanding the NBPTS as a means of ensuring highly qualified teachers for every student. This study aims to discover whether or not there is any definitive association between teachers who attain the national certification and higher student achievement on standardized tests specifically the Florida Comprehensive Assessment Test (FCAT) in a local central Florida school district.

The researcher attempted to determine if students assigned to classrooms of nationally board certified teachers outperformed students of comparable backgrounds that were assigned to classrooms of teachers that were not nationally certified. To accomplish this, the researcher looked at reading and math test scores of third grade students in

nationally board certified teachers' classrooms and compared them with those of students assigned to non-nationally board certified teachers to determine if the gains made by one group were statistically significantly different from the other.

Recommendations were made for further exploration of the link between NBCTs and student achievement.

This dissertation is dedicated to my wife Pamela, my two sons Michael and Jacob, my father Tony, my first mentor Jean Cross, and my good friend Jackie Flanigan.

My wife Pamela has supported me on this journey from the word go, and has never wavered in her support. Her simplistic solutions to what, at times, seemed like insurmountable obstacles always gave me fresh perspective.

My sons, Michael and Jacob, are probably not yet aware of the ways in which they had to sacrifice to help me get through these past few years, but I am grateful. They have had to endure many long nights with long commutes home late at night after very long days of school. They seemed to always look on these days and nights as adventures.

I also dedicate this dissertation to my father, Tony. Without his support and commitment, this journey could never have even begun. Were it not for his endless hours of babysitting and picking up and dropping off of kids I never would have been able to survive the logistics involved in successfully completing a doctoral program.

To Jean Cross, who probably thinks I forgot about her; I have not. You were my first mentor in education, and you had, and continue to have, a profound impact on the teacher that I am today. I thank you for all of your early encouragement when I was just getting my feet wet. I continue to think of you often.

I am deeply indebted to Jackie Flanigan (WTPA – FOAG), who first encouraged me to seek my doctorate after our first round of graduate school together. Without her endless commitment to ruthlessly push me in the end, and her dedication to reading and revising

every word that was put on paper, I would not have been able to finish. She has been a constant pillar of support and she is greatly appreciated.

## ACKNOWLEDGMENTS

Dr. Larry Holt, who willingly agreed to be my chair and spent a good deal of time and energy getting me through the IRB and dissertation processes. I am grateful for your time and efforts. I would also like to thank Dr. George Pawlas who, even though was not on my committee, never failed to give advice when sought or make recommendations when needed. Thank you for your valuable input.

I would also like to thank the members of my committee for their expertise, guidance, patience, and most of all feedback as I struggled and sometimes stalled during this long process: Drs. Jeff Kaplan, Randy Hewitt, Carolyn Walker-Hopp, and Chris Sagar thank you.

Finally, I would like to thank my many friends at UCF that I've had the great privilege to work with over many years now. Your subtle encouragement has meant the world to me and made this process possible.

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## **CHAPTER 1: INTRODUCTION**

On January 8, 2002, President Bush signed into law the No Child Left Behind (NCLB) Act of 2001, which reauthorized the Elementary and Secondary Education Act (ESEA) of 1965. This far reaching educational reform act has had an undeniable impact on educational reform throughout the United States. The stated purpose of NCLB was to provide every child with a fair, equal and significant opportunity to obtain a high quality education, and reach proficiency on challenging state academic achievement standards and assessments (NCLB, 2001). Title II of the NCLB legislation focused its attention on providing every child with a highly qualified teacher. It is this section of the NCLB legislation that much attention has been focused. Concurrently, the National Board of Professional Teaching Standards (NBPTS), born of the Nation at Risk report commissioned in the mid 1980's under then President Ronald Reagan, had been gaining recognition nationally for its focus of identifying highly qualified teachers for the purposes of rewarding and providing for a nationally recognized certification that would designate an individual as extremely competent.

The National Board of Professional Teaching Standards (NBPTS) is a non-profit, independent, non-partisan organization governed by a board of 64 members, most of whom are elementary and secondary school teachers, whose purpose is to identify highly qualified teachers by identifying the skills, knowledge and traits that they possess (Baratz-Snowden, 1990).

Nationally, numerous studies report findings of the positive impact of National Board Certified Teachers (NBCT) on student achievement measured through a wide variety of instruments (Minichello, 2004; Goldhaber & Brewer, 2000). Individual teachers as well report positive professional growth in addition to student progress (Linnen, 2001; Center for the future of teaching & learning, 2002 & National Board, 2001). In Florida, the CNA Corporation (CNAC) conducted research in Miami-Dade that found students of NBCTs achieved greater gains on testing (March 2005). Research is currently in progress from Florida State University focusing on student achievement and performance of Florida students of NBCTs, research that is focused on student gains and growth rates at the elementary level (Herrington, in progress).

### Theoretical construct

There exists a theoretical framework that serves to justify this focus on ascertaining exactly what constitutes a highly qualified teacher. It is this construct which served as the foundation for this study. Known as scientific curriculum making, this theoretical construct was articulated by Franklin Bobbitt and W.W. Charters in the early 1900's. Scientific curriculum making is rooted in scientific processes and methods. Scientific methods are a process of correcting or integrating new knowledge; information is gathered through observable, empirical, and measurable evidence. The scientific principle consisted of collecting data through observation and experimentation. Both Bobbitt and Charters held the belief that applied scientific principles could be applied to

curriculum making. This idea was not new. Frederick Taylor described them in *The Principles of Scientific Management* in 1911, and these principles had been applied with great success in business (Flinders and Thornton, 2004). Thus, scientific curriculum making was born. While Bobbitt approached scientific curriculum making by providing, “the professional educators in the twentieth century with the concepts and metaphors – indeed, the very language - that were needed to create an aura of technical expertise... Charters approached the problems of curriculum from the perspective of functional efficiency” (Kliebard, 1975, p. 28). In other words, Bobbitt provided the framework and Charters provided the mechanism. Charters believed that through careful analysis of the activities that a subject performed, regardless of the field of the activity, that a discrete set of skills could be distilled, and accordingly, a curriculum created to teach these skills. This idea remains consistently strong and evident today. “If anything is ingrained in curriculum thinking today, it is the notion that it is the job of curriculum planners to anticipate the exact skills, knowledge, and – to use today’s most fashionable term – ‘competencies’ that will stand one in good stead at an imagined point in the future. These predictions about what one will need in the future become the basis of curriculum planning” (Kliebard, 1975, p.30).

The thinking surrounding scientific curriculum making was brought to its inevitable conclusion in two clear examples in present day educational bureaucracy. First, this line of thinking leads predictably to the belief in a finite set of skills and knowledge to be learned over a stated period of time. The belief that one can critically

observe a group of school aged children and determine what skills and knowledge they require to be successful in future grades is derived from the ideals of scientific curriculum making. Authors such as E.D. Hirsh have written entire series of books reinforcing this belief. If this is the case, then a single summative assessment could be utilized, such as the Florida Comprehensive Assessment Test (FCAT), to determine if a child has mastered the predetermined skills and attained the knowledge necessary to perform successfully in future endeavors.

The second example of scientific curriculum making could be found in the creation of the National Board of Professional Teaching Standards (NBPTS). The goal of NBPTS was to identify highly effective teachers. They did not seek to create these teachers, rather to identify and eventually label them through certification. To accomplish this goal, the NBPTS developed a list of skills and competencies, outlined in five core principles, which highly effective teachers possess. The Board could then use this discreet list for the purpose of identifying those same skills and competencies in others for the purpose of deeming them highly qualified. The creation of the NBPTS for this purpose was a logical evolution of Charters' work in the area of scientific curriculum making. Underlying this example is the belief that you can identify, and ultimately quantify the skills and competencies of a master teacher and then develop a curriculum around the identified skills.



### Statement of purpose

The purpose of this study is to examine:

1. the relationship between student achievement in third grade students in a local Central Florida school district, and national board certified teachers - as measured by the reading and math portions of the Florida Comprehensive Assessment Test (FCAT).
2. the extent to which students of Nationally Board certified teachers in third grade differ in achievement on the reading and math portions of the FCAT, from students of non-Nationally Board certified teachers.

### Research questions

This study will add to the body of research linking national board certification and higher levels of student achievement on the FCAT.

The following questions will guide the research:

1. To what extent is there a relationship between National Board certification and the achievement results of third grade students in a local Central Florida School District on the reading and mathematics portions of the FCAT?
2. To what extent do third grade students of nationally board certified teachers perform differently than their counterparts taught by non-nationally board certified teachers on the reading and mathematics portions of the FCAT?

### Hypothesis

1. Board certification has a positive impact on the achievement results of third grade students on the reading and mathematics portions of the FCAT in this particular school district.

### Population

The population for this study included third grade students in a local Central Florida school district. This district, a primarily rural region with growing areas of urbanization, comprises the demographic configuration of the county in which the district resides. The students in this county are predominantly Hispanic (50.4%), and white/non-Hispanic (31.7%). Blacks make up the third largest population (10.2%) (School District of Osceola County, 2007).

### Timeline

The researcher contacted the Superintendent of the selected Central Florida school district to begin the process required to obtain and utilize student and teacher data for the purposes of this research. Once approval was secured from the Institutional Review Board (IRB) at UCF, the FCAT data was retrieved from the school district's Office of Statistics utilizing data from the spring administrations from the 2004 – 2005, 2005 – 2006 and the 2006 – 2007 school years. The data provided three consecutive years of FCAT reading and mathematics achievement levels, raw scores, scaled scores, teacher

assignments, socio-economic status (SES) in the form of free/reduced lunch, gender, and race for the third, fourth and fifth grade years of the students whose scores were utilized for this study. In addition to the student data that was collected, the researcher collected information on the core classroom teacher for each year for which student data was collected. Information included teacher status with regard to NBPTS certification, number of years of experience, gender, age of the teacher, and race. All data was entered into the Statistical Package for the Social Sciences (SPSS) and analyzed using various statistics to determine whether a relationship exists and to determine to what extent, if any, NBCT impact student achievement. Utilizing the data collected, the researcher examined to what extent, if any, student performance were impacted by NBCT.

#### Assumptions and limitations of the review

A review of literature on the impact of teachers holding certification from the NBPTS on student achievement in Florida entails the use of a variety of sources. The subject of NBPTS Certification for the nation's teachers has been the focus of much scrutiny, media hype and several studies since the National Board was founded in 1987. The federal *No Child Left Behind* (NCLB) *Act* also defined the relationship between improving student achievement and higher standards for qualifying classroom teachers (Ed.gov, 2001; Rotberg, Futrell and Lieberman, 1998). Additionally, the *Florida A+* program, in support of NCLB, has resulted in policy that requires Florida teachers to be "highly qualified." As a result, Florida teachers may seek NBPTS certification that

carries with it the additional incentive of merit pay through the Dale Hickam Excellent Teaching Program Act (Teaching Profession Committee, 2003; State Action-Florida, 2005).

It should be noted that the structure of this review involves the combining of National Board standards as they address federal and Florida policy (National Board, 2004) with standards from the Florida A+ program. It should also be understood that while this review focuses on the issue of student achievement, the reader must also be provided a review of the provisions of the NBPTS in addition to a review of the literature on teacher quality as it relates to student achievement. Moreover, an examination of the literature on educational quality in the state of Florida, as well as a review of the provisions of the measures of student achievement, including the FCAT, will be necessary to establish a relationship between NBPTS certification and student achievement in Florida.

For the purposes of this study, the review of pertinent literature will focus on the following:

- History of the National Board for Professional Teaching Standards and National Board Certification,
- Florida Comprehensive Assessment Test.
- National Board Certification in Florida,
- Highly qualified teachers and National Board Certification
- Impact of the NBPTS teacher certification on student achievement, and
- Educational quality in Florida.

Assumptions made during this study:

1. Nationally board certified teachers are more effective than their non-nationally certified counterparts.
2. Students of nationally board certified teachers achieve at higher rates than students on non-nationally board certified teachers.
3. Achieving National Board Certification implies a teacher is highly qualified.
4. Being highly qualified translates into being highly effective.

Significance of this study

The significance of this study is that it will add to the increasing body of literature examining the effectiveness of Board certified teachers at increasing the achievement results of their students in greater proportion than their non-certified counterparts.

“...[O]n the basis of extant research and a vision of exemplary teaching, the National Board for Professional Teaching Standards stipulated a definition of a superior teacher. The Board did this without empirical evidence to support their claim that teachers’ who meet the standards set by the Board were superior in promoting academic achievement to those who did not meet those standards” (Vandevoort, Amrein-Beardsley, & Berliner, 2004, p.1). In the years since the creation of the National Board, researchers have conducted studies to examine the link between Board certification and student achievement. To date, “only a few empirical studies have addressed this important issue” (p.1). In this study, the researcher compared the Florida Comprehensive Assessment Test

(FCAT) scores in reading and math for two groups of third grade students: those taught by a teacher with Board certification, and those taught by teachers without Board certification. These two groups consisted of 4 classrooms and approximately 80 third grade students in each group. The goal of this study was to provide empirical evidence of a connection, or lack of, between Board certification and student achievement for third grade students in this local central Florida school district.

## CHAPTER 2: REVIEW OF LITERATURE

### Purpose

The purpose of this study was to examine the extent to which Board certified teachers' students differed in performance on the reading and mathematics portions of the FCAT compared to students of teachers that were non-Board certified that had comparable backgrounds, gender, experience and degree. Further, to examine the relationship, if any, between nationally Board certified teachers and student achievement in third grade students in a local central Florida school district.

### National board of professional teaching standards

In 1986, three years after the publication of *A Nation at Risk*, the Carnegie Task Force on Teaching issued a responsive report entitled *A Nation Prepared: Teachers for the 21<sup>st</sup> Century*. The primary recommendation in this report was the initiation of a National Board for Professional Teaching Standards (NBPTS) (National Board, 2004). Co-sponsored by the American Federation of Teachers (AFT) and the National Education Association (NEA) (Goldberg, 2001), the NBPTS was organized with the mission to develop a voluntary certification system for experienced teachers. In 1987, the Board began the first of three major phases to their work; policy development. In 1989, after a year of work, the Board issued a policy statement, *Toward high and rigorous standards for the teaching profession* (NBPTS, 1989); this policy formed the foundation for credentialing standards for National Board Certification of teachers. The National Board

uses the word certification to refer to the process of conferring distinction upon those who meet their rigorous standards. This definition of certification is contrasted here with licensure; a process by which states regulate entry into the field of teaching (Baratz-Snowden, 1990). The policy position of the NPBTS is indicated in five core propositions:

- 1) teachers are committed to students and their learning;
- 2) teachers know the subjects they teach and how to teach those subjects to students;
- 3) teachers are responsible for managing and monitoring student learning;
- 4) teachers think systematically about their practice and learn from experience; and
- 5) teachers are members of learning communities

(National Board, 2004).

Phase two of the Board's work, research and development, began in the spring of 1990 with the issuance of three requests for proposals (RFPs). One RFP was for the support of an assessment development laboratory to develop the assessment instruments that would be used to evaluate candidates seeking certification in Early Adolescence/English Language arts. Another RFP was issued to develop instruments for the Early/Adolescence Generalist certification, and the third RFP sought proposals to support the four projects relating to the subject matter assessment (Baratz-Snowden, 1990).

The third, and final, phase of the Board's initial work began in 1993 with the implementation of the certification process. The NBPTS certification process targets the following five key areas: improved teaching skills, state-to-state mobility of teachers, improved teacher training, bringing admiration and respect to the profession of teaching,



and recognition of expert teachers (Chaika, 2000/updated 2004). The NBPTS and NBCT are recognized in all fifty states and in the District of Columbia (Chaika, 2000/updated 2004; National Board, 2004), and by 2004, the NBPTS had certified 40,200 teachers across the Nation (U.S. Classrooms Gain, 2005). The NBPTS plans to eventually offer as many as 30 different teaching certificates that take into consideration the varying developmental levels of the children being taught (Baratz-Snowden, 1990).

Certification by the NBPTS is both rigorous and expensive. Assessment is performance-based; teachers are expected to videotape classroom practice, and create a portfolio that reflects use of theory in classroom practice. In addition, teachers are tested at an assessment center through specific activities and written responses particular to content knowledge (Vandevoort, Amrein-Beardsley & Berliner, 2004). The success rate for participating teachers is low; the average success rate in the first three years of the NBPTS certification assessment was about 35%; in 1998, the rate increased to 45% (Rotberg, Futrell & Lieberman, 1998). By 2003, the rate was approximately 49% (Goldhaber & Anthony, 2004).

Scoring such performance-based assessment is expensive; therefore, the cost for the assessment is high, approximately \$2,300.00 per applicant (Vandevoort, Amrein-Beardsley & Berliner, 2004); however, many states offer reimbursement and scholarship programs as a means of incentive to achieve certification (Rotberg, Futrell, and Lieberman, 1998; State Action-Florida, 2005). According to the NBPTS website, legislation, through the Dale Hickam Excellent Teaching Program Act, increased funding

in 2004-2005 to \$67.7 million to pay up to 90% of the certification fee (NBPTS, 2006). The Florida legislature appropriated \$102 million dollars for the 2007 – 2008 school year to this fund. This figure was later revised to \$88 million in a special session (K. Hattaway, personal communication, January 14, 2008, 1024am).

In addition to cost for certification, the overall cost for the program is significant. The NBPTS is partially funded by the United States Department of Education. By 2003, \$300 million in federal funds had been spent in support of this program (Goldhaber, and Anthony, 2004b).

#### Educational quality in Florida

Yearly, Morgan Quitno, an independent private research and publishing company, lists results of the “Smartest State Award.” In 2004, Florida ranked 39/50 on the twenty-one factors used in the survey (Morgan Quitno Press, 2004). With diversity that includes a focus on tourism with international attractions such as Walt Disney World and Universal Studios, and high-tech industries such as Cape Canaveral/John F. Kennedy Space Center, Florida also became home to thousands of Cubans fleeing Castro, as well as a growing influx of immigrants from Europe and the Caribbean (FloridaSmart, 2005). Additionally, Florida’s diverse population includes both transient military families stationed around the state’s operational bases and “snowbirds;” retired people who winter in the state. The diversity of Florida’s population has had, and continues to have, a definite impact on education and educational quality in this state. Florida is also one of

the fastest growing states in the country (FloridaSmart, 2005), and this growth has a direct impact on the educational system. The transient nature of the population, the high number of students who speak English as a second language, or who speak no English at all (Stein, 2002) and the burgeoning population have all been linked to poor student performance in Florida schools.

Under the NCLB guidelines for assessing schools, “In 2003, no less than 75 percent of the elementary schools in Florida were designated as needing improvement” (West and Peterson, 2004).

#### Florida comprehensive assessment test

The pervasive nature of testing, not only in Florida, but across the nation, can be seen as a natural extension of the scientific curriculum making which spawned the belief that a finite set of skills and knowledge can, and therefore should, be determined, and subsequently tested.

As required under Title VI of the NCLB legislation titled Flexibility and Accountability (2007), and a general atmosphere for greater accountability sweeping the nation, many states, including Florida, began to require statewide assessment tests in order to determine student achievement. Initiated as a result of a recommendation by the Florida Educational Reform and Accountability Commission, the Florida Comprehensive Assessment Test (FCAT) is used to provide information regarding student achievement, inform parents of student progress, and identify critically low and high performing

schools. According to The Florida Department of Education, work began “on FCAT development in May 1996 and was assisted by classroom teachers, curriculum specialists, administrators, and citizens from across Florida. Through a contract with a test publishing company, the Florida Department of Education developed FCAT Reading and Mathematics and first administered the test to students in Grades 4, 5, 8, and 10 in 1998. The FCAT was expanded to include Grades 3 through 10 in 2001 and to include FCAT Science in 2003” (FLDOE, Unknown a, para. 1). First administered statewide in 1998, the FCAT replaced the two separate tests that were being used to determine students’ performance in the state; the State Student Assessment Test (SSAT) and the High School Competency Test (HSCT). All students in Grades 3-10 now take the FCAT Reading and Mathematics in the spring of each year. All students in Grades 4, 8, and 10 take FCAT Writing and FCAT Science is administered to all students in Grades 5, 8, and 10. The FCAT “is made up of two kinds of tests: a criterion-referenced test (CRT), which measures how well students are meeting the *Sunshine State Standards* in reading, writing, mathematics, and science, and a norm-referenced test (NRT), which allows educators and parents to compare Florida student performance on reading and mathematics with the performance of students nationwide” (FLDOE, Unknown b, para. 1). According to the Florida Department of Education, “each year, professional test item writers prepare drafts of new FCAT questions according to specifications prescribed by the Florida Department of Education. Committees of Florida classroom teachers and curriculum supervisors, working with Department staff, then review and revise each test item. In addition,

community representatives review all items for bias and issues of concern to communities (FLDOE, Unknown c, para. 1). Summary data for schools are reported for the 67 county school systems in Florida, the Florida School for the Deaf and Blind (district number 68), and the university laboratory schools (Florida Department, 2005). Although many schools and districts utilize additional standardized testing, both norm and criterion-referenced, the operational standard for determining student achievement and progress in the state of Florida is the FCAT. According to the Florida Department of Education,

“The FCAT is the only test administered statewide in Florida public schools that is directly linked to the Sunshine State Standards.

The FCAT was designed to represent the kinds of tasks and activities that parents and teachers expect as part of good instruction. This is accomplished by using types of information on the test that students encounter in their classes and outside of school.

The FCAT Reading, Mathematics, and Science tests require students to analyze, synthesize, and evaluate the information presented and to apply strategies or procedures they have learned. The level of thinking required of students goes beyond the recall of facts and literal comprehension required in many standardized tests. Similarly, FCAT Writing topics require students to apply their writing skills by drafting an original piece of writing in response to a real-world topic”

(FLDOE, Unknown d, para. 1).

The FCAT measures student performance on benchmarks in reading, writing, mathematics, and science as defined by the Sunshine State Standards. “The Sunshine State Standards were first approved by the State Board of Education in 1996 as a means of identifying academic expectations for student achievement in Florida. These original standards were written in seven subject areas and were divided into four separate grade

clusters (Pre-K-2, 3-5, 6-8, and 9-12). This format was chosen to provide flexibility to school districts in designing curriculum based on local needs” (FLDOE, 2006, para. 3).

The FCAT Reading tests contain passages (articles, stories, and poems) from books, magazines, and other publications. Students are expected to read and analyze the passages and answer questions based on the passages. The FCAT Writing assessment requires students to draft a written response to an assigned topic within a designated time period. The FCAT Mathematics tests require students to solve numerical problems taken from real-life situations. The FCAT Science tests require students to apply science knowledge and concepts to real-world situations (FLDOE, Unknown e).

The scoring or grading of the FCAT requires the use of electronic scoring for most grades and a combination of electronic scoring and “hand scoring” for grades with performance tasks. All of the answer documents that students complete are imaged, a process that involves scanning the answer document (FLDOE, Unknown f). An electronic picture of each page is taken, including students’ answers in their own handwriting. The scanning, imaging, and scoring is done by an outside contractor.

Students’ multiple-choice and gridded-response answers are scored using computer programs that read the students’ bubbled answers and score them based on an answer key. Qualified and trained scorers read and evaluate students’ answers to the performance tasks referred to as hand scoring. They use answer keys and rubrics established and validated by educators from throughout Florida (FLDOE, Unknown f).

The scores in Reading, Mathematics, and Science range from 100 to 500. In FCAT Writing, students receive a score from 1 to 6, with 6 being the highest possible score. The Reading and Mathematics scores are also reported as developmental scale scores that range from 0 – 3000. The developmental scale scores allow parents to track their child’s progress from year to year (FLDOE, Unknown f).

#### National board certification in Florida

Florida is an extremely complex school system as the fourth largest in the nation with 67 districts serving over 2 million students. They experience annual growth, in terms of new student enrollment, in excess of 40,000 students (CEPRI, 2003). The Council for Education Policy, Research and Improvement (CEPRI) (2003) also acknowledges the link between effective teachers and student achievement. Furthermore, they outlined three critical attributes effective teachers possess: strong verbal and cognitive skills, deep content knowledge, and experience. According to CEPRI (2003), “official state estimates show that more than 162,000 new instructional personnel will be needed in Florida between now and 2010” (p.2). The critical teacher shortage that nearly all states are experiencing has often been referred to as a teacher retention issue, not a teacher shortage issue. Nationally, statistics show that approximately one-third of all teachers leave the profession during their first 3 years of service. Inadequate salary is listed among the top 5 reasons for this loss (CEPRI, 2003). One initiative put forth by the state of Florida involves paying teachers bonuses up to 20% of the previous year’s

average teaching salary if they attain National Board Certification. Teachers could receive this bonus for the duration of their 10 year Board certification. Because a teacher may not attempt Board certification prior to completing 3 years of successful teaching experience, this initiative could be seen as an attempt by the State of Florida to stem the flow of young teachers leaving the profession citing inadequate salary chiefly among their concerns.

By 2004, 6,365 Florida teachers and school counselors had achieved NBPTS certification (Minichello, 2004). The same year, Florida ranked second nationally in the number of teachers achieving NBPTS certification (Minichello, 2004). This year, Florida certified more NBCTs than any other state with 1,675 (NBPTS, 2007). That represents more than 200 more certifications than the next highest state. It also means that 6.7% of the teaching force in Florida is now Board certified (2007). However, it must be stated that certification through the NBPTS does not eliminate state teacher certification or licensure for teachers seeking certification in Florida from outside the state (Florida Department, 2005).

Florida has invested considerable funds for this process aimed at raising teaching standards through external credentialing with an increase in funding to total \$102 million for 2007-2008. This number was subsequently reduced to \$88 million (K. Hathaway, Personal communication, January 14, 2008, 1024am). This funding allows a state system of merit pay associated with achievement of NBCT status; this pay increase for NBCT is significant, a 10% salary increase for the life of the certificate with an additional bonus of



10% for providing mentoring services for the equivalent of twelve work days per year to other teachers who are, or are not, National Board certified (NBPTS, 2007). The state also provides a \$150 incentive to help defray the cost of the National Board certification portfolio process (NBPTS, 2007). This large financial commitment by the state of Florida in an attempt to identify and retain highly qualified teachers is a direct result of trying to meet the NCLB mandates under Title II requiring all teachers to be highly qualified by the 2005 – 2006 school year.

#### “Highly qualified teachers” and national board certification

NCLB required that 100% of every state’s teachers be highly qualified by the 2005-2006 school year. This rapid schedule of implementation and limited financial resources posed, “a serious problem for building a profession of teaching, which must be marked by a coherent teacher development system of standards, assessments, and incentives” (Berry, 2002, p1). In addition to this rapid implementation schedule imposed by NCLB, Goldberg (2001) suggested that societal changes continue to transform the education and assessment of teachers and that of teacher performance. Policies established during the Clinton administration, including a call for smaller primary classes, and the current NCLB mandates, coupled with individual state initiatives, has resulted in a significantly increased demand for highly qualified teachers (Riley, 1998). The National Board of Professional Teaching Standards grew out of the growing belief that teachers are a key factor in improving student achievement (Vandevoort, Amrein-

Beardsley, & Berliner, 2004). Thus, the NBPTS was established to attempt to address this need for highly qualified teachers, as well as provide a catalyst for recognition of content knowledge and skill of practice (Goldhaber and Anthony, 2004). According to Vandevort, Amrein-Beardsley, and Berliner (2004), “contemporary research on teaching indicates that teachers are powerful contributors to students’ academic achievement, though the set and interrelationships of characteristics that make for high-quality and effective teaching have yet to be satisfactorily determined” (p. 1). According to Berry (2002), “as long as federal guidelines place a premium on defining teacher quality solely by measuring subject matter competence, we will continue to experience a flood of new teachers who may know their subjects, but don’t know much else about teaching and learning” (2). According to Goldhaber and Brewer (2000), very little evidence exists linking the effectiveness of teacher licensing and positive student outcomes. Only a few studies have explicitly analyzed the link between teacher licensing and student performance. “Hawk, Coble, and Swanson (1985) found that students taught by teachers certified in math outperform students taught by teachers certified in areas other than mathematics” (Goldhaber and Brewer, 2000, p130). Contrary to this finding, Rudner (1999) found that students that were homeschooled by at least one parent that was a licensed teacher did no better than students homeschooled by parents who held no teaching license. According to Ferguson (1998), in Texas, where teachers are required to pass state certification exams before gaining licensure, districts with higher overall averages on the teacher exams have higher overall student performance on exams in

mathematics. Goldhaber and Brewer (1999) find that, “students whose teachers have any kind of certification (standard, emergency, alternative, etc.) outperform students whose teachers have no certification or are certified in a different subject” (83). They also report that students whose teachers have emergency certification do no better or worse than students whose teachers hold standard teaching certification (Goldhaber and Brewer, 1999). According to Hanushek (1971), schools are looking at the wrong characteristics when hiring teachers. His research indicates that it is not necessarily the amount of experience that matters most, but the amount of time teachers spent disciplining students and the teacher’s verbal facility, which acts as a measure of communicative ability. Donald Cruickshank and Donald Haefele noted in an edition of *Educational Leadership* (February, 2001), that the accountability movement in the U.S. toward teachers began in the 1970s with an effort to identify specific competencies that teachers should possess. This thinking is derived directly from the idea of scientific curriculum making pioneered by W.W. Charters in the early 1900’s. Charters believed that through careful analysis of the activities that an expert performed, regardless of the field of the activity, that a discrete set of skills could be distilled and accordingly a curriculum created to teach these skills. The ultimate result of this line of thinking is the development of a test that would subsequently be utilized to ascertain whether or not a subject has mastered the required skills necessary to perform the indicated job, in this case, teaching. “Even the National Council for Accreditation of Teacher Education is moving toward assessing the competence – the knowledge and skills – of preservice teachers...” (Bradley, 1998).

There has been much debate over the definition of “highly qualified” since the introduction of NCLB in 2001. This focus on highly qualified teachers comes directly from the NCLB legislation so it would seem imperative that we look to NCLB for the definition of what highly qualified teacher means. According to NCLB, highly qualified means, “that a teacher is certified and has demonstrated proficiency in his subject matter” (Watson and Doue, November 2007, 51). To demonstrate proficiency in his / her subject matter, one only need pass a subject area test. Under the NCLB mandate, it is not required, or even necessary, for a highly qualified teacher to have had any training, or knowledge of, teaching methodology. Of the more than one hundred thousand new teachers that enter classrooms across the country every year, some enter with strong preparation while many others are wholly unprepared to meet the needs of the children they will teach or the challenges they will face. According to Linda Darling-Hammond and Joan Baratz-Snowden (2007), there are many reasons that so many teachers will end up in classrooms unprepared for what awaits them; “many people do not understand what successful teaching requires, and do not see teaching as a difficult job that requires rigorous training” (112). Why does this happen? “As a society we do not invest seriously in the lives of children, most especially poor children and children of color, who receive the least-prepared teachers” (111).

There is much literature on the effects of teacher traits on student achievement, however; many of these studies focused on teachers’ educational background, years of experience teaching, and even teacher salaries (Jacob and Lefgren, 2002). “The results of

this work are mixed,” according to Jacob (51). It is clear that certain teachers are better at increasing student gains than others, but what is less clear is what, if any, measurable characteristics can account for these gains (Jacob and Lefgren).

“School administrators, parents, and students themselves widely support the notion that teacher quality is vital to student achievement, despite inconsistent evidence linking achievement to observable teacher characteristics” (Rockoff, 2004, p. 247). However, according to Rockoff, “in an environment where many observable teacher characteristics are not related to teacher quality, policies that reward teachers based on credentials may be less effective than policies that reward teachers based on performance” (251). “These inconsistencies have driven many researches to conclude that while teacher quality may be important, differences in teacher quality are driven by traits that are “difficult or impossible to measure” (247). To help overcome this problem, researchers have begun to focus on using matched student-teacher data to organize the data into “fixed-effects.” Researchers can then assign importance to individuals, teachers, schools, etc.

#### Impact of the NBPTS certification on student achievement

Research continues to provide evidence that it is the quality of the classroom teacher that is the most significant factor in predicting student outcomes (Goldhaber, 2002). However, according to the 1996 report, *What Matters Most: Teaching and America's Future*, twenty-three percent of all secondary teachers lack degree expertise in

their teaching field, expertise that would require a minimum of a minor in the specified content area (Hopkins, 1998). This represents a degree of significance as research indicates a positive relationship between student outcomes and teacher performance on measures of proficiency, such as licensure and content area testing (Greenwald, Hedges & Laine, 1996).

Conversely, research has yet to produce consensus over which teacher characteristics are associated with students' learning gains (Goldhaber & Anthony, 2004), and the attributes typically used for certification, selection and assessment (i.e., degrees and experience levels) are not strongly correlated with student learning gains (Goldhaber & Anthony, 2004; Goldhaber and Brewer, 2000). In spite of the importance of teacher in-service and training in most school districts, there is amazingly little evidence on the effect of this training on student achievement (Jacob and Lefgren, 2002). According to Dr. Dan Goldhaber of the University of Washington, "...teachers clearly matter, but teacher *quality* is not strongly related to observed *teacher credentials*" (Goldhaber & Anthony, 2004). Criticism of the NBPTS certification process includes the reality that certification standards are measured internally by standards set by the NBPTS. "The NBPTS maintains that only those teachers who have proven their ability to enhance student learning earn Board certification status" (Vandevoort, Amrein-Beardsley, & Berliner, 2004). The expectation, then is that students of Board certified teachers perform better than their counterparts taught by non-Board certified teachers (2004). One key area of concern is a lack of quantitative research on NBPTS certification and student

achievement measured by external validity measures (Goldhaber & Anthony, 2004) such as standardized state assessment instruments (Bond, Jaegar, & Hattie, 2001; Ballou & Podgursky, 1998). However, Vandevort, Amrein-Beardsley, and Berliner (2004) suggest that we do not need student data to conclude that a teacher is highly qualified. They liken it to doctors that achieve board certification status, in that their patients are not looked at to determine if a doctor is highly qualified. The implication is that a board certified doctor, or in this case teacher, is likely to achieve better results than those that are not board certified (2004). Regardless, in a research report published in 2001, the NBPTS reported that 70% of survey respondents believed that certification had a positive impact on students' "engagement, achievement and motivation" (National Board, 2001), and nationally, individual teachers report positive growth for themselves as professionals and on student progress (Linnen, 2001; Center for the, 2002). Linda Jacobson (March, 2004) noted in a study that research showed that end of the year test scores improved an average of 7 percent more for students who were taught by nationally certified teachers when compared to teachers who failed to earn the certification. It is important to note that this increase was on end of the year tests, and not nationally normed standardized assessments. Hanushek (1992) estimated that a highly qualified teacher could produce as much as a full years difference in learning gains compared to a lesser-qualified teacher. In Florida, the CNA Corporation conducted research in Miami-Dade that found students of NBCT achieved greater gains on testing (March 2005). Jacobson and the CNA Corporation were not the only ones to note that teachers make a difference. Contrary to

what used to be the popular notion that students of poor, low educated parents couldn't perform as well as students with more affluent, educated parents, research by Sanders and Rivers (1996) shows strong evidence of the impact that teachers have on students. "A paper prepared for the National Bureau of Economic Research put it this way: 'The results show large differences among schools in their impact on student achievement. These differences are centered on the differential impact of teachers, rather than on the overall school organization, leadership, or even financial condition'" (Hanushek, Kain, & Rivkin, 1998, p3).



### **CHAPTER 3: METHODOLOGY**

The purpose of this study was to examine the extent to which students assigned to classrooms taught by teachers that were nationally board certified differed on the reading and math portions of the FCAT from those students assigned to classrooms with teachers that were not nationally board certified. Two questions were addressed in this research:

1. To what extent is there a relationship between National Board certification and the achievement results of elementary grade students in a local Central Florida School District on the reading and mathematics portions of the FCAT?
2. To what extent do third grade students of nationally board certified teachers perform differently than their counterparts taught by non-nationally board certified teachers on the reading and mathematics portions of the FCAT?

#### Participants and site selection

The participants in this study were collected from a local central Florida school district. The data consisted of scaled scores, raw scores and achievement levels for FCAT reading and math for students in third grade.

This particular school district was chosen due to its size and relative ease with regard to obtaining scores through the district. This district was also representative of the three other local school districts with regard to the percentages of NBCTs employed and general demographic composition of their student populations.

The four Board certified teachers were chosen because they were the only four Board certified teachers that had full-time contact with students in a general education

classroom setting for the entire year. The four non-Board certified teachers were chosen based on their selection variables to provide the closest match to their Board certified counterparts. The selection process first looked for a teacher in the same school, then grade level taught, years of experience, highest degree earned, gender, and finally race were used to select teachers for comparison.

#### Rationale for utilizing the independent t-test

The independent-samples  $t$  test assesses whether the means of two groups are statistically different from each other. This analysis is appropriate whenever you want to compare the means of two groups. The two groups in this study are the scores of students of Board certified teachers, and the scores for those students that are not Board certified. The two variables utilized to conduct the independent-samples  $t$  test are scaled scores, a continuous dependent variable, and NBCT, a categorical independent variable. This categorical independent variable was created to distinguish between those teachers that are Board certified and those that are not Board certified. Those teachers that are Board certified were coded with a one (1) to identify them, while those teachers that were not Board certified were coded with a blank. The independent samples  $t$ -test was used as a preliminary analysis. It is important to bear in mind, however, that the  $t$ -test does not take into account any potential confounders which might also have an effect on scores, such as students' SES, ethnicity, etc. In order to take these effects into account, a multivariate analysis was needed.

### Rational for utilizing hierarchical linear modeling

Hierarchical Linear Modeling (HLM) was used in order to determine the association between teacher certification and students' grades after controlling for the following variables:

- student gender,
- student ethnicity,
- student SES, and
- teacher's number of years of teaching experience

HLM is the preferred analysis because the aforementioned variables (as well as teacher certification) are measured at different levels: gender, ethnicity and SES are measured at the student-level; while certification and experience are measured at the teacher-level. HLM takes into account the fact that there are correlated error terms between students who have the same teacher. For example, if a teacher is "unusually good," then this would positively affect the scores of all his or her students. Given that there is a potential correlation between students with the same teacher, HLM is needed. Moreover, HLM is fairly standard in educational research when analyzing the effects of teacher characteristics on student-level variables, as in this case.

### Data selection

Once the data were collected, it was entered into the Statistical Package for the Social Sciences (SPSS). It was then sorted based on the categorical variable, NBCT\_Status. This allowed the researcher to identify those teachers that were Board certified. The data were then sorted on a second level to include students. This organized the data by those students that were taught by a Board certified teacher. Once this sorting procedure was completed, it became evident that there were only four teachers in the county with Board certification that were teaching full-time in a classroom with students. This determination was made by identifying those students that had both reading and math scaled scores for a single grade level, and had the same teacher identified as their classroom teacher. Those students that had different teachers indicated for math and/or reading, for the same grade level were excluded from the analysis. Once this process was complete, the researcher was able to identify eighty (80) students taught by four Board certified teachers in three different schools.

Once these four Board certified teachers were identified, the researcher was able to access demographic data concerning these teachers. These data included age, gender, step (used as an indicator of years of teaching experience), degree, and race. The researcher then conducted a nested sort of the data base in the following order: school, teacher, step, degree, gender, age, and race. This sorted the database according to school first, allowing the researcher to select four, non-Board certified teachers that most closely resembled the demographics of the four Board certified teachers.

### Data analysis

As a preliminary analysis, an independent-samples  $t$  test was conducted to compare the scale scores for in reading and mathematics for students of NBCTs and non-NBCTs. The independent-samples  $t$  test assesses whether the means of two groups are statistically different from each other. This analysis is appropriate whenever there is a need to compare the means of two groups. The two variables utilized to conduct the independent-samples  $t$  test were scaled scores, a continuous dependent variable, and NBCT, a categorical independent variable. This test determined whether there was a statistically significant difference in the mean scores for the two groups. In other words, does the mean scaled score differ significantly for NBCTs and non-NBCTs?

### Problems acknowledged

This first noticeable problem occurred once the data were collected and compiled. The researcher was aware of approximately 120 NBCTs in the selected county where the research was being conducted. As it turned out, there were only four (4) NBCTs that actually continued to work full time in a general education classroom with full contact with students throughout the school day. This occurred in 2004 -2005 school year. The second problem occurred when the researcher noticed that there was only one student in the collection of data that had been taught by a NBCT for two consecutive years. These two problems combined to require a shift in focus. No longer was the researcher able to

conduct analysis to determine if there was a cumulative effect on student achievement as a result of being taught by a NBCT for more than one consecutive year. The final problem that arose with the data was the number of students taught full time by NBCTs. Of the more than 30,000 students for whom information was collected, the researcher could only identify 80 students that were with NBCTs for full time instruction. While many other students had contact with NBCTs, they were not with this teacher full time. Most often these students were with a NBCT as part of a pull out program where they presumably received remediation in either reading or mathematics.

The shift in focus for this research allowed the researcher to identify four Board certified teachers along with the schools in which they taught. Thus, the researcher was required to isolate four additional teachers that did not hold National Board Certification who were teaching in the same three schools as the identified NBCTs. The selection of non-Board certified teachers then required the researcher to examine teachers on the basis of grade taught, experience, degree, gender and race. Upon further isolation of the variables, it became clear that not all variables would be used to select the four non-Board certified teachers. In two of the four selection cases, simply selecting a teacher at the same school location and teaching the same grade level as the Board certified teacher was all that could be accomplished due to the limited number of teachers for the third grade at that particular location. Once the data were sorted enough to determine which teachers met the required criteria, the selection of the four non-Board certified teachers

was made. At this point the researcher was able to perform various analyses to compare the two groups of students.

## CHAPTER 4: DATA ANALYSIS

### Purpose

The purpose of this study was to examine the extent to which Board certified teachers' students differed in performance on the reading and mathematics portions of the FCAT compared to students of teachers that were not-Board certified that had comparable backgrounds, gender, experience, and degree. Further, to examine the relationship, if any, between nationally board certified teachers and student achievement in third grade students in a local central Florida school district.

The following questions guided this study:

1. To what extent is there a relationship between National Board certification and the achievement results of third grade students in a local Central Florida School District on the reading and mathematics portions of the FCAT?
2. To what extent do third grade students of nationally board certified teachers perform differently than their counterparts taught by non-nationally board certified teachers on the reading and mathematics portions of the FCAT?

The hypothesis for this study was: board certification has a positive impact on the achievement results of third grade students on the reading and mathematics portions of the FCAT in the specified school district.



### Descriptive statistics

The sample consisted of 162 individuals, distributed along eight different classrooms. The following table presents the frequencies for the demographic variables related to students' gender, SES and ethnicity:

**Table 4.1: Frequency Distribution for Gender, SES and Ethnicity (N = 162)**

Variable	N	Percentage
<i>Gender</i>		
Female	88	54.32%
Male	74	45.68%
<i>SES</i>		
Didn't Apply	100	61.73%
Eligible <b>FREE</b>	49	30.25%
Eligible <b>REDUCED</b>	13	8.02%
<i>Ethnicity</i>		
Asian	5	3.09%
Black	7	4.32%
Hispanic	53	32.72%
Indian	1	0.62%
Multi-racial	5	3.09%
White	91	56.17%

As can be gleaned from table 4.1, the majority of students were females (54.032%). Moreover, the majority of students were White (56.17%), followed by Hispanic (32.72%). Furthermore, the majority of students had not applied for free/reduced lunch programs (61.73%). These percentages are not in-line with those of the district at large which reports the following populations: females (49%), Hispanic (50%), and White (32%) which can be seen in table 4.9.

The following table presents the demographic variables associated with the teachers utilized in this study:

**Table 4.2: Demographic variables for teachers in study**

<b>teacher</b>	<b>school site</b>	<b>grade</b>	<b>experience</b>	<b>gender</b>	<b>race</b>	<b>age</b>
<b>1</b>	271	3rd	15	F	W	39
<b>1.1</b>	271	3rd	8	F	W	62
<b>2</b>	271	3rd	14	F	W	39
<b>2.1</b>	271	3rd	5	F	W	46
<b>3</b>	932	3rd	17	F	W	40
<b>3.1</b>	932	3rd	2	F	W	34
<b>4</b>	811	3rd	14	F	W	44
<b>4.1</b>	811	3rd	13	F	W	38

Table 4.2 highlights which school site each teacher was working at, as well as the grade taught, years of experience, gender, race and age. The teacher numbers 1, 2, 3, and 4 are the nationally board certified teachers that were utilized during this study. The teacher numbers 1.1, 2.1, 3.1, and 4.1 were the non board certified counterparts used for analysis in this study. The teacher pairs were as follows: teacher 1 and teacher 1.1; teacher 2 and teacher 2.1; teacher 3 and teacher 3.1; and teacher 4 and teacher 4.1. You

will notice in the table that each non board certified teacher matches their board certified counterpart in terms of school site, grade taught, gender and race. The only two variables that were not an exact match were age and experience.

The following table presents descriptive statistics on the Reading and Math scores of these students in 3<sup>rd</sup> and 4<sup>th</sup> grade:

**Table 4.3: Descriptive statistics for reading and math scores**

	Minimum	Maximum	Mean	Std. Deviation
Math (3rd Grade)	173	437	317.16	56.621
Math (4th Grade)	100	441	310.07	54.112
Reading (3rd Grade)	100	500	315.42	64.578
Reading (4th Grade)	100	433	314.80	58.237

As can be seen in table 4.3, the range of scores for 3<sup>rd</sup> grade math was from 173 to 437 with a mean score of 317.16 and a standard deviation of 56.621. The range in scores for 4<sup>th</sup> grade math scores was from 100 to 441, with a mean score of 310.07 and a standard deviation of 54.112. The range in scores for 3<sup>rd</sup> grade reading was from 100 to 500, with a mean score of 315.42 and a standard deviation of 64.578. Finally, the range in scores for 4<sup>th</sup> grade reading was 100 to 433, with a mean score of 314.80 and a standard deviation of 58.237. These scores represent the 8 classrooms that were utilized for the purposes of this study.

These students were distributed in eight classrooms with eight different teachers. Half of these teachers held National Board certification, while the other half did not hold

this certification. The number of years of teaching experience of these teachers ranged from 2 through 17, with a mean of 11 years ( $SD = 5.34$ ). Board certified teachers had an average experience of 15 years while non-Board certified teachers had an average experience of 7 years.

#### Relationship between certification and Reading and Math scores

In order to determine whether there was a relationship between National Board certification and the achievement results of elementary grade students in a local Central Florida School District on the reading and mathematics portions of the FCAT, independent samples  $t$  tests were performed as a preliminary analysis. Mean Reading and Math scores in 3<sup>rd</sup> and 4<sup>th</sup> grade were compared between the group of students who had teachers with Board certification and the group of students who had teachers without Board certification. Results of these tests are presented in the following table:

**Table 4.4: T-tests for Reading and Math scores between students with Board certified and non-Board certified teachers**

	NBCT_Status	Mean	Std. Deviation	T statistic	P value
Math (3rd Grade)	NOT NBCT	307.73	51.332	2.159	.032*
	NBCT	326.84	60.377		
Math (4th grade)	NOT NBCT	306.00	49.461	0.949	.344
	NBCT	314.31	58.595		
Reading (3rd grade)	NOT NBCT	310.23	57.414	1.028	.305
	NBCT	320.73	71.158		
Reading (4th grade)	NOT NBCT	311.88	51.069	0.631	.529
	NBCT	317.84	65.072		

*\*Results are statistically significant*

As can be gleaned from table 4.4, although the sample means were generally higher for students with Board certified teachers, there were significant differences only for Math scores in 3<sup>rd</sup> grade ( $p = 0.032$ ). In that case, the mean 3<sup>rd</sup> grade Math score for students with Board certified teachers ( $M = 326.84$ ,  $SD = 60.377$ ) was significantly higher than that of students with non-Board certified teachers ( $M = 307.73$ ,  $SD = 51.332$ ). However, no other significant differences were found.

This would suggest that Board certification was significantly associated to Math scores in 3<sup>rd</sup> grade, but not to any of the other measured scores. It is important to bear in mind, however, that the  $t$  test does not take into account any potential confounders which might also have an effect on scores, such as students' SES, ethnicity, etc. In order to take

these effects into account, a multivariate analysis is needed. This is presented in the following section.

#### Multivariate analysis for the relationship between certification and reading and math scores

Hierarchical Linear Modeling (HLM) was used in order to determine the association between Board certification and students' grades after controlling for the following variables:

- student gender,
- student ethnicity,
- student SES, and
- teacher's number of years of teaching experience.

HLM was the preferred analysis because the aforementioned variables (as well as Board certification) were measured at different levels: gender, ethnicity and SES are measured at the student-level; while Board certification and experience were measured at the teacher-level. HLM takes into account the fact that there are correlated error terms between students who have the same teacher. For example, if a teacher is "unusually good," then this would positively affect the scores of all his or her students. Given that there is a potential correlation between students with the same teacher, HLM is needed. Moreover, HLM is fairly standard in educational research when analyzing the effects of

teacher characteristics on student-level variables, as in this case. Results of HLM are interpreted in such a way as to correctly take into account the fact that there are correlated error terms among groups of students.

Results of the HLM are presented in the following tables. One HLM was performed for each of the four scores. The independent variables included in each of these analyses were: teacher Board certification status, number of years of teacher experience, student gender, student ethnicity and SES. The ethnicity variable was re-coded into White, Hispanic, or Other, given the small sample size of many of the groups. Similarly, SES was re-coded as Didn't Apply or Eligible (which included students eligible for free or for reduced lunch).

**Table 4.5: Results of HLM on 3<sup>rd</sup> Grade Math**

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	285.561005	24.659628	53	11.580	.000
<i>SES</i>	<i>32.343073</i>	<i>9.325833</i>	<i>153</i>	<i>3.468</i>	<i>.001*</i>
<i>Ethnicity = White</i>	<i>29.247395</i>	<i>14.058726</i>	<i>53</i>	<i>2.080</i>	<i>.039*</i>
Ethnicity = Hispanic	5.498516	14.023425	53	.392	.696
Gender	3.140829	8.322725	53	.377	.706
Certification Status	-11.733567	14.500594	53	-.809	.420
Teacher Experience	-.186229	1.457348	53	-.128	.898

*\*Results statistically significant*

The results for the HLM on 3<sup>rd</sup> grade math indicate there were two statistically significant outcomes. There is a statistically significant relationship between NBCT\_Status and SES ( $t = 3.5, p < .01$ ), and between NBCT\_Status and ethnicity\_white ( $t = 2.1, p < .05$ ).

**Table 4.6: Results of HLM on 4th Grade Math**

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	283.385425	24.234980	146	11.693	.000
SES	37.412930	9.250098	146	4.045	.000*
Ethnicity = White	11.044396	13.771728	146	.802	.424
Ethnicity = Hispanic	-4.901988	13.923011	146	-.352	.725
Gender	-1.669849	8.308803	146	-.201	.841
Certification Status	.022274	14.239614	146.000	.002	.999
Teacher Experience	-.032277	1.444529	146.000	-.022	.982

*\*Results statistically significant*

The results of the HLM on 4<sup>th</sup> grade math indicate there was only one statistically significant outcome. There is a statistically significant relationship between NBCT\_Status and SES ( $t = 4.05, p < .01$ ).



**Table 4.7: Results of HLM on 3<sup>rd</sup> Grade Reading**

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Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	301.220470	28.869232	153	10.434	.000
SES	33.249200	10.917830	153	3.045	.003*
Ethnicity = White	29.301721	16.458668	153	1.780	.077
Ethnicity = Hispanic	1.773923	16.417341	153	.108	.914
Gender	-18.364298	9.743484	153	-1.885	.061
Certification Status	-8.029068	16.975967	153	-.473	.637
Teacher Experience	-.824024	1.706130	153	-.483	.630

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*\*Results statistically significant*

The results of the HLM on 3<sup>rd</sup> grade reading indicate there was only one statistically significant outcome. There is a statistically significant relationship between NBCT\_Status and SES ( $t = 3.05$ ,  $p < .01$ ).

**Table 4.8: Results of HLM on 4<sup>th</sup> Grade Reading**

Parameter	Estimate	Std. Error	df	t	Sig.
Intercept	254.867072	25.712687	146	9.912	.000
<i>SES</i>	<i>33.016081</i>	<i>9.814115</i>	<i>146</i>	<i>3.364</i>	<i>.001*</i>
<i>Ethnicity = White</i>	<i>35.205542</i>	<i>14.611448</i>	<i>146</i>	<i>2.409</i>	<i>.017*</i>
Ethnicity = Hispanic	15.208540	14.771955	146	1.030	.305
<i>Gender</i>	<i>-19.084489</i>	<i>8.815426</i>	<i>146</i>	<i>-2.165</i>	<i>.032*</i>
Certification Status	15.814403	15.107863	146	1.047	.297
Teacher Experience	1.539460	1.532608	146	1.004	.317

*\*Statistically significant result*

The results for the HLM on 4<sup>th</sup> grade math indicate there were three statistically significant outcomes. There is a statistically significant relationship between NBCT\_Status and SES ( $t = 3.4, p < .01$ ); between NBCT\_Status and ethnicity\_white ( $t = 2.4, p < .05$ ); and between NBCT\_Status and Gender ( $t = 2.2, p < .05$ ).

As can be gleaned from these results, Board certification was not significantly associated with any of the four measured scores. Therefore, these results do not support the hypothesis that Board certification had a positive effect on Reading and Math scores at 3<sup>rd</sup> or 4<sup>th</sup> grades.

The only variable that was consistently found to be significantly related to scores was SES. In particular, students who did not apply for free/reduced lunch programs

tended to have higher scores in 3<sup>rd</sup> grade Math ( $b = 32.34, p = 0.001$ ), 4<sup>th</sup> grade Math ( $b = 37.41, p < 0.001$ ), 3<sup>rd</sup> grade Reading ( $b = 33.24, p = 0.003$ ) and 4<sup>th</sup> grade Reading ( $b = 33.01, p = 0.001$ ).

Ethnicity was significant in two of the cases: White students had significantly higher scores than students with Other ethnicity in 3<sup>rd</sup> grade Math ( $b = 29.24, p = 0.039$ ) and 4<sup>th</sup> grade Reading ( $b = 35.20, p = 0.017$ ). Furthermore, a correlational analysis identifies a negative correlation between white students and Board certified teachers. This negative correlation indicates that white students are more likely to be assigned to Board certified teachers. Finally, female students tended to do worse on 4<sup>th</sup> grade Reading than male students ( $b = -19.08, p = 0.032$ ). No other significant results were found.

As can be seen in table 4.9, the percentages with regard to ethnicity of the students in this study were atypical within this particular school district.

**Table 4.9: Racial profile of selected schools**

School	Ttl Enrl.	M/F	Wh	Hisp.	Black	Multiracial
271	973	54%/46%	65%	24%	2.60%	7%
811	1,066	53%/47%	39.20%	41.30%	10%	6.50%
711	1,227	50%/50%	74%	15%	3%	4%
<b>COUNTY TOTALS</b>	<b>53,531</b>	<b>51%/49%</b>	<b>32%</b>	<b>50%</b>	<b>10%</b>	<b>5%</b>

The participating county at large reports a student population of 51% males to 49% females, 32% white, 50% Hispanic, 10% black, and 5 % multiracial. The selected schools for this study were as follows: school #271 reports a student population of 54% males to 46% female, 65% white, 24% Hispanic, 2.6% black, and 7% multiracial; school #811 reports a student population of 53% males to 47% females, 39% white, 41% Hispanic, 10% black, and 6.5% multiracial; school #711 reports a student population of 50% males to 50% females, 74% white, 15% Hispanic, 3% black, and 4% multiracial.

### Research question 1

To what extent is there a relationship between National Board certification and the achievement results of third grade students in a local Central Florida School District on the reading and mathematics portions of the FCAT?

### Summary

Results obtained from this data analysis do not support the hypothesis that Board certification is related to achievement results of third grade students in this particular school district. Independent *t*-test results showed that Board certification was associated with higher scores only in 3<sup>rd</sup> grade Math ( $t = 2.159, p < .05$ ). However, when potential confounders (such as teacher's years of experience and student's demographics) were introduced into the model, no significant effects of Board certification were observed. Tables 4.10, 4.11 and 4.12 illustrate these differences.

**Table 4.10: Mean scores for 3rd grade math and reading**

	Minimum	Maximum	Mean	Std. Deviation
Math (3rd Grade)	173	437	317.16	56.621
Reading (3rd Grade)	100	500	315.42	64.578

Table 4.10 shows that mean scores for 3<sup>rd</sup> grade math were 317.16 with a standard deviation of 56.621 while mean scores for 3<sup>rd</sup> grade reading were 315.42 with a standard deviation of 64.578.

**Table 4.11: Mean 3rd grade reading & math scores for NBCTs**

School Site	N	3rd_read_scale		3rd_math_scale		NBCT_Status
		Mean	SD	Mean	SD	
271 Teacher1	20	321.65	81.055	326.65	58.643	YES
271 Teacher2	20	338.65	83.322	339.3	63.357	YES
932 Teacher3	17	326.53	40.68	322.59	41.569	YES
811 Teacher4	18	311.39	59.509	322.00	72.857	YES

Table 4.11 presents mean scores and standard deviations for reading and math for the four NBCTs utilized in this study. The range of mean 3<sup>rd</sup> grade reading scores for this group of Board certified teachers was from 311.39 to 338.65. The range of mean 3<sup>rd</sup> grade math scores for this same group of teachers was from 322.00 to 339.30.

**Table 4.12: Mean 3rd grade reading & math scores for Non-NBCTs**

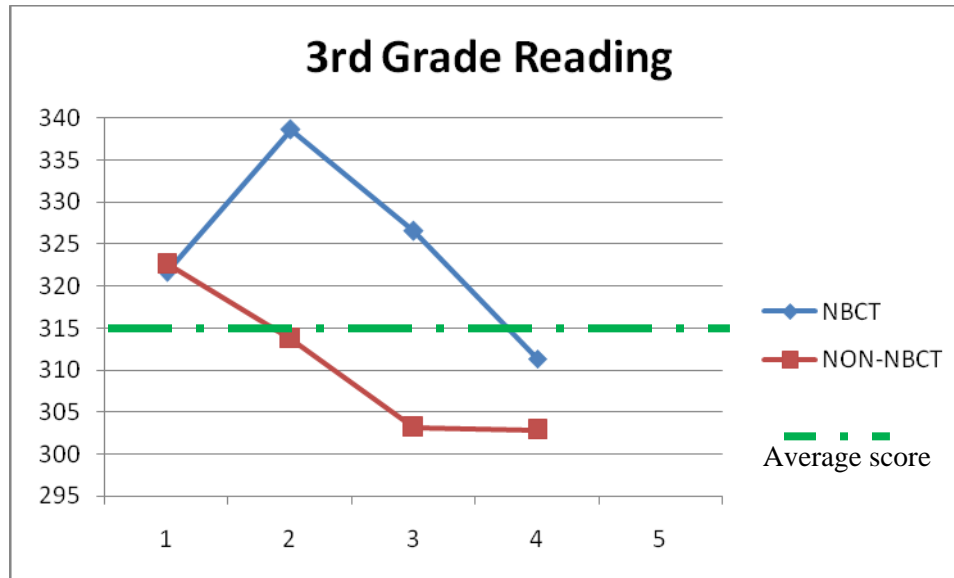
School Site	N	3rd_read_scale		3rd_math_scale		NBCT_Status	
		Mean	SD	Mean	SD		
271	Teacher1.1	21	322.62	47.901	316.76	50.642	NO
271	Teacher2.1	18	313.72	68.875	319.56	51.813	NO
932	Teacher3.1	17	303.18	43.989	281.41	56.413	NO
811	Teacher4.1	20	302.9	69.605	310	48.029	NO

Table 4.12 presents mean scores and standard deviations for reading and math for the four non-Board certified teachers utilized in this study. The range of mean 3<sup>rd</sup> grade reading scores for this group of non-Board certified teachers was from 302.90 to 322.62. The range of mean 3<sup>rd</sup> grade math scores for this same group of teachers was from 281.41 to 319.56.

Research question 2

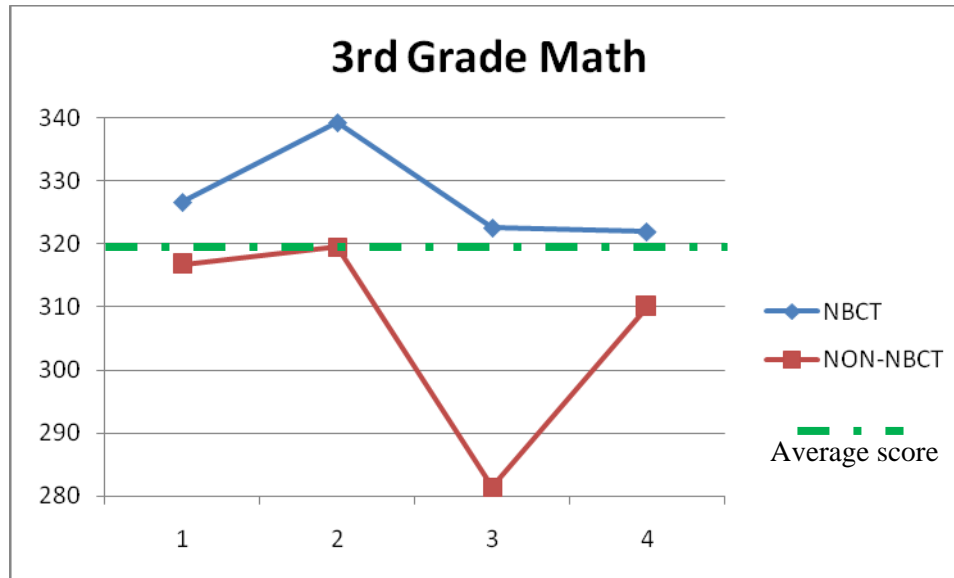
To what extent do third grade students of nationally board certified teachers perform differently than their counterparts taught by non-nationally board certified teachers on the reading and mathematics portions of the FCAT?

Figures 4.1 and 4.2 illustrate the relationship of the mean 3<sup>rd</sup> grade math and reading scores of Board certified and non-Board certified teachers.



**Figure 4.1: 3rd grade mean reading scores**

Figure 4.1 is a graphic representation of the mean reading scores for the eight participating classrooms in this study. The green line represents the mean score for 3<sup>rd</sup> grade reading for the entire group of students. The blue line represents the four mean reading scores for the Board certified teachers, while the red line represents the four mean reading scores for the non-Board certified teachers. While it may appear from this figure that the Board certified teachers outperformed their non-Board counterparts, there was no statistical significance once other factors including SES, gender, ethnicity, and experience were taken into account.



**Figure 4.2: 3rd grade mean math score**

Figure 4.2 is a graphic representation of the mean math scores for the eight participating classrooms in this study. The green line represents the mean score for 3<sup>rd</sup> grade math for the entire group of students. The blue line represents the four mean math scores for the Board certified teachers, while the red line represents the four mean math scores for the non-Board certified teachers. While it may appear from this figure that the Board certified teachers outperformed their non-Board counterparts, there was no statistical significance once other factors including SES, gender, ethnicity, and experience were taken into account.



### Summary

Results obtained from this data analysis do not support the hypothesis that Board certification has a positive effect on students' test scores. Independent *t*-test results showed that Board certification was associated with higher scores in 3<sup>rd</sup> grade Math. However, when potential confounders (such as teacher's years of experience and student's demographics) were introduced into the model, no significant effects of Board certification were observed.

SES and ethnicity were two variables that consistently impacted 3<sup>rd</sup> grade student performance in both reading and math.

## **CHAPTER 5: CONCLUSIONS, DISCUSSION, AND RECOMMENDATIONS**

### Purpose

The purpose of this study was to examine the extent to which Board certification affected the performance of third grade students on the reading and mathematics portions of the FCAT. Further, to examine the relationship, if any, between nationally Board certified teachers and student achievement in third grade students in a local central Florida school district.

The following questions guided this study:

1. To what extent is there a relationship between National Board certification and the achievement results of third grade students in a local Central Florida School District on the reading and mathematics portions of the FCAT?
2. To what extent do third grade students of nationally board certified teachers perform differently than their counterparts taught by non-nationally board certified teachers on the reading and mathematics portions of the FCAT?

The hypothesis for this study was: board certification has a positive impact on the achievement results of third grade students on the reading and mathematics portions of the FCAT in the specified school district.

### Conclusions

According to the analyses that were conducted utilizing the data obtained from the participating school district, I conclude that Nationally Board Certified teachers do not

have a significant impact on their students' achievement results in reading or math as indicated on the Florida Comprehensive Assessment Test (FCAT). Furthermore, the analyses indicated that several other factors, including SES, ethnicity, and gender play a greater role in determining how third grade students will perform on the FCAT.

Results obtained from this data analysis do not support the hypothesis that Board certification had a positive effect on students' test scores. While independent *t*-test results showed that Board certification was associated with higher scores in 3<sup>rd</sup> grade math, once potential confounders (i.e., teacher's years of experience and student demographics) were introduced into the model, no significant effects of teacher certification were observed.

### Discussion

It is worth noting the schools that were selected for this study were atypical regarding racial / ethnic breakdowns within the selected district. The district at large represents nearly 70% minorities while the three schools selected for this study ranged from a low of 22% (school site #711) to a high of 56% (school site #811) minority students.

Also worth noting are the mean scores for each group. Mean math score of 317.16 and a mean reading score of 315.42 for all third graders in the sample. However, with only one exception, the NBCTs in the study had mean reading scores above the 3<sup>rd</sup>

grade average while the non-Board certified teachers, with one exception, had mean reading scores below the 3<sup>rd</sup> grade average. Nevertheless, the only difference that was statistically significant in the preliminary analysis was that of 3<sup>rd</sup> grade math in the Board certified teacher's classroom.

Once the final data set were collected and organized, it became clear that years of teaching experience of the non\_Board certified teachers needed to be addressed. In two of the cases selected, the non-Board certified teachers had considerably less teaching experience than their Board certified counterparts.

As presented in chapter 4, while students of NBCTs had higher overall mean scores than students of non-NBCTs, once confounders, including the teachers' years of experience was accounted for these differences were not statistically significant.

The one variable that did consistently affect student scores significantly was the SES variable. In particular, students who did not apply for free/reduced lunch tended to have higher scores in 3<sup>rd</sup> grade math ( $b=32.34$ ,  $p=.0001$ ) and 3<sup>rd</sup> grade reading ( $b=33.24$ ,  $p=.003$ ). Ethnicity was significant in only one of the cases that was examined: White students had significantly higher scores than students with Other ethnicity in 3<sup>rd</sup> grade math ( $b=29.24$ ,  $p=.039$ ).

These findings lead to several questions that must be asked if such large amounts of money are to continue to be spent in support of NBPTS.

- If there are not substantial data to support the premise that NBCTs are any better at improving student gains than their non-board certified counterparts, then why should

states, Florida in particular, continue to spend significant amounts of money to support their use in public school classrooms?

- Regardless of student gains, if the premise that the NBPTS is effective at identifying highly qualified teachers, why are those teachers more likely to be found in classrooms whose students are primarily white, even within a district that is predominantly comprised of hispanic and black students?
- If the focus of NCLB is to provide every child with a highly qualified teacher, why are not the neediest students in this central Florida school district getting those teachers? The state is paying for these teachers to earn certification. In addition the state pays them as much as 20% of their yearly salary in bonuses each year for having this certification and mentoring other teachers.

Based on the findings in this study, it may be prudent to investigate other uses for this money. It may prove wise to spend these funds on programs specifically targeted at raising student achievement for the neediest students; specifically, prekindergarten programs, before school and after school tutoring programs, and fully funding the reduced class size amendment to the Florida Constitution. The immediacy of several of these questions is punctuated by an article in the Orlando Sentinel on Sunday, April 6, 2008, citing that this school district will need to cut \$11 million dollars from next year's budget. In the face of such daunting budget constraints and a seemingly ineffective national certification with regard to improving student achievement, it would be prudent to reexamine budget allocations.

While NBPTS is certainly garnering backing at the national level, as evidenced by its increase in financial support over the past ten years, there doesn't appear to any real evidence that these funds are being spent in support of the NCLB mandates requiring a highly qualified teacher for every student. Other states, including Georgia and North Carolina, have begun to address the issue of improving student achievement by only paying additional funds for NBCTs who teach high needs and/or high risks students. This attempt to put the most highly qualified teachers with the students that need them the most would demonstrate a concerted effort to ethically meet the tenants of NCLB. This practice is also support by the research. The one group that has been shown to be most impacted by working with a NBCT is high need students.

In this study, the only variable that national board certification was able to adequately predict was the race of the students in the classrooms of the nationally board certified teacher. In this particular case, that race was white. This occurred in a county where 60% of the student population is either hispanic or black. This brings into serious question the use of NBCTs within this district.

The theoretical construct which underpins this study, scientific curriculum making, suggests that one can identify the traits and qualities that make teachers highly qualified, and presumably effective, and teach those traits to others so that they too may become highly qualified and effective. There are two problems related to the use of scientific curriculum making that became manifest as a result of this study. First of all, if we are going to use scientific curriculum making to measure both teacher quality and student

achievement, then the use of NBCTs falls woefully short of the mark on 2 levels. NBCTs are not certified utilizing a single exam. They are required to complete multiple exams involving multiple scenarios, as well as complete a portfolio documenting specific competencies. Also, based on the results of this study; they do not produce the gains in student achievement that one would expect to see. Secondly, if NBCTs are highly qualified based on the depth of their assessment, then why are students not assessed in a like manner? To assess students we offer a single, summative assessment. Students are not offered the opportunity to demonstrate their knowledge and competencies through multiple modes. This dichotomy demonstrates the split in thinking within the educational community.

### Recommendations

While this study was forced to deal with a small representative sample size, it would be worthwhile to conduct a similar study in a larger district which would provide for a much larger sample size.

Another line of inquiry with regard to NBCTs, would be to examine their use within the district. At the time of this study, the participating school district boasts 120 Nationally Board Certified teachers within its ranks. However, upon closer examination, there are very few that had full time contact with students in general education classrooms. Based on the number of students and the courses they saw them for, the majority of the NBCTs in the participating school district were being utilized in varying

capacities from resource teachers to coaches. It will be important to examine the utilization of NBCTs within the district to determine if they are in fact being utilized to provide every student with a highly qualified teacher, and if so, in what capacity they are providing said service. An objective examination of their use within the district is necessary.

Further, because some of the student demographics were providing statistically significant results, these data should be examined more closely. For example, in these analyses, SES and ethnicity provided for statistically significant differences in student scores among the four variables. However, a closer examination of the effects of gender on these differences should be conducted to determine the role gender plays in influencing a student's success.

Additionally, because two-thirds of the schools utilized in this study were predominantly white while the county at large is predominantly Hispanic, further examination of the role of ethnicity is warranted. In other words, while ethnicity played a key role in this particular analysis, when the schools were overwhelmingly white, would it still play such a significant role in schools that are predominantly Hispanic?

Many of these questions can be elucidated through a more detailed, thorough analysis on a larger scale. These insights may prove valuable when allocating resources and structuring District boundaries in the future. Looking at this same study in a larger county with a larger number of Board certified teachers teaching full-time in general education classrooms would make for an analysis that is more easily generalized to a



larger population. Of particular interest will be how minority populations fare in relation to non-minority students when controlling for confounders such as teacher experience and student socio-economic status, especially given that in this smaller sample size ethnicity was negatively correlated with Board certification. This negative correlation demonstrates that white students were more likely to be associated with Board certified teachers. This goes to the heart of whether or not highly qualified teachers are being utilized effectively for the benefit of all students, which is one of the major tenants of the No Child Left Behind Act of 2001, and the impetus behind the National Board of Professional Teaching Standards.

**APPENDIX A: IRB APPROVAL LETTER**



University of Central Florida Institutional Review Board  
Office of Research & Commercialization  
12201 Research Parkway, Suite 501  
Orlando, Florida 32826-3246  
Telephone: 407-823-2901, 407-882-2901 or 407-882-2276  
[www.research.ucf.edu/compliance/irb.html](http://www.research.ucf.edu/compliance/irb.html)

### Notice of Expedited Initial Review and Approval

From : **UCF Institutional Review Board**  
**FWA00000351, Exp. 5/07/10, IRB00001138**

To : **Thomas Vitale**

Date : **December 06, 2007**

IRB Number: **SBE-07-05182**

Study Title: **WHAT IS THE RELATIONSHIP BETWEEN NATIONAL BOARD CERTIFICATION AND THE ACHIEVEMENT RESULTS OF STUDENTS?**

Dear Researcher:

Your research protocol noted above was approved by **expedited** review by the UCF IRB Chair on 11/26/2007. **The expiration date is 11/25/2008.** Your study was determined to be minimal risk for human subjects and expeditable per federal regulations, 45 CFR 46.110. The category for which this study qualifies as expeditable research is as follows:

5. Research involving materials (data, documents, records, or specimens) that have been collected or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

All data, which may include signed consent form documents, must be retained in a locked file cabinet for a minimum of three years (six if HIPAA applies) past the completion of this research. Any links to the identification of participants should be maintained on a password-protected computer if electronic information is used. Additional requirements may be imposed by your funding agency, your department, or other entities. Access to data is limited to authorized individuals listed as key study personnel.

To continue this research beyond the expiration date, a Continuing Review Form must be submitted 2 – 4 weeks prior to the expiration date. Advise the IRB if you receive a subpoena for the release of this information, or if a breach of confidentiality occurs. Also report any unanticipated problems or serious adverse events (within 5 working days). Do not make changes to the protocol methodology or consent form before obtaining IRB approval. Changes can be submitted for IRB review using the Addendum/Modification Request Form. An Addendum/Modification Request Form **cannot** be used to extend the approval period of a study. All forms may be completed and submitted online at <http://iris.research.ucf.edu>.

**Failure to provide a continuing review report could lead to study suspension, a loss of funding and/or publication possibilities, or reporting of noncompliance to sponsors or funding agencies.** The IRB maintains the authority under 45 CFR 46.110(e) to observe or have a third party observe the consent process and the research.

Please note: Any complaints regarding this research project are to be forwarded directly to Ms. Angela S. Marino, Director of Research, Evaluation, and Accountability, The School District of Osceola County.

On behalf of Tracy Dietz, Ph.D., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 12/06/2007 08:54:36 AM EST

IRB Coordinator

**APPENDIX B: REQUEST FOR USE OF DATA**

June 18, 2007

Blain Muse  
Superintendent

Osceola County Schools  
817 Bill Beck Blvd.  
Kissimmee, Florida 34744

Dear Mr. Muse:

My colleague, Jackie Flanigan, and I are currently doctoral candidates at the University of Central Florida. As part of our dissertation requirements, we have chosen to examine the relationship between Nationally Board certified teachers and student achievement.

To complete our studies we will need access to data that Osceola County routinely gathers regarding student FCAT scores and teacher's years of experience and NBPTS certification status. We understand Osceola County's need for discretion and confidentiality with regard to these data and assure you that any and all information gathered is solely for the purpose of research and we will maintain the strictest levels of confidentiality with regard to such information.

The data we specifically require are: elementary students and their previous two years of FCAT scores (specifically reading and mathematics scores), the teachers to which they were assigned, the numbers of years of experience for the teacher, whether or not the teacher holds NBPTS certification, the name of the school the student attended, gender of NBCT's, race of NBCT's, grade level NBCT's teach, subject(s) taught by NBCT's and schools where NBCT's are currently assigned.

We will both be more than happy to make our findings available to you and any of your subordinates in a timely manner, and would like to thank you in advance for your cooperation.

Sincerely,

Thomas Vitale, M.Ed.  
**Doctoral Candidate**  
**University of Central Florida**

Jacqueline Flanigan, M.Ed.  
**Doctoral Candidate**  
**University of Central Florida**

**APPENDIX C: PERMISSION TO OBTAIN DATA FROM SCHOOL DISTRICT**



The School District of Osceola County, Florida

**BLAINE A. MUSE – SUPERINTENDENT**

817 BILL BECK BOULEVARD • KISSIMMEE, FLORIDA 34744-4495  
PHONE: 407-870-4600 • FAX: 407-870-4010 • [www.osceola.k12.fl.us](http://www.osceola.k12.fl.us)

July 20, 2007

Mr. Thomas Vitale, E.Ed.  
6594 CR 532  
Davenport, FL 33896

Dear Mr. Vitale:

This letter is to inform you that we have received your request to conduct research in our School District. Based on the description of the research you intend to conduct, I am pleased to inform you that you may proceed with your work as you have outlined.

I will remind you that all information obtained for the purpose of your research must be dealt with in complete confidentiality. At no time is it acceptable to release any student or staff identifiable information.

I wish you the best of luck in your future endeavors. If I can be further assistance, please do not hesitate to contact me.

Sincerely,

Angela Marino  
Director  
Research Evaluation & Accountability

**SCHOOL BOARD MEMBERS**

THOMAS E. CHALIFOUX, JR.  
DISTRICT NO. 2-KISSIMMEE  
PHONE: 407-646-0977

TOM GREER  
DISTRICT NO. 4-KISSIMMEE  
PHONE: 407-892-8200

JOHN MCKAY  
DISTRICT NO. 5-ST. CLOUD  
PHONE: 407-957-4056

DAVID STONE  
DISTRICT NO. 3-KISSIMMEE  
PHONE: 407-933-2700

Board Meets First Tuesday of Each Month  
DISTRICT-WIDE ACCREDITATION BY THE SOUTHERN ASSOCIATION OF COLLEGES AND SCHOOLS  
An Equal Opportunity Agency

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