

**Views of the Common Core: An Examination of Upper Elementary Mathematics
Teachers' Lived Experiences**

by

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Abstract

This study was conducted to investigate perspectives of upper elementary mathematics teachers on the Alabama College and Career Readiness Standards, the Common Core State Standards for Alabama. Participants in this study were six mathematics teachers from one school in a large school system in Alabama. Two third grade teachers, two fourth grade teachers, one special education teacher, and I, the fifth grade teacher, kept journals for twelve weeks, documenting thoughts and experiences as we taught the standards. One hour-long focus group was also conducted with five participants. Data analyses revealed three themes. The first dealt with teacher attitudes about the standards. Included in this theme was a recognition of the benefits of the universal curriculum, an appreciation of the mathematical practices, a belief that some standards were not developmentally appropriate, the thought that standards presumed all students achieved mastery on initial presentation, and dissatisfaction with standards that prescribed only one way to solve a problem. The second theme dealt with actual implementation of standards. Components of this theme were challenges faced in implementation, factors affecting implementation, and proposed changes to make implementation easier. The final theme dealt with teachers' perceptions of the impact of the standards on students. Findings indicate that teachers are generally supportive of standards but have misconceptions about them. This study suggests that the district could more effectively assist teachers with implementation by offering greater accessibility and responsiveness to teachers' concerns. Additionally, reducing other district mandates would allow teachers to more fully focus on implementation.

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I never dreamed that when I started this journey that it would last for six years. When it started, I was working as a clinical assistant professor at a university, and when it ended I was back doing what I truly love, teaching fifth grade mathematics. This has been a challenging and rewarding experience, and I have grown so much both personally and professionally because of it. I have not traveled this road alone, and I want to acknowledge those who have been there with me.

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Two Bible verses have sustained me throughout this experience, and I want to conclude by sharing them. The first is Philippians 4:13, “I can do all things through Christ who strengthens me.” The second is Colossians 3:17, “And whatever you do or say, let it be as a representative of the Lord Jesus, all the while giving thanks through him to God the Father.”

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CHAPTER 1: INTRODUCTION

With the publication of the 1983 report *A Nation at Risk*, Americans became increasingly concerned about the state of the public education system and a series of policies were implemented with the goal of fixing what was wrong (Howe, 1995). One of the reforms that many lobbied for was for the establishment of national standards and assessment (Ravitch, 1996; Smith & Kovacs, 2010). Presidents George H.W. Bush, Bill Clinton, and George W. Bush became proponents of the standards in their quest to improve American public schools and to make American students first in mathematics and science achievement (Klieger & Yakobovitch, 2011). The most far reaching standards act occurred in 2001 under George W. Bush with the No Child Left Behind Act (NCLB), a renewal of the Elementary and Secondary Education Act. Its ultimate goal was the improvement of the public education system by closing the “achievement gap” of America’s children by improving schools (Lewis, 2003, p. 57). The Act also focused on data and scientific research to drive curriculum and programs. New federal accountability rules were put in place, and schools were required to meet the required federal accountability guidelines or suffer consequences such as state takeovers or loss of federal funding. Most daunting in the NCLB legislation was the provision that all children would be proficient in math and language arts standards set by the state by the year 2014 or a school would be labeled a failing school (Goertz & Duffy, 2003; Sanders, 2003).

According to Robert Rothman (2012), the NCLB law was a driving force for the establishment of national standards because of discrepancies between state standards. Since states were allowed to determine what proficiency was, there was a wide discrepancy between what was expected. Some states that scored high in proficiency on state tests scored low on the nationally required National Assessment of Educational Progress (NAEP) test, suggesting that

these states set lower standards for proficiency than did other states (Rothman, 2012). National standards seemed the most logical way to avoid the pitfalls of state standards and to encourage excellence and equity in the American public school system (National Research Council, 2008). In 2009 the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers joined forces to create a set of challenging academic standards in mathematics and language arts that could be used by all states. Their product, the Common Core State Standards Initiative (CCSSI) was unveiled in 2010 and was quickly adopted by a majority of states (Rothman, 2012). This was partly fueled by President Obama's administration's Race to the Top competition to receive federal funds. States that adopted the standards by August 2 of 2010 won points in the competition for a share of the \$3.4 billion that was awarded in September (Lewin, 2010). Another contributing factor was that states that adopted Common Core standards could receive a waiver from the NCLB requirements, an attractive option in light of the expected one hundred percent proficiency of all children in 2014 (Klein, 2011).

Alabama approved the Common Core Standards in November 2010. Although there was opposition to the adoption, the State Board of Education passed the measure 7-2 (Leech, 2010). According to State Superintendent of Education, Dr. Tommy Bice, "Incorporating the Common Core Standards into our already highly regarded content standards brings a new level of rigor and perceptual understanding to teaching and learning" (Alabama Department of Education, 2012, p. 3).

While there was input from teachers into the Common Core Standards, this was more in the form of teacher organizations, rather than individual teachers (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010).

Assurances to teachers that they are not being told how to teach, only what to teach are found at both the Common Core website and the Alabama State Department of Education website (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010; Alabama Department of Education, 2012). Beginning with the 2012-2013 school year, teachers were charged with the task of implementing these newly adopted standards.

When Alabama adopted the Common Core State Standards in 2010, they were given a new name, the Alabama College and Career Readiness Standards (CCRS). Additional standards in the English/Language Arts area for elementary school students were also included in the CCRS. No additions or deletions, however, were made to the CCRS in the area of elementary school mathematics (Kendall et al., 2012). At the time the CCRS came into existence, I was a clinical assistant professor at a state university responsible for instructing pre-service teachers in the course Teaching Mathematics in the Elementary School. Although I was very familiar with the National Council of Teachers of Mathematics Standards and Content and Process Standards, I had never heard of the Common Core Standards. I first encountered them when I returned to teaching in the elementary school in 2012.

After one year of implementing the CCRS, I found myself increasingly frustrated with my classroom practice. My students were not progressing as I expected, and I was unsure of what to do. I considered myself a strong mathematics teacher who was passionate about my job and was comfortable teaching in a manner that would be acceptable to the NCTM. When test scores from the spring of 2014 came back and a large majority of my students were not considered proficient in mathematics, I was very concerned and discovered that other teachers were experiencing the same frustrations that I was encountering. As I pondered topics for my

dissertation, it seemed only logical to conduct a qualitative study of upper elementary math teachers who were currently implementing the Common Core State Standards for Mathematics.

Statement of the Problem

As with most issues in education, there are two conflicting viewpoints on the Common Core Standards. Proponents insist that the new standards will result in students better prepared for college and careers (Conley, 2011). Opponents claim that it is unlikely that one set of standards can effectively prepare all students everywhere for any college or career (Tienken, 2012). Despite the efforts of critics to get the adoption of the Common Core Standards in Alabama repealed, it appears that it is here to stay (*Montgomery Advertiser*, 2013). As the National Council of Teachers of Mathematics point out in their 2014 publication, *Principles to Action*, standards alone are not enough to ensure that all students become proficient in mathematics. Research has continually shown that the most important factor in student achievement, particularly in the area of elementary mathematics is an effective teacher (Ball, 1990; Battista, 1994; Guskey, 2003). Most policymakers, experts, and the general public agree that the classroom teacher is the one who will ultimately bring about student achievement and educational reform (California's Colleges and University Presidents and Chancellors, 2001; Cochran-Smith & Lytle, 1999; Darling-Hammond, LaFors & Snyder, 2001; National Commission on Teaching and America's Future, 1996).

If this is true, then one question needed an answer. It was "What do teachers, the ones charged with implementing these new standards, have to say about the Common Core Standards? Teachers are greatly impacted by these new standards in their professional lives, yet very seldom are teachers asked to give input about curriculum reform (Armstrong, 2008). At this point, very little was known about teachers' views of Common Core Standards, its impact on their

instructional practices, and their thoughts on how the Common Core Standards affected their students. In their study on Common Core State Standards and assessment, Newton and Kasten (2013) called for study of the Common Core State Standards for Mathematics (CCSSM) and its impact on students and teachers. They referred to joint statements by The National Council of Teachers of Mathematics (NCTM), the National Council of Supervisors of Mathematics, the Association of State Supervisors of Mathematics, and the Association of Mathematics Teachers Educators calling for research both on the standards and their implementation (Newton & Kasten, 2013). This study, which explored teachers' attitudes about the standards and their experiences implementing the standards, answered the call.

Significance of the Problem

There is no doubt that American school children lag behind their international counterparts when it comes to mathematics achievement. Reports such as the Third International Mathematics and Science Study (TIMSS, 1995, 2007), Program for International Assessment (PISA, 2000, 2003, & 2006) and Trends in International Mathematics and Science Study (National Center for Educational Statistics, 2012) consistently rank American students behind students from other countries when it comes to mathematics. Additionally, NAEP results for 2013 show that students in Alabama lag behind the national average in mathematics performance (National Center for Educational Statistics, 2013).

To make this situation even graver is the fact that these students will be increasingly in need of mathematics skills to survive in the world. As far back as 2000 the National Commission on Mathematics and Science Teaching for the 21st century (NCMST) stated that students would need to be proficient in mathematics to live and work in the future. A 2005 report by the Business Roundtable said that the number of jobs that would require mathematics

would double by 2015(Business Roundtable, 2005). The Bureau of Labor Statistics (2009) stated that 8 out of 10 jobs in the future will require mathematics and science. In 2006 the National Science Board issued a report called *America's Pressing Challenge-Building a Stronger Foundation* which stressed the need to equip American students with critical mathematics skills. It called for better preparation of future workers to supply them with more complex skills in both mathematics and science in order for the United States to remain economically competitive. It also pointed to the need to equip all students with a strong background in mathematics and science, due to the technological advances in all areas. Even students who would not be employed in areas such as engineering and technology must have this foundation in order to be functional Americans (National Science Board, 2006). The latest publication of the NCTM, *Principles to Actions* also reaffirms the need for mathematics education that supports the learning of all students at the highest possible level (NCTM, 2014).

Purpose of the Study

The purpose of this study was to examine the experiences of upper elementary mathematics teachers who were implementing the Common Core State Standards for Mathematics. Teachers are greatly impacted by these new standards both in their professional lives and personal lives, yet very seldom are teachers asked to give input about curriculum reform (Armstrong, 2008). At this point, very little was known about classroom teachers' views of Common Core Standards, its impact on their instructional practices, and their thoughts on how the Common Core Standards affects their students.

Additionally, by examining the experiences of teachers through their eyes, an "insider perspective" was added to the dialogue about the Common Core and the knowledge base was

expanded. This study also provided insight into the obstacles teachers face as they implement the standards.

Research Questions

This study examined mathematics teachers' views of Common Core Standards, their attitudes about them, their experiences implementing the standards, and their perceptions of the impact of those standards on their students. Three questions guided this study:

1. What are teachers' attitudes towards the CCRS?
2. How do teachers describe their lived experiences with these standards?
3. How do teachers report their students have been affected by the CCRS?

Significance of the Study

There is little doubt that schools need to do a better job of equipping students with the skills that they will need for college and career (Business Roundtable, 2005). Most of the school reforms that have been in place have come from the top down with little input from the teachers who actually implement the program (Armstrong, 2008; Cuban, 2008; Whitaker & Moses, 1990). What is needed is reform that comes about because teachers are asked about what is going on in the classroom, what is working and what isn't, what they need to implement the standards, and how the standards could be strengthened (Burrill, 1997; Burton & Frazier, 2012; Charalambous & Philippou, 2010). When this occurs, then educational reform is most likely to be effective and long lasting. This study provided a voice for teachers, who are on the ground implementing the CCRS. Teacher perspectives on the implementation process and ideas about what teachers need to more effectively implement those standards shed light on these standards that are impacting over forty states. It also showed some of the misconceptions that teachers

have about the CCRS and how the district can better provide assistance with implementation of the standards.

Summary

Currently there is a great deal of discussion about the Common Core Standards and the topic has both proponents and opponents, most of whom are not responsible for the implementation of those standards (Tienken, 2012). This study was an attempt to discover and present the views of those who deal with those standards on a daily basis. There is little doubt that the classroom is where the “rubber meets the road” and this is particularly true when it comes to the standards. By following six upper grade elementary mathematics teachers who taught the Common Core mathematics standards each day, a more thorough understanding of teachers’ attitudes about the standards and their experiences as they implemented the standards was obtained.

CHAPTER 2: LITERATURE REVIEW

This study sought to examine the attitudes and experiences of six upper grade elementary mathematics teacher as they implemented the Alabama College and Career Readiness Standards (Alabama Department of Education, 2012), this states adaptation of the Common Core State Standards for language arts and mathematics. This chapter includes a review of the literature related to the history of mathematics education in the United States, the standards movement, and mathematical habits of mind. The role of teachers in the standards and characteristics of effective elementary mathematics teachers will also be examined.

History of Mathematics Education in the United States

During the early part of the twentieth century, the mathematics curriculum was designed, through the use of surveys, to match content to the students' developmental level and readiness to learn. Generally, most of the more difficult topics, including multiplication and division, were reserved for junior high and high school students. This trend continued through the middle of the century with the prevailing belief being that mathematics education should concentrate on equipping students with the skills needed to function as working adults (Martinez & Martinez, 2007).

One of the leading advocates of this social utility theory, was Guy Wilson. He outlined three major objectives for mathematics education. First, it should provide students with the skills needed for business. Second it should build on the interests of the child, and finally there are numerous areas of mathematics that should be explored in appreciation units. These were done for pure enjoyment and to build interest in areas of mathematics that were not required for success in business. They were not to be taught for mastery. Among the areas he suggested for

appreciation units were square roots, fractions that were not useful, measurement, ratios and proportions, and areas within the geometry domain (Wilson, 1951).

World War II made Americans, particularly in its leaders, more aware that the mathematics curriculum should be broadened and the standards increased to provide greater rigor for students. The National Council of Teachers of Mathematics (NCTM) led the charge with The First Report of the Commission on Post-War Plans, published in *The Mathematics Teacher* in May, 1944. Five tentative proposals regarding mathematics courses were offered, including the call for an expanded mathematics curriculum (Commission on Post-War Plans of the NCTM, 1944). In 1947 the President's Commission on Higher Education called for a dramatic increase in college enrollments which would require a greatly expanded mathematics curriculum to prepare students for the rigors of college (Martinez & Martinez, 2007).

As a result of the launch of Sputnik on October 4, 1957 by Russia, the National Defense Education Act was passed by Congress with the purpose of providing millions of dollars for the development of mathematics and science curricula (Eisner, 1998; Martinez & Martinez, 2007). The 1960s became the era of the "new math" (Center for the Study of Mathematics Curriculum, 2004). During this time, the focus was on the structure of mathematics and the emphasis was on the study of sets, number systems, different number bases, and number sentences. Teachers were to be facilitators of concept discovery rather than lecture about them. Hard to understand textbooks and parent complaints of an inability to help children with homework were common during this time (Martinez & Martinez, 2007). There was a great deal of professional development for secondary mathematics teachers, but there was almost none for elementary mathematics teachers (Phillips, 2014).

The federal government again became involved in the process of public education with the Elementary and Secondary Education Act (ESEA) of 1967, part of Lyndon Johnson's war on poverty. Johnson believed that every citizen, particularly those who are at risk, deserved equal access to a rigorous and quality education (Halperin, 1979). To this end, the ESEA established Title I funds for schools serving at risk students to ensure student learning and academic success (Lazerson, 1987).

During the 1970s, partly because of the frustration from the "new math" of the 1960s, there was a call for a return to traditional mathematics or a back-to-basics movement. This movement advocated teacher lectures, drills, and an increased focus on testing and test scores. Not everyone agreed with this assessment, and there was a heated debate about what mathematics instruction should include (Center for the Study of Mathematics Curriculum, 2004). In 1977 the National Council of Supervisors of Mathematics (NCSM) proposed a list of basic skills that should be included in the mathematics classroom, but they insisted that more than just computation should be viewed as necessary skills (National Council of Supervisors of Mathematics, 1977). A lack of research and documentation about what was actually being done in classrooms led the National Council of Teachers of Mathematics to design and implement an extensive survey of stakeholders in the mathematics education process in 1977. This data collection, known as Priorities in School Mathematics Project (PRISM) was funded by the National Science Foundation with its purpose being to investigate the beliefs and responses to the changes in the mathematics curriculum during the 1980s (National Council of Teachers of Mathematics, 1981). Data collection continued from September 1978 until February 1979 (Center for the Study of Mathematics Curriculum, 2006). A report of the findings was published

by the NCTM in 1981 and results were also used to call for reform in mathematics instruction in the 1980 NCTM publication *An Agenda for Action* (Kennedy, Tipps, & Johnson, 2004).

A Nation at Risk, the 1983 report from President Ronald Reagan's National Commission on Excellence in Education was a catalyst for reform in education. The report stated that the United States, which was once the unchallenged world leader in business, science, and technology, was in danger of losing that position to other nations. While it recognized that there were multiple causes, it focused specifically on the educational system since it was the basis for the American way of life. It stated that schools, which were once a source of pride, were currently mediocre, and that other nations educational achievements were exceeding those of the United States. It said that if this was not corrected, the future of the United States was in doubt (National Commission of Excellence in Education, 1983).

The report attributed declines in educational performance to the tendency to use minimum requirements to set the educational standards. It pointed to the need for consistent and vertically aligned standards and for the need for universal standards. The study identified four important aspects of the educational process: content, expectations, time, and teaching.

Recommendation B of the report addressed the need for rigor in the standards that could be measured more reliably (National Commission on Excellence in Education, 1983).

Equally disturbing in the 1980s were international studies which indicated that American students did not do as well on tests of mathematical proficiency as did children in other countries (Lapointe, Mead, & Phillips, 1989; Travers and McKnight, 1984). All of these events pointed to the need to reform. As a result, NCTM began work on a set of standards in 1986 (McLeod & Adams, 1989). The resulting *Curriculum and Evaluation Standards for School Mathematics*, a 1989 NCTM publication, ushered in the standards movement in mathematics education (Van

Walle, Karp, Bay-Williams, 2010). Included in the document was a description of what was necessary for a quality mathematics curriculum from kindergarten through twelfth grade (Cathcart, et al, 2011). Early in 1989 NCTM also established a Commission on Professional Teaching Standards and charged them with the task of designing a set of standards for teaching mathematics. In the summer of 1990 the draft standards were revised, and in 1991 *Professional Standards for Teaching Mathematics* was released with the purpose of guiding reform in the 1990s (NCTM, 1991). In 1995 *Assessment Standards for School Mathematics*, a guide for using assessment in initiating change, was published. It recognized the need for reform and called for changes in the way mathematics was taught (NCTM, 1995). It was the third document produced by NCTM as a part of the reform movement (Van Walle, Karp, Bay-Williams, 2010). While these set standards across the profession in hopes that states would use them in creating their standards, these were not officially adopted national standards.

The documents and call for reform was met with some opposition from critics throughout the 1990s. The back-to-basics proponents insisted that the standards advocated problem solving at the expense of learning basic skills, and that children were not being prepared (Kilpatrick et al., 2001). Other charges made were that the standards curriculum did not challenge students and failed to teach them mathematics (Aboufadel, 1998). Even more dramatic were the charges that advocates of the standards were teaching "fuzzy math" or "placebo math" and were "dumbing down to promote classroom equality" (Mathematically Correct, 1997; Leo 1997, p. 14). In fact, the hostilities reached such a level that then Secretary of Education Richard W. Riley asked for a "cease-fire in the current math wars" (Riley, 1998, p.2) in his 1998 "The State of Mathematics Education" address, to a joint Mathematics Meetings at which the American Mathematical Society (AMS) and the Mathematics Association of America (MAA) met with groups such as

the Mathematics and Education Reform Forum (MER) and the Young Mathematicians Network (YMN). He also expressed concern that the disagreements would only endanger gains made in mathematics achievement (Riley, 1998).

About six months after the publication of *Curriculum and Evaluation Standards for School Mathematics* President George H.W. Bush convened the nation's governors in September 1989 for the purpose of discussing the state of American education. Out of this meeting came a group of officials known as the National Education Goals Panel and six national goals for education. The third goal said that by the year 2000 "All children will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter" (National Education Goals Panel, 1995, p.11). To do this, there would have to be national standards and tests that showed whether students had achieved competency, but Bush was unable to get his plan known as America 2000 through Congress before he left office. Bill Clinton modified the America 2000 plan into his Goals 2000: Educate America Act. Clinton's plan was passed by Congress and set up eight national goals and gave states federal money to set standards and to create tests to measure student progress against the standards. The 1994 reauthorization of the ESEA, known as the Improving American Schools Act, required states to create challenging standards for student performance in mathematics and language arts and to develop tests to measure student performance in meeting these standards (Rothman, 2012).

Principles and Standards for School Mathematics was an updated version of the 1989 standards which had been reviewed and revised by both teachers and the public (NCTM, 2000). Although built on the same goals and philosophy as the original standards, the new standards were also modified to include core beliefs known as principles. In addition, the standards were reorganized into four grade bands, prekindergarten through second grade, third through fifth

grade, sixth through eighth grade, and ninth through twelfth. Also included were five content standards which tells what mathematics content students should know, as well as five process standards which provide the context for learning mathematics or the processes students should use as they learn mathematics (Cathcart, et.al, 2011; Kennedy, Tipps, & Johnson, 2004). More emphasis was placed on computational skills in this version of the standards than had been in the 1989 set (Rothman, 2012).

In 2001 President George W. Bush built on the standards based system when he renewed the ESEA with a series of expansions and a new name, the No Child Left Behind Act (NCLB). Its ultimate goal was the improvement of the American public education system by closing the “achievement gap” of America’s children by improving schools (Lewis, 2003, p. 57). The Act also focused on data and scientific research to drive curriculum and programs. New federal accountability rules were put in place, and schools were required to meet the required federal accountability guidelines or face severe sanctions. Most daunting in the NCLB legislation was the provision that all children would be proficient in mathematics and language arts standards set by the state by the year 2014 or a school would be labeled a failing school (Goertz & Duffy, 2003; Sanders, 2003).

According to Robert Rothman (2012), the NCLB law was a driving force for the establishment of national standards for several reasons. Since states were allowed to determine what proficiency was, there was a wide discrepancy between what was expected. Some states that scored high in proficiency on state tests scored low on the nationally required National Assessment of Educational Progress (NAEP) test, suggesting that these states set lower standards for proficiency than did other states. A research study conducted by the Northwest Evaluation Association for the Fordham Foundation determined that some state tests had become easier over

time, allowing more students to be labeled proficient, while other states had made their test more difficult (Cronin et al.2007). Researchers also found that content standards varied greatly from state to state, and that mathematics standards in many states did not expect mastery of a topic at the grade level it was first presented (Porter, Polikoff, & Smithson, 2009).

As a result of these concerns, there was a movement for a set of national standards, which seemed the most logical way to avoid the pitfalls of state standards and to encourage excellence and equity in the American public school system (National Research Council, 2008). In 2009 the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers joined forces to create a set of challenging academic standards in mathematics and language arts that could be used by all states. By 2010 the final draft of the Common Core State Standards Initiative (CCSSI) was unveiled and quickly adopted by a majority of states, creating the first set of national standards in American history (Rothman, 2012). Part of the reason for this is because of President Obama's administration's Race to the Top competition to receive federal funds. States that adopted the standards by Aug. 2 of 2010 won points in the competition for a share of the \$3.4 billion to be awarded in September (Lewin, 2010).

On June 2, 2010 NCTM issued a joint statement with the National Council of Supervisors of Mathematics (NCSM), the Association of State Supervisors of Mathematics (ASSM), and the Association of Mathematics Teacher Educators (AMTE) supporting the Common Core Standards (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010). In a statement on their website dated August 2013, NCTM says:

The widespread adoption of the Common Core State Standards for Mathematics (CCSSM) presents an unprecedented opportunity for systemic improvement in

mathematics education in the United States. The Common Core State Standards offer a foundation for the development of more rigorous, focused, and coherent mathematics curricula, instruction, and assessments that promote conceptual understanding and reasoning as well as skill fluency. This foundation will help to ensure that all students are ready for college and careers when they graduate from high school and that they are prepared to take their place as productive, full participants in society (NCTM, 2013, p.1).

One of the documents that the authors of the CCSSI used in creating their mathematical standards was *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics*, a 2006 publication of the NCTM. It highlighted three critical areas that should be emphasized in each grade with the message being that these topics are vitally important to student understanding and future success in mathematics instruction for that grade should be determined by the focus areas outlined (Cathcart, et. al, 2011; Van Walle, Karp, & Bay-Williams, 2010).

Achieve (2012), one of the organizations involved in the development of the Common Core State Standards, identified four benefits of the standards in addition to preparing students for college and career success. First, the Common Core State Standards are comparable to other nation's standards, producing students who can compete internationally. Second, the standards result in equitable expectations for students across the country. Third, these standards communicate clear expectations for students, teachers, and parents. Finally, shared standards allow for collaboration across districts and states, leading to better resources and more effective professional development (Achieve, 2012).

The Standards Movement

The idea of standards or standardization of curriculum was first introduced in the United States by Horace Mann in 1837. By establishing standards to be taught in all schools in

Massachusetts, Mann believed that students would receive an equitable education no matter which school they attended (Education News, 2013). Alabama's initial establishment of standards came about in 1921 when the State Department of Education released the publication *Course of Study for Elementary Schools* (Hall, 2015). Up until the release of *A Nation at Risk* (National Commission on Excellence in Education, 1983), which was critical of state standards, there was little demand for a national set of standards.

When the National Council of Teachers of Mathematics (NCTM) released *Curriculum and Evaluation Standards for School Mathematics* in 1989, it ushered in the national standards movement in mathematics education (Van Walle, Karp, Bay-Williams, 2010). In 1989 Shirley Frye, President of NCTM described the standards as a way to definitively show what is important in mathematics education. The standards set a quality mathematics curriculum, including how it should be taught and assessed. She further explained that those standards were in response to the calls for reform in light of students' poor performance on standardized mathematics assessments (Frye, 1989). Those in favor of the new standards argued that the traditional methods of instruction were not working and that there was a better way to teach (Hiebert, 1999; Martinez & Martinez, 1998).

Although NCTM was a powerful force, there were opponents of the standards movement who argued vehemently against the implementation (Hekimoglu & Sloan, 2005). Lynne Cheney wrote an Open Editorial in the *New York Times* denouncing the standards (Cheney, 1997). Others decried the lack of emphasis on basic skills and its call for concrete as opposed to abstract, as well as its call for cooperative learning (Finn, 1993; Haimo, 1998). Others said that it was foolish to base reform entirely on the standards outlined by NCTM (Holbein, 1998).

Despite the arguments against the standards, NCTM had built their standards on mathematics research about what works and what doesn't and what could work better and more equitably (Hiebert, 1999; Research Advisory Committee, 1988). Also supporting NCTM call for standards was a study done by John Bishop in 1997. He compared student performance in countries with standard-based education to those without such a system. Nations that had standards and a curriculum based external exit examination (CBEEE) to measure student achievement performed significantly better on international mathematics tests than did nations without them (Bishop, 1997).

A comparative study of the Core-Plus Mathematics Project (CPMP), a standards-based mathematics program and a more traditional program was done in 1997 at six sites. The purpose of the study was to investigate the effectiveness of the reform called for in the NCTM Standards by comparing reform based curriculum built on those standards to more traditional curricula. Results found that there was significant evidence supporting reform, but also found that there were areas where the traditional students performed better than the CPMP students, particularly in manipulating symbolic expressions when there was no application context and students were not allowed to use graphing calculators. Huntley called for more studies in the area (Huntley, 2000).

Blum (2001) found a positive relationship between standards based instruction and student achievement in Reynolds Unified School District in Oregon. This small school district, consisting of fourteen schools, implemented a series of standards based programs throughout the district. In 1999 twenty-two percent of students exceeded state standards in reading as compared to fourteen percent in 1996. Fourteen percent of students exceeded state standards for mathematics in 1999 while only eight percent had done that in 1996. The number of students not

meeting state reading standards decreased from fifty percent in 1996 to forty-one percent in 1999, and the number not meeting mathematics state standards declined from sixty-four percent in 1996 to fifty-four percent in 1999. Blum concluded his report by saying that this school district shows how standards can impact student performance. He pointed to small gains which were significant because of an increase in the percentages of low-income students, as well as limited English speaking students. He also recognized that improvement was a positive since there was also an increase in ethnic diversity in the system (Blum, 2001).

Standards based reform was also reported to have a positive effect in a study done in Massachusetts in 1999 by Riordan and Noyce (2001). They compared the performance of two groups of fourth and eighth grade students on the statewide standardized tests. The first group was made up of fourth grade students who were using Everyday Mathematics and eighth grade students using Connected Mathematics, two standards based curriculum programs. The second group consisted of demographically similar students fourth and eighth grade students who were taught using the traditional mathematics curriculum. Findings showed that students of every gender, race, and economic status in the standards based programs significantly outperformed matched peers from schools not using the standards based programs. These students performed better in all four areas of mathematics and on all three types of questions. The authors concluded that the results from this study added to the growing body of evidence that standards based mathematics programs positively impact student learning (Riordan & Noyce, 2001).

Similar results were found by Reys et al. in a 1999 study of middle school students in Missouri who were a part of a standards-based mathematics curriculum. Their achievement on the mathematics portion of the state administered test was compared to similar students in districts not using a standards-based curriculum. Findings showed that students involved in

standards-based curriculum for at least two years matched or surpassed achievement levels of those of their counterparts in the control group on the state mathematics test (Reys, et al, 2003).

Students utilizing the standards-based mathematics program, which included a standards based textbook, *Everyday Mathematics* in second and third grades were the participants in a study done by Fuson, Carroll, and Drucek. As first graders these students were tested and interviewed by the researchers and their performance surpassed that of students not in a standards based program. As second and third graders, their achievement levels again exceeded those of their counterparts not in standards-based programs (Fuson, Carroll, & Drucek, 2000).

Not all research found a positive impact on student achievement from standards-based programs. Grady, Watkins, and Montalvo (2012) conducted a study of mathematics achievement for sixth graders in rural Illinois in 2006 and 2007. They compared the mathematics scores from the state tests between three cohort groups for two years. The first group had been taught mathematics with the standards-based program *Everyday Mathematics* for six years, the second had been taught traditional math, and the third group had been taught with a traditional method with a supplemental review math. There was no statistically significant difference in mathematics achievement among the three groups (Grady, Watkins, & Montalvo, 2012).

Another study with negative findings focused on the impact of standards-based mathematics reform on the achievement of American Indian/Alaska Native (AIAN) students. Akiba, Chiu, Zhauang, and Muller (2008) examined data from the 2000 National Assessment of Educational Progress (NAEP), including the teacher survey about standards and student responses to questions about their experiences in the mathematics classroom. They discovered that AIAN students were least likely of all ethnic groups to be taught by a teacher familiar with

standards and who implements them in the classroom. They also discovered that AIAN students who were taught by teachers who reportedly taught the standards did not perform as well on the NAEP as did AIAN students who were taught the traditional way. Researchers concluded that it was critically important that mathematics teachers of AIAN students understand the students' culture and to develop "culturally relevant instruction" as they implement the standards (Akiba, et al., 2008).

Mathematical Habits of Mind

Prior to 1989 there was very little emphasis on the habits of mind to be successful in mathematics but rather on computation and basic skills (Hekimoglu & Sloan, 2005). Mathematics education was simply drill and practice with the focus being on memorization of facts and rote calculations. In 1989 the NCSM put forth "Essential Mathematics for the Twenty-first Century" and the NCTM published *Curriculum and Evaluation Standards for School Mathematics*. Both documents stressed the importance of problem solving, mathematical reasoning and higher-order thinking skills, as well as the need for students to explore and apply mathematics in hands-on and real-life situations. Communication of mathematical ideas was critical in the mathematics curriculum and meaning and patterns should be stressed in computation. Finally, both publications expressed the belief that a challenging mathematics curriculum was beneficial to all students (Martinez & Martinez, 2007).

In 2000 the release of *Principles and Standards for School Mathematics* placed elevated the habits of mind to be successful in mathematics to a new prominence. With its identification of five process standards (communication, connections, problem solving, reasoning and proof, and representation) and the need for those to be integrated throughout the curriculum, mathematical habits of mind came to the forefront of the mathematics classroom (Cathcart et. al,

2011). Two other events also helped advance the cause of mathematical habits. In 1985 the American Association for the Advancement of Science (AAAS) kicked off Project 2061 whose purpose was to propose educational reforms to equip children for the changes in science and technology that will happen before the year 2061. Many of the reforms suggested in this study are the same as the ones outlined in *Principles and Standards for School Mathematics* (Martinez & Martinez, 2007). The second event was the release of the Glenn Commission Report in 2000 which stressed the need for improvement in American students in their performance in mathematics and scientists. It echoed the findings of *A Nation at Risk* (1983), saying that if America was to remain competitive, then students would have to achieve greater success in the areas of mathematics and science. The report said that the key to this improvement was for all students to have the benefit of better teaching in these subjects. It further stated that sixty percent of the jobs in the twenty-first century would require mathematics skills that only twenty percent of the current workforce had (National Commission on Mathematics and Science Teaching for the 21st Century, 2000).

In his book, *The World Is Flat: A Brief History of the Twenty-first Century*, Thomas Friedman, (2007) talks about the need for Americans to be prepared to compete in a global economy. He discusses skills that will make workers invulnerable to economic downturns and suggests that people who enjoy and are proficient in mathematics will always have job opportunities (Friedman, 2007). With changing world influences, the need for developing mathematical habits and a positive attitude towards mathematics in students becomes imperative.

Mathematical habits are a part of the Common Core Standards and are known as the Mathematical Practices. These are a combination of the NCTM process standards and the five strands of mathematical proficiency. The Mathematical Practices provide teachers a focus as

they teach the content and outline skills that all teachers of mathematics should strive to develop in their students (Common Core State Standards Initiative, 2016).

The NCTM process standards are communication, connections, problems solving, reasoning and proof and representation. The two practices which correlate with problem solving are making sense of problems and persevere in solving them and using appropriate tools strategically. Reasoning abstractly and quantitatively, critiquing the reasoning of others, and looking for and expressing regularity in repeated reasoning are the three practices that involve reasoning and proof. Communication is addressed through the mathematical practice of constructing viable argument, and attending to precision and looking for and making use of structure are the practices that are associated with connections. The final practice of modeling with mathematics is connected to the process strand representation (Hull, Miles, Balka, 2012). The five strands of mathematical proficiency were introduced in the document *Adding It Up: Helping Children Learn Mathematics* (National Research Council, 2001). The five are conceptual understanding, procedural fluency, strategic competence, adaptive reasoning, and productive disposition (National Research Council, 2001). They are “interwoven and interdependent in the development of proficiency in mathematics” (National Research Council, 2001, p. 116).

Research played a major role in the development in of the mathematical habits of mind and in the reforms that led to the current standards. *Principles and Standards for School Mathematics* relied heavily on research to justify its recommendations. An excerpt from the document illustrates this point:

Well-documented examples demonstrate that all children, including those who have been traditionally underserved, can learn mathematics when they have access to high-quality

instructional programs that support their learning (Campbell 1995; Griffin, Case, and Siegler 1994; Knapp et al. 1995; Silver and Stein 1996). These examples should become the norm rather than the exception in school mathematics education (NCTM, 2000, p. 13).

Also found in the document is research related to teaching mathematics, learning, technology, the content strands, and the process strands. Throughout the document are references to the research which supports their positions; the references pages contain over 125 citations, proving that their calls for reform are based on extensive research (NCTM, 2000).

Research also supports the reforms made as a result of NCTM. From 1990 to 2005 NAEP scores showed a steady increase as did the mathematics subsection of the ACT and SAT. American students in both fourth and eighth grade scored above the international average on the 2003 Trends in International Mathematics and Science Study (TIMSS) in both mathematics and science (Martinez & Martinez, 2007). It is well documented that students who are taught mathematics according to standards based instruction do as well or better when tested on mathematics skills as do students taught the traditional way (Van Walle, Karp, Bay-Williams, 2010).

The Role of Teachers in Standards

With reform and the advent of the standards came the need for a change in the way teachers teach mathematics. The traditional methods would no longer prove effective. NCTM realized the new standards called for changes in teaching saying that the standards required teachers to teach in a far different way that they had experienced as students in classrooms prior to the standards. NCTM said that in order for this to occur, teachers must have time to learn and adapt their pedagogy, and they must have the right kind of sustained professional development,

as well as the support and encouragement of parents, administrators, and supervisors. There was also a call for a reward for teachers who demonstrated the kind of teaching that this set of standards called for (NCTM, 1991).

It appears that standards are far easier to establish, than it is to convince teachers to change the way they teach. Burrill (1997) recognized that one of the impediments to mathematics reform was teachers. Research supported her claim (NCES, 1997). Futch & Stephens (1997) suggested that while educators agreed in principle with the NCTM Standards, “there is also reason for concern about how the standards will be realized, when after 4 years of intensive reform efforts, few significant changes have been realized in the beliefs of teachers and administrators about the practice and process of mathematics teaching and learning “(Futch & Stephens, 1997, p. 247). Another study in Georgia yielded similar results with teachers saying that they had greatly changed their instructional style, while the data revealed very little change in their teaching strategies (Obara & Sloan, 2009).

Cuban (1995) reported that states which had instituted standards based reform had little evidence of change in teaching because of the reform (Cuban, 1995). Polikoff (2012) found a modest alignment of teachers’ instruction with the standards, but concluded that it was not enough to bring about the reforms needed (Polikoff, 2012). Results of study of Oklahoma City teachers showed that while standards-based instruction had a positive impact on student performance, there were still many non-standards-based instructional practices occurring. Lecture, independent seat work, quizzes and text homework were still the norm in many classrooms, despite the extensive three years of training received by teachers (Thompson, 2009). Jitendra, Griffin, & Xin found that some teachers were much more effective than others in implementing the standards and concluded that teachers’ inconsistent application of the

standards made it unlikely that true reform was going to be achieved (Jitendra, Griffin, & Xin, 2010).

McCaffrey et al. (2001) found that teachers with graduate degrees were more likely to implement teaching methods consistent with reform. They suggested that there could be a link between student achievement and teacher preparation based on instructional practices teachers adopt as a result of their training and called for additional research in the area. Teachers with a strong content knowledge were far more likely to be utilizing standards-based pedagogy than those without it (Tchoshanov, 2011). Choppin (2009) reported that teachers experienced a greater understanding of standards-based mathematics curriculum in subsequent years and spoke to the need to actually teach a unit before they could truly understand it.

It appears then, that, professional development should take into account the teachers' need for deep content understanding and an understanding of the activities to teach the standards rather than just giving teachers a basic overview of the program (Paik et al., 2011; Trafton, Reys, & Wasman, 2001). Loeb, Knapp, & Elfers (2008) also recommended more focused professional development after finding that standards-based reform was a difficult and problematic process for teachers and that teachers felt that too much was expected of them in implementing the standards. Additional training is also needed for teachers working with a culturally diverse student population in order to provide them strategies appropriate to successfully implement mathematical practices with these children (Obara & Sloan, 2009).

Sustained professional development over a three-year period enabled second and third grade teachers in nine Title I school to positively impact student achievement. Bailey (2010) said that the study indicated that successful professional development should include sufficient focus in the following areas of study: (a) teachers' thinking, their understanding of and ability to

effectively use strategies that led to problem solving by students; (b) the knowledge teachers possessed about national standards, including NCTM and NAEYC standards, as well as state mathematics standards; (c) how well teachers understood and could utilize NCTM principles to develop appropriate mathematics curriculum; and (d) suitable mathematics content which had been demonstrated to affect teachers' ability to effectively assess (Bailey, 2010).

A critical summary of the research shows that there is a definite positive relationship between the standards-based reform occurring in the mathematics classroom and student achievement in the majority of the research (Blum, 2001; Fuson, Carroll, & Drueck, 2000; Reys, et al, 2003; Riordan & Noyce, 2001; Thompson, 2009). There were, however, some studies that found little or no positive relationship between standards-based instruction and student achievement (Akiba et.al., 2008; Grady, Watkins, & Montalvo, 2012; Huntley, 2000).

Research also shows that the biggest obstacle to standards based reform has been the teachers who often give lip service to the reform but fail to actually implement the necessary changes in their own classrooms (Cuban, 1995; Futch & Stephens, 1997; Jitendra, Griffin, & Xin, 2010; NCES, 1997; Obara & Sloan, 2009). In addition, the research points out that teachers who have greater content knowledge and training are the most likely to implement the standards (McCaffrey et.al, 2001; Tchoshanov, 2011).

Research tells us that the way to overcome this obstacle is through effective professional development. This development should increase content knowledge, gives teachers an understanding of strategies for implementing reform, and equips teachers of diverse cultural populations with the tools they will need to enable those students to achieve mathematically (Bailey, 2010; Choppin, 2009; Loeb, Knapp, & Elfers; Obara & Sloan, 2009; Trafton, Reys, & Wasman, 2001).

Characteristics of Effective Elementary Mathematics Teachers

For teachers to be effective at implementing reform, it is important to know what makes teachers effective mathematics teachers. Deborah Ball, a former elementary teacher and mathematics teacher educator, and mathematician Hyman Bass set out to find what mathematical knowledge is needed to effectively teach elementary mathematics (Ball & Bass, 2000, p.89). What they discovered was that the mathematics knowledge needed by teachers was quite different than that needed by mathematicians (Ball & Bass, 2000). Teachers have to be able to listen to their students, to be flexible and to “represent ideas in multiple ways, connect content to contexts effectively, and think about [problem solving] in ways other than their own” (Ball & Bass, 2000, p. 94). What matters most for elementary mathematics teachers is both “knowing and being able to use the mathematics required inside the work of teaching” (Ball, Thames, & Phelps, 2008, p. 404).

Another leading authority on what elementary teachers need to know to be effective mathematics teachers is Ma Liping. In her seminal work *Knowing and Teaching Mathematics* (Ma, 1999), Ma contrasts the practices of American teachers with Chinese teachers. She talks about the need for elementary mathematics teachers to have a “profound understanding of fundamental mathematics” (PUFM). This encompasses a deep conceptual understanding of mathematics and the ability to communicate this understanding to students. An important component of PUFM is familiarity with the overall elementary mathematics program, as opposed to knowing just the objectives of the mathematics program for one grade level. She also contrasts the amount of time each group of teachers has outside the classroom and how the lack of time hinders American teachers, saying that it was obvious that American teachers lacked sufficient time and effective support to be able to analyze and mull over the content of what they

were to teach to their students. She believed that this prevented teachers from being able to effectively teach the mathematics content to students (Ma, 1999).

Kaplan (2012) conducted a qualitative study to examine the qualities of effective elementary mathematics teachers in a variety of socioeconomic and cultural settings. She found four common practices reported by all teachers. These included supplementing lessons with resources and adapting lessons based on prior experience, using formative assessments, differentiating instruction, and reflecting on the teaching process. She also discovered that these teachers took personal responsibility for student learning. She concluded that what separated these teachers from others was their “underlying intrinsic motivation that drives them about the what and how it is that they really want their students to learn” (p.11).

Summary

A review of the literature shows that reform in mathematics education is a constant throughout the last half of the twentieth century and continues into the twenty-first century. During this time, standards in mathematics have evolved, as have the mathematical habits of mind. The literature also shows that teachers play a major role in the reform movement and that professional development is critical to the success of reform. Finally, the qualities of teachers who are effective in teaching elementary school mathematics is also found in the literature.

CHAPTER 3: METHODOLOGY

Qualitative research is focused on understanding how different people make sense of their lives and the goal is to accurately capture the perspectives of those being studied (Bogdan & Biklen, 2003). Eliot Eisner says that the use of qualitative research in educational settings results in insights that can be used to improve schools. He reminds us that schools must be evaluated not just with test scores but also through the stories that exist there (Eisner, 1998). Qualitative research allows the researcher to present experiences through the eyes of those who have lived them (Miles & Huberman, 1994). It regards the acts, views, and interpretations of the participants as important tools for discovering meaning (Bogdan & Biklen, 2003). Creswell (2007) says qualitative research is needed to hear silenced voices. In this study, qualitative research was used to give voice to teachers.

Specifically, the qualitative approach of action research in the form of practitioner research was utilized in this study. Practitioner research allows a teacher to examine his or her own situation for the purpose of improving (Bogdan & Biklen, 2003). Eisner (1998) recognizes that this form of research can ultimately lead to better schools. Action research is also viewed as a way to empower teachers and allow them to be leaders in the educational profession, leading to improvements in their classrooms, their schools and districts, and ultimately in society as a whole (Beaulieu, 2013; Diana, 2011; Lee et. al, 2014; Hines & Lavery, 2014).

The value of action research in the educational system cannot be underestimated. Hines and Lavery (2014) identify three key benefits of this kind of research. First, it allows teachers to have a “systematic, collaborative, and participatory process of inquiry” that enables teachers to examine problems they face. Second, it gives teachers the skills and knowledge to bring about positive changes. Finally, it gives them the ability to be “innovative in their professional lives.”

Beaulieu (2013) points to the “growing tradition” of action research and asserts that “it fits well with scholarly research agendas that are aimed to improve the quality of life” (p. 34). As a result, I selected action research as the qualitative method used in this study. I knew from the beginning of the study that the data found in this study would enable me to make changes that would positively impact my teaching of the CCRS, as well as allow me to be a resource for other teachers in my school.

Grounded Theory

In addition, grounded theory was used since the approach here is to develop theory from those who have first-hand experience with the phenomenon (Creswell, 2007). In this case, little was known about the CCRS from the perspective of teachers who are implementing it. Through the use of grounded theory in this study, information was provided that can result in more effective teaching of the standards. It was my desire to use the data collected to create a theory that could be shared with others so that teachers’ lived experiences are known, and this information used to make implementation of the CCRS both easier and more effective.

Grounded theory, developed by Glaser and Strauss (1967), is appropriate when a researcher wants to develop a theory of a to help others understand a process experienced by participants (Creswell, 2007). Each participant sees the situation from his or her own narrow perspective, and to understand the whole, the voices of many must be heard (Corbin & Strauss, 2008). Grounded theory requires the researcher to get into the world that he or she is studying in order to fully understand it so that the findings truly portray what is there (Patton, 1990). In a grounded theory, data analysis begins as soon as the first data is collected. This enables a researcher to determine what the pertinent themes are, to follow up with effective questions, and to listen and observe in more sensitive more empathetically (Corbin & Strauss, 2008).

Research Questions

The following questions served as a general guide the research:

1. What are teachers' attitudes towards the CCRS?
2. How do teachers describe their lived experiences with these standards?
3. How do teachers report their students have been affected by the CCRS?

Pilot Studies

While enrolled as an education specialist student, I conducted a qualitative study on teachers' perspectives on the newly enacted legislation *No Child Left Behind* (NCLB). I was both the researcher and a participant in that study. I maintained a personal journal of my thoughts and experiences of the impact the act had on me, conducted an interview with a veteran teacher affected by the highly qualified teacher requirement, and held informal interviews with other colleagues. The finished product was published in the peer reviewed *Journal of Early Childhood Education and Family Review*.

As a doctoral student, I used qualitative research in the form of action research to discover the perspectives of former students on the mathematics methods class I taught. I conducted a focus group and an individual interview to gain data that was used to revamp the class so that it better met the needs of the students. Later, I used the same strategies from qualitative research to develop field experiences for the class that better prepared students to be successful during their internships.

Research Setting

The research site is the elementary school in a large school system in south central Alabama where I am employed as the fifth grade mathematics teacher. Eastwood Elementary (pseudonym) is a neighborhood school with approximately 750 students in grades kindergarten

through fifth grade. The population there changed demographically in 2011-12 when students from a nearby school that closed were reassigned to Eastwood. This increased the population of English Language Learner (ELL) students and African American students. In 2013-2014 the principal who had been there for eighteen years retired and was replaced by the assistant principal who had also been there for eighteen years. The close proximity of the school to a military base means there are students whose parents are actively deployed. Eastwood first met the criteria for Title I funding during the 2014-2015 school year. In 2015 the scores for the school on the Act-Aspire test showed that 72% of the students were proficient in English, 40% were proficient in mathematics, 34% were proficient in reading, 32% were proficient in science, and 22% were proficient in writing. The scores for the school met or exceeded the national average in every grade level and subject.

Epistemological Stance

In this study, I was the researcher as well as a participant. As the researcher, I recognized that what I see is strongly impacted by the experiences that have shaped me. While some might see this as a drawback, Eisner observes, “the way in which we see and respond to a situation, and how we interpret what we see, will bear our own signature. This unique signature is not a liability but a way of providing individual insight into a situation. In that form of qualitative inquiry, called educational criticism, the picture and the assumptions in qualitative research are different. ...Educational criticism views unique insight as the higher good” (Eisner, 1998, p. 34).

Life experiences which have strongly impacted my view of teaching mathematics include fourteen years of teaching fifth grade mathematics and also four years of teaching methods of teaching elementary mathematics methods to undergraduate students as a clinical professor. Although I enjoyed working with college students, it did not kindle the same passion in me as

did teaching in the elementary school. As a result, I returned to teaching fifth grade mathematics.

I believe that I have a unique perspective to offer on the impact of the standards on mathematics teachers. I am, first and foremost a classroom teacher, but I also have an understanding of the role of the teacher educator. Since I taught pre-service teachers the mathematics methods class, I have more knowledge about the teaching of mathematics than do most classroom teachers. That teaching experience also gave me an understanding of the needs of adult learners, which is what all of the teachers in this study are. In addition, I am passionate about the teaching of mathematics and wanted to bring that into this study.

In all forms of qualitative research, the researcher is the key instrument. As Eisner describes it, “the self is the instrument that engages the situation and makes sense of it” (p.34). In this study, I was more than the observer who collects data and makes sense of it, since I was a participant. I was recording daily my own experiences and including those in analysis. I believe that this gave me greater credibility with the other participants and made them more likely to share honestly with me. I am also convinced that it made analysis of all data more effective because I was not an outsider. The findings are a better representation of the lived experiences of teachers with the CCRS because it is my story too.

I was one of the six elementary school mathematics teachers participating in this study. This is my twenty-first year in education and my fourteenth year teaching fifth grade mathematics. I am in departmentalized grade with four other teachers with one teaching reading, one teaching science and health, one teaching social studies, and one teaching language arts. Each of us teaches our favorite subject. We have five classes of students who rotate together to

each teacher. I have an education specialist degree in elementary education and am also a doctoral student.

Data Collection

Data collection occurred from August 13, 2015 until November 6, 2015. Participants signed the IRB consent form on August 10th and were asked to keep a journal of their experiences as they implemented the CCRS. They were initially asked to make data entries from August 13th until November 16th. Data saturation however, was reached before this date. As a result, data collection ended on November 4th. Participants were also asked to sit in on a focus group on September 8th during the lunch hour of a teacher in-service.

In a qualitative study, the researcher determines what data to collect and obtains it at the site for the purpose of hearing silenced voices in order to obtain a detailed understanding of the topic (Creswell, 2007). To do this, multiple forms of data need to be collected. Creswell (2007) describes four categories of information that can be classified as forms of qualitative data. These are audiovisual materials, documents, interviews, and observations. Of those four, I selected two to use in this study. Journals, which were kept by all six participants, would be considered documents. These were selected for use because they offer vivid accounts of how their authors view their world (Bogdan & Biklen, 2003). Also included in this study were focus groups which are a form of interviews. Interviews involve personal interaction between individuals or groups and may be structured, semi-structured or unstructured. Focus groups are best used when those being interviewed interact well and that interaction produces the best information (Creswell, 2007).

Documents.

Journals were the document used in this study. First, I kept a detailed personal journal of my experiences as I implemented the standards in fifth grade mathematics. I recorded entries on

a daily basis. I provided a binder and notebook paper for each of the other participants and asked them to record any reflections or thoughts they had about standards or their experiences teaching mathematics. I asked them to record journal entries at least twice a week. Journal entries were collected from all participants every other week. As I collected data, and themes began to emerge, I e-mailed weekly prompts to participants, and they responded to those prompts in their journals.

Interviews.

One focus group interview was held for one hour with Sandy, Pamela, Pansy, and Lindy in early September. Adele had a doctor's appointment and was unable to attend. This focus group occurred during the one-and-a-half-hour lunch break of a teacher in-service meeting held the day after Labor Day. I provided lunch for the participants and we met in my classroom at Eastwood. After lunch was finished, we sat at a table in the back of the room and conducted the focus group. The format was a semi-structured interview where all participants responded to questions and offered insights into their experiences implementing the standards and their perspectives on the standards themselves. That meeting was audiotaped and transcribed verbatim. Field notes were taken during the focus group so that I had observational notes and a way to make analysis easier in the future (Patton, 1990).

Data Analysis

Miles and Huberman (1994) identify three steps in data analysis in a qualitative research study. In the first process, data reduction, the researcher selects, focuses, simplifies, abstracts, and transforms the data. In this stage, the researcher organizes the data so that it can be coded. The second step, data display, involves showing the data in words, graphs, or tables. Finally, in the third stage, conclusions are drawn from the data and then verified. In analyzing the data, all

three of the steps they describe were used as I went through the journal entries given to me by the participants. These steps were also used with the transcription of the focus group, and the field notes that were taken during the focus group. Data analysis began with the first collection of journal entries in late August and analysis began soon after. By the middle of data collection in early October, data analysis was used to formulate a series of prompts, as outlined by Bryant and Charmaz (2010).

Coding .

To code data, I followed the following steps suggested by Bogdan and Biklen (2003). First, data was chronologically organized and then carefully read. As I read, I looked for patterns and topics. As I read, I wrote down words or phrases which could possibly become topics or coding categories. I looked for categories that would fully describe the experiences and actions that were investigated (Kvale & Brinkmann, 2009). My initial categories were: central office and the standards, concerns about the CCRS impact on students, frustrations with the standards, gaps in the students' knowledge, good things about the standards, hurdles in teaching the standards, inappropriate standards, and time and the standards. After I developed these preliminary codes, I assigned the codes to the data through the use of different color markers. I then used subcategories to break major codes into smaller categories. Then a list of codes was developed and each was assigned an abbreviation. Finally, I went through the data and marked each part with the code which best fit it. After I had the general categories I used ATLAS.ti as a file for storing the data and to make it easier to manipulate the data. From the codes, I created themes and a theory. Ultimately, a narrative was developed to present the findings of my study.

Trustworthiness

Trustworthiness in a qualitative study is equivalent to reliability and validity in a quantitative study. This can be achieved when the data collected are enough to answer the

questions put forth by the researcher, and it is collected over time from a variety of sources (Merriam, 1988; Patton, 1990). The was true of the data I collected in this study. In addition, I had numerous opportunities for discussion and interactions with participants through all aspects of school life.

Other steps were also taken to ensure trustworthiness. *Member Checking* was utilized when the research participants were asked to review the themes and narrative discovered in the study. Structural corroboration was achieved through the use of multiple subjects who all recorded their thoughts in isolation without any input from other subjects, but yet they described similar thoughts and experiences (Bogdan & Biklen, 2003). Finally, an attempt has been made to make the study transferable through the use of thick description which allows readers to determine if the findings in this study fit their context (Miles & Huberman, 1994).

Summary

Grounded theory was used in this study to examine the perspectives of six upper grade elementary mathematics teachers. Five of the participants were general education teachers who taught mathematics in third, fourth, and fifth grades. The fifth participant was a special education teacher who worked with fourth and fifth grade students in the mathematics classroom. Data consisted of journal entries from all participants and one focus group interview with four of the participants. Data analysis was done in conjunction with data collection and coding was used to determine the themes found in the data. A narrative was developed from those themes. Member checking, structural corroboration, and thick description were utilized in an attempt to ensure the trustworthiness of this study.

CHAPTER 4: FINDINGS

It seems logical to go to classroom teachers to determine what impact the CCRS standards have had on them personally and professionally and how their perspectives on how the standards have impacted their students. As a veteran teacher with my own experiences with the CCRS, this topic was of particular interest to me. Dana (1991) suggests that teacher research must be closely linked with the development of an awareness of a teacher voice. Additionally, Connelly and Clandinin (1990) conclude that people are essentially story tellers who individually and collectively have stories to tell and that educational research should recognize and take advantage of this fact. Thus, the purpose of this study was to identify themes generated by the voices of teachers who are charged with implementing the standards in order to deepen our understanding of the CCRS.

Qualitative methods were utilized in this inquiry because the focus was on investigating a topic in all of its complexity. Qualitative researchers are more interested in the process rather than just the results or products (Bogdan and Biklen, 2003). Investigating the impact of the CCRS standards on teachers and their students required an examination of daily events in context to fully understand the effect, as opposed to a study that reduced individuals to data in a statistical analysis. Also critical to this method was acknowledging subjects' outlooks as "participant perspectives" which provide insight into a situation through the eyes as those who are experiencing it (Bogdan & Biklen, 2003). In examining educational practice, this is particularly important because as Fullan (2007) points out educational change is entirely dependent upon the teacher.

This qualitative study utilized a grounded theory approach because in order to create theory, there must be an accurate portrayal of the characteristics and qualities that together

comprise the life of schools (Eisner, 1998). Grounded theory can be used to describe the experiences of those involved in a situation and to create a framework for the development of a theory based on that description (Creswell, 2007). The purpose of this study was to examine the perspectives of six upper elementary mathematics teachers as they implemented the CCRS. From their perspectives I expected to discover information that could be used to improve my own teaching of the standards, as well as to offer insights into what professional development was needed for the mathematics teachers at my school. I also hoped to generate theory that could be used to improve implementation of the CCRS at other sites.

The following questions guided the study: What are teachers' attitudes towards the CCRS? What do teachers have to say about the implementation of the CCRS standards? How do teachers perceive their students have been affected by the CCRS standards? Data were collected from group discussions, private interviews, and journal entries. At the end of data collection, all material was reviewed and recurring themes identified. Those themes are teacher attitudes about the CCRS, implementation of the CCRS, and teacher perceptions of students and the CCRS. Each of these findings is explored in this chapter. Thick description (Merriam, 1998) to support the findings is provided in the actual quotes of the participants.

Participants

Purposeful sampling was used to select the participants since the focus was on third through fifth grade teachers who teach math. All six mathematics teachers in grades three and four were invited to participate, and only one declined. Four of the participants teach mathematics in a regular classroom setting, and the other participant is a special education teacher who works with fourth and fifth grade students. Four of the participants have masters degrees, two in elementary

education and two in special education. All five identify mathematics as their favorite subject to teach. To maintain confidentiality, all participants have been assigned a pseudonym.

Table 1 Participant Information

Name	Grade Level	Highest Degree Held	Degree Area	Years of Experience
Sandy*	Third	Masters	Elementary Education	11
Pamela*	Third	Masters	Elementary Education	30
Pansy*	Fourth	Bachelors	Elementary Education	7
Adele*	Fourth	Masters	Special Education	24
Lindy*	Special Education	Masters	Special Education	21
I	Fifth	Education Specialist	Elementary Education	21

*Pseudonym

Sandy.

Sandy is in her first year of teaching at Eastwood. She has a masters degree and education is her second career field. She taught in a private school before receiving certification and for five years after that. She did her internship at Eastwood and was hired this year on the recommendation of her supervising teacher. She has eleven years of teaching experience, two of that in third grade. She was the elementary mathematics department head at a private school before coming to Eastwood. She is in a paired third grade and teaches math, science, and social studies. She describes her method of teaching mathematics:

I use manipulatives, music, and any other way that a child can understand. I always tell students that mathematics is a process, and someone’s process may be different than

another's. As long as one can explain this process and solve a problem, we are successful.

Sandy believes that the CCRS standards for third grade “do not begin at an appropriate level” and need to include more time for mastering basic skills.

Pamela.

Pamela has thirty years of teaching experience, seventeen of that has been in third grade. She has a masters degree in elementary education and has held many leadership positions, including serving on the district mathematics textbook committee and as a district mentor teacher. She is in a three way third grade and teaches mathematics and spelling. When she talks about teaching mathematics, she says,

I try to teach students the relevance of mathematics and how it will be used in everyday life. If I know several ways to teach a skill, I will show students so they can decide what works best for them. Since I enjoy mathematics so much, I want my students to enjoy math. I try to make it fun and interactive using manipulatives, groups, partners, Smartboard, games, etc. As the year goes along I go back and review important skills.

Pamela is frustrated that her students do not come to her ready for third grade mathematics and wishes that she had time to review before beginning to teach third grade standards. She also feels like she has to “move too fast and not completely cover skills.”

Pansy.

This is Pansy's first year at Eastwood, although she has seven years of experience. This is the second year she has taught fourth grade mathematics. She is in a paired fourth grade and also teaches science and social studies. Her philosophy of teaching mathematics is to adapt the material to be taught so that it is “easy for the kids to understand”. She frequently introduces

material with a power point presentation, then pairs students and uses her own resources. Pansy believes that the greatest shortcoming of the CCRS is a lack of appropriate resources.

Adele.

Adele is a veteran teacher with twenty-four years of teaching experience, three of that in fourth grade. She has a masters degree in special education and was on the school CCRS team and did the “turn around” training for the mathematics teachers. Her thoughts on the CCRS echo those of Sandy and Pamela:

The standards assume students have mastered multiplication facts (most have not). Some standards I question if students are developmentally ready for some skills such as measurement. The idea of showing students different approaches to solving problems is good. However, I don’t think students should be evaluated on each approach- it defeats the purpose.

Her approach to teaching mathematics is to model, then have guided practice, and then independent practice. She calls each child to her to check their progress. If she sees that the students are not progressing, she reteaches in a small group or one-on-one. Once the skill is taught, then she uses cooperative groups.

Lindy.

Lindy, the special education teacher, has a masters in special education and is currently working on an education specialist degree in the same field. She has twenty-one years of teaching experience and has taught mathematics for fourteen years. She is the school’s special education facilitator. Her philosophy for teaching mathematics is:

My philosophy is that children must have the basics. Unfortunately, in today’s education world, every child has to do grade level standards whether they understand basics or not.

I try to teach my students compensatory strategies to compensate and to provide them with as many visual/written cues as possible.

When it comes to the CCRS, she “piggybacks off the general education teachers, admitting it is “hard to keep up with multiple grade level standards.” She does have trouble understanding the sequence in which the skills are taught, calling it “confusing”.

Teacher Attitudes about the CCRS

All participants readily acknowledged that there are positive aspects to the CCRS. In fact, the positives were the first things that were identified by teachers. As I analyzed data, two topics related to the positive aspects emerged: recognition of the benefits of a universal curriculum and appreciation of the mathematical practices found in the CCRS. Participants believed that both were beneficial to students and felt that the second had a positive impact on the teaching of mathematics in general.

Recognition of the benefits of a universal curriculum.

Participants were quick to point out that having a universal curriculum was a good thing. Pamela put it this way: “The most positive thing would be that if children moved around a lot, the same skills should have been taught.” Adele agreed saying, “The intention of having all states teach the same standards at each grade level is a good idea.” Sandy who came to Eastwood from a private school said, “We taught the Common Core at Unnamed Private School because quite a few of our students were military and would be moving within a year, and that ensured that our students would be prepared for their next school.”

Veteran teachers at Eastwood understood this sentiment since its student body contains children whose parents are stationed at a nearby air force base attend school at Eastwood. As a result, teachers are particularly aware of the advantage of teaching standards that are the same

across the country. I noted in a journal entry in August, “I have ten students this year who live on the base. I am glad that we are teaching the same standards here in Alabama as the rest of the country. These students will be prepared when they move to another state.”

Appreciation of the mathematical practices.

Participants also cited the mathematical practices as a benefit of the CCRS. The district required that mathematical practices be posted in all mathematics classrooms and that teachers list the mathematical practices utilized in lessons in lesson plans and on the strategic agenda board in the classroom. Teachers were also expected to go over the mathematical practices with students. Prior to implementation of the CCRS, the mathematical processes encouraged by the NCTM had largely been ignored by the district. In my journal I wrote,

I have always emphasized problem solving in my mathematics classroom, but I feel like there is more emphasis on it by the district and state than there was when we used the Alabama Course of Study. Previously when I went to district in-services problem solving was all about solving word problems, and now it is more focused on authentic problem solving.

Other participants concurred, often referring to the school wide Problem of the Month in their journals. Sandy said, “They loved the Problem of the Month. They were given free rein to create their own playground design using designated shapes. Next we will be working on symmetry.” Pamela related her experiences with Problem of the Month by saying, “Even though the Problem of the Month took a day out of my teaching, the students did enjoy it.” Pansy also pointed to the positive aspects of having students work together to solve the Problem of the Month, as did Adele who wrote “I see cooperative groups as a tool to teach problem solving.”

Identification of Problem Areas Within the CCRS

Teachers also recognized that there were flaws in the CCRS standards. First, there were standards deemed developmentally inappropriate for the grade to which they were assigned. Next the built-in assumption that all students would master the standards in the year in which they were presented since there was no review of standards in ensuing years was criticized. Finally, issue was taken with standards which required students to solve a problem using only one certain method.

Developmentally inappropriate standards.

Two of the standards that I teach in fifth grade were formerly skills that were taught in six and seventh grades. I noted in my journal the struggles that my students were having with one of them and expressed my belief that the standard was developmentally inappropriate.

I have spent the past three days trying to help my students master subtracting mixed numbers with regrouping. We have approached this first with hands-on activities using pizza models and then developed the algorithm for regrouping. I would venture to say that maybe 5 of the 105 students have mastered this skill and remember being told in the past by a district administrator that this skill was too abstract and developmentally inappropriate for fifth graders. I have to say that I think she is right!"

Sandy also addressed her concerns about developmentally inappropriate standards in her journal, describing "a daily struggle to make sure that I teach the standards that need to be taught and do it correctly." She felt that it was due to the fact that many of her students were "not developmentally ready for this." In a later entry, she wrote about trying to "squeeze in concepts." She gave two reasons she was forced to do this. First, the students weren't developmentally ready for the concepts she had to teach in the third grade standards. Second,

they had not mastered lower grade prerequisite skills. Her focus had been on teaching those prerequisite skills, leaving her frustrated “because I know what I should be doing, yet I can’t.”

Built-in assumption that all initially master standards.

Teachers believed that there was a built-in assumption that students were expected to master the CCRS the first time it was presented since there was no review of previously presented standards in subsequent years. This belief was reinforced by the district in meetings where teachers were told that they were to teach only the standards for the current grade level. Pansy referred to this saying, “But last year, we were told that if anybody as in downtown or whatever ever walks in your class you have to be teaching grade level stuff. Your job is to teach grade level stuff.”

Lindy also referenced this in her journal when she wrote,

Teachers are told they can teach only grade level standards. They don’t have to go back and teach lower grade standards. They aren’t responsible for those. But what do you do if the child doesn’t know it? Specifically, special education students- my kids have missed out on the foundation of mathematics (reading too) like adding and subtracting. If they can’t do this, how are they going to master grade level skills that build on lower grade skills. They are just going to get further behind.”

Pamela believed her biggest challenge was “children not being ready for third grade skills”. Then she discussed the obstacles she faced in trying to prepare them for those skills. “I don’t have time to try and catch them up since I am supposed to follow the pacing guide and teach only third grade skills.” She spoke of her struggle to meet the needs of her students by teaching addition and subtraction since the students lacked mastery of those skills, and yet follow the mandates of the district. She pointed out that most of her students did not even know the

facts, yet the district required her to teach multiplication to her third graders the third week of school.

Only one way to solve a problem.

Finally, teachers expressed dissatisfaction with standards that specified problems be solved only one way. I was particularly upset with the fifth grade standard that required student to use the standard algorithm to solve multi-digit multiplication problems because many of my students did better using lattice multiplication. I referenced this frustration in an early journal entry.

Although the CCRS standard for multiplication says that the kids will multiply using the traditional algorithm I am showing them lattice multiplication so that they can use that. I don't understand why the standard insists on the standard algorithm. When I went to the *Alabama Math, Science, Technology Initiative (AMSTI)* training ten years ago, we were given an article on alternative algorithms and told to share all of them with the kids and let them use the one that works best for them. I am still doing that despite the standard. This is where I have a problem with the CCRS, there are multiple ways to solve, so why not recognize that? I thought we were emphasizing conceptual understanding, not procedure!

I was even more certain that I was right in my view when I gave the test on multiplication. Most of the students did very well. When I shared this fact with Lindy, she remarked that even her lowest students understood and could effectively use lattice multiplication. It was a strategy that the students liked and enjoyed using. I reflected on this in my journal, "It is very rewarding to see the kids get excited about something like this. I had one

kid tell me today that he absolutely loves using lattice and could do those kind of problems all day long.”

Lindy related her personal experience with standards that require students to solve problems a certain way. Her niece’s daughter in (another city) got a problem counted wrong because she used different steps. She had the correct answer but did not work it out the way the teacher wanted. Lindy said, “You and I were talking the other day and I thought the point was to find your answer whatever way works best for you.” In her journal she wrote about her professional opinion on these kinds of standards saying, “I will say that I teach whatever works with the students. It may not be the way they want it implemented, but I want them to be successful with the skill.”

In a later journal entry, she referred to what she had learned from the lower grade special education teacher about first grade subtraction. The first graders were shown and “expected to use three different methods to solve the problems including naming a related addition problem, using a ten frame, and demonstrating with manipulatives.” Lindy thought that required too much time and presentation of all of the methods was confusing to students who were “just learning the concept.”

Pansy disagreed with this aspect of the standards too, saying, “Last year on quarterly district tests, I counted answers correct even if they didn’t use the steps or method that the answer key specified. Why stick to one way when there are thousands?” Adele believed that that using different methods for teaching skills was a sound teaching practice, but thought that assessing students on using one single strategy “defeats the purpose.”

Implementation of the CCRS

The bulk of the data collected related to implementation of the standards, which is not surprising since this is the teachers' focus on a daily basis. The current school year was the third consecutive year of implementation of the CCRS in the district and four of the participants, including me, had been teaching the CCRS in the same grade level all three years so there was a wealth of experience to draw upon. Journal entries and conversations reflected this and examination of data led to identification of three elements related to implementation, including challenges related to implementation, things that impact implementation, and proposed changes in the CCRS document that would make implementation easier.

Challenges related to implementation.

Despite the fact that teachers were much more comfortable with the standards and implementing the standards in their classrooms than in the initial two years, participants were still frustrated by aspects of CCRS implementation. Four specific areas emerged as problematic. First, CCRS implementation required more planning time than did the previous curriculum. Closely related to this was a lack of resources available to teachers for implementing the CCRS in the classroom. Teachers were also challenged by gaps in students' knowledge which made it difficult to teach the CCRS. Finally, time was an issue in teaching the standards to students.

Planning time.

Adele reflected on the increase in planning time in journal entry in mid-October. She felt that CCRS had "increased planning time tremendously." She thought that the district could ease some of this by creating "a department to create lesson plans teachers could choose from." She felt that this would be much more "efficient" than "each teacher researching sources to plan and decide what needs to be taught that isn't mentioned." She identified a benefit of this as being

that teachers “would be able to actually spend time teaching and interacting with students and have a life outside school.”

Sandy, too, felt that the CCRS required additional time to plan. She wrote about time being a “huge factor” in planning to teach the CCRS standards. She related that it took a great deal of time “to find the most effective lessons and methods to teach the concepts so that mastery can occur in minimal time.” Searching for “supplemental material” was also mentioned as being a time consuming part of planning for Sandy.

Planning time was an issue for me as well, despite the fact that I had prepared materials over the summer. Since the district curriculum framework/pacing guide was not available during the summer, I planned based on the previous year’s sequence of standards. When the district released the document the week before school started, there was a change in the standards. I reflected on this in a mid-October journal entry.

I will be spending a lot of time this weekend preparing for next week. I have to redo all of my tests and daily work this year because the district changed the order in which the standards are presented. While I definitely like the order of the standards better, it has meant I have had to redo everything from last year. Since I don’t use any materials from the textbook or workbook and make all assessments myself, I am spending a lot of time to get things together. Next year, if we stick with the same order, I should be in better shape, although I never repeat lesson plans exactly. However, having to redo all of my assessments is taking time away from finding new resources.

Lack of resources.

Equally frustrating was the lack of resources provided to implement the CCRS. The district discouraged the use of the textbook and did not even list pages in it as a resource on the

curriculum framework or pacing guide. Few other resources were listed in the curriculum framework. Of one that was, Adele said, “One of the resources we are told to use is the Flip Book which was developed by North Carolina State Department of Education. Alabama is copying other states’ interpretation of the standards-how do we know if they are correct?”

Pansy related this lack of resources as being one of the most negative aspects of the CCRS. She felt that the mathematics textbook was ineffective in teaching the standards and that the district should “just give us a bunch of resources we could pull from and still meet the needs of every standard taught.” She believed that,

One of the ways that the CCRS has negatively impacted me is with my time and having to pull other resources. I mean I find myself going back to other resources and those ways of my Go Math book and trying to stick with the CCRS standards. I feel like if downtown walked in my classroom during a mathematics lesson I might get in trouble. But I’m doing what I have to do to get my students where they need to be, in order for them to follow their book and the standards that are being taught this quarter.

Pamela reflected on how the lack of resources impacted her. “Because we do not have as many resources tangibly available to use, I have to spend much more time searching for ‘good material’. Sandy also acknowledged that she spent quite a bit of time searching for supplementary materials. Early in the year, I commented in my journal, “We are not teaching out of the book this year, which I usually don’t do anyway but I have the resources to do that. I feel for new teachers who don’t have the resources that are needed.”

Gaps in students’ knowledge.

Gaps in students’ knowledge was a major hurdle to implementation of the CCRS. Lindy spoke of the problem she had with State Board of Education when they “adopted the CCRS

across the board.” She felt that as a result of this, “there are skills that the students totally missed out on because so many skills were shifted from one grade level to another. Pamela talked about how teachers were told “when we instituted the CCRS” that “there would be gaps in between what was being taught with the Alabama Course of Study (ACOS) standards and the CCCRS at the same grade” and that would last about three years. She believed that “it is still an issue.”

Participants felt that it was extremely difficult to implement the CCRS when the children were not coming into a grade prepared to master the standards. Pamela referred to her third graders coming to her not ready for multiplication. “Because like I said, we’re already supposed to be in multiplication but I’ve got . . . these children don’t know how to subtract. I think if children don’t come to us on level, it is very difficult to implement the CCRS.” Pansy agreed, “They’re lost. Yeah, I think that’s what I was trying to get at. Your teaching is almost pointless. Because we can’t follow a pacing guide when they don’t come to us ready.”

Sandy recorded her experiences her journal, “CCRS certainly requires a great deal of differentiated instruction. I’m fighting the gaps.” Adele wrote, “Right now I am having difficulty with students being able to perform previously taught skills such as subtraction. From the number of students having difficulty, it is apparent that they did not master this skill under previous standards.” I also found gaps in my students’ knowledge and wrote,

We are working on rounding decimals and I can see gaps in my kids’ understanding We never talk about rounding whole numbers, that is no longer a fifth grade standard, and I don’t think some of my kids can do that so there are going to be issues with it. I am still pushing the idea with manipulatives, but I don’t think the light bulbs are going on for some of them. What else can I do?

Another entry said,

Frustrating day. I graded most of the tests from last week on decimal addition and subtraction and a few still can't subtract with regrouping. I think using the manipulatives helped, but it didn't reach everyone. I need to move on, and I am really not supposed to teach subtraction, but it is frustrating. I also have more than I should who are not proficient at multiplying by 1-digit numbers which is a skill that they are supposed to have mastered in fourth grade. I am now teaching multiplying by 2-digit numbers and I know those kids are going to be lost.

Lindy also talked about this saying, "My biggest hurdle all the time is the gap in knowledge. Most of my kids are at least two grade levels below where they should be. A couple are four grade levels below in at least one subject."

Time.

Time was also an issue when it came to teaching the CCRS standards. All six participants referred to time in their journal entries. Pansy reflected that time was a problem for her, saying, "I think my biggest struggle is always going to be time. You know, having the time to get it all done. And having time to reinforce. Because I've got these children who don't have the skills they need. So we've got to a certain extent find time to reinforce these skills, and there's just not much time there."

Sandy's journal contained five separate entries related to time. Early in September she wrote, "We've started multiplication with arrays. Most are doing okay with it but I feel like I'm missing the extra time I need to continue adding and subtracting multi-digit numbers fluently. I am frustrated and feel like I'm spinning my wheels." Twice she wrote about taking time from other subjects to teach math. First she said, "The students do show improvement at test times, which is very positive, but that's because we have to lose a little extra time with other subjects to

reinforce and intervene.” Later she related, “It is so hard to find time to teach other subjects and still teach mathematics the way it needs to be taught. I am squeezing in time for science and social studies every day.” In late October she noted, “In teaching CCRS standards, time is a huge factor because I have to find the most effective lessons and methods possible to teach the concepts so that mastery can occur in minimal time.” She also pointed to the effect time had on her students, “The students are feeling stress because they are forced to rush through concepts for which they must have more time.”

Adele and Pamela both complained about the lack of time given to certain concepts. Adele said, “Long division for fourth grade is given a little over a week – just before Christmas break!” Pamela was upset there was little time to review before moving to more complex material. “I am very concerned about the lack of time they give us to review place value, odd/even numbers, addition and subtraction before we are supposed to go into multiplication. My students are not fluent with addition and subtraction skills yet.”

Pamela also had trouble trying to find time to meet the needs of all of her students. She recorded her attempt to reach a balance between “teaching the students what I have to and getting them over the hump where they are slowed.” She wrote about the trouble that some of her students were having with adding ones, and trying to find time to provide intervention to those who were struggling.

Another time she wrote, “Even though we go back and review addition/ subtraction facts, I haven’t had time to catch them up. I feel rushed! There seems to be more skills and not enough time allotted to have students master them.”

Lindy had issues with time as well. Her problem with time involved the lack of time she had to work with her special education students because of mandatory meetings held during school hours.

I have experienced more hurdles this year with regards to time. I have missed more instructional time with my kids this first nine weeks than I have in previous years. I can't help them if I'm not there. I really get frustrated when I think about what my kids are supposed to achieve. They are held to the same standards as grade level peers yet are lagging behind in basic skills. There isn't enough time to address the basic needs because you are trying to get them to understand the grade level content.

She also was exasperated by all that she was required to do and expressed this in her journal by writing, "There isn't enough time in the day to address IEP goals!!!!!!"

I too was overwhelmed by time constraints and wrote in my journal, "It takes so long to get manipulatives ready for kids to use, but it worth it. I just wish I had more time to spend finding resources for teaching. There just isn't enough time for all I have to do!" Another time I wrote about using manipulatives with the students "in hopes that the kids who are struggling will understand the concept better by seeing it with manipulatives." Then I talked about how long it took to get the manipulatives ready and how I was frustrated by time, saying, "I can't seem to get it all done. I can't do more things that I think would benefit my kids more because there is no time!"

Factors affecting implementation.

Implementation of the CCRS at Eastwood was affected by factors over which the classroom teacher had little control or input. Foremost among these was the district office.

Another was the myriad of responsibilities given to teachers. Finally, interruptions to instructional time played a role in the quest to effectively teach the standards.

District office.

The district office plays a large role in the life of all local schools, and Eastwood is no exception. The greatest impact that the district office has on implementation of standards comes in two ways. The first is through the development of the mandatory curriculum framework/pacing guide for each grade level and subject. It outlines what standards must be taught each nine weeks. The second is through quarterly assessments developed by the district office to measure student achievement of the specified standards. Participants were outspoken about each component.

Pacing guide/curriculum framework.

Adele wrote in early October that she was “frustrated with jumping around in skills that used to be presented in a logical order.” Although she understood the “idea of connecting certain skills,” she thought “there is something to be said for teaching one skill all together.” She explained by saying, “For example, in a unit on fractions students gain understanding/insights into more complex skills based on previous lessons leading up to them” She believed that students needed to be taught to simplify fractions before dealing with mixed numbers. She also thought that “divisibility rules/prime numbers/factors support simplification of fractions,” yet they were not even “mentioned before adding mixed numbers,” nor was “turning improper fractions into mixed numbers.” In a later journal entry, she said, “I don’t like my pacing guide. The only positive is that it does make sense to teach metrics after multiplication of 10, 100, and 1000. After that it jumps from skill to skill. Fractions are taught before division.”

She was not alone in her concern about the framework/pacing guide. Sandy wondered about the logic in the order in the third grade framework/pacing guide. “In terms of the curriculum framework, I feel that it is random and shows no reasonable progression. The concepts jump from one to the next and then back to the previous.” In a later entry, she reflected,

CCRS standards in third grade seem nonsensical at times. The students must have more time spent on addition and subtraction before jumping into multiplication and division. Even using timed tests and drills, many of the students are not fluent in addition and subtraction facts. Without this fluency, there is no way they can master multiplication and division. Also the standards jump around constantly. After spending time on dividing, we jump into measurement and right back to division. There is no consistency.

She was not any more pleased with the second nine weeks pacing guide. She thought it was “as random as the previous nine weeks.” She felt that it lacked a “logical sequence” and that those who created the guide had “never taught a child a day in their lives.” Sandy believed that in order to cover all of the standards listed meant “running through everything just to touch on it.” She wondered whether the goal was to “teach to mastery or cover all the standards as quickly as possible?”

Pamela had concerns about the third grade framework/pacing guide too. She believed that it lacked “thought and effort” and that it was just “thrown together.” She gave an example to support her assertion. She pointed to the third grade pacing guide which “only covers dividing by 2, 3, and 4.” She asked where the rest of the division facts were. Pamela felt that the expectation was to “to cover exact skills for each grading period” despite the fact that “the first nine weeks was a week behind because of interruptions and students not prepared for

multiplication.” She believed that it should truly be a guide and give teachers some leeway, and if it did that, she “wouldn’t have a problem with it.”

Pamela also wondered about the practicality of the framework/pacing guide for the second nine weeks.

I do not understand our pacing guide for the second nine weeks. We start out with measurement with a ruler. (We ended last nine weeks with mass and liquid volume). Next we divide only by 2, 3, 4. Then we have division word problems. Then modeling division as equal groups- shouldn’t that be the beginning of division? Next is unknown factors, then addition and subtraction word problems, then picture and bar graphs. Then BACK to measuring with a ruler. Then liquid volume and mass (which we did earlier in first nine weeks), then we start fractions. With all of this jumbled mess, we are never told to finish division facts!! We cover too many topics and don’t finish division. Of course my classes will. All of our third grade will, however, I have to be concerned about new teachers in other schools.

Lindy believed that the districts made mistakes with the pacing guide/framework. She thought that the “district tries to cram too much in a nine-week period.” She related how she was having to teach multiple standards at the same time because her students “forget – such as fractions, they forget how to divide so I have to re-teach in order to simplify. Another example: I have to reteach subtraction when dividing. What happened to the teacher setting the pace?”

I, too, discovered what I perceived to be errors in the district framework/pacing guide. Early in the first nine weeks I realized that they had completely omitted one section from the standard on the district pacing guide. The pacing guide/framework listed standard AL CCRS 5.NBT.7 which says “Add, subtract, multiply, and divide decimals to hundredths, using concrete

models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.” They had not, however, included adding and subtracting decimals on the pacing guide. Instead of listing all parts of the standard, it listed only multiplying and dividing decimals on the pacing guide. As a veteran teacher who knew what the standards said, I taught adding and subtracting decimals even though it was not on the pacing guide. In my journal I wrote, “I hope that new teachers realize that they are responsible for decimal addition and subtraction too.”

District quarterly assessments.

The district quarterly assessments were also something of an obstacle for teachers. Participants identified problems with format and content, as well as pointing out mistakes that were in the tests. During the first nine weeks, third grade received three copies of the assessment. In addition, there were standards on the assessment which had not been covered because the first nine weeks was only eight weeks long.

The third grade teachers were very frustrated with the assessment, and their journals reflected their frustrations. Sandy said that the district assessment was “put together very poorly.” She listed mistakes in the document such as use of the word communicative instead of the word commutative. She also complained about “duplicate questions” and “concepts on the test that shouldn’t have been a focus.” Pamela wrote about receiving “the original and two revisions!!” and wondered about the lack of proofreading and the fact that the “third one still had errors!”

The frustration with the district assessment was not limited to third grade. Lindy, who saw both the fourth and fifth grade assessments, talked about her amazement at the number of

mistakes contained in the quarterly assessments at every grade level. She was also irritated that “skills are placed on tests that haven’t been taught because it wasn’t required to be taught that nine weeks.” She also took issue with the wording of the problems, saying that it was often difficult for her to understand what the problem was asking. She then posed the question, “And if I, a college graduate with a Master’s degree and twenty years of teaching experience, can’t understand, how in the world can a fourth or fifth grade special education student understand?”

Like Lindy, I was unhappy with the district assessment and thought that it was poorly formatted and did not fully align with the standards. I wrote in my journal about my frustration, District test for the first quarter came today, and I am not happy. It is poorly formatted, and not really aligned to the standards. It frustrates me to have to give this test. At the beginning of the year, we had to sign a form saying that we would count it as a major grade, and it says at the top that it is a minor grade. There are also some typos in it. I wish that we could go back to the days of site based management! I know that I could come up with a better test than this one. It also covers material that I haven’t gotten to yet because I covered the standard on addition and subtraction of decimal numbers which the district left off their pacing guide. Since the standards says, (AL CCRS 5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.) I covered it so I am behind and haven’t covered some of the material on the test. The test also has multiplication by 1-digit numbers and the standard says, Fluently multiply multi-digit whole numbers using the standard algorithm. How do

they expect teachers to teach the CCRS when the district doesn't even know what the standards are?

Other job responsibilities.

Another component impacting implementation of the CCRS was the numerous other responsibilities given to the classroom teacher. Two that took a great deal of time were relatively new requirements by the district. First was electronic documentation of the Response to Intervention (RTI) required for all students with less than a C average. No longer could teachers document work done with RTI on paper kept in the classroom. Now they were required to keep an electronic folder. The second district requirement was the posting of a daily Strategic Agenda Board for each lesson. It contained the following components: standard, outcome, before, during, after strategies, resources, RTI, technology, assessment, and mathematical practices.

RTI.

For the first time teachers were required to complete an electronic folder for each child that was in the RTI process. The folder was on the district drive and required an update to be uploaded each time the document was edited. It was a process that could not be done in a twenty-minute planning period. In addition to the electronic folders, teachers were required to meet an hour each month to discuss the RTI process. Pansy reflected on the impact of RTI by saying that the documentation in the electronic folder took time that could be used to work with the children. She wondered why she couldn't continue to document in a notebook in her room which was what she had always done. She felt that this electronic folder required her to duplicate her efforts.

I also struggled to understand why the electronic documentation was necessary. It required more paperwork than I felt was needed and did not guarantee that the students were actually getting the help they needed. I elaborated on these feelings in my journal after the new guidelines were given to us.

Our hour planning today was spent on RTI meeting with the guidance counselor, and she outlined some of the things we have to do for Tier 2 and Tier 3 kids. It seems like the paperwork is going to take longer than the time spent working with the kids. The main problem is that there is no time during the school day to do the paperwork so it will have to be done on personal time, which is becoming more and more limited. I just wish I felt like this was worthwhile. It seems obvious to me that the district emphasis is on paperwork and things that really don't teach like lesson plans. Programs don't teach and standards don't either. It all depends on the teacher which is something everyone in education seems to either forget or ignore.

Strategic agenda board.

The Strategic Agenda Board was also a fairly new requirement within the district. All teachers were expected to have one, and district personnel were sent out to check and make sure that they were posted in each classroom. Participants were very vocal in questioning the benefits of the Strategic Agenda Board. Sandy thought that it was a "tool for adults" and had "no impact on students." Pamela agreed, "I do not feel that the Agenda Board is beneficial at all for third graders. I still plan my lessons how I want to and just do the minimum of what they are requiring." I wrote, "I am not sure why the Strategic Agenda Board is such a critical thing. No one has explained its purpose to my satisfaction." It seemed pointless to me since all of the components in it are found in lesson plans which have to be posted in INOW. I also pointed out

in my journal, “just because I list it on the agenda board doesn’t mean I do it.” All participants felt that it took time away from planning and finding resources to teach the standards.

Lindy was the only teacher who was not required by the district to complete the agenda board, yet she thought it was “ridiculous!” She thought that “writing stuff will not make a teacher a better teacher.” She pointed out that the students don’t even look at it unless the teacher calls their attention to it. She thought that requiring teachers to have the board took time that could be better used in planning.

She also commented on all the additional things that were required of teachers did nothing to make them better teachers. She suggested that “all the extra things” like the agenda boards and specifically formatted lesson plans due in INOW by 8:00 on Friday morning of the preceding week only brought “more stress and less time to plan instruction.” She also felt that there were far ‘too many meetings for everything.’”

Interruptions to instructional time.

Interruptions to instructional time was also seen as a barrier to effective implementation of the CCRS standards. These interruptions included book fairs, field trips, programs to reward students for good grades or good conduct, assemblies, and numerous other things. It seemed like there was seldom a normal instructional day. I referenced this in a journal entry which said,

Math test today and the kids didn’t do as well as I would have liked. Of course some of the low grades could be the result of all the distractions this week- book fair, walk your child to school which we did for 15 minutes this morning which threw off our schedule and disrupted the normal day and cut into my teaching time! It is so hard to keep things together with all the distractions.

Interruptions were an issue for Pam as well – “Due to all of the interruptions, I will not be able to get everything covered the first nine weeks that the pacing guide says.” Another of her journal entries read, “It’s almost the end of the month and I still haven’t found time for all that I have to do. I LOVE teaching math and do not appreciate all of the extras that take time away from teaching math.”

Proposed changes that would make implementation easier.

In addition to the areas of concern already cited, the teachers involved in the study pinpointed flaws in the CCRS that they felt could easily be fixed. None of the changes involved abolishing a standard but rather required a revision in the way the standards are presented to the classroom teacher. Participants pointed out that the standards needed to be explained in greater detail. They also believed that prerequisite standards and skills need to be spelled out for each standard so that teachers could easily know what students need to know to master a standard. The format of the 2003 Alabama Course of Study document, used immediately prior to adoption of the CCRS was seen as more user friendly than the current CCRS document.

Lack of specifics.

Adele was the first to point out the lack of specifics in the CCRS standards. “While planning, it becomes evident that CCRS standards are a bit vague. Standards state a general idea of what is to be taught/learned. Specific details are needed addressing to what extent at each developmental stage.” Pamela concurred with this assessment, saying, “I feel like the 2003 Course of Study Standards were more thorough. I feel like we jump around too much now and play Hit or Miss.” Adele further stated, “I like the 2003 Course of Study because it was more specific as to the objectives and supporting details. You could spend more time planning and teaching instead of trying to figure out what to teach.” Lindy believed that it was easier to write

annual IEP goals using the 2003 document. She thought the goals were “more specific” and found the examples given in that document helpful both for herself and for parents of students.

I encountered the problem of a lack of a specific standard when I talked to other teachers about standards when I was teaching a unit on fractions. I had asked Pamela and Adele when students were taught to simplify fractions. I discovered that it is not a specific standard in either third or fourth grade. I had assumed that students had been taught it in a previous grade since it was not specifically listed as a fifth grade standard. I reflected on this in my journal

We have a math test tomorrow on fraction addition and subtraction. I realize that I have got to go back and cover simplifying fractions and changing improper fractions to mixed numbers. While talking to other teachers today, I am finding that the standards at all levels are too broad. No one grade level has a standard that specifically addresses reducing or simplifying fractions. I am beginning to think that part of the problems with the standards is that they are too broad and fail to specify exactly what should be taught as a part of that standard.

After that incident, I pulled a 2003 Alabama Course of Study Document and studied it carefully. I shared my findings in my journal:

I studied the old COS and found that it was much more explicit than the CCRS. I am wondering how many teachers are not teaching needed skills because they think they are covered in previous years or don't realize that they are a part of a standard not expressly stated. I know that I am going to have to go back and cover simplifying fractions and converting mixed numbers to improper fractions and vice-versa. I don't understand why the standards are not more explicit.

Prerequisite skills.

Another problem area for me occurred when I was working with powers of ten and multiplication patterns. Students were required to use an exponent in this process. I quickly discovered that students had no prior experience working with exponents and had no idea what an exponent even was. This meant I had to teach them what exponents were and how to use them before I could teach the fifth grade standard. I recorded my experiences in my journal:

We are working with multiplication patterns with powers of 10, but students have no idea what exponents are or what they mean. Students won't be able to grasp the multiplication pattern if they don't know what exponents are, yet the standard doesn't specify that students need to be taught what an exponent is.

I was not the only participant who experienced a situation where students could not master a current standard because students had not been taught a necessary prerequisite skill. Sandy offered another example which provided further proof of the need for the listing of prerequisite skills in the CCRS document.

The second year I taught Common Core math in sixth grade at Any Private School and when I got to the unit on equations and expressions students had no clue about adding and subtracting integers. Before Common Core, the Harcourt series introduced this prerequisite skill in fifth grade. With Common Core, this skill is not covered. We went back through every grade, nothing. So I had to stop what I was doing and teach an entire unit on integers. Because they had no concept of that going to equations, and why you're moving that over here and why this is negative and none of it. It was a mess.

Teacher Perceptions of the Impact of the CCRS on Students

All participants were concerned about the impact of the CCRS on their students. Teachers recognized that the standards required students to operate at a higher cognitive level

and with greater rigor and were concerned about students who struggled because of the CCRS standards. Some students, particularly special education students were perceived as being “left behind”. Meeting the needs of students despite the CCRS standards was a challenge faced. Parental concerns were also addressed.

Left behind students.

Lindy was particularly concerned about her special education students. She knew that they were missing basic skills like addition and subtraction. She wondered, “How in the world are they supposed to do grade level standards in fourth and fifth grade such as multiplication and division when they can’t add and subtract? The standards mean nothing to them.” Later she talked about it was becoming increasingly “difficult for my children with special needs to achieve with the CCRS standards.” While she appreciated the increased rigor of the CCRS and higher thinking skills, she worried about the struggles her students faced. She also felt that the self-esteem of her students suffered as they struggled.

Lindy also pointed to the increased frustration her students felt when attempting to solve problems using the alternative methods mandated by the CCRS. Pansy, Adele, and Sandy all noted that they had seen a similar reaction in their own classrooms with regular education students. Pamela said, “I do not feel this is best for all the children. As usual, I do not think enough thought and planning went into this before we started doing it.”

Participants felt that it was important to intervene and discussed things that they were doing to help children succeed with the CCRS standards. Sandy said, “We are doing more timed tests. It seems to be helping with addition, which, I hope will help with multiplication. We’ve talked about different strategies to use (memory, repeated addition, arrays, etc.)” Pamela related,

“Students did really well on first multiplication test. I feel like they at least have the concept. Some of them needed to draw groups or arrays, however, I am fine with that at this time.”

In her journal, Sandy told about her strategies for helping her students master division. We worked on division this week. I was worried because I don't feel as if the students have mastered multiplication, yet I am throwing them into division. However, we used counters, fact family cards, and other strategies to group objects. Surprisingly, the students have caught on very quickly and even if they are not sure of the multiplication fact to check their answers, they are able to draw pictures to solve the problem. That was a huge success for me.

Parents and the CCRS.

At a focus group meeting, the topic of parents and the CCRS was introduced. Lindy talked about how parents at several IEP meetings said that they couldn't help their children with mathematics anymore because they didn't understand the steps to solving CCRS problems. Pansy, Sandy and Pamela had all heard similar comments from their parents. I shared that I had not experienced that and explained why I thought I had not. “I have homework notes on the board for students to copy. Students have these notes so parents can know the steps. Not every kid will copy it down, but they're supposed to and the parents know they're supposed to.” While the other teachers liked this method, they did not think it would work for them.

Sandy said, “I have received notes from parents who are concerned with their children's scores on work assignments. I wish I could tell parents to contact the committee that created CCRS so they could convey their thoughts on the inappropriate nature of it.” Pansy related the conference she had with a parent who said that she didn't understand anything that was sent home for math. Lindy mentioned her phone conversation with a parent who told her that they

were having a hard time helping their daughter with math despite the fact that both parents had college degrees. From this it was obvious that not only our students were affected by the CCRS, but their parents were as well.

Summary

Findings from this study suggest that teachers have an important perspective to offer in regard to the CCRS standards. First, these teachers recognized the value of a universal curriculum and the importance of the mathematical practices outlined by the CCRS. Second, they do have some reservations about aspects of the CCRS. As seasoned professionals, they believe that some of the CCRS standards are developmentally inappropriate for the grade level to which they are assigned. They also take issue with the inherent assumption that all students master a standard the first time it is presented and that it would be more beneficial for students for more difficult standards to be presented more than once. Teachers in this study also question the validity of standards that prescribe one method of solving a problem; instead they promote the presentation of multiple methods and let students select the methods that works best for them.

Implementation of the CCRS standards is an area where teachers truly are the experts since they are the ones charged with doing it. The data presented in this chapter indicates that teachers in this study are frustrated in four areas as they put the CCRS standards into practice in their classrooms. First, the CCRS requires increased planning time. Second, teachers are faced with a lack of resources for teaching standards. Another hurdle is gaps in students' knowledge and a fourth obstacle comes from time. Other factors which affect implementation of the CCRS in the participants' classrooms include the district office, other job requirements, and interruptions to instructional time. Research subjects also propose changes to the CCRS document which outlines standards which would make it more user friendly. They advocate that

standards should be explained in greater detail, that prerequisite skills be included with the standards, and that the document be formatted more like the old Alabama Course of Study Standards.

Finally, teachers in this study relate the impact the CCRS standards have on some students, particularly special education students. They offer some strategies that they are using to meet the needs of their students as they utilize the CCRS standards. They also touch on their experiences with parents and the CCRS.

CHAPTER 5: DISCUSSION

This study examined the lived experiences of upper grade elementary mathematics teachers with the Alabama College Career Readiness Standards. Five classroom teachers and one special education teacher recorded their experiences with the CCRS in a journal for twelve weeks and were interviewed once. Data analysis revealed that the teachers are not opposed to the CCRS standards, but they do have reservations about certain aspects of the standards. Implementation of the CCRS standards was occurring in these teachers' classrooms, although they faced hurdles in the process. Finally, teachers in the study were deeply concerned about the effect on CCRS on students and their families.

There were three questions that guided this study. They will be used to frame the discussion on the themes that emerged from the study. The questions are:

1. What are teachers' attitudes towards the CCRS?
2. How do teachers describe their lived experiences with these standards?
3. How do teachers report their students have been affected by the CCRS?

What are Teachers' Attitudes towards the CCRS?

The Common Core State Standards were developed to make sure that students across the country were prepared to succeed in either college or career when they graduated from high school (Common Core State Standards Initiative, 2016). States that chose to adopt the Common Core were allowed to add fifteen percent content to the Common Core Standards, and Alabama chose to do that when it adopted the standards. (Kendall et al., 2012). Alabama's version of the Common Core, College and Career Readiness Standards (CCRS) had additional mathematics content for grades nine through twelve only and additional content in all grade levels for

English/Language Arts (Kendall et al., 2012). Teachers in this study were dealing only with standards that came straight from the Common Core.

Proponents of the Common Core point to four major benefits. First, the Common Core has comparable standards to other nations', resulting in internationally competitive students. They also say that the standards lead to equitable expectations for students across the country. Another benefit they see for the standards is that they communicate clear expectations for students, teachers, and parents, and finally they believe that shared standards allow districts and states to collaborate for collaboration across districts and states, resulting in better resources and more effective professional development (Achieve, 2012).

While participants in this study do identify some of the benefits of the proponents, others are not mentioned, and others appear to be contradicted. The universal curriculum identified by the teachers in this study aligns with the second benefit, equitable expectations for students across for the country. Eastwood is near a military base and has military students who are there for only one year, so the universal curriculum was an obvious advantage to teachers. The first, producing internationally competitive students, and the third, clear expectations for all, are not addressed. The fourth benefit, collaboration across district and states which results in better resources and more effective professional development conflicts with data found in this study.

Things teachers like about the CCRS.

The universal curriculum is something that the teachers in this study were quick to point out as a benefit. They believed that it was good for military students and for others who moved to another state. Schreiner (2014) found similar results in her study of teachers in a Colorado school district that was implementing standards based reform. Like the teachers in this study, the Colorado teachers understood the need for unifying the curriculum through the establishment of

a universal set of standards. They too were supportive of the standards and appreciated the content (Schreiner, 2014).

The other CCRS benefit recognized by teachers in this study, the mathematical practices and problem solving, has been greatly emphasized within the school so teachers were very aware of it. Additionally, at least two of the participants in this study have been advocates of hands-on mathematics and problem solving for many years, implementing this approach in their classrooms before the mathematical processes were even formulated. They were empowered by this aspect of the CCRS. They realized that the use of the mathematical practices leads students to discover mathematics is an engaging, challenging, evolving subject which they can enjoy (Russell, 2012). These participants buy into the research that says that the mathematics classroom should be a place where students are actively engaged in learning mathematics (Donovan and Bransford 2005; Lester 2007). Sandy referenced this when she said, “They were given free rein to create their own playground design using designated shapes.” In my journal I talked about this when I said,

Fridays are the days I pull in motivational stuff for my students. They get up and do three different graphs, we use estimation jars, and they solve Encyclopedia Brown mysteries. The kids love it. They are using the mathematical practices, learning mathematical concepts, and most importantly learning that mathematics is fun!

Things teachers don't like about the CCRS.

While the teachers were supportive of the CCRS standards, they readily pointed to what they perceived as flaws. First, teachers took exception with CCRS standards that require students to use a specified method to solve a problem. For example, fourth grade standard 4.NBT.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm and

fifth grade standard 5.NBT.5. Fluently multiply multi-digit whole numbers using the standard algorithm both name the method students must use to solve a problem. Fourth and fifth grade teachers in this study felt that if students were more successful using an alternative algorithm, then they should be allowed to use that method. They subscribe to NCTM thinking outlined in NCTM Standards (2000) which encourages teachers to give students multiple methods for each operation so that students have the option to choose the method most appropriate for the situation. Further, NCTM recommends that students in grades 3-5 be encouraged to develop and use methods to solve multiplication and division problems that differ from the standard algorithm.

Fuson and Beckmann (2012) discuss the use of the term standard algorithm in the standards. They propose that since the writers of the standards fail to specify what the standard algorithm is, then there are several methods including lattice multiplication that fit the definition of the standard algorithm. The Common Core Standards Writing Team addressed the definition of the standard algorithm on March 6, 2015. In the publication, *Progressions for the Common Core State Standards in Mathematics* they point out that the standards purposely do not specify a particular standard algorithm for each operation. Rather they provide examples of algorithms that fit the criteria of a standard algorithm and the advantages and disadvantages of each (Common Core Standards Writing Team, 2015). This information demonstrates that teachers are knowledgeable in their beliefs about learning and teaching mathematics, but it also shows that teachers need more support in understanding the standards. It also shows that there is a greater need for teachers to do their own research. If I had not been working on this dissertation it is unlikely that I would have come across this information.

Lindy, the special education teacher, objected in her journal, to teaching first graders three methods to solve a subtraction problem. This is a part of the standards in first grade. When questioned about her position, she said that while she did not oppose the use of any of the methods, she believed that presenting all three methods at once was confusing to the young learners. She felt that if they were presented on different days and students were allowed to select the method to use, it would be more effective. Although the standards do require the presentation of all three, they do not mandate they be shown on the same day.

Another issue that teachers had in this study was their perception that some of the standards were developmentally inappropriate for their students. They are not the first to raise that issue. Main (2012) expressed similar thoughts in an article in *Early Childhood Education Journal*. She stated that the Common Core State Standards for Mathematics were not developmentally appropriate for kindergarteners and first graders. She pointed to kindergarten standard K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones and first grade standard 1.NBT.2. Understand that the two digits of a two-digit number represents amounts of tens and ones. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones-called a “ten.” b. The numbers from 11 to 19 are composed of ten and one, two, three, four, five, six, seven, eight or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight or nine tens (and 0 ones). Researchers from Western Australia found that children are not generally able to partition numbers until they are between

six and nine and can successfully partition two-digit and three- digit numbers between the ages of nine and eleven (Western Australian Minister for Education, 2006).

The Common Core State Standards Initiative website addresses this issue. In the “Frequently Asked Questions” section of the website (<http://www.corestandards.org>) the question, “Are the standards developmentally appropriate for students?” is posted. The response says that the standards are based on both research and the expertise of educators about what is developmentally appropriate. The Common Core website says that there are national education organizations and early childhood experts, as well as research, which support the developmental appropriateness of the standards. These include the National Association for Education of Young Children (NAEYC), the Thomas B. Fordham Institute, and early childhood expert Douglas Clements. Clements was a member of the working group on the standards and has co-authored an article supporting the standards on the blog of the National Institute for Early Education Research (<http://www.nieer.org>). NAEYC has a position paper on its website which supports the teaching of Common Core using developmentally appropriate strategies (<http://www.naeyc.org>).

Participants were also concerned with the vertical alignment of the CCRS. In it, each grade level’s standards are built on standards taught and presumably mastered the previous year. To teachers this appeared to be a built in assumption that all students will master the standards in the year in which they are presented. Students who fail to achieve proficiency with this year’s standards will struggle with subsequent years’ standards (Bowdon, 2015). In districts like Eastwood’s where teachers have been told that they are to teach only current grade level standards, this sets up students for failure and leads to frustration for teachers.

Upon closer examination this perceived flaw was not truly a problem with the CCRS, it was a district created issue. There is no direction in the standards that teachers could only present the current grade level's standards since curriculum matters are left up to the state. The state does not have a mandate that teachers teach only current grade level standards. In fact, the *2015 Alabama Course of Study for Mathematics* recognizes that students' ability to learn at the current grade level is dependent upon prior learning. The document says that it is unrealistic to expect all students to be prepared for the current grade level standards since students do not all learn in the same way or at the same point in their development. It says that the standards are placed where they are on the basis of comparisons with other states and nations, as well as on the judgments and experiences and professionals such as educators, researchers, and mathematicians. It encourages teachers to meet the needs of individual students in their classrooms based on their current understanding, particularly since the opportunities for learning vary from school to school and system to system.

Based on this information, the teachers in this study are mistaken in thinking the CCRS forbade teachers from reviewing or re-teaching previous year's standards. They are correct in assuming that the district pacing guide prohibited a review of standards from lower grade levels. The problem is not truly with the CCRS but with the district's implementation of it.

A close examination of the literature leads to the determination that the three perceived flaws the teachers identified in the data reveals that none of them can be considered a true weakness of the CCRS. All of them should be seen as shortcomings in the implementation of the CCRS, a problem created by the teachers' lack of knowledge about the standards. It is, however, difficult to lay the entire blame on the teachers.

Much of what the teachers know comes from training by the district, and that training has provided only cursory knowledge about the standards. Indeed, the primary training has been “turn around” training where two teachers attended a week long workshop and were instructed to return to the school and train others on the CCRS in two days. This is not supported by findings from the literature which tells us that effective professional development increases content knowledge, gives teachers an understanding of strategies for implementing reform, and equips teachers of diverse cultural populations with the tools they will need to enable those students to achieve mathematically (Bailey, 2010; Choppin, 2009; Loeb, Knapp, & Elfers, 2008; Obara & Sloan, 2009; Trafton, Reys, & Wasman, 2001). Additionally, “effective mathematics professional development is sustained and embedded within professional learning communities and focused on the actual tasks of teaching using the same materials you use with students” (Larson et al., 2012).

In addition, there is no mathematics resource person on-site, only an instructional coach whose expertise is in primary grade literacy. All communication from the mathematics supervisor at the district is relayed through her, and she is responsible for sending concerns to the district office. There is no direct access to the mathematics supervisor, and the elementary mathematics advisory council which originally served as a liaison between the district and the schools was discontinued when the former district mathematics supervisor retired in 2014.

Teachers are reluctant to voice concerns to the current district mathematics supervisor because of past experience. Pamela relates the following story about an incident with the mathematics supervisor when she complained about inaccuracies in the quarterly assessment:

And then you (mathematics district supervisor) come in my room when I complain and have the nerve to ask me if I make up a test can I send it to you to proofread? No ma'am.

These 25 children are my responsibility. That's your job. I didn't mind telling her that real quick. So I just think they need to be more, I think the people who are telling us what to do need to be more professional. They need to make sure that what they present to us follows what it's supposed to follow.

I also had an experience with the district office which was equally frustrating. I received an e-mail from the instructional coach asking for me to complete the following survey and return it to her as soon as possible since it was due by noon the following day. Because my test scores on the ACT-Aspire had increased from 26% to 41% in 5th Grade Mathematics on ACT Aspire from 2013-14 to 2014-15, I was asked to rank five things which caused the "demonstrated improvement" on ACT Aspire. Only one of them, continued use of mathematical practices, was something I actually utilized. All of the others were district meetings or programs in which I had not participated.

The role of the district in implementation of the standards cannot be underestimated. Porter et al. (2015) examined the ways educators at the school level experience the Common Core Standards and its implementation at two public elementary schools in North Carolina. Their findings suggest that the school district plays a major role in implementation of the Common Core. Results from their study indicated that changes in the guidelines from the district and failure to effectively communicate could be obstacles to continuous and so prove to be barriers to sustained and uniform implementation of the standards. Data from this study appears to support those findings.

How Do Teachers Describe Their Lived Experiences with these Standards?

Although all participants in the study indicated that they were fully implementing the standards, they faced challenges in the task. They listed the following as things that hindered

them as they sought to teach the standards: increased planning, lack of resources, gaps in students' knowledge, and the need for additional teaching time. Teachers implementing new standards in Colorado cited a lack of resources and the lack of time for preparation (Schreiner, 2014) to support the change, themes which were also apparent here. Porter et al. (2015) examined the ways educators at the school level experience the Common Core Standards and its implementation at two public elementary schools in North Carolina. The teachers in that study, like the ones in this study, revealed that it took a significant amount of time and energy to implement the standards (Porter et al., 2015).

With continued implementation of the CCRS year after year, perhaps some of these will become less of an issue or disappear altogether. As teachers work with CCRS standards, they will likely be able to find strategies and materials they can use. It is probable, then, that increased planning, lack of resources, and the need for additional teaching time will no longer be a problem in future years. Research supports this, suggesting that teachers become more adept at teaching standards and become more comfortable with new curriculum in successive years of implementation (Bailey, 2010; Choppin, 2009; Loeb, Knapp, & Elfers, 2008).

There could be some improvement in the gaps in student knowledge because the curriculum in lower grades will have time to be implemented. However, it is likely that there will be continued problems with this issue, particularly since teachers are told to teach only current grade level standards. It is imperative, then, that teachers be made aware of the policy outlined in the Course of Study which instructs teachers to meet the needs of students, allowing teachers to re-teach standards from lower grades. It is also equally important that additional support be provided to teachers in interpreting and implementing the standards. Professional development at the district level and in-service meetings at the school level must address these

needs. There must also be time provided for mathematics teachers to collaborate across grade levels so teachers understand the vertical alignment of the standards. The district curriculum framework/pacing guide should be less emphasized because research points out that teachers who are forced to strictly follow pacing guides often feel pushed to stay on pace. As a result, they will often exclude the more time consuming problem-solving tasks that are essential for developing deeper mathematical understanding (David & Greene, 2007).

Challenges in implementing the CCRS.

Data from this study indicated that the school district office played a major role in CCRS implementation. It provided a curriculum framework/pacing guide and quarterly assessment of standards to hold teachers accountable. Many of the frustrations that teachers conveyed were more with these documents than with the CCRS standards. Teachers voiced dissatisfaction with the pacing and order in which the standards were presented, although the district had a rationale for their sequence. The *Usage of Curriculum Frameworks and Pacing Guides for K-5 Mathematics* (2015) document states that the standards were arranged in the order suggested by the Wire Graph of the Standards. This graph was developed by Jason Zimba, a mathematician who was one of the lead writers for the mathematics standards. On the Wire Graph (Zimba, 2012) there is no mention of sequencing of topics within a grade level. Mobile County Public Schools has posted its elementary mathematics framework online (<http://www.livebinders.com/play/play1379359>) and state that their sequence is based on Zimba's document, but their sequence of standards differs from the one used by the district in the study. The Alabama Department of Education has a suggested curriculum framework/pacing guide posted on its website (<http://www.alex.state.al.us/ccrs/sites/alex.state.al.us/crs/files/Grade5>) and the sequencing on it differs from both Mobile's and the district's in this study. In fifth grade

Mobile begins the year with standard OA.1 and OA.2, the district in the study fifth grade begins the year with NBT.1, and the framework suggested by the state begins fifth grade with the standard MD.3. It would seem, then, that this is a valid concern.

Equally disconcerting to teachers was the district assessment which they believed was poorly put together and was viewed by teachers as a way to check up on their teaching. Pamela best summed up the feelings of the research participants about the district when she wrote:

I hate that I sound so negative on my comments. I love teaching math and will continue to enjoy teaching it. I feel like people who have taught math a lot fewer years than I have (if at all) are dictating what I need to do. Please let me do my math teaching with leadership and guidance from professionals who know their stuff!! (RANT OVER)

Other job responsibilities, such as strategic agenda boards and RTI documentation, also impacted CCRS implementation, as did interruptions to instructional time. Data showed that teachers felt that all of these took time that could better have been used to plan for CCRS instruction and find resources. The teachers in this study were not the first to reach this conclusion. Wagner (2001) and Darling-Hammond (1997) both assert that the increased paperwork brought about by reform and teacher accountability actually prevent teachers from engaging in activities that lead to student learning. Schmoker (2006) believes that teachers already have the knowledge and skills needed for greater student achievement, but that all of the demands on a teacher's time from all of the reform efforts thwart them from the collaboration and lesson planning leading to more effective lessons.

How teachers would improve implementation.

Analysis of the data revealed that the teachers had specific suggestions for improving the document which contained the CCRS standards to make it easier for them to use. They

suggested the format be changed to more closely resemble the 2003 Alabama Course of Study (Alabama Department of Education, 2003) document used prior to adoption of the CCRS standards. In it, the standards are listed as they are now, but there are also bullets which specify prerequisite skills. Examples are also given. In the 2003 Alabama Course of Study Mathematics document, Measurement Standard 13 for fifth graders states: “Convert a larger unit of measurement to a smaller unit of measurement within the same system (customary or metric). Examples: 4 cups = 32 ounces, 2 meters = 200 centimeters, 2 miles = 10,560 feet” (Alabama Department of Education, 2003, p. 29). In the current Alabama Course of Study for CCRS, Measurement and Data 18. “Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multistep, real-world problems” (Alabama Department of Education, 2015, p. 44). The fractions standard in the current document says, “Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example,* $\frac{2}{3} + \frac{5}{4} = \frac{8}{12} + \frac{15}{12} = \frac{23}{12}$. *(In general,* $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$.*)*” (Alabama Department of Education, 2015, p. 42). In the 2003 document, the same skill is written:

Determine the sum and difference of fractions with common and uncommon denominators.

- Changing mixed numbers to improper fractions
- Solving problems involving addition and subtraction of fractions with common and uncommon denominators
- Using least common multiples

- Estimating sums and differences of fractions (Alabama Department of Education, 2003, p. 28).

In the 2003 document, the teacher knows exactly which skills are necessary to master the standard, and it is easier to plan for instruction. Teachers in this study would like the current document to be revised to provide more explicit information and more user friendly language, as was found in the former document. They also believe that prerequisite skills should be listed as a component of the current skill if they are not taught in a previous grade. This would allow for more effective planning by the teacher.

How Do Teachers Report Their Students Have Been Affected by the CCRS?

Teachers in the study were worried about the impact of the CCRS on their students and their families. Lindy, as the special education teacher, was particularly passionate as she discussed the negative effects the CCRS had on her students. Other teachers also felt that the CCRS standards caused stress for general education children. A qualitative study done by Murphy and Haller (2015) found similar concerns among teachers of students with disabilities and teachers of English language learners. Loeb, Knapp, & Elfers (2008) also found that a standards-based reform program in Washington state did not address the needs of all children. Adomou (2011) explored teachers' perceptions of both the value and effects of standards-based reform in relationship to curriculum, instructional practices, and the quality of student learning in three districts in California. He discovered that teachers were supportive of reform but were concerned about the impact it had on their students who struggled because they lacked the knowledge and skills to be successful, themes that were also evident in this study. In order for the standards to be successful, there must be flexibility to meet the needs of these students and

teachers must develop strategies to lessen the anxiety of students struggling with the mathematics standards.

Implications

Teachers are the key to educational reform. When all is said and done, the relationship between teacher and student is the bedrock of education and matters far more than the mandates of the district or legislature (Dewey, 1902). More recently, reformers have recognized that if schools are to be successful, teachers must buy into reform so that change will produce truly occur, (Goldstein, 2014; Fullan, 2007; Darling-Hammond, 1997; Wraga, 1999). This is unlikely to happen when teachers feel like they have little or no input into what should occur in the classroom. In this study, teachers have voiced their thoughts and beliefs about the CCRS, the most recent school reform. They have acknowledged the positives in the CCRS, pointed to perceived flaws, and offered specific suggestions for making the CCRS standards more user-friendly and easier to implement. Teachers have pinpointed the obstacles they face as they implement the standards each day in their classrooms.

Analysis of the findings from this study indicate that the issues these teachers identify as weaknesses with the CCRS are truly a lack of accurate information about the standards. Since most of what teachers know comes from the district, then the district is not doing an effective job of communicating what the standards actually say and how to most effectively teach them. The district is also doing a disservice by allowing teachers to believe that they cannot remediate students by teaching standards from other grade levels.

The district also needs to closely examine the curriculum framework/pacing guide and district assessments so that these documents are more in-line with the needs of the classroom teacher. This would prevent a great deal of frustration on the part of the teachers. It would also

be advisable for the district to reduce some of the requirements on teachers like the Strategic Agenda Board and excessive RTI paperwork so that teachers have more time to focus on the CCRS. Teachers who are overloaded and tend to be less effective at implementing reform (Evans, 2001). Additionally, frustrations brought about by circumstances over which teachers perceive they have little control can impede effective teaching (Goodlad, 1984).

There are unintended consequences of implementing a major curriculum change, and this is apparent in this study. Those who advocated the changes failed to anticipate the misinformation and lack of communication that would hinder the teachers in their efforts to teach the standards. They also did not realize how the broad wording of the standards would make implementation more difficult. Inclusion of more teachers at the grassroots level could possibly have prevented some of the unintended consequences found in this study. This study highlights the need for teachers to be involved and heard when implementing any kind of educational change.

The results of this study would be of interest to State Department of Education officials who are tasked with creating the Course of Study for Elementary Mathematics document that contains the CCRS standards. Information from this study could be used to make the document more user friendly for teachers. District personnel who create the curriculum frameworks/pacing guides that teachers must utilize as they implement the standards and the quarterly assessments would benefit from information contained in this study. Principals could also find information in this study useful as they serve as instructional leaders in the quest to implement the CCRS. Teacher educators could use the information found here to ensure that they prepare preservice teachers to be informed, to question, and to let their voices be heard in the world of education. This information could also use the findings from this study to become advocates for the

classroom teachers who are implementing changes in the curriculum. Finally, teachers who are implementing the CCRS might find encouragement in this study, knowing that there are other teachers who share a similar perspective.

Limitations

Initially, the intention of this study was to examine the CCRS for mathematics from the perspective of teachers. The findings of this study are related to the implementation of the CCRS in one district, so this is a limitation of the study. Also, this research was conducted at one elementary school so findings are applicable only to that site and to the teachers involved in the study. In addition, the experiences of these teachers were impacted by information given them by the district which had a new person in the position of mathematics supervisor. Findings in another district may radically differ from the ones in this study. Teacher participants all readily agreed to participate in the study. Other teachers may have far different views than the ones presented here. Another limitation was the fact that data was collected for twelve weeks and not for an entire school year. Data collection was also done during the first semester and before state testing occurred in the spring. It is likely that teachers would be more focused on testing which could provide interesting data. The fact that interrater reliability was not utilized to code data is also a limitation. Finally, I was both the researcher and a participant in the study. As a result, some might view the study as too subjective or biased. I would argue that the study was strengthened by my dual roles. Eisner (1998) believed that those who studied educational practices should “to some significant degree” possess knowledge about “about the subject being taught and the ways in which it might be taught” (p. 244). I believe that I meet that criteria. I am also convinced that I was a more effective qualitative researcher because I was telling my story.

Future Research

Areas for future research are many. First, the research in this study was limited to six teachers in grades three, four, and five. Additionally, all six teachers were Caucasian females who had seven or more years of experience. All teachers in this study preferred to teach mathematics rather than language arts, and all participants are very confident in their mathematical ability. Future research should seek to include a more heterogeneous group of participants at varying grade levels, as well as include teachers of mathematics who are not comfortable with the subject. It would also be beneficial to study novice teachers as they seek to implement CCRS standards. This would provide insight into how those teachers find resources and implement standards without the use of the textbook. A longer study would also result in a more complete understanding of the impact of CCRS implementation on both teachers and students. Studying teachers in another district to determine the impact of district support on the CCRS implementation would likely provide additional insights that would be useful. A study about the impact of the Common Core State Standards in several states that are implementing it to discover similarities and differences across the states would be beneficial as well. Future research should also include observations in the classrooms of teachers who are implementing the CCRS.

Summary

This qualitative grounded theory study sought to discover the perspectives of third, fourth, and fifth grade mathematics teachers as they implemented the CCRS standards each day in their classrooms. The data showed that teachers support the CCRS standards, but also have misconceptions about them. Analysis indicated that that the district could more effectively assist with implementation by offering greater accessibility and responsiveness to the concerns of

teachers. Additionally, reducing some of the other district mandates would allow teachers to more fully focus on the CCRS implementation.

As I end this study, I have to wonder what the implementation of the CCRS is like in other districts in Alabama. I also question how these standards can be common when the implementation of them is left up to individual districts. We know from research that teaching varies from classroom to classroom, school to school, and district to district (Morris & Hiebert, 2011). How can a common set of standards ensure that this will change, particularly when a district is left to disseminate information about the standards and provide the professional training to implement it?

I also have to question how the CCRS can be effectively implemented in other places. The teachers in this study are all very dedicated teachers who have a minimum of seven years of experience. They have a keen understanding of teaching mathematics to children and have a wealth of resources. Their school is seen as one of the best in the district with a strong administration and an active parent association. Teacher morale has never been an issue at this site, and collaboration among teachers is the rule rather than the exception. If the CCRS is a problem in this setting, I have to wonder about teachers in places with less support. I also question whether teachers who have alternative certification with four weeks of preparation of those who enter the classroom through programs such as Teach for America can successfully implement the standards.

The questions raised by this study could also be generalized to other situations. While this study dealt specifically with upper elementary teachers of mathematics, the findings could also apply to lower grade elementary teachers and secondary mathematics teachers. As I shared my findings with a colleague who teaches upper elementary language arts, she stated that she

believed the same things were true with the standards for language arts, particularly the finding that the standards were written very broadly and were not user friendly. It can also be argued that the findings could also apply to other educational changes, including curriculum changes.

This study was born out of my own frustrations with implementing the CCRS in my fifth grade classroom. My school district required a different order of teaching the standards in each of the first three years of implementation. Although I am a veteran mathematics teacher with 21 years of experience, I found it extremely difficult to keep up with all of the changes and still meet the needs of my students. Also contributing to my desire to conduct this research was my intense desire to give voice to the classroom teacher.

This study has been an intense exercise in professional growth. I was surprised that what the teachers in this study, including me, perceived as weaknesses in the CCRS were not really things wrong with the standards at all. Lack of knowledge was the problem. I am disappointed in myself that I didn't do the research on my own, not for this dissertation, but as a professional to discover the truth. I realize, now, that is part of my job as a teacher to find the facts myself about the things I teach and how I should teach them. I cannot depend on the district or even my principal to do this. It is up to me to act and to share the knowledge with my colleagues. This is the lesson both for me and for other teachers.

As a result of this study, I can identify specific changes that will be made in my professional life, both in my classroom and in my school. I will continue to share alternatives to traditional algorithms in my classroom without fear because I now know that the intent of the Common Core writers was for teachers to identify and teach any method that fits the definition of a standard algorithm and not just the traditionally used method. I will also be more proactive and teach needed skills that are not expressly identified as fifth grade standards. I will also do

my own research instead of depending on the information provided by the district. Additionally I have spoken to my principal about sharing what I learned with the other mathematics teachers.

I am in the fifth grade classroom because that is where I truly want to be. I believe that is where the “rubber meets the road”. I want to be respected for that choice, and I want to have a voice in the educational process. I believe what John Dewey said in 1895 still holds true.

It is . . . advisable that the teacher should understand and even be able to criticize, the general principles upon which the whole educational system is formed and administered. He is not like a private soldier in an army, expected merely to obey, or like a cog in a wheel, expected merely to respond to and transmit external energy; he must be an intelligent medium of action.

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Appendix A Coding Book

CODE BOOK

Categories that emerged from the analysis of the data regarding upper elementary teachers' perspectives on the CCRS:

1. Teacher Attitudes about the CCRS

This category dealt with how teachers feel about the CCRS, and what they see as good and bad about the standards.

1.1 Benefits of the CCRS- the good aspects of the standards, according to the teachers

A positive that I find with any type of guide is that it will state what students are expected to learn in any grade and subject. It helps guide the planning and instructing in the classroom and it allows for students across the country to be taught the same things.

1.2 Problem Areas within the CCRS – the things that teachers believe are weaknesses

CCRS standards in third grade seem nonsensical at times. The students must have more time spent on addition and subtraction before jumping into multiplication and division.

Even using timed tests and drills, many of the students are not fluent in addition and subtraction facts. Without this fluency, there is no way they can master multiplication and division. Also, the standards jump around constantly. After spending time on dividing, we jump into measurement, and right back to division. There is no consistency.

The students are feeling stress because they are forced to rush through concepts for which they must have more time.

2. Implementation of the CCRS

This category consists of the experiences that teachers have while teaching the CCRS.

2.1 Frustrations with Implementation – things that frustrate teachers or make teaching the standards more difficult

2.1.a Gaps in students' knowledge

I remember when we instituted CC that the major discussion was there would be gaps in between what was being taught with ACOS standards and the CC at the same grade. The thought was that we would be fighting that gap for about three years. I feel like it is still an issue.

2.1.b. Inappropriate standards

This week we have been trying to squeeze in concepts that have to be taught. The students are not developmentally ready for the concepts and there are other skills that the students must master, therefore the focus has been on those. It's frustrating because I know what I should be doing, yet I can't.

2.2 Things that Impact Implementation of the CCRS – factors that affect the teaching of the standards

2.2 a. Central Office

FRUSTRATION!!! The new curriculum framework and pacing guide is now up instead of being up in June when I could effectively plan. I specifically asked at the last Teacher Advisory Panel last spring for us to get this material in May when I could effectively plan in the summer. We were assured that we would have it no later than June. Since it is only available on the Intranet, I have been up here every week to check. They downloaded it Monday August 3rd when I was out of town. Everything is different than it was last year so all of the planning I did this summer is now void!

2.2 b. Time

In teaching CCRS standards, time is a huge factor because I have to find the most effective lessons and methods possible to teach the concepts so that mastery can occur in minimal time. I spend quite a bit of time searching for supplemental materials.

2.3 Proposed Changes that Would Make Implementation Easier – suggestions from the teachers about ways the standards could be better formatted to teaching of the standards less of a struggle

While planning, it becomes evident that common core standards are a bit vague.

Standards state a general idea of what is to be taught/learned. Specific details are needed addressing to what extent at each developmental stage.

3. Teachers' Perceptions of the Effect of the Standards on Students

3.1 "Left Behind" Students – students who are not meeting the standards or who are stressed by the standards

When they can't get it they shut down. But it's not just those kind of students either getting frustrated. I think it's even with the basic classroom children getting frustrated and shutting down.

3.2 Parental Concerns – how the standards impact the parents of students

I had another parent tell me on the phone today that they have a hard time helping their daughter with math and "We both have college degrees!"

Appendix B IRB Form

(NOTE: DO NOT SIGN THIS DOCUMENT UNLESS AN IRB APPROVAL STAMP WITH CURRENT DATES HAS BEEN APPLIED TO THIS DOCUMENT.)

INFORMED CONSENT

for a Research Study entitled

“Upper Elementary Mathematics Teachers’ Perspectives on Alabama’s College and Career Readiness Standards”

You are invited to participate in a research study to investigate the experiences of upper elementary mathematics teachers who are currently implementing the Alabama College and Career Readiness Standards. The study is being conducted by Celeste Granthum, a doctoral student under the direction of Dr. Megan Burton, Associate Professor in the Auburn University Department of Curriculum and Teaching. You were selected as a possible participant because you are a teacher of mathematics in grades three, four, or five or an employee of a public school who works with upper grade mathematics teachers and are age 19 or older.

If you decide to participate in this research study, you will be asked to keep a journal of your experiences as you teach mathematics and share copies of your mathematics lesson plans. Finally, you will be asked to participate in focus groups and be interviewed individually. All meetings will take place at a mutually convenient time and place, outside the realm of the regular school day. To protect your privacy, names will be changed to pseudonyms before data collection begins. A final copy of the report will be made available to you for input and editing. Your total time commitment will be approximately one hour a week for each week you keep the journal. An additional hour will be required of you four times during the sixteen week study for focus groups and interviews. Focus groups and interviews will be audio taped for transcription by the researcher. Tapes will be destroyed once the transcription is complete.

The risk associated with participating in this study is breach of confidentiality. To minimize these risks, we will assign a pseudonym to all participants and sites prior to data collection. In addition, all data and audio tapes will be stored in a locked file cabinet in the researcher’s personal residence.

There are no benefits to participants, and participants will not receive compensation. There are no costs to participating.

If you change your mind about participating, you can withdraw at any time during the study. Your participation is completely voluntary. If you choose to withdraw, your data can be withdrawn as long as it is identifiable. Your decision about whether or not to participate or to stop participating will not jeopardize your future relations with Auburn University, the Department of Curriculum and Teaching or Celeste Granthum.

Participant’s initials _____

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Your privacy will be protected. Pseudonyms will be used in transcripts and other research documents to insure your privacy and also the school system's privacy and confidentiality in the course of this investigation. Pseudonyms will disguise the identity of any information that is given during the study. These will be assigned prior to the beginning of the study so that is no need to include your true identity in the research phase. This will be seen only by the researcher and will be destroyed at the conclusion of the study. Audio tapes will be destroyed when transcripts have been made of the conversations.

Any information obtained in connection with this study will remain confidential. Information obtained through your participation may be used to fulfill the requirements for a doctoral dissertation, be published in a professional journal, and/or presented at a professional meeting.

During the course of data collection, you have the right to refuse to provide information or to answer any questions that you do not want to answer without any repercussions to you. You will be allowed to review, edit, and change all transcripts that you deem necessary. A copy of all information will be given to you for your perusal and editing. Please feel free to make any changes that you feel will best represent the information that you gave to the researcher.

The investigator also reserves the right to terminate your participation at any time.

If you have questions about this study, please ask them now or contact Celeste Granthum at GRANTCF@auburn.edu or Megan Burton at meb0042@auburn.edu. A copy of this document will be given to you to keep.

If you have questions about your rights as a research participant, you may contact the Auburn University Office of Research Compliance or the Institutional Review Board by phone (334)-844-5966 or e-mail at IRBadmin@auburn.edu or IRBChair@auburn.edu.

HAVING READ THE INFORMATION PROVIDED, YOU MUST DECIDE WHETHER OR NOT YOU WISH TO PARTICIPATE IN THIS RESEARCH STUDY. YOUR SIGNATURE INDICATES YOUR WILLINGNESS TO PARTICIPATE.

Participant's signature Date Investigator obtaining consent Date

Printed Name

Printed Name

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Appendix C Focus Group Protocol and Questions

Thank you for agreeing to participate in this research study. I am interested in discovering teachers' perspectives on the Common Core State Standards for Mathematics or the Alabama College and Career Readiness Standards, as they are known in Alabama. You are under no obligation to answer any questions that you prefer not to. We will simply move on to the next question.

1. What math needs do you see most frequently with your students?
2. What are your greatest challenges in teaching math?
3. What was the first time you ever heard about the Common Core Standards or the CCRS standards for math? First time you ever heard about common core?
4. Well what's one thing you've learned as a result of the CCRS?
5. How has the CCRS impacted your method of teaching math?
6. How has your teaching of math evolved over time? How is it different today than it was a year ago or two years ago or ten or twenty years ago?
7. How has the CCRS affected students in your classroom?
8. How does the CCRS frustrate you as a teacher?
9. What would you tell downtown about the CCRS training or the CCRS?
10. What math needs do you see most frequently with your students?
11. What is the best thing about the CCRS?
12. How has the CCRS impacted your methods of teaching?
13. How do you believe your students have benefitted from the CCRS?
14. How has the CCRS affected the students in your classroom?
15. What effect has the CCRS has on your attitude about teaching math?

16. What is the biggest obstacle that math teachers face today in implementing the CCRS? Give me a specific example from your own experience or your own classroom.

17. What is the biggest hurdle you have had to overcome with the CCRS?

18. How does the CCRS differ from the Alabama Course of Study standards you taught previously?

19. Identify the 3 things that have been your best resources in teaching the CCRS standards. Tell why they have been helpful and where you discovered them.

20. Identify the 3 biggest hurdles you have faced this week in teaching the standards. Explain how they were a problem.

Thank you for your willingness to answer these questions and to discuss your experiences, thoughts, and beliefs related to math and the CCRS with me. I greatly appreciate it and thank you for taking the time to meet with me.

Appendix D Typical Journal Entry

We spent a couple of days last week and the beginning of this week on telling time and elapsed time. The students have really done well with this. Because they have been doing good, we have had time to play some fun SmartBoard games dealing with time. Students and I have enjoyed time. Elapsed time is more difficult for them; however, we are making progress. Still, children not being ready for third grade skills is my biggest challenge. Since they aren't ready, my next challenge is that I don't have time to try and catch them up since I am supposed to follow the pacing guide and teach only third grade skills. This year I have several students who just don't care. After talking to several parents, I see where the students get it from. Motivation is lacking!! (Pamela's journal entry 10/5/15)

I don't like the idea of my students being tracked throughout their school career. We have always been told that we couldn't track kids when it comes to grouping, etc. Why is it okay now? Plus they aren't just tracking scores. Other info is also being tracked. We are just trading teaching to one test (SAT10/ARMT) to teaching another (ACT Aspire). Also, why can't reading be just for fun? I was watching a reading class trying to break down complex text. The text doesn't always have to be broken down. Sometimes we read for pleasure, but I'm afraid kids won't want to do that since all the focus seems to be on more complex text. It all goes back to if the kids could make it in the general ed. classroom to begin with, then they wouldn't need special ed. (Lindy's journal entry 9/21/15)

Better day today. My kids are doing better with multiplication. Most of them, even the very low ones, seem to have a good grasp of lattice multiplication. I am still conflicted over the standard

which plainly says standard algorithm only - AL CCRS 5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm- but I am going to do what is best for my kids! I saw today where there are upcoming workshops on lesson planning. I wish the powers that be would understand that lesson planning is not the same as good teaching. What they need to be doing is having model lessons and observation sessions with master teachers. That would also go a long way to helping teachers better implement the standards. I once worked with a principal who says the classroom is where the rubber meets the road. That is why they need to identify good teachers and hold them up rather than burdening them with ever increasing useless requirements! (My journal entry 9/22/15)