TEACHER READING CERTIFICATION EFFECTS ON ELEMENTARY READING OUTCOMES: AN EXPLORATORY MULTILEVEL STUDY OF TEACHER PREPARATION

By

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To Eric, Emily, E.J., and Greta

For all that you are, individually and together. I love you!

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LIST OF DEFINITIONS

ENGLISH LANGUAGE LEARNER	Student enrolled in an ESOL (English for Speakers of Other Languages) program.
EXCEPTIONAL STUDENT	Individual who receives specified instructional interventions as indicated on an Individual Education Plan (IEP) due to a documented disability.
FREE/REDUCED LUNCH	Indicates that a student's family income falls below 185% of the federal poverty guidelines, indicating low family income (U.S. Department of Agriculture, 2011)
NAEP	National Assessment of Education Process
NCLB	No Child Left Behind Act of 2001
NICHD	National Institute of Health and Human Development
NRP	National Reading Panel

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This multilevel study investigated effects of teacher reading certification on elementary student reading outcomes. Two reading certifications, “Reading Endorsement” and “Reading K-12”, both of which require specific training in reading instruction, were analyzed. The research questions were “Do teacher certifications in reading predict the scores and sub-scores of elementary students?” and “Does reading endorsement certification predict the reading scores and sub-scores of elementary students?” The “Reading K-12” certification could not be analyzed separately due to the small number of such teachers in the dataset.

Hierarchical linear modeling was used to analyze de-identified student scores and teacher certification data. The study was designed with student variables situated in Level One, and teacher certification data in Level Two. Student variables analyzed were sex, grade level, disability status, and free/reduced lunch status. Data representing race/ethnicity and English Language Learner status could not be analyzed due to small sample sizes of those variables. Composite test scores, as well as several sub-scores, were analyzed.

No significant effects of teacher reading certification were found in the composite scores, or in the sub-scores, of the reading certification analysis. However, significant effects were found in four sub-scores in the reading endorsement analysis. In three of those scores, the means were higher for students in the non-reading endorsed classes. Chapter 5 offers possible explanations for these findings.

Other findings included a small number of reading certified teachers in the dataset used in the study, as well as a significantly larger number of students with disabilities assigned to classes of teachers holding reading certifications. Additionally, an interaction effect was observed in which students with disabilities in reading-certified classes scored significantly lower than their counterparts in non-reading certified classes. However, the small sample size of that particular demographic, and lack of knowledge regarding the nature of each child's disability must be noted regarding this finding.

The findings raised questions regarding the assignment of students to classes, especially in light of increasing teacher accountability, as well as on the competencies included in reading certifications. The study also illuminated complexities inherent in the study of teacher effectiveness.

CHAPTER 1
INTRODUCTION

Learning to read may be the single most critical component of an individual's entire education. Reading has been described as the "fundamental skill on which all formal education depends", and the teaching of reading has been called "the most fundamental responsibility of schools" (Moats, 1999, p. 5, 7). Additionally, the detrimental effects of low reading achievement on schools and communities, as well as on the lives of individuals, have been well documented (Moats, 1999; National Institute of Child Health and Human Development, 2000). The International Reading Association (IRA, 2008/2009) asserted that "all children are entitled to be taught by high-quality teachers who are prepared to provide effective reading and writing instruction…" (p. 1).

In spite of the importance of reading competency, many students at all levels of the K-12 system lack the skills necessary to achieve required literacy levels. According to the National Assessment of Education Process (NAEP), a large percentage of students read at below basic levels. Nationally, 33% of fourth grade students were reading at below basic level in 2009. In the same year, 25% and 26% of eighth and twelfth graders respectively scored below the basic level. In 2009, at all of the aforementioned grade levels, only about a third of students scored in the proficient range in reading (National Center for Education Statistics, n.d.). Ornstein (2010) noted that one third of high school graduates read below a 9th grade level. Additionally, Moats (2005) wrote that fully 25% of the adult population in our country is functionally illiterate.

Scores on the NAEP examination are significantly lower for members of specific population groups. For example, among fourth graders in 2009, students who qualified for free and reduced rate lunch scored 26 points lower on the NAEP than students who

did not qualify. Students with learning disabilities scored 34 points lower than students without disabilities. Students classified as lacking English proficiency scored 36 points lower than their English-proficient peers. The scores of male students averaged six points lower than those of females. Differences in outcomes of the NAEP were also found among children of different races. Asian/Pacific Islanders scored the highest with an average of 235 points. White students followed, with an average score of 230. Black and Hispanic students both averaged 205 points, and the average score for Native Americans was 204 (National Center for Education Statistics, n.d.).

However, despite these discouraging numbers, reading failure can, in many cases, be prevented or remedied through the use of scientifically research-based instructional methods (Moats, 1999; Snow, Burns, & Griffen, 1998). Moats (1999) contended that with access to instruction featuring research-based methods, 95% of students can be taught to read at levels indicated by their listening comprehension and reasoning levels. The National Reading Panel Report, a seminal meta-analysis of research on reading instruction from the National Institute of Child Health and Human Development (NICHD, 2000), delineated research-based literacy instructional methods in five components of reading (comprehension, vocabulary, fluency, phonics, and phonemic awareness). In the area of reading comprehension, for example, summarization and student question generation, as well as the use of graphic organizers and story structures to understand the meaning of text, were found to be effective research-based strategies. In the years since the release of the report, continuing research has built on the findings of the National Reading Panel, thus creating a plethora of research-based strategies.

This issue of reading failure has become even more pressing in light of the *No Child Left Behind Act* (2001) that calls for 100% of students to reach grade level reading proficiency by the year 2014. In 2012, new legislation loosened some of these restrictions on states which had submitted approved alternate accountability plans. However, these revisions do not signal the end of the accountability movement; they are merely a change (Hu, 2012).

Recent increases in accountability have also begun to reach the colleges of teacher education which have traditionally prepared the majority of teachers in the United States since reading failure is increasingly being attributed to teacher training (U.S. Department of Education, 2009d; Walsh, Glaser, & Wilcox, 2006). The new federal “Race to the Top” legislation calls for an accountability link between student achievement, defined as test scores on state assessments, and the teacher preparation programs attended by their teachers (U.S. Department of Education, 2009d). Currently, twelve states (District of Columbia, Delaware, Florida, Georgia, Hawaii, Massachusetts, Maryland, North Carolina, New York, Ohio, Rhode Island, and Tennessee) have been awarded federal grants for their implementation of initiatives which “use student achievement as an outcome indicator for teacher education programs” (Crowe, 2011, p.11) Furthermore, five of those states (District of Columbia, Massachusetts, Maryland, New York, and Rhode Island) have created plans to “use the results to hold the programs accountable” (Crowe, p. 11). The American Association of Colleges for Teacher Education (2011) has also called for accountability measures to tie teacher preparation programs to student learning outcomes of graduates.

The need for effective literacy education has also become more pronounced than ever due to the demands of today's post-industrial global society in which many manual occupations have disappeared (Barone & Morrell, 2007; Snow et al., 1998). Additionally, today's general education teachers are accountable for effectively teaching increasingly socio-culturally and linguistically diverse students. As members of the American Association of Colleges for Teacher Education reported to the U.S. Congress, "All new teachers must be prepared to implement high-impact instruction designed to realize attainment of demanding objectives for all learners, including low-income students, students with disabilities, and English language-learners" (2011, p. 3).

Elementary level teachers are responsible for building children's foundational understanding of reading; that is, reading is a significant part of the content in which these teachers have been certified and are hired to teach. Additionally, research, such as the National Reading Panel report (NICHD, 2000), has demonstrated the critical nature of the earliest years of literacy instruction in the development of successful reading. In his seminal work, Torgesen (1998) implores educators to "*Catch Them* (students) *Before They Fall*" because it is more difficult to remediate reading difficulties in older students than to circumvent such problems through effective instruction and intervention in the early grades. When the research on the importance of early reading success is coupled with the research on teacher quality effects on student learning (Clotfelter, Ladd, & Vigdor, 2007), we can see the importance of quality reading instruction delivery by elementary school teachers.

However, what constitutes an effective "reading teacher" at the elementary school level? What are the qualifications of our nation's foundational reading instructors? What

must teachers know to effectively teach literacy skills, and how much training is needed to master those competencies? Official qualifications to teach elementary school vary by state, but teachers in every state must meet the minimal guidelines set forth in *No Child Left Behind* (2001). To be considered highly qualified under this law, teachers must be state certified in all areas in which they teach. Such certification must include attainment of a bachelor's degree and demonstration of knowledge in each academic area taught. The majority of new teachers have no further training than their bachelor's degree when they begin teaching; therefore, the attainment of content and skills required to teach the foundations of reading during undergraduate work is critical.

Allington (2009) asserted that although NCLB requires teachers to be "highly qualified", it does not specify that they must be expert reading teachers. This distinction is especially important for elementary teachers, whose primary responsibilities include building a strong literacy foundation in students. Though teachers in most states must pass a test in elementary education content knowledge, states vary in the tests used and the scores required to be considered highly qualified (U.S. Department of Education, 2009b). Additionally, reading is only one of several subjects for which competency is required for elementary teachers; therefore, elementary subject area tests include questions on content in addition to reading. The National Council of Teacher Quality (2009) determined that elementary certification tests may be inadequate if potential educators can pass without proving mastery of the specific science of reading instruction. They warned that states should not certify elementary teachers who do not evidence competency in the scientifically-based instruction of reading. The current differences in state certification regulations and assessments have

led to inconsistent levels of knowledge requirements for attainment of “highly qualified status” throughout the country.

Though many educators are eligible to teach reading at the elementary level under the current official “highly qualified” regulations, studies have found deficits in teacher content knowledge of literacy (Cheesman, McGuire, Shankweiler, & Coyne, 2009; Joshi, Binks, Hougan, Dahlgran, Ocker-Dean, & Smith, 2009; Lyon & Weiser, 2009; Moats, 2009b; Piasta, Connor, Fishman, & Morrison, 2009). Moats (2009b) wrote that teachers often report feeling unprepared to teach students who exhibit reading problems. Additionally, researchers have found that it is the expert application of specialized literacy education knowledge that is the critical component of authentic teacher quality (Allington, 2002; International Reading Association, 2008/2009; Piasta et al.). Such specific, expertly applied instruction requires a deep, flexible understanding of pedagogy.

Researchers also question how well traditional elementary education teacher preparation programs train teacher candidates in the science of reading as elucidated by research (Walsh et al., 2006). In their seminal work, *Preventing Reading Difficulties in Young Children,* Snow et al. (1998) criticized the small amount of time dedicated to literacy instruction in undergraduate teacher preparation programs, arguing that the amount of content included in these programs precluded the dedication of adequate time to master the skills and knowledge required to effectively teach reading. They advocated continuous development of literacy instruction skills throughout the career, and contended that such development should include traditional instruction as well as opportunities to observe and collaborate with other teachers. The International Reading

Association (2008/2009) also described literacy education skills as developmental, asserting that “Improvement in teaching reading is a lifelong enterprise that requires mentoring, observation, follow-up evaluation, and problem solving with peers” (p. 5). Continued professional development, such as reading endorsement and certification programs offered in some states, can help to ensure that teachers develop their literacy instructional skills and knowledge.

Cooter and Perkins (2011) related teacher training to Vygotsky’s (1978) zone of proximal development. They discussed the importance of instructional scaffolding for teachers as they develop their literacy teaching skills and implement new strategies in the classroom. They contended that this scaffolding should include time, practice, and coaching, and can exist within comprehensive on-going professional development.

The research, therefore, describes a need for both effective initial teacher preparation, and continued professional development in the area of reading instruction.

Context of the Study

In the state in which this study was conducted, elementary teacher certification requires the passage of an elementary education subject area test which includes questions on competencies related to literacy. These competencies include knowledge of the reading process, literature and literacy analysis, writing process and applications, reading methods and assessments, communication, and information and media literacy. Each competency, in turn, has a number of associated specific indicators (Florida Department of Education, 2011). Additionally, in order to be considered highly qualified in Elementary Education, teachers must attain a bachelor’s degree in elementary education which includes coursework in the teaching of reading at the K-6 level, or a degree in another major which includes coursework in the prescribed reading

competencies. No specific number of reading instruction courses is required as long as the specified competencies are mastered by prospective teachers (Florida Department of Education, 2002a).

In an effort to increase teacher qualification and effectiveness in the area of reading, this state began to offer a reading endorsement certification option for teachers in 2002. Teachers must complete 300 hours of training in six specified and detailed competencies to earn this designation. The competencies may also be met through participation in an approved infused in-state teacher education program. The attainment of a reading endorsement, therefore, can be included as part of pre-service training, or achieved through specific in-service professional development for practicing teachers. In-service endorsement training can be attained through approved university courses or local district training on the prescribed competencies. Because some teachers become endorsed through infused undergraduate programs and others through additional training, there may be great variance in the actual number of hours of reading instruction that endorsed teachers complete. However, teachers endorsed through both routes must master the six required competences: foundations in language and cognition, foundations of research based practices, foundations of assessment, foundations of differentiation, application of differentiated instruction, and demonstration of accomplishment practicum (Just Read, Florida, n.d.).

The state also offers K-12 reading certification. Teachers who wish to earn this certification must complete a master's degree specifically in reading, or complete 30 hours of specified reading coursework. They must also pass a state subject area test in reading (Just Read, Florida, n.d.).

The National Council on Teacher Quality (2009) graded this state as “nearly meeting goal” in education preparation in reading instruction since it does require elementary education programs to teach the five components of reading as delineated in the National Reading Panel, and it does address those competencies on the state certification assessment.

NAEP outcomes in this state are similar to the national achievement levels. At the fourth grade level, 27% scored at below the basic level in 2009, and 36% scored at the proficient level. At the eighth grade level, 24% were below basic, and 32% were proficient. In twelfth grade, 30% were below basic, and 32% were proficient. In this state, as well as the nation, there are great differences in the assessment performance of students from different demographics (National Center for Education Statistics, n.d.).

Purpose of the Study and Research Questions

Current NAEP scores demonstrate a need for further study on reading instruction in our schools. Because the foundation of reading is taught in elementary school, it is critical to consider the training and qualifications of elementary teachers in the instruction of reading. The competency-based reading endorsement purports to insure that teachers are truly highly qualified in the area of reading (Bates, Breslow, & Hupert, 2009). This study seeks to determine if teacher attainment of the reading endorsement certification, or full state K-12 reading certification, affects elementary student reading outcomes.

It is not the researcher’s intention to argue that elementary school teachers do not know how to teach reading effectively. Rather, the purpose of the study is to determine the extent to which specific teacher development in the science of reading as required by these certifications affects student outcomes. If teaching reading is indeed the

“rocket science” described by Moats (1999), then extensive, focused training should increase outcomes. If, as Allington (2001) argued, expert teachers are essential, then we must seek to determine the ways in which teachers can increase their expertise. Therefore, the purpose of the study is to determine the effect of the training required for reading specific certifications on student reading assessment outcomes. Furthermore, the study will investigate the effects of this teacher development on students from varied demographic backgrounds, as well as student achievement on the reading skills measured by the included sub-scores.

The research questions for this study are:

1. Do teacher certifications in reading (including reading endorsement and full state K-12 reading certification) predict the reading scores and sub-scores of third, fourth, and fifth grade elementary students?
2. Does teacher reading endorsement (specifically) predict the reading scores and sub-scores of third, fourth, and fifth grade elementary students?

The study will use a hierarchical linear model to analyze the effects of teacher reading certification level on elementary students from diverse subgroups. Additionally, the researcher will examine relationships between teacher reading certifications and outcomes on the four reading subtests of the state assessment (words and phrases in context, main ideas, plot, and purpose, comparisons and cause/effect, and reference and research), and on both literary and informational questions included on the test (Florida Department of Education, 2009).

The results of the study will be discussed in terms of implications on teacher training and state certification policy.

Significance of the Study

Because many of our nation's children struggle to learn how to read proficiently, teacher effectiveness in literacy instruction is a critical issue. Florida has created two specific reading certifications that elementary teachers can attain in addition to their elementary education qualifications. However, there is a lack of research on the effects of reading-specific certification on elementary student outcomes. The examination of assessment data in relation to teacher certification in the specific area of reading may have implications for both state policies across the country and program design within schools of teacher education. Philips (2010) asserted that effects of teacher qualification may be more profound on students deemed at risk than for the general population. Therefore, there may be specific implications for students from different subgroups. As Zigmond, Bean, Kloo, and Brydon (2011) wrote, "Education policy matters for all students, but especially for those with reading difficulties" (p. 474).

At the policy level, the study may indicate a relationship between teacher certifications in reading and elementary student reading outcomes. Such a relationship could indicate a need for greater literacy instructional training or certification levels for elementary teachers. This study may induce further discussion of state competency-based literacy requirements in the certification of elementary teachers. Discussion of both of these issues could lead to changes in state reading education policies.

In a 2011 editorial published in the IRA's "the Reading Teacher", Cooter and Perkins called for further research on teacher professional development in reading that is both evidence- and outcome-based. Since teachers often attain the reading endorsement as professional development, findings from this study may also address this need since it analyzes relationships between student outcome data and

certifications of teachers. The recent *Race to the Top* legislation also calls for the provision of “effective, data-informed professional development” (U.S. Department of Education, 2009d, p. 10) which includes instructional strategies and differentiation. Since the reading endorsement includes these competencies and is often completed as professional development, it is relevant to analyze the outcomes of reading endorsed teachers. Additionally, in a critical analysis of research on teacher education, Risko, Roller, Cummins, Bean, Block, Anders, & Flood (2008) noted a dearth of studies which include student outcomes. The present study may serve to provide data which connects teachers and student outcomes.

At the level of higher education, there are implications for course and program design. Schools of education may use competency-based outcomes to design their reading requirements in elementary teacher education. Schools of education may also choose to participate in graduate level or professional development education for teachers, especially in states that offer additional reading certifications. Other implications for higher education could come from the analysis of subtests. Results could drive instruction in a variety of teacher education programs, including those in Elementary Education, Exceptional Student Education, and English for Speakers of Other Languages.

Assumptions and limitations of the study

This study assumes that state accountability tests in the area of reading are valid indicators of student reading competency. There are several limitations in this study. First, teacher certification data does not indicate the amount of classroom experience that teachers have attained. Teacher experience has been associated with more effective teaching (Clotfelter et al., 2007). Block, Oakar, and Hurt (2002) described a

continuum of teacher effectiveness associated with increasing experience in the classroom. They wrote that at the expert level, “a state of fluid, flawless teaching develops” (p. 183). At that level, they asserted, there is a level of intuitivism that is not present in earlier stages of teaching development. Such intuitivism, they wrote, takes time to develop.

Additionally, we cannot determine which teachers attained the reading endorsement as part of pre-service training and who earned it as professional development, and whether this distinction and possible difference in training hours makes a difference in outcomes.

As with any study that involves students of teachers, it cannot be asserted that students were randomly assigned to classes or that classes were randomly assigned to teachers (Phillips, 2010). Also, because the results are based on standardized tests, there is always a question of whether some teachers are effective in ways that do not show up on high-stakes tests (Chingos & Peterson, 2011), and whether high-stakes tests, in general, accurately assess student skills. Finally, the study did not control for previous learning of students.

CHAPTER 2
LITERATURE REVIEW

This study seeks to determine whether teacher certification in reading has an effect on elementary student reading outcomes. There are a number of components of this question that will be presented in this review of the literature that will help to contextualize this study. First, an overview of studies related to expert reading instruction will be addressed. Next, research, trends, and policies in education that have impacted the instruction of reading in the elementary school classroom will be presented. An overview of research related to literacy instruction within elementary teacher preparation programs and elementary education certification requirements precedes the conclusions.

Expert Reading Instruction

If we are to study teacher expertise, we must first understand it. Danielson (2007) described expertise as a state of automaticity which allows teachers to notice and focus on differences in student learning. She wrote that expert teachers are able to more quickly and accurately notice discrepancies from the norm, and are better able to interpret and respond to what they see. She noted that expertise and experience are two different things, in that “not all experienced teachers are experts. However, experience is necessary for the acquisition of expertise. But, although it is necessary, it is not sufficient; the development of expertise requires conscious effort by teachers” (p. 38). This implies that teachers must seek to increase their skills in order to become experts. The challenge before us is to determine how to raise teacher expertise to levels sufficient to bring all students to their highest potential in the area of reading.

In her seminal paper, Louisa Moats (1999) argued that "*Teaching Reading IS Rocket Science"* because it is much more complicated than it is generally believe to be. The instruction of reading has been deemed a science in recent years because results from experimental research have shown that specific methods are effective in reading instruction. Lyon and Weiser (2009) wrote that the science of reading includes the ability to "apply knowledge about the complex sub-skills that must be taught to ensure that students reach mastery" (p. 477). This description illustrates the intricacies involved in effectively teaching reading to diverse students. Indeed, research (Moats, 1999; NICHD, 2000; Torgesen, 1998) suggests that the instruction of the foundations of reading is indeed complex in the elementary years, and that effective reading instruction can be the difference between success and failure in future learning.

Allington (2002) proclaimed that regardless of reading programs used, "programs don't teach, teachers do" (p. 17). He cited the work of Pressley, Allington, Wharton-McDonald, Block, & Morrow (2001) which found that expert reading teachers succeeded in teaching students, regardless of commercial reading programs used. Allington (2002) attributed this success to the ways in which expert teachers use their knowledge to deliver instruction that meets the specific needs of students. He claimed that less effective teachers lack requisite knowledge and the ability to appropriately adapt curriculum to student needs. Pressley et al. (2001) reported that effective teachers focused instruction on student needs rather than the directions of a core curriculum plan. Piasta et al. (2009) found that even when using scripted curriculum, teachers with higher levels of literacy knowledge had better student learning outcomes than less knowledgeable teachers. They ascribed this finding to the ability of expert teachers to

correctly understand and respond to student errors and questions, and to use the assigned curriculum more flexibly based on actual student needs. Block et al. (2002) observed that highly effective teachers of literacy “can be distinguished by their automaticity in executing specialized teaching behaviors and self-regulated strategies” (p. 187). They also reported specific grade-level proficiencies exhibited by effective teachers. Though domains of teaching were found across grade levels, effective strategies differed among grade levels. This finding denotes an additional layer of expertise that teachers must attain to reach maximum effectiveness in the instruction of reading.

The History of Reading Instruction, Research, and Policy in the United States

Shannon, Edmondson, Ortega, Pitcher, & Robbins (2009) suggested that the last fifty years of federal involvement in reading education is made up of two movements. They described the first movement as an enthusiastic period replete with promise of great social and educational progress. This was the era of the implementation of legislation such as the Civil Rights Act (1964) and the Elementary and Secondary Education Act (1965), both of which included policies to increase equity among American students, thereby improving education in our country. The second period, ranging from 1980 to the present was described as one of new federal government prescription and restriction. Indeed, the research and policy of the latter twentieth century led to many changes in reading instruction and teacher accountability. Some of these changes, in turn, have had a strong impact on teacher certification and training in the area of reading.

For much of the twentieth century, reading in the elementary grades was most frequently taught through the “look-see approach”, which focused instruction of high

frequency words in contrived texts presented in basal readers. Phonics was not emphasized, and when taught, it was done using previously learned words. Daily instruction included small homogenous reading groups and often an independent work page for students to complete (Pressley et al., 2001). The “centrality of the teacher” in one such program was described by Pressley et al. as evidenced by the prohibition against children taking books home to practice. Reading scholar Elfrieda Hiebert (2010) recalled that during her own childhood, students in her class were instructed to secure the unread portions of their basals with sealing jar rings so they would not read ahead of their assignments.

One of the earliest criticisms of literacy education in the U.S. was Flesch’s (1955) *“Why Johnny Can’t Read”* which lambasted the “look-see” approach to reading instruction, and was one of the first to call for phonics instruction in the schools. Other important works which championed the instruction of phonics followed. These included Chall’s (1967) seminal work, *Learning to Read: The Great Debate*, which increased awareness of the importance of early and systematic phonics instruction, and Adams’ (1994) *Beginning to Read: Thinking and Learning about Print,* which described the importance of automaticity in the decoding of letters, word patterns, and words, and how such fluency allows for comprehension to occur.

Reading instruction in the early 1970s has been thus described: “Teachers, armed with basal manuals, controlled the learning situation as never before, and students continued to play the role of passive recipient of the knowledge and skills mediated by the teacher” (Pearson, 2010, p. 11).

However, during the 1960s and 1970s, research described by Pearson as "conceptual revolutions in cognition, sociolinguistics, and philosophy" (2010, p. 12) was emerging. Pearson credited sociolinguists of this period with several paradigm shifts which continue to affect reading education today; these include interpretation of student reading errors as a way to gauge student processing including miscue analysis (Goodman, 1965), the use of prediction and prior knowledge in comprehension (Smith, 1978), and the model of reading as making meaning (Rosenblatt, 1978). During this era, schema theory also became widely accepted within the reading community (Piaget, 1969).

Barone and Morrell (2007) called the 1980s a "decade of standards" (p. 168) during which states began to more closely dictate curriculum to the schools. In 1983, the National Commission on Excellence in Education released a report called "A Nation at Risk" which awakened a new interest in educational reform in the United States. This report described the mediocrity of American education and argued that improvement was urgently needed if the U.S. planned to sustain global competition with other countries. The report called for various reforms in education as well as in the preparation of teachers.

No Child Left Behind (NCLB)

Seismic changes took place in the field of reading education as the new millennium was dawning. These changes were the result of both new research and new legislation. One key report, *"Preventing Reading Difficulties in Young Children"* (Snow, et al., 1998) proclaimed that the knowledge required to effectively teach students to read was indeed available, and identified such necessary skills and strategies. The National Reading Panel Report (NICHD, 2000) expanded on this research through the

identification of five components essential to reading, and presented scientifically based methods for teaching reading. The NRP report itself was a meta-analysis of experimental research on the science of reading. The five reading components delineated by the report - phonics, phonological awareness, fluency, comprehension, and vocabulary – have become the foundation of reading instruction in this country.

The “No Child Left Behind” Act (2001), formally the reauthorization of the Elementary and Secondary Education Act of 1965 (ESEA), was composed of four “common-sense pillars” (U.S. DOE, 2004, p. 1). Two of these pillars, accountability and the use of research-based teaching methods, have had wide-reaching implications on the instruction of reading. In fact, the legislation led to a “culture of accountability” (U.S. Department of Education, 2004, p. 6) since it called for evidence of outcomes at several levels of the educational system. At the most basic level, under this legislation all students were required to meet state-developed grade-level benchmarks by the 2013-2014 school year. Standardized tests, defined by the U.S. Department of Education as “professionally developed tests administered under standard conditions, producing scores that can be used to evaluate programs or children” (2004, p. 45) were chosen as the instrument used to determine student progress. The outcomes of these assessments were to be disaggregated to determine the progress of subgroups, such as English language learners, students from families from low socioeconomic groups, and students with disabilities. Data would also be disaggregated by gender and racial groups. Additionally, outcome data would also be used to determine the quality of individual schools and districts (Department of Education, 2004).

The accountability requirements also impacted the training and certification of teachers who would now be obligated to attain “highly qualified” status in all subject areas in which they teach. The legislation allowed states to manage their own certification requirements within prescribed parameters. However, under NCLB, teachers must earn state teaching certification and a bachelor’s degree, and must prove competency in their subject areas in order to be considered highly qualified. For elementary certification, subject area competency must be demonstrated through passage of a “rigorous state test” (U.S. Department of Education, 2004, p. 10), though the qualifications of “rigor” were not defined.

According to a U.S. Department of Education report, though 34 states considered their educator requirements rigorous before NCLB, 33 states reported making changes in certification requirements in response to the legislation. These changes included adding coursework requirements to approved teacher preparation programs and testing requirements for certification. Changes implemented to meet NCLB requirements also included the establishment of middle school endorsements, which in some cases included reading endorsements (U.S. Department of Education, 2009a).

Reading First, a grant funding initiative under NCLB, was designed to provide effective early instruction (K-3) in reading to prevent future reading failure among students. *Reading First* grants were made available to schools with a designated proportion of low-income students to provide professional development for teachers in the use of scientifically-based reading instruction methods, as well as related materials and ongoing reading assessment (U.S. Department of Education, 2009c). *Reading First* grants contained prescriptive curriculum and assessment requirements including the

use of a core curriculum and dedicated block of reading instruction time. Lane, Hudson, Leite, Kosanovich, Strout, Fenty and Wright (2009) described *Reading First* as “the largest and most comprehensive effort in our nation’s history to bridge the research-to-practice gap in literacy education” (p. 60).

Mixed results have been reported on the success of the *Reading First* program. Two major impact studies (Gamse, Bloom, Kemple & Jacob, 2008; Gamse, Jacob, Horst, Boulet, and Unlu, 2008) described negligible results in comprehension outcomes of *Reading First* schools, though they did find a positive, statistically significant impact on time spent on the instruction of the five core components of reading. Gamse, Jacob, et al. (2008) also reported a positive, statistically significant impact on increased professional development in scientifically-based teaching methods, reading coach support, the amount of reading instruction in class, and support for readers who are struggling. Studies on *Reading First* outcomes in individual states, however, reported more encouraging results, including improved comprehension outcomes in some grade levels (Bean, Draper, Turner, & Zigmund, 2010; Carlisle, Cortina, & Zeng, 2010; Connor, Jakobsons, Crowe, and Meadows, 2009; Dole, Hosp, Nelson, & Hosp, 2010; Foorman, Petscher, Lefsky, & Toste, 2010).

Scholars have proposed several explanations for the mixed results. Dole (2010) argued that the lack of statistically significant difference between *Reading First* and non-*Reading First* schools was because many non-*Reading First* schools did, in fact, implement *Reading First* program components though they were not part of the official grant program. Therefore, she asserted, non-*Reading First* schools actually attained benefits from *Reading First*, too, thus narrowing statistical differences found among the

studied schools. Zigmond et al. (2011) asserted that individual state grants were based on interpretation of the legislation and, therefore, varied in their effectiveness. They also argued that *Reading First* was implemented within diverse contexts and with varying levels of fidelity. Bean et al. (2010) argued that new programs in general take time to run well; therefore, some of the studies may have been conducted too soon to adequately assess the actual value of *Reading First*.

In Florida, the *Reading Fir*st grant contained several components. These were presented to the state in 2001, under the auspice of the "Just Read, Florida!" initiative. Most relevant to this study was the creation of the state reading endorsement certification, implemented in 2002. This certification was created to increase teacher expertise in the area of reading by providing teachers with an opportunity to achieve a certification which, in turn, would increase their marketability. Very specific literacy content criteria were delineated for attainment of the endorsement and these criteria had to be met through approved programs (Just Read, Florida, n.d.)

The most recent federal education legislation, the Race to the Top grant initiative, is designed to assess and improve teacher quality. This is relevant to this study because states that receive grant funding through the initiative are required to "link student achievement and student growth data to the students' teachers and principals, to link this information to the in-state programs where those teachers and principals were prepared for credentialing, and to publicly report the data for each credentialing program in the state." (U.S. Department of Education, 2009d, p.10). Student achievement is specifically defined in the initiative as including state test results.

Criticisms of NRP, NCLB, and Reading First

Rothstein, Jacobson, and Wilder (2009) asserted that NCLB was an impossible mission in that it required all students to meet “challenging standards”. They wrote that student variability would always render reaching the 100% proficiency goal as an impossible one. Shannon et al. (2009) argued that the prescriptions of NCLB and the accompanying Reading First grants led to restrictions in instruction and assessment of literacy. They also asserted that pedagogy is now largely dictated by the bottom-line results of test scores. Other scholars have also criticized the focus on test scores in the accountability movement (Darling-Hammond, 2007; Duffy, Webb, & Davis, 2009; Teale, Hoffman, Paciga, Lisy, Richardson, & Berkel, 2009). Darling-Hammond argued that “the law wastes scarce resources on a complicated test score game that appears to be narrowing the curriculum, uprooting successful programs and pushing low-achieving students out of many schools” (p. 13).

Critics of NCLB (Allington, 2009; Duffy et al., 2009), have also denounced the required fidelity to state-adopted assessment systems and core curriculums. Pearson (2007) described this phenomenon as the “McDonaldization of teaching” (p. 154) because teachers are forced to follow prescribed lessons and thus, decrease the use of their professional expertise in teaching. Connor et al. (2009) asserted that one of the of problems with prescribed use of core curricula is that such materials, due to publication processes, may not be completely up-to-date. Allington (2011) argued against dependence on core reading programs for three reasons. He wrote that such programs inhibit student choice of reading materials, don’t provide adequate reading, and don’t promote reading at the appropriate levels for students, especially those at risk for

failure. NCLB has also been criticized for its failure to close the achievement gap (Allington, 2009).

Rothstein et al. (2009) criticized the subjectivity of state proficiency standards, stating that there are large disparities between states, and that some states have set standards that are not truly rigorous. In a more recent movement, many states have adopted “common core standards” in an effort to use internationally benchmark standards to indicate that students have learned what they need to know to succeed (U.S. Department of Education, 2010).

Phillips (2010) questioned NCLB’s teacher qualification requirements. She argued that the policy sought to improve student outcomes through teacher quality, yet research has not found strong relationships between the components of “highly qualified” designations under NCLB and student achievement. Loeb & Miller (2009) described NCLB as “too focused on inputs at the expense of what really defines a good teacher - their actions within the classroom” (p. 201). The American Association of Colleges of Teacher Education (2011) argued that in addition to being “qualified”, teachers should also be designated as “effective” based on outcome criteria such as student learning outcomes. Such designation, they claim, would be more indicative of a teacher’s impact on student learning than the current designation of “highly qualified” alone, which focuses mainly on inputs.

Phillips (2010) suggested that qualifications not addressed in NCLB, such as recency of degree, specific school of education attended, and additional professional development attained, could be important characteristics of a truly “highly qualified” teacher. In short, she argued that “highly qualified” teachers may not be effective

teachers, describing “vast differences (which) existed among the effectiveness as well as the preparation of highly qualified teachers” (p. 486). Phillips claimed that NCLB did not delineate qualities that are “consistently related to positive achievement gains” (p. 486) and that the qualities that were specified in the legislation have not been consistently implemented.

Rebell and Wolff (2009) argued that NCLB does not, in fact, ensure teachers who are highly qualified; instead it qualifies teachers who only meet minimum standards. They wrote that instead of focusing on minimal inputs, states should “promote effective induction, mentoring, and professional development of programs that will develop a maximum number of teachers who are truly effective on the job” (p. 272). They recommended different levels of certification, including one for new teachers, and another for teachers who have a deep understanding of content knowledge and proficiency requirements.

Researchers (Pressley, Duke, & Boling, 2004; Shannon et al. 2009; Teale et al. 2009) also questioned the limitations on the research included in the National Reading Panel report and endorsed by NCLB, arguing that the inclusion of studies using a broader range of research methods would have created a greater quantity of acceptable research. Pressley et al. (2004) argued that some phenomena cannot be described solely by using experimental research. They also asserted that expert teachers continuously mold their instructional strategies, arguing that “much more effective beginning reading instruction will occur to the extent that educators understand and commit to combining many techniques, each of which produces a small positive effect” (p. 53). Such intricate and expert teaching is difficult to capture and report in

experimental research. However, research on authentic teaching and learning can have great value. Therefore, Pressley et al. called for a “second generation” of reading research to be applicable under NCLB (2004, p. 53).

In spite of such criticisms, the National Reading Panel report is widely acknowledged as the framework of the nation’s current reading curricula, as well as the basis of many teacher education and professional development programs. Although there have been criticisms of the NRP report, “no subsequent work of serious scholarship has challenged its findings” (Walsh et al., 2006, p. 8).

Achievement Gap

One of the goals of NCLB was to improve achievement among students from population groups which historically have lower rates of academic success. The achievement gaps described in the NAEP scores included in Chapter 1 reflect national trends. Nettles, Millett, and Oh (2009) reported national racial achievement gaps beginning as early as the 4th grade NAEP, and continuing through to the SAT® and GRE® exams taken by high school and college students. They also described the nationwide gap between students who qualify for free and reduced lunch, and those who do not.

Recent social trends have the potential to further increase the effects of the achievement gap within our nation. According to a recent Brookings Institution report, child poverty has greatly increased in recent years in the United States due to the economic downturn. The same report also reported that Florida is now classified as a “high child poverty” state, which is delineated as one in which at least twenty percent of children live in poverty (Isaacs, 2011). Additionally, Wells (2009) described immigration patterns in which more low-wage workers who do not speak English are arriving in the

United States, potentially increasing the population of students who lack English proficiency. Benner, Bell, and Broemmel (2011) discussed the recent increase in the inclusion of students with disabilities in general education classrooms. Ornstein (2010) wrote that Hispanic and Black students will represent majority school enrollments by the year 2015. Individual students are often represented in more than one at-risk demographic group. For example, Bali and Alvarez (2003) discussed lower income as a correlate of race. McLaughlin, Miceli, and Hoffman (2009) described relationships between racial and socioeconomic group membership and identified disability status.

In an effort to remove confounding variables, Bali and Alvarez (2003) studied outcomes for White, Black, and Hispanic students whom had similar background variables (middle socioeconomic status, fifth-grade males who receive free/reduced lunch, live with both parents, and do not have English proficiency issues), and still found achievement gaps, though the gap between the Hispanic group and the White students was not as great as the gap between the Black students in this group and their white counterparts.

School characteristics have also been implicated in student outcome gaps. Nettles et al. (2009) addressed the numbers of African American students who attend economically-disadvantaged schools, and the low achievement scores attached to such schools.

Each of the these studies illustrates that the achievement gap in the United States and associated student risks are complex and multi-faceted issues which demand further research that includes disaggregated outcome results. Additionally, the recent

social trends indicate an even greater need for high quality literacy instruction in all American schools.

Qualification and Certification of Elementary Teachers

Historically, individual states have been responsible for state accreditation of education programs as well as certification of new teachers (Snow et al., 1998). However, under NCLB, states must follow federal guidelines for certification, which include a bachelor's degree and subject area competency. Scholars have questioned whether these certification requirements truly insure qualification to teach.

Philips (2010) pointed out the dearth of research on teacher quality in elementary education in general, stating that the bulk of the teacher quality research has focused on secondary education. She argued that the self-contained nature of elementary instruction, in fact, increases the effect of a single teacher on individual students. Such increased effect, she argued, may be even more critical to students who are perceived to be "at-risk" due to factors such as disability, low socioeconomic status, or English as a second language status. In her study, she examined reading achievement in relation to teacher qualifications such as certification, undergraduate education (including relevant coursework), graduate education (including major), and teaching experience. The only qualification found statistically significant to student outcomes was the possession of a graduate degree in elementary education. However, it must be noted that no reading or literacy graduate degrees were reported in the study; therefore, we do not know the significance of reading specific degrees. The effect of elementary graduate degrees was found to be even greater among at-risk students than among the general population of students.

Scholars have advanced several issues regarding teacher certification testing including the variations in state assessments and benchmarks (Allington, 2009, Philips, 2010, U.S. Department of Education, 2009b), and the alignment between certification tests and required competencies (Lyon & Weiser, 2009, Philips, 2010). For example, Stotsky (2009) found that teacher certification tests in special education lacked adequate assessment of teacher knowledge of reading instruction. A report from the National Council on Teacher Quality (2009) reported that many elementary education certification tests do not contain adequate questions on the science of reading to satisfactorily ascertain whether teachers have mastered these competencies. Moats & Foorman (2003) described implications of the certification of teachers who lack mastery of literacy instruction. In addition to obvious instructional issues, teachers routinely monitor student progress and make critical instructional and placement decisions based on their knowledge of reading assessment outcomes. Their ability to understand and use assessment outcome data affects these high-stakes decisions which can have far-reaching implications for students.

To avoid certification of elementary teachers with inadequate literacy training, the National Council on Teacher Quality (2009) called for states to include specific assessment on the science of reading instruction on certification tests. Idaho, for example, requires passage of a comprehensive literacy assessment by all K-8 pre-service teachers. Three standards (language learning and literacy development, comprehension, and literacy assessment and intervention) are assessed through questions on related definitions, strategies, and scenarios (Squires, Canney, &

Trevisan, 2009). Alternatively, some states use a subscale within the elementary certification test to determine knowledge of the science of reading.

Reutzel, Dole, Read, Fawson, Herman, Jones, Sudweeks, and Fargo (2011) suggested the importance of testing two forms of teacher knowledge of reading. The first of these is “inert” or actual content knowledge, such as language and linguistic components. The second is referred to as “enacted” knowledge, which encompasses knowledge of teaching methodology used in the classroom. Reutzel et al. advocated ongoing assessment of in-service teachers in addition to initial certification testing. They claimed that the initial exam assesses only minimal skills, and that teachers should continue to increase their skills while working in the classroom. Use of continuing assessments should include specific observations of literacy instruction by trained observers to capture the true quality of the teaching. They also recommended that these assessment results could be used to plan additional professional development as appropriate to increase teacher effectiveness.

A 2009 U.S. Department of Education report illustrated the variation in state certification requirements and raised the question of whether the requirements of some states are sufficiently rigorous to insure high quality instruction (2009a). This report described a 22-point difference in pass scores among the numerous states that use the *PRAXIS II® Elementary Education: Curriculum, Instruction, and Assessment test* (Educational Testing Service, 2010) for teacher certification. Additionally, all of the cut scores used by the states fell below the median score calculated for the test. The lowest cut score (146 in Washington, D.C.) is 31 points below the calculated median score of 177 (U.S. Department of Education, 2009b). Pennsylvania’s cut score was the highest

of the thirteen states analyzed, with a cut score of 168. Even this score, though, was nine points below the national median. Crowe (2011) argued that states should work towards the creation of common tests, and that cut-scores must be increased to promote teacher quality.

Piasta et al. (2009) described knowledge deficiencies among first-grade teachers, all of whom held bachelor's degree as required by "highly qualified" regulations. Twenty-nine percent of teachers in the study had also completed master's degrees, though the content area of those degrees was not disclosed. The teachers had an average history of 11.4 years in the classroom. The researchers contended that teachers who have formal qualifications may still lack critical literacy knowledge. They argued that though specific knowledge may theoretically be required for certification, those competencies may not be adequately (or proportionately) reflected in state certification exams and standards.

Moats and Foorman (2003) questioned the level of literacy expertise needed by classroom reading teachers as opposed to reading specialists. This is a relevant question since in many states attainment of a master's degree or certification in reading qualifies teachers to work as reading specialists or coaches, thus precipitating their departure from the classroom. At the same time, as Allington (2009) described, under current legislation, many schools in general, and Title I schools in particular, are hiring fewer reading specialists to work directly with students, as new models call for classroom teachers to perform student reading remediation. Allington argued that classroom teachers may be less prepared than reading specialists to engage in remediation work with students.

Much has been written on the effects of advanced degrees on teacher quality, though different outcomes have been reported. Croninger, Rice, Rathbun, & Nishio (2007) reported mixed effects in a review of a number of studies on advanced degrees and student outcomes. Klecker (2010) reported on a study of fourth grade reading in Kentucky in which NAEP scores of students in the classrooms of teachers with master's degrees were higher than those under the tutelage of teachers with bachelor degrees. Chingos and Peterson (2011) reported no improvement in student reading assessment outcomes related to advanced degrees held by teachers. However, they warned that studies of advanced degree effects do not control for teachers' level of effectiveness before they attained their advanced training. They also described a lack of research regarding the effect of specific subject areas of master degrees. One such study, by Croninger, et al. (2007) explored the effects of teacher degree type on first grade students' outcomes. They examined the content area of teacher graduate work and found that master's degrees in elementary education were related to greater gains in reading than other graduate level degrees, or no graduate degree at all. However, the authors do not discuss graduate degrees in literacy or reading education. School-wide reading gains were discovered in schools employing teachers who had participated in graduate level courses specifically in reading. The authors theorized that this may have occurred because an enhanced composite knowledge among a teacher team may lead to better planning and program implementation, and that teachers with graduate work in reading may be better able to support struggling colleagues.

Clotfelter et al. (2007) studied the competitive level of colleges attended by teachers, but did not find a relationship between this variable and student reading outcomes.

Though there has been no research on the specific effects of graduate degrees in reading on student outcomes, Grisham (2008) studied teacher response to participation in a graduate level reading program. Participating teachers reported increased professional knowledge and understanding of the literacy processes. One participant responded that he believed “every primary teacher should go through the program” (p. 35). Another compared his graduate program with his undergraduate experience. He said:

> With the pre-service, I don’t know if I didn’t get it, or I think it was just the fact that I didn’t have a class yet, and I heard the information coming in like theory-wise, but I couldn’t apply it to anything yet. Where after teaching, I knew what I needed so I really learned a lot in comparison (p. 37).

The authors reported that program completers believed that their pedagogy was more “strategic and planful” (p. 37) as a result of their participation in the program and thus, that they had become better at serving students’ individual needs.

Researchers have described the importance of professional development in reading for elementary teachers. Indeed, the importance of professional development in literacy was demonstrated by the prominent role it played in the *Reading First* legislation. However, professional development programs are diverse. In Florida, the reading endorsement coursework is often completed as professional development (Just Read, Florida, n.d.). Additionally, many Florida teachers received professional development in reading under the *Reading First* grant. (Reading First in Florida, n.d.)

Duffy (2004) described two models of professional development. The first model is training-based. In this form of professional development, teachers are taught specific practices to implement in their classrooms. The expectation of such training is often teacher compliance. The other model, described as educative, focuses on teacher decision-making based on situation and knowledge. This form of professional development would seem to lead to what Duffy calls “adaptive responsiveness” of effective teachers, which he compares to the ways in which doctors and pilots respond to situations they encounter (p. 7). He wrote that effective reading teachers “see the point of various practices, use judgment to select from them when adjustments become necessary, and adaptively apply them rather than faithfully following certain tenets and procedures regardless of situational conditions” (p. 11). The comprehensive content and practicum experiences included in the attainment of reading certification as professional development would allow teachers the opportunity to be trained in instructional methodology, as well as to have the educative opportunities to implement what they learn.

Literacy Content Knowledge of Elementary Education Teachers

Researchers have observed relationships between teacher content knowledge and student outcomes. In a study of pre and post results of a teacher-training intervention, McCutchen, Green, Abbott, and Sanders (2009) found a relationship between the linguistic knowledge of teachers and student performance. The relationship was more pronounced among low-performing students. Moats and Foorman (2003) found a relationship between teacher knowledge of language structure and student reading achievement. In another study, Lane et al. (2009) found teachers’ knowledge of fluency was a significant predictor of reading progress in specific reading components

among first and second grade students. Piasta et al. (2009) described a relationship between levels of teacher knowledge and use of decoding strategies, and student success in reading. They found that first grade teachers with low levels of literacy instruction knowledge tended to teach decoding incorrectly or incompletely.

There are several domains of content knowledge that have been identified as critical for teachers of reading. The National Reading Panel (NICHD, 2000) delineated five components of reading (phonemic awareness, phonics, comprehension, vocabulary, and fluency), which now comprise the framework of literacy instruction in this country. However, a number of researchers have suggested additional critical teacher knowledge in literacy instruction. Moats (2009a) asserted that such content includes knowledge of reading and language structure, as well as the pedagogy necessary to differentiate instruction as needed in the classroom. Moats also argued that the large and complex body of knowledge required to effectively teach reading cannot be attained through participation in “one or two college courses, or [by] attending a few one-shot in-service workshops” (1999, p. 11). Snow et al. (1998) developed a framework of competencies, which included linguistic and psycholinguistic studies, psychological, sociological, and anthropological studies, and several aspects of the pedagogy of reading. Block et al. (2002) denoted six domains of expertise of reading teachers. These were roles and responsibilities, methods of motivation, methods of re-teaching, instructional techniques, classroom qualities, and characteristics of lessons. Pressley, Dolezal, Roehrig, and Hilden (2002) asserted that general teaching competencies may be associated with increased reading achievement. These include

classroom management strategies, cooperative learning, peer work, and introduction of engaging children's literature.

Several scholars have discussed the depth and related flexible use of knowledge required to teach reading effectively. Walmsley and Allington (2007) wrote that expert teachers' knowledge of literacy development and processes is evident in their understanding of student intervention needs – particularly in how they model and explain strategies. Wepner (2006) discussed the need for teachers to modify the degree and pace of support required by struggling readers. Moats and Foorman (2003) described the importance of "the teacher's insight into what causes variation in students' reading acquisition, and the ability to explain concepts explicitly, to choose examples wisely, and to give targeted feedback when errors occur" (p. 38). The National Reading Panel (NICHD, 2000) determined that teachers "required instruction in explaining what they are teaching, modeling their thinking processes, encouraging student inquiry, and keeping students engaged" (p. 16).

Researchers have also studied the importance of teacher knowledge in relation to the effective use of required core reading programs. Brenner and Heibert (2010) asserted that core reading programs offer an abundance of materials but little guidance on which are most helpful to struggling students. They questioned the activities teachers tended to choose, and how those choices are aligned with students' learning needs. Wepner (2006) wrote that teachers must use their expertise to employ curricular components in ways which most benefit students rather than rely on publishers' suggested activities. This would suggest that teachers who lack expertise may not be able to use such materials effectively. In fact, Moats (2009b) reported that teachers

often do not implement curriculum materials correctly. Duffy et al. (2009) described student teachers and new teachers as overwhelmed with commercial core materials.

Dewitz, Jones, and Leahy (2009) studied the comprehension components of five widely used core reading curricula. They reported shallow coverage of too many skills, and lack of actual instruction on the use of strategies. Lack of practice, including guided practice, was also noted as a weakness of these programs. The researchers warned that inadequate practice would affect struggling students most negatively. They also asserted that though the programs boasted “research-based” instruction, they often lacked the intensity and explicitness recommended in the original model research studies. Additionally, strategies were often not presented in a cohesive and logical manner, and discussion of the thinking processes used in the strategies was also neglected. For these reasons, teachers cannot depend on a core curriculum to provide effective teaching. Instead teachers must have mastery of reading instructional methods in order to properly utilize curriculum materials.

Kosnik and Beck (2009) asserted that critical content knowledge in any subject area must include understanding of the most powerful ways of representing the subject, awareness of important works and teaching materials, and familiarity with common difficulties students encounter with the content. The science of reading, as every other content area, has specific pedagogy to address each of these components of teaching. To become proficient in all of these areas requires a great deal of in-depth study of both the pedagogy and content of the subject area.

Unfortunately, researchers have found substantial gaps in the literacy knowledge of elementary teachers. In fact, Reutzel et al. (2011) described “a nationally pervasive

deficit in the preparation of elementary teachers in reading and writing" (p. 187). It might seem incongruous that college graduates do not naturally have the ability to teach basic introductory reading skills. However, Spear-Swerling & Brucker (2006) found that even adults with seemingly competent reading skills are likely to have deficits with some components of reading. Such deficits may not be evident in general reading, but may inhibit effective teaching of specific literacy skills. Several studies (Cheesman et al. 2009; Cunningham, Perry, Stanovich, & Stanovich, 2004; Moats, 2009b; Piasta et al., 2009) described inadequate teacher competency in the areas of phonemic awareness and phonics. Also, Moats and Foorman (2003) described deficits in teacher knowledge of language structure. Lyon and Weiser (2009) reported that many teachers have weak instructional skills in comprehension strategies and vocabulary development, and lack a foundational understanding of how to teach reading specifically to early and struggling readers. Cunningham et al. also reported a lack of calibration between the level of literacy knowledge that teachers reported, and that which they actually had.

Literacy in Teacher Preparation Programs

In her seminal work, Moats (1999) described a chasm between the literacy instruction recommended by research and what actually occurs in classrooms. She blamed this, in part, on literacy education in teacher preparation programs. Roller (2010) reported that there was a range in quality in reading instruction incorporated within teacher education. Programs differed greatly in both literacy coursework requirements and related practicum experiences offered to students. The IRA (2008/2009) found that there was variation in the number of hours of reading instruction required by teacher education programs. Literacy education requirements ranged from

3 to 24 course hours, with an average of 2.2 courses taken by pre-service elementary school teachers

In a three-year longitudinal study, Hoffman, Roller, Maloch, Sailors, Duffy, and Beretvas (2005) found that preparation in a high-quality program had a positive influence on the adoption of effective teaching practices during the first three years of teaching. They found that teachers from eight programs deemed excellent by an expert panel for an International Reading Association study were more effective than other teachers in “creating and engaging their students with a high-quality literacy environment” (p. 267). Programs were determined to be “excellent” if they “met widely accepted standards within the profession” (Hoffman et al., p. 271).

Lacina and Block (2011) described common characteristics of reading curricula found in teacher preparation programs deemed “distinctive” by the International Reading Association. The common characteristic most valued by experts in the study was “consistent, carefully selected, and relevant field experiences….closely tied to program philosophy, programmatic vision, and content presented in courses” (p. 336). These field experiences were found to include repeated modeling of practices prior to their implementation by teacher candidates. Feedback from college faculty supervisors was also found to be important in these programs. The opportunity for teacher candidates to participate in the authentic use of varied strategies and assessment was also found to be a highly valued component of these programs. The distinctive programs were also found to include literacy curricula that were “integrated, aligned, and spiraling” (p. 338). Exposure to highly qualified university faculty was also deemed to be a valued common component of these distinguished programs.

In an analysis of research on reading teacher education, Risko et al. (2008) found that the provision of explicit instruction, defined as teaching which includes explanations, examples, modeling, focused feedback, and practice, was beneficial to pre-service candidates in teacher preparation programs.

Literacy instruction in teacher education programs has been criticized in numerous studies (Joshi, Binks, Hougen, et al., 2009; Lyon & Weiser, 2009; Risko, 2009; Walsh et al., 2006; Wold, Farman, Grisham, & Lenski, 2008). In a national study of 72 schools of education, Walsh et al. found that only 15 percent of elementary education programs were minimally addressing the science of reading as delineated by the National Reading Panel. They also argued that many reading education courses “reflect low expectations, with little evidence of college-level work” (p. 31). They cited a lack of research papers and other rigorous assignments in these programs, as well as limited practical application of the skills and strategies presented in the classes. Lyon and Weiser (2009) also questioned the rigor of coursework in teacher education programs.

Risko (2009) argued that undergraduate teacher education programs tend to have too few reading courses, and offer only limited opportunities for the level of engagement required to master the strategies used to teach reading. She also described the importance of multiple exposures to content and application of information within teacher education. Moats (2009b) asserted that it may not be possible for teacher-candidates to master all of the knowledge required to teach reading within the small number of hours sometimes assigned to reading within teacher education programs.

Snow, et al. (1998) asserted that the limited amount of instruction of reading within teacher education programs is a natural consequence of the large quantity of content

covered and asserted, therefore, that continued professional development in the instruction of reading is necessary after completion of the undergraduate degree. In a study of a redesign of an elementary education program, Haid (2005) described a professor who felt that the original program provided “too little time to teach too much” (p. 122), including literacy content. The revised program included more time for instruction of literacy competencies such as strategies, assessment, and differentiation. The practicum experiences were also greatly increased. Snow et al. (1998) also described teacher education as generally “lacking a strong apprenticeship system and hobbled by a course-by-course approach in college education” (p. 279). Moats (1999) also called for greater accountability in teacher education programs.

In a national study of 2,237 pre-service teachers, Sallinger, Mueller, Song, Jin, Zmach, Toplitz, Partridge, and Bickford (2010) found that most believed they had adequately mastered the five components of reading during their undergraduate training. However, only one quarter of respondents reported a strong focus on the components within their education programs. They reported uneven programmatic focus on the components. When these respondents were given an assessment of their knowledge of the five components of reading, they scored an average of 57%. The lowest scores were on the alphabetic section of the test. College faculty have been described as part of this problem. Joshi, Binks, Hougen et al. (2009) described deficiencies in the content knowledge of the professors who teach reading in schools of education. This study specifically showed faculty weaknesses in the areas of morphemes and phonemes.

The quality of literacy faculty in education programs is critical. L'Allier (2005) described the importance of faculty ability to flexibly utilize reading strategies during literacy education classes, as well as their effective use of modeling and guided practice during instruction of future reading teachers. Lacina and Block (2011) described the importance of highly qualified faculty in teacher education reading courses. They described such faculty as those who develop innovative lessons, provide students with necessary feedback, and model effective literacy instruction for their students. Haid (2005) and Wold et al. (2008) described the importance of developing the critical thinking abilities of pre-service reading teachers as they prepare to teach reading. Professors, therefore, must also be proficient in teaching critical thinking.

Researchers (Haid, 2005; Hoffman et al., 2005; Wold et al., 2008; Duffy et al., 2009; IRA, 2008/2009; Morris, 2011; Wepner, 2006) stress the importance of practicum experience in literacy education. Risko et al. (2008) wrote that changes in prospective teacher beliefs and knowledge were found to occur during actual work with students in practica settings, and while collecting pupil data. Roller (2010) wrote that reading practica vary greatly in length and intensity, and can consist of free-standing, or course related experiences. Practica may also range in number of students with whom teacher candidates work, as well as the age and grade levels of students.

Many benefits of reading-focused practica have been discussed in the literature. Wold et al. (2008) discussed the importance of repeated practice and refinement of literacy teaching which occurs during the practicum experience. The IRA (2008/2009) described the significance of field experiences in learning to teach high-needs students. They also discussed the importance of teacher modeling during practicum experiences.

Haid (2005) described greater competency in instructional planning among candidates with more field experience. Such planning is critical to good instruction and differentiation. Hoffman et al.(2005) asserted that extensive, supervised field experiences can help students to feel comfortable with the instructional methods they have learned in their education programs, thus rendering them less likely to blindly follow a prescribed curriculum. Moats (1998) argued that practicum experiences allow students to experience instructional strategies in the classroom as well to observe experienced teachers modeling the use of such strategies. Risko (2009) discussed the importance of congruence between the university and classroom environments, which can largely be accomplished through practicum experiences.

The National Council for Accreditation of Teacher Education (2010) called for quality practicum experiences for education programs and specifically discussed the importance of “rigorous criteria for the preparation, selection, and certification” (p. iii) of faculty members who supervise students in practicum experiences. Pre-service teachers should be placed in the classrooms of teachers who are themselves effective. Participation in a reading specific practicum is one of the requirements of the Florida Reading Endorsement as well as the state K-12 Reading Certification, an observation that is critical to this study (Florida Department of Education, 2002B, Just Read Florida, n.d.).

Literacy textbooks used in teacher preparation programs have also been studied. Researchers (Joshi, Binks, Graham, Ocker-Dean, Smith, & Boulware-Gooden, 2009; Walsh et al., 2006) have described the inadequacies of textbooks used to train teacher candidates in university programs. These studies found inadequate coverage of the

science of reading outlined by the National Reading Panel. Actual inaccuracies were also found in widely-used literacy education textbooks. Lyon & Weiser (2009) wrote,

> Prospective teachers will continue to receive inadequate information about reading development, reading difficulties, and reading instruction as long as higher education courses and textbooks reflect superstition, anecdotes, and beliefs about reading development rather than research-based evidence from reading science (p. 478).

The National Reading Panel (NICHD, 2000) called for more research on teacher education in reading, including optimal pre-service and in-service training, effects of pre-service experiences, and the assessment of the effectiveness of teacher training. Duffy et al. (2009) described a lack of research targeted at the effectiveness of teacher preparation programs in general. They also described a need for more research on the extent to which program completers actually implement literacy instruction learned in teacher education programs since fidelity requirements in schools frequently limit teachers' curricular decisions.

Florida Reading Certification

In an effort to increase the instructional skills of teachers in the area of reading, the state of Florida introduced an add-on Reading endorsement certification in 2002. The endorsement requires training in six specific components; Foundations of language and cognition, foundations of research-based practices, foundations of assessment, foundations of differentiation, applications of differentiation, and demonstration of accomplishment. (Just Read, Florida, n.d.).

Research on the reading endorsement has been conducted at the secondary level. Greenwell and Zygouris-Coe (2012) reported on high-school teacher responses to the training received during Florida Reading Endorsement training. This qualitative study reported that the teachers felt that a greater focus on comprehension and

vocabulary strategies would be more valuable to high school students. They also felt that more time was needed to process the information presented and to engage in more peer collaboration. The participants also reported that the length and intensity of the reading endorsement deterred other teachers from seeking the certification. They also would have valued the opportunity to see more demonstrations of the strategies taught. Greenwell and Zygouris-Coe also called for more discussion between the policy makers who design state certifications and the teachers who seek to attain them, as well as the professional developers who teach the training.

Summary

As NAEP scores in reading languish, states continue to seek ways to improve students' reading outcomes. Since it seems that even “highly-qualified” teachers are not always effective, research is needed to find ways to improve literacy instruction. Teaching reading is a complex undertaking, and today’s teachers must have the ability to provide effective, differentiated instruction to a variety of learners. This review illuminated a lack of research on the effects of elementary teacher certifications in the area of reading, and demonstrated the need for comprehensive training in the area of literacy for elementary teachers. An analysis of the outcomes of the students of teachers with differing reading certifications may help to determine the benefits received from the additional training received by these instructors.

CHAPTER 3
RESEARCH DESIGN

This study was designed to investigate whether the additional training required for specific state reading certifications predicted higher scores in reading among elementary school students. In this study, the researcher analyzed the effects of teacher certification in reading (K-12 reading certification or reading endorsement) on elementary student reading outcomes. Reading endorsement data was also analyzed separately to determine this level of certification's impacted reading achievement scores. Reading outcomes of student demographic populations, as well as student performance on specific skills tested within the state assessment instrument, were also examined in an attempt to determine whether reading certifications were more significant for different student subgroups, or in teaching the specific competencies measured in the sub-scores. This chapter describes the research questions and hypotheses, the study design, and the process of data analysis using the Hierarchical Linear Model Design**.**

Research Questions and Hypotheses

The study contained two research questions, both of which analyzed the effectiveness of teacher reading certifications on student reading outcomes.

1. Do teacher certifications in reading predict the reading scores and sub-scores of third, fourth, and fifth grade elementary students? The null hypothesis for this question was that there would be no significant difference in reading scores and sub-scores between elementary students of teachers who hold certification in the area of reading and those of teacher who do not hold such certifications. H_o: $\gamma_{01} = 0$

2. Does teacher reading endorsement certification predict the reading scores and sub-scores of third, fourth, and fifth grade elementary students? The null hypothesis for this question was that there would be no significant difference in reading scores and sub-scores between students of reading-endorsed teachers and those of teachers without reading certification. H_o: $\gamma_{01} = 0$

Study Design

After approval from the university Institutional Review Board was received, a data set comprised of de-identified student assessment and teacher certification data was attained from a medium-sized school district in Florida.

Student Data

The student data used in the study was comprised of de-identified reading scores from the Florida Comprehensive Assessment Test® (FCAT), the state-mandated standardized reading assessment that is administered each year. Student scale scores, indicators of student outcomes, were the dependent variable. Scale scores on the assessment range from 100-500.

Reading subtest scores were also attained and analyzed. The FCAT® reading test contains four subtests. The first, *Words and Phrases in Context*, assesses student use of strategies to increase vocabulary such as the use of context clues, and word structure and relationships. The *Main Idea, Plot, and Purpose* subtest assesses student ability to determine main idea, identify important details, sequence events, identify purpose, and understand plot and conflict within text. The *Comparisons and Cause and Effect* subtest assesses student recognition of these text structures, and the *Reference and Research* subtest assesses student interpretation and use of written and otherwise represented information for research and academic purposes (Florida Department of Education, 2007). Passages used within the texts are also designated as informational or literary. Thus, students are also scored on their success with each kind of text. This study analyzed the scores of the four subtests as well as student scores on the two types of text.

The Florida Department of Education reports that the FCAT® test "meets or exceeds the professional standards for standardized achievement tests" (Florida Department of Education, 2007, p. 37). The state has reported reliability in terms of Cronbach's Alphas of 0.89, 0.85, and 0.87 for grades three, four, and five respectively in 2006. Concurrent validity has been reported in terms of a correlation between the criterion-referenced portion of the test and the norm-referenced portion. The correlations were reported as 0.84, 0.83, and 0.83 in grades three, four, and five respectively in 2006 (Florida Department of Education, 2007). The test is based on the Florida state standards.

Data for a number of student subgroups are reported in annual FCAT® outcome reports, and were analyzed in this study. These subgroups include gender, race/ethnicity, English language learner status, Exceptional Student Education services due to disability, and free/reduced lunch status (Florida Department of Education, n.d.).

Teacher Data

De-identified teacher data that indicated state certifications was used to determine teacher reading certification status. The dataset indicated that there were 323 third, fourth, and fifth grade teachers of which thirteen held one of the two reading specific certifications. Nine of the teachers held the reading endorsement, and four held K-12 reading certification. The small number of certified teachers necessitated a change in the planned study design. Instead of using district-wide data, the researcher matched the thirteen reading-certified classes with non-certified classes of similar size at the same grade level, and analyzed the outcomes of only those classes. Due to the large number of non-reading certified teachers, efforts were made to match reading certified teachers' classes to non-reading certified teachers' classes in a way that would

minimize confounding variables. The criteria used to choose the match classes were, in rank order, grade level, class size, teacher hire date, same school, school with closest percentage of students who receive free and reduced lunch, and number of students in the class who received free and reduced lunch.

The scores of the students from all thirteen reading certified teachers were analyzed with the matching classes of the non-certified teachers. The scores from the nine classes taught by reading endorsed teachers were also analyzed with their matched classes in an additional, separate analysis. The four K-12 certified teachers' classrooms scores were not analyzed apart from the original reading certified analysis of the thirteen pairs due to the small number of teachers of that designation.

Data Analysis with the Hierarchical Linear Model Design

A hierarchical linear model (HLM) (Raudenbush and Bryk, 2002) was used to analyze the data because the individual student data can be nested within the classes of teachers with varying certification levels. Hierarchical Linear Models are used to analyze groups of participants in clusters, such as classes, thus allowing researchers to better adjust for type 1 error than the use of more traditional, non-nested models. McCoach and Adelson (2010) pointed out that more traditional models of analysis underestimate standard error since they assume independence of variables. HLM models enable researchers to better allow for the true non-independence of nested individual variables; individuals are not truly independent because they are nested in the same group (i.e., members of the same class), and will therefore, have some similar characteristics (experiences). "Generally speaking, observations that are clustered tend to exhibit some degree of interdependence" (McCoach & Adelson, 2010, p. 152). Therefore, treating them as though they were independent is likely to skew the

calculation of error. HLM models also account for the hierarchical structure of data. Through the use of HLM, “We can now readily pose hypotheses about relations occurring at each level and across levels and also assess the amount of variation at each level” (Bryk & Raudenbush, 2002, p. 5). Predictors from both the individual and contextual levels, as well combinations of the two, can be studied in relation to dependent variables (McCoach, 2010).

In this study, level one of the model included individual student variables. Planned level 1 predictors were gender (X1ij), disability ($X2_{ij}$), English Language Learner (X3ij), Free/Reduced lunch (X4ij), and Race (X5ij). However, due to the small number of English Language Learners and students of some of ethnic/racial groups in the dataset, these predictors were not analyzed.

Level two indicated the reading certification of the teachers of the classes. Two level 2 predictors were used in the model for each of the research questions. For research question 1, the level 2 predictors were no reading certification (W-0) and reading certification (W-1). For research question 2, the level 2 predictors were no reading endorsement (W-0) and reading endorsement (W-1).

The HLM equation was designed using Raudenbush and Bryk’s (2002) model. In this equation, there are *i* = 1..., n_j units nested with *j* = 1...,*j* level 2 units. Student *i* is nested in teacher *j;* level 1 students nested within level 2 teacher.

$$Y_{ij} = B_{oj} + B_{1j} X_{1ij} + B_{2j} X_{2ij} + B_{3j} X_{3ij} + B_{4j} X_{4ij} + B_{5j} X_{5ij} + r_{ij}$$

$$B_{oj} = \gamma_{00} + \gamma_{01} w_j + U_{oj}$$

$$r_{ij} \sim N (o, \sigma^2)$$

$$u_{oj} \sim N (o, \pi_{00})$$

Y_{ij} will represent the score or sub-score analyzed in each regression. The HLM design allows the researcher to control for the included level 1 variables during the analysis.

SAS® PROC GLIMMIX, a program specifically designed to be used in multi-level analyses such as HLM, was used to run the statistical tests. Singer (1998) described this program as appropriate when the researcher seeks to “examine the behavior of a level-1 outcome as a function of both level-1 and level-2 predictors” (p. 325) which was the goal of this study.

HLMs were run using the mean scale scores as well as scores for each of the subtests and text types. P scores <.05 were considered statistically significant.

CHAPTER 4
FINDINGS

Research Question 1 - Analysis of Students of Reading Certified Teachers (Reading Endorsed and K-12 Reading Certification)

Demographics

The final sample included 411 students who were 51.82% male, 48.18% female, 52.07% White, 32.12% Black, 8.27% mixed race, 5.6% Hispanic, 1.7% Asian, and 0.24% Native American. There were 29.2% third grade students, 32.12% fourth grade students, and 38.69% fifth grade students, 13.38% of the students were identified as having a disability, while 86.62% were non-disabled. Also, 55.47% of the students were identified as eligible for free or reduced lunch (FRL), while 44.53 were not, 0.73% of the sample participated in English Language Learner (ELL) programs, 99.27% of the sample did not participate in these programs. 50.36% of the sample was enrolled in the reading-certified classes, while 49.64% were enrolled in the non-reading certified classes.

The only demographic variable found to be distributed significantly differently between the reading-certified and non-certified classes was disability. In the reading certified classes, 18.84% (n=39) of students had identified disabilities. In the classes taught by non-reading certified teachers, 7.84% (n=16) had identified disabilities (chi-square p-value = 0.00).

Results of Research Question 1

Composite scale score analysis

Multi-level HLM analyses were conducted in which student level variables (gender, race/ethnicity, disability, grade level, ELL, FRL) were controlled. Composite mean scale scores of student level variables and teacher reading certification are displayed in Table

4-1. Due to the small sample sizes of ELL students and racial/ethnic groups, these variables were not analyzed.

Table 4-1. Composite mean scores by student variables

	Mean Score	Standard Deviation
Male	318.68	61.48
Female	328.31	63.31
3rd Grade	344.35	65.15
4th Grade	320.84	59.24
5th Grade	309.50	59.08
Disability	280.36	69.77
Non-disability	329.96	58.64
Free/Reduced Lunch	305.08	58.71
Non Free/Reduced Lunch	346.04	59.66
Reading Certified	324.27	62.29
Non-Reading Certified	322.35	62.82

HLM tests of fixed effects were conducted to determine which variables were significant to the scale scores. Disability, sex, and free/reduced lunch status were found to be significant to these scores. The mean scale score for students with disabilities was 280.36, and for students without disabilities, 329.96. The mean scale score for students eligible for free or reduced lunch was 305.08. Ineligible students had a mean score of 346.04. Females scored higher than males, earning scale scores of 328.31 and 318.68, respectively. The analysis of scale scores of the reading certified and non-reading certified classes yielded a non-significant value for the effect of teacher reading certification ($p = 0.24$). Therefore, the null hypothesis for Research Question 1 cannot be rejected. Table 4-2 illustrates the tests of fixed effects for the composite scale scores.

Subtest and text type analysis

Comparison/Cause Effect Subtest. Disability, free and reduced lunch status, and grade level were significant to the *Comparison and Cause and Effect Subtest*

scores. The mean score was 6.46 for students with disabilities, and 8.57 for students with no disability. The mean score for students who were eligible for free or reduced lunch was 7.46 on this subtest. The mean score for students who were ineligible was 8.89. The mean scores for third, fourth, and fifth grades were 5.27, 8.15, and 10.19, respectively. Reading certification was not significant to this subtest. The effects of student and teacher variables on the *Comparison and Cause and Effect Subtest* are illustrated in Table 4-3.

Table 4-2. Tests of fixed effects – composite scale scores

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	385.2	4.12	0.0431
Grade Level	2	19.44	1.86	0.1829
DIS	1	389.3	18.89	<.0001
FRL	1	398.2	23.63	<.0001
Reading Certification	1	31.34	1.45	0.2374
Sex*Reading Certification	1	385.2	0.14	0.7122
Grade Level*Reading Certification	2	19.44	1.09	0.3561
DIS*Reading Certification	1	389.3	8.69	0.0034
FRL*Reading Certification	1	398.2	2.07	0.1512

Table 4-3. Tests of fixed effects – comparison/cause and effect subtest

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	386.2	2.41	0.1215
Grade Level	2	16.65	38.82	<.0001
DIS	1	392.2	10.35	0.0014
FRL	1	398.1	17.47	<.0001
Reading Certification	1	32.64	1.63	0.2109
Sex*Reading Certification	1	386.2	0.22	0.6412
Grade Level*Reading Certification	2	16.65	1.65	0.2212
DIS*Reading Certification	1	392.2	7.29	0.0072
FRL*Reading Certification	1	398.1	0.75	0.3864

Main Idea/Plot/Purpose Subtest. Several variables were significant to student scores on this subtest. Sex was significant, with females scoring 18.38, and males, 17.14. Grade level was significant with third, fourth, and fifth grade students scoring 19.19, 19.07, and 15.53, respectively. Disability was also significant in that non-disabled

students scored 18.30 and disabled students mean score was 14.07. Finally, free/reduced lunch status was found to be significant. The mean score for students who received free or reduced lunch was 16.61. For students who did not receive free or reduced lunch, the mean was 19.15. Reading certification was not significant. Table 4-4 illustrates the effects of variables on the *Main Idea/Plot/Purpose Subtest.*

Table 4-4. Tests of fixed effects – main idea/plot/purpose subtest

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	387	8.03	0.0048
Grade Level	2	19.45	6.95	0.0053
DIS	1	391.8	16.16	<.0001
FRL	1	399	15.74	<.0001
Reading Certification	1	35.3	2.72	0.1083
Sex*Reading Certification	1	387	0.00	0.9559
Grade Level*Reading Certification	2	19.45	1.49	0.2499
DIS*Reading Certification	1	391.8	10.50	0.0013
FRL*Reading Certification	1	399	2.86	0.0914

Words and Phrases Subtest. Grade level was significant to this subtest with third, fourth, and fifth grade students earning mean scores of 5.20, 5.04, and 3.31, respectively. Disability was also significant to this subtest. The mean for students with disabilities was 3.38. Students with no disability had a mean score of 4.58. Free/reduced lunch status was also significant. Students who received free or reduced lunch had a mean score of 4.09. Those who did not qualify for free and reduced lunch had a mean score of 4.83. Reading certification was not significant to this subtest. The effects of student and teacher variables on the *Words and Phrase Subtest* are illustrated in Table 4-5.

Reference/Research Subtest. Grade level, disability, and free/reduced lunch status were significant to the *Reference and Research Subtest*. The grade level mean scores were 4.73, 2.12, and 1.81 for grades three, four, and five, respectively. In

students with disabilities, the mean score was 2.04. For students with no disability, the mean score on this subtest was 2.87. Students who received free or reduced lunch had a mean score of 2.29; students who did not qualify had a mean score of 3.34. Reading certification was not significant to this subtest. The effects are illustrated in Table 4-6.

Table 4-5. Test of fixed effects – words and phrases

Effect	Num DF	Den DF	F Value	Pr>F
Sex	1	391.3	0.08	0.7717
Grade Level	2	16.36	36.34	<.0001
DIS	1	397.7	14.34	0.0002
FRL	1	380.1	24.67	<.0001
Reading Certification	1	43.22	1.02	0.3183
Sex*Reading Certification	1	391.3	0.10	0.7495
Grade Level*Reading Certification	2	16.36	0.39	0.6817
DIS*Reading Certification	1	397.7	2.80	0.0953
FRL*Reading Certification	1	380.1	0.09	0.7667

Table 4-6. Tests of fixed effects – reference/research subtest

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	385	0.15	0.6951
Grade Level	2	19.89	35.88	<.0001
DIS	1	388.6	5.25	0.0225
FRL	1	397.4	21.63	<.0001
Reading Certification	1	30.78	0.33	0.5721
Sex*Reading Certification	1	385	0.51	0.4774
Grade Level*Reading Certification	2	19.89	0.54	0.5915
DIS*Reading Certification	1	388.6	1.83	0.1767
FRL*Reading Certification	1	397.4	1.85	0.1746

Literary text questions. All of the student variables except reading certification were significant to the literary text questions on the test. Females had a mean score of 19.47, and males had a mean score of 18.19. Third, fourth, and fifth grade students had mean scores of 22.53, 18.33, and 16.40, respectively. The mean score for students with disabilities was 14.82, and for students with no disability was 19.42. Students eligible for free or reduced lunch had a mean score of 17.46. Students who were not eligible had a mean score of 20.48. The effects are illustrated in Table 4-7.

Table 4-7. Tests of fixed effects – literary text

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	385.8	8.46	0.0038
Grade Level	2	19.29	11.02	0.0006
DIS	1	390.2	17.60	<.0001
FRL	1	398.8	20.16	<.0001
Reading Certification	1	32.58	2.02	0.1650
Sex*Reading Certification	1	385.8	0.14	0.7038
Grade Level*Reading Certification	2	19.29	1.62	0.2230
DIS*Reading Certification	1	390.2	12.17	0.0005
FRL*Reading Certification	1	398.8	2.91	0.0889

Informational text questions. Grade level, disability and free and reduced lunch status were found to be significant to the informational text questions on the test. Third, fourth, and fifth grade students had mean scores of 11.87, 16.05, and 14.44, respectively. Students with disabilities had a mean score of 11.69, and those with no disability had a mean score of 14.60. Students who qualified for free or reduced lunch had a mean score of 12.99 on the informational questions, and those that did not qualify had a mean score of 15.73. Reading certification was not significant to the informational text questions on the test. Fixed effects are illustrated on Table 4-8.

Subtest and text type summary. Reading certification was not significant to the outcomes of any of the subtests or either of the text genres. Sex was significant in the main idea subtest as well as on the literary text questions. On the main idea subtest, the mean score was 18.38 for females and 17.14 for males. On the questions classified as literary on the test, the mean score was 19.47 for females and 18.19 for males. Disability and free/reduced lunch status were significant to all of the subtests as well as to both text types.

Interaction analysis

Interactions between teacher reading certifications and student level variables were also analyzed through HLMs. There was a significant difference in scores of

disabled students between reading certified and non-reading certified classes (p = 0.00). The mean scale score for the students with disabilities in reading certified classes was 271.15. In non-certified classes, the mean scale score for students with disabilities was 302.81. However, it must be noted that there were only 39 students with disabilities in the reading certified classes, and 16 students with disabilities in non-reading certified classes, thus making this a small sample. This interaction was also observed in all of the subtests and both of the text types. Table 4-9 illustrates the results of the interaction between disability and teacher reading certification.

Table 4-8. Tests of fixed effects – informational text

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	387.3	0.71	0.4005
Grade Level	2	18.12	11.50	0.0006
DIS	1	392.9	13.33	0.0003
FRL	1	398.1	24.03	<.0001
Reading Certification	1	35.56	2.08	0.1580
Sex*Reading Certification	1	387.3	0.08	0.7748
Grade Level*Reading Certification	2	18.12	1.53	0.2434
DIS*Reading Certification	1	392.9	5.28	0.0221
FRL*Reading Certification	1	398.1	0.64	0.4240

Table 4-9. Mean scores of students with disability by teacher reading certification

	Reading Certified (SD)	Non-Reading Certified(SD)
Mean Scale	271.15 (67.22)	302.81 (72.93)
Comp/Cause Effect	6.46 (3.89)	8.38 (3.59)
Main Idea	13.08 (5.41)	16.50 (5.91)
Reference/Research	2.03 (1.66)	2.06 (1.00)
Words/Phrases	3.28 (1.75)	3.63 (1.93)
Informational Text	10.82 (4.74)	13.81 (5.43)
Literary Text	14.03 (5.94)	16.75 (5.69)

Research Question 2 - Analysis of Students of Reading Endorsed Teachers

Demographics

The sample for this analysis included 290 students. This student sample was 50.34% female, 49.66% male, 51.38% White, 33.45% Black, 6.90% mixed race, 6.55%

Hispanic, 1.38% Asian, and 0.34 Native American. The sample was comprised of 41.38% third grade students, 21.38% fourth grade students, and 37.24% fifth grade students. Students with disabilities made up 14.14% of the sample; students without disabilities comprised 85.86% of the group. 53.79% of the sample were eligible for free and reduced lunch, 46.21 were ineligible,1.03% of the sample was enrolled in programs for English Language Learners, and 98.97% were not. Also, 51.03% of the students in the sample were members of a class with a reading endorsed teacher while 48.97% were in the class of a non-reading endorsed teacher.

The only student variable found to be significant in the demographic composition of the reading endorsed and non-reading groups is disability. In the reading endorsed classes, 20.27% (n = 30) of students had an identified disability. In the non-reading endorsed class, only 7.75% (n = 11) of students had a disability (chi square p-value = 0.00).

Results of Research Question 2

Composite scale score analysis

Multi-level HLM analyses were conducted in which the student level variables (gender, race, disability, ELL, FRL, grade level) were controlled. Mean composite scale scores of student and teacher level variables are displayed in Table 4-10. Due to the small sample of ELL and ethnic/racial group members, these variables were not analyzed. Disability and free/reduced lunch status were found to be significant to the composite scale scores. Students with disabilities had a mean scale score of 287.07. Students with no disability had a mean scale score of 336.51. Students who qualified for free or reduced lunch had a mean scale of 309.47. Students who were ineligible for free and reduced lunch had a mean scale score of 352.87. The analysis of scale scores of

Table 4-10. Composite mean scale scores by student variable

	Mean Score	Standard Deviation
Male	326.19	61.42
Female	332.82	62.93
3rd Grade	344.35	65.15
4th Grade	321.16	63.24
5th Grade	317.85	54.89
Disability	287.07	69.89
No disability	336.51	58.04
Free/Reduced Lunch	309.47	57.96
No Free/Reduced Lunch	352.87	58.84
Reading Endorsed	327.49	65.72
Non Reading Endorsed	331.64	58.39

the reading endorsed and non-reading endorsed yielded a non-significant value for the effect of reading endorsement ($p = 0.07$). Therefore, the null hypothesis for Research Question 2 cannot be rejected. Scale score analysis is illustrated in Table 4-11.

Table 4-11. Tests of fixed effects of composite scale scores

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	268.4	3.04	0.0821
Grade Level	2	12.25	0.46	0.6414
DIS	1	267.6	7.32	0.0073
FRL	1	276.5	16.74	<.0001
Reading Endorsement	1	16.36	3.77	0.0696
Sex*Reading Endorsement	1	268.4	0.02	0.8917
Grade Level*Reading Endorsement	2	12.25	0.38	0.6887
Disability*Reading Endorsement	1	267.6	14.40	0.0002
FRL*Read Endorsement	1	276.5	0.00	0.9734

Subtest and text type analyses

Comparison/Cause and Effect Subtest. Grade level, disability, free/reduced lunch status, and reading endorsement were found to be significant to this subtest. Grade level mean scores for third, fourth, and fifth grades were 5.27, 7.66, and 10.62, respectively. The mean score for students with disability was 6.80, and for students with no disability, 7.93. Students who are eligible for free or reduced lunch had a mean score of 7.31 on this subtest. Students who were ineligible had a mean score of 8.31.

Students in teacher reading endorsed classes had a mean score of 7.78, and those in non-reading endorsed classes had a mean score of 7.77. The effects of the variables on the Comparison/Cause and Effect subtest are illustrated in Table 4-12.

Table 4-12. Tests of fixed effects – comparison/cause and effect subtest

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	270.1	0.39	0.5351
Grade Level	2	11.76	42.66	<.0001
DIS	1	268.8	3.99	0.0467
FRL	1	276.5	5.97	0.0152
Read Endorsement	1	20.76	4.73	0.0414
Sex*Read Endorsement	1	270.1	0.39	0.5312
Grade Level*Read Endorsement	2	11.76	1.44	0.2754
DIS*Read Endorsement	1	268.8	10.02	0.0017
FRL*Read Endorsement	1	276.5	0.03	0.8592

Main Idea/Plot/Purpose Subtest. Sex, disability, free/reduced lunch status, and reading endorsement were found to be significant to this subtest. Females had a mean score of 18.58. Males had a mean score of 17.49. Third, fourth, and fifth graders had scores of 19.19, 19.21, and 16.07, respectively. Students with identified disabilities had a mean score of 14.80, and students with no disability had a mean score of 18.57. Students who received free or reduced lunch had a mean score of 16.73, and those who were ineligible had a mean score of 19.55. Students in teacher reading endorsed classes had a mean score of 17.72 on this subtest, and those in non-reading endorsed classes scored 18.36. The effects of the variables on the *Main Idea/Plot/Purpose Subtest* are illustrated in Table 4-13.

Words and Phrases Subtest. The effects of the variables on the *Words and Phrases Subtest* are illustrated in Table 4-14. Grade level, free/reduced lunch status, and reading endorsement were found to be significant to this subtest. Third, fourth, and fifth grade students had mean scores of 5.20, 4.98, and 3.51, respectively. Students

eligible for free or reduced lunch had mean score of 4.15, while ineligible students had a mean score of 4.96. Students in teacher reading endorsed classes had a mean score of 4.44 and those in non-reading endorsed classes had a mean score of 4.61.

Table 4-13. Tests of fixed effects – main idea/plot/purpose

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	268.7	5.15	0.0240
Grade Level	2	12.14	1.99	0.1791
DIS	1	267.9	6.51	0.0113
FRL	1	277.5	11.79	0.0007
Read Endorsement	1	17.3	4.79	0.0427
Sex*Read Endorsement	1	268.7	0.56	0.4537
Grade Level*Read Endorsement	2	12.14	0.50	0.6188
DIS*Read Endorsement	1	267.9	15.12	0.0001
FRL*Read Endorsement	1	277.5	0.08	0.7717

Table 4-14. Tests of fixed effects – words and phrases subtest

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	270.2	0.52	0.4722
Grade Level	2	10.44	13.35	0.0013
DIS	1	268.6	2.54	0.1120
FRL	1	271.2	16.57	<.0001
Read Endorsement	1	21.15	5.42	0.0299
Sex*Read Endorsement	1	270.2	0.02	0.8920
Grade Level*Read Endorsement	2	10.44	0.10	0.9055
DIS*Read Endorsement	1	268.6	6.40	0.0120
FRL*Read Endorsement	1	271.2	3.70	0.0556

Reference and Research Subtest. Grade level and Free/reduced lunch status were significant to this subtest. Third, fourth, and fifth graders had mean scores of 4.73, 2.11, and 1.92, respectively. Students who were eligible for free or reduced lunch had a mean score of 2.55. Students who were ineligible had a mean score of 3.79. Reading endorsement was not significant to this subtest. The effects of the variables on the *Reference and Research Subtest* are illustrated in Table 4-15.

Table 4-15. Tests of fixed effects – reference/research subtest

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	268.3	0.62	0.4321
Grade Level	2	12.2	17.69	0.0002
DIS	1	267.6	3.10	0.0797
FRL	1	276.4	17.66	<.0001
Read Endorsement	1	16.2	0.59	0.4518
Sex*Read Endorsement	1	268.3	0.00	0.9726
Grade Level*Read Endorsement	2	12.2	0.15	0.8655
DIS*Read Endorsement	1	267.6	3.11	0.0792
FRL*Read Endorsement	1	276.4	0.33	0.5633

Literary text questions. Sex, grade level, disability, and free/reduced lunch status were found to be significant to the scores on these questions. Females had a mean score of 20.06 on these questions, and males had a mean score of 19.04. Third, fourth, and fifth graders had mean scores of 22.53, 18.19, and 17.04, respectively. The mean score for students with identified disabilities was 15.46. For students with no disability, the mean was 20.23. The mean score for students who were eligible for free or reduced lunch was 18.10, and for students who were ineligible was 21.25. Reading endorsement was not significant to the literacy questions on this test. The effects of the variables on these questions are illustrated in Table 4-16.

Table 4-16. Tests of fixed effects – literary text

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	268.7	5.37	0.0212
Grade Level	2	12.25	5.11	0.0243
DIS	1	267.9	7.84	0.0055
FRL	1	277.3	13.66	0.0003
Read Endorsement	1	17.19	4.10	0.0586
Sex*Read Endorsement	1	268.7	0.88	0.3481
Grade Level* Read Endorsement	2	12.25	0.54	0.5949
DIS*Read Endorsement	1	267.9	17.60	<.0001
FRL*Read Endorsement	1	277.3	0.10	0.7572

Informational text questions. Grade Level, free/reduced lunch status and reading endorsement were all found to be significant to these questions. Third, fourth,

and fifth grade students had mean scores of 11.87, 15.77, and 15.08, respectively. The mean score for students who were eligible for free or reduced lunch was 12.64, and for those who were ineligible was 15.37. The mean score for students in reading endorsed classes was 13.77. The mean for students in non-reading endorsed classes was 14.04. The effects of the variables on the informational text questions on the test are illustrated in Table 4-17.

Table 4-17. Tests of fixed effects – informational text

Effect	Num DF	Den DF	F Value	Pr > F
Sex	1	269.1	0.06	0.8071
Grade Level	2	11.85	7.15	0.0092
DIS	1	268	3.84	0.0512
FRL	1	278	14.13	0.0002
Read Endorsement	1	18.15	4.80	0.0417
Sex*Read Endorsement	1	269.1	0.00	0.9468
Grade Level*Read Endorsement	2	11.85	0.95	0.4127
DIS*Read Endorsement	1	268	8.13	0.0047
FRL*Read Endorsement	1	278	0.19	0.6626

Subtest and text type summary. Reading Endorsement was significant to the *Comparison, Main Idea*, and *Words a Phrases* subtests as well as the informational questions. Sex was significant to the *Main Idea* subtest as well as to the literary questions. Grade level was significant to both text types and all of the subtests except *Main Idea.* Disability was significant to the *Comparison* and *Main Idea* subtests as well as the literary questions. Free/reduced lunch status was significant to all of the subtests and both text types. Scale scores for subtests in which reading endorsement was significant are illustrated in Table 4-18.

Interaction analysis

Interactions between teacher reading endorsement and Level 1 student variables were also analyzed through HLMs. There was a significant difference in scores of disabled students between the students of reading endorsed and non-reading endorsed

teachers (p = 0.00). The mean scale score for the students with disabilities in reading endorsed classes was 271.50. In non-endorsed classes, the mean scale score for students with disabilities was 329.55. However, it must be noted that there were only 30 students with disabilities in the reading endorsed classes, and 11 students with disabilities in non-reading endorsed classes, thus making this a small sample. This interaction was also observed in both of the text types and all of the subtests except *Reference and Research*. Table 4-19 illustrates the results of the interaction between disability and teacher reading endorsement.

Table 4-18. Mean scores of significant sub-scores by teacher reading endorsement status

	Reading Endorsed (SD)	Non-Reading Endorsed (SD)
Comparison/Cause	7.78 (3.72)	7.77 (3.23)
Main Idea	17.72 (5.06)	18.36 (4.94)
Words/Phrases	4.44 (1.52)	4.61 (1.67)
Informational	13.77 (4.73)	14.04 (4.75)

Table 4-19. Scores of students with disability by teacher reading endorsement

	Reading Endorsed (SD)	Non-Reading Endorsed(SD)
Mean Scale	271.50 (70.23)	329.55 (50.23)
Comp/Cause Effect	6.07 (3.89)	8.82 (3.49)
Main Idea	13.33 (5.59)	18.82 (4.38)
Words/Phrases	3.53 (1.74)	4.55 (1.51)
Informational Text	10.93 (4.93)	15.45 (5.15)
Literary Text	14.13 (6.24)	19.09 (4.23)

CHAPTER 5
DISCUSSION

Summary of the findings

Neither reading certification nor reading endorsement was found to be significant to the mean scale score of the composite reading test used in this study. Though reading certification was not found to be significant to any of the sub-scores, the reading endorsement was found to be significant to some of the subtests as well as to the informational text questions. Mean scores were significantly higher in reading endorsed classes on the *Comparison/Cause and Effect* subtest. Mean scores were significantly lower in reading endorsed classes on the *Main Idea* and *Words and Phrases* subtests as well as on the informational questions.

Interaction effects were discovered between student disability and both the reading certification and reading endorsement. In both cases, the students in the classes in which the teachers had additional literacy training scored lower than their counterparts. This interaction was also observed in both text types as well as in all of the subtests except for the *Reference and Research* subtest in the reading endorsement analysis.

However, in both the reading certification and reading endorsement analysis, there were small samples of students with disabilities. In the reading certification analysis, there were 39 students with disabilities in the reading certified classes, and 16 students with disabilities in the non-reading certified classes. In the analysis that was limited to the reading endorsed classes, there were 30 students with disabilities in the reading endorsed classes, and 11 students with a disability in the non-reading endorsed classes.

The number of students with disabilities in the reading certified and endorsed groups was itself statistically significant. In both analyses, there was more than double the amount of students with disabilities in the classes of the teachers with additional training in the area of reading. This begs the question of whether school personnel place students with greater reading issues into classes taught by reading certified and endorsed teachers. As Phillips (2010) asserted, we cannot assume that students are assigned to classes randomly. If significantly more students with disabilities are placed in reading certified classes, it is possible that other students with greater literacy needs may also be placed in these classes since the teachers possess additional instructional credentials. Without judging the placement of struggling students in the classes of reading certified teachers (since such placement may, indeed, be warranted) it must be noted that, in regard to research, such placement could significantly bring down the mean student test scores of such teachers, thus skewing the results as they relate to instructional effectiveness. Such skewed results may improperly suggest that non-reading certified teachers are more effective than their reading certified counterparts. Further questioning in this vein may have implications for the current trend in teacher evaluation which is based on student test outcomes.

Implications of the Findings

In a large Dutch study, Peetsma, van der Veen, Koopman, & van Schooten (2006), observed that class composition affected individual student growth. They found that classes containing large numbers of low-achieving students affected the progress of students within them. This might have occurred because struggling students required more individual teacher attention. Peetsma et al. also asserted that specialists are often assigned to work with low-achieving students. This point is relevant to the current study.

Perhaps struggling students were assigned to reading certified teachers because those teachers were seen as more qualified to help the students. Additionally, if these classes do have more struggling students, the effect described by Peetsma et al. may have been plausible for students in the reading certified classes.

The findings also beg the question of whether the state test actually assesses the competencies included in the reading endorsement. Greenwell and Zygouris-Coe (2012) reported that reading endorsed high-school teachers reported a need for more comprehension and vocabulary instruction training within the required endorsement coursework. Though that study focused on high school students, it may apply to the current study. Comprehension and vocabulary are also large components of the elementary level assessments analyzed in this study.

Additionally, the reading endorsement is still a fairly new certification. As Bean et al. (2010) wrote about *Reading First*, another recent reading initiative, new programs often taken time to show results. The reading endorsement may show greater gains when it has been honed and practiced. Therefore, it is possible that though a reading endorsement may be effective professional development, it may require some adjustment from its current form if it is to optimally prepare teachers for the skills that are tested. The state has revisited the reading endorsement competencies, passing new regulations in late 2011. The new competencies will be implemented in late 2012 (Florida Department of Education, n.d.). The new competencies may render different results.

Implications for Research and Policy

In this study, the researcher attempted to analyze the effects of teacher certification in reading among elementary students. While in that process, this study

illuminated difficulties encountered when attempting to study teacher certification effects on student learning. The small number of reading endorsed teachers in this study suggests that larger sample sizes (multi-district or statewide) could be used to increase the number of reading certified teachers included in the research. This would be especially critical in regard to the study of individual subgroups, many of which had student samples too small to analyze in the current study.

Replications of similar studies in different states could be valuable since teacher certification requirements vary by state. Such studies could lead to comparison of teacher reading certifications among states. Longitudinal studies which track students' teachers, and their certification levels through the years would also help to untangle the mysteries of student success and teacher certification. "Value-added" models can also be used to attempt to more precisely identify student gains achieved with each teacher. Value-added ratings are calculated by using a student's previous achievement scores to predict future achievement (Duffrin, 2011), thereby determining if the student achieves at a rate higher or lower with their actual teacher. Duffrin warned, however, that even value-added scores do not allow for characteristics or experiences in the class that are unrelated to teacher performance.

Studies of school-wide effects might indicate an additional value of reading certifications. Croninger et al. (2007) described a school-wide effect of teachers with graduate degrees, though these teachers did not show class-wide effects of their advanced training. Such an effect might also be found in the schools that employ teachers with reading certifications.

Since the study focused on so few teachers, it is possible that they were not truly a representative sample. There were only nine reading endorsed and four K-12 reading certified teachers. Therefore, it is possible that the randomly picked match teachers happened to be exceptional teachers. A larger sample size would decrease that possibility**.** In a review of studies on teacher effectiveness, Sawchuk (2011) found that "some teachers do produce stronger achievement gains among their students than others do" (p. 3). It is possible that the match teachers were highly effective.

Implications for Higher Education

Colleges of education offering degrees in Elementary Education must be on the cutting edge of state certification requirements. Colleges of education find themselves in the unique position of following state policies and mandates, while concurrently shaping them through research. At the same time, elementary education programs must prepare teachers who can strongly affect student learning. Continued analysis of state certifications as well as research on what works in the classroom will help colleges of education to create programs and reading courses that maximize the limited time that pre-service teachers have to become effective reading teachers before entering the classroom. Additionally, the current climate of accountability is creating continued connection between the outcomes of a teacher's students, and the college of education that trained that teacher. These new funding and accountability measures are adding pressure to teacher education programs to produce teachers who yield the desired student outcome results.

The small number of reading endorsed and reading certified teachers also has implications for higher education. Greenwell and Zygouris-Coe (2012) wrote that reading endorsed teachers described the comprehensive nature of the required training

as a deterrent to teacher attainment of the certification. Colleges of education may seek to streamline the competencies into infused undergraduate programs, or stand-alone graduate courses that may cover the requirements in a way that is not as overwhelming for teachers, thus encouraging more teachers to attain the qualification.

Limitations

An unforeseen outcome of this study was the small number of teachers in the district who have achieved reading certification (nine reading endorsed teachers and four K-12 reading certified teachers). The reading endorsement has been available since 2002, and this study utilized data from the 2009-2010 school year. The small sample of reading-certified teachers led to samples of subgroups that were too small to analyze. Additionally, due to the vastly unequal sample sizes, the researcher had to match classes.

Also, although the teachers had been identified as reading certified or endorsed at the time that the data was collected, the researcher was unable to ascertain the exact dates of the certifications. Therefore, it is possible that some of the teachers may have been in the process of earning these certifications at the time they taught the students in this study. However, with the belief that completion of even part of the training for the certification could have an effect on student learning, the researcher decided to continue with the analysis with the understanding that this would be a limitation of the study.

An additional factor which may have confounded the study results was that many teachers in this state received intensive reading instructional training under state reading grants (i.e. Reading First) in recent years. There is no way to ascertain which teachers in the study received such training. Much of that training was aligned with

reading endorsement competencies. This training, therefore, may have boosted the reading instructional skills of the non-certified teachers in the study. However, although Reading First may have increased skills of the teachers in the present study, the grant no longer exists, and therefore, cannot be counted on to increase the skills of future teachers.

Conclusion

This study sought to investigate the effect of elementary teacher reading certification, and the requisite additional training, on elementary student reading outcomes. Few significant findings resulted. However, findings on some of the sub-scores indicated significantly lower outcomes among the students of those teachers who had attained advanced certification and training. Since this is counterintuitive, this finding demanded further investigation into how such findings could be possible.

One important finding of this further analysis was the large number of students with disabilities placed into the classes of reading certified teachers. This significant finding would seem to indicate administrative confidence in these teachers. It also begged the question of whether other students with greater needs in reading are placed in these classes. This finding is especially important in the consideration of recent teacher assessment policies that attach teacher retention and salary to student learning outcomes. It also raises questions on the growing use of K-12 student outcomes to assess the colleges of education from which teachers graduate. If struggling students are assigned to teachers with advanced training in reading, that fact should be considered when evaluating these teachers and the colleges of education that trained them. This study also indicated that classroom composition must not be ignored when studying teacher certifications and other educational policy issues.

Additionally, this study illustrated the complexities which are inherent in the assessment of teachers. Despite the use of HLM to control confounding variables, and efforts to match classes closely, the results of this study clearly indicate that it is indeed difficult to capture exactly what contributes to the elusive quality known as teacher effectiveness, and whether such attributes can be measured through the use of standardized testing.

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