

MIDDLE AND HIGH-SCHOOL TEACHER PERCEPTIONS  
OF THE  
MATHEMATICS GEORGIA STANDARDS OF EXCELLENCE

By

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A Dissertation

Submitted to the Faculty of  
Columbus State University  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Education

in Curriculum and Leadership

Columbus State University

Columbus, GA

April 2017

## DEDICATION

This dissertation is dedicated to my husband, Keith, and my three children, Griffin, Kursten, and Jake who were all patient as I worked to finish a three-year long journey. They watched me sacrifice and work hard because of my determination to work to the finish line. I hope through this process my children have learned the importance of an education through hard work, dedication, and perseverance.

## ACKNOWLEDGEMENTS

I would like to acknowledge and give thanks to God who makes everything possible and has given me strength when I thought I had nothing left. I would also like to acknowledge the members of my committee; Dr. Lemoine, Dr. Richardson, and Dr. Garretson. Each of the committee members took their time and efforts to provide feedback and words of support during the dissertation process.

I especially want to express my gratitude and appreciation to Dr. Lemoine, my committee chair. As I reflect on the journey, I am amazed at the amount of patience and support she provided to not only myself, but other students as well. There were times when we spoke on the phone and I am sure that I must have asked the same question five times, yet I always received a kind answer. Thank you, Dr. Lemoine, for believing in me and providing never-ending support. I will always be grateful.

## ABSTRACT

Public education in the United States had frequent curriculum changes throughout history. The curriculum initiatives of the past had a focus on improving education in schools based on one of four topics: (a) common standards, (b) preparing students for post-secondary education, (c) improving the quality of education, and (d) increasing the rigor of the content (Wallender, 2014). In February 2015, the Georgia State Board of Education approved revisions to the Common Core Mathematics Curriculum, which was the third set of mathematics curriculum standards implemented in Georgia since 2012. The standards were named The Georgia Standards of Excellence Mathematics Curriculum (GSE). With the change in curriculum, there were expectations for changes in teacher practice, student performance, testing, and accountability measures in middle and high-school mathematics. For the purposes of this study, the researcher examined middle and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum in one South Georgia school district. The information in this study provided insight on teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum. With this knowledge of teachers' perceptions, policymakers and administration could possibly determine effective methods to support teachers through the process of curriculum change.

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## CHAPTER I

### INTRODUCTION

Throughout the history of education, policymakers have been faced with the curriculum dilemma. What would be taught, how the material would be taught, and who would make the final decision are all questions addressed through the curriculum designing process. According to Hagay, Baram-Tsabari, and Peleg (2013), there is a significant difference between the required curriculum and what students truly needed to know. Nevertheless, public education has experienced curriculum initiatives which focused on improving schools in the United States based on four areas: common standards, students being prepared for college, students receiving a quality education, and increasing the rigor in schools (Wallender, 2014). Curriculum change has been a combination of one or more of the four areas mentioned, however, the Common Core State Standards movement (CCSS) was a fusion of all four.

The journey of curriculum change began in the 1950s, when Russia launched Sputnik into space ahead of the United States (Hewitt, 2006). The blame for the United States not making the discovery first was assigned to education. As a result, President Dwight D. Eisenhower attempted to discuss national goals that would enable Americans to be competitive against other nations by proposing and signing the National Defense Education Act (NDEA) (Sloan, 2010). NDEA, which was signed into law on September 2, 1958, challenged American schools to increase rigor and prepare students for college with the intention of the United States being more competitive in the global economy (Barnes & Slate, 2013; Cheng, 2012; Wallender, 2014). Although the primary focus of the NDEA was to improve the United States' ability to compete in the areas of science

and technology, the NDEA was the beginning of the United States' federal government being more involved in education (Barnes & Slate, 2013; Wallender, 2014).

Next, the leaders of education promoted a quality education for all students. In 1965, the federal legislators worked to ensure a quality education for all students through the Elementary and Secondary Education Act (ESEA) (Wallender, 2014). The ESEA was amended by the Congress; however, a national publication in the 1980s, *A Nation at Risk*, advocated a quality education for all students (National Commission on Excellence in Education, 1983; New York State Education Department [NYSED], 2009).

In 1983, *A Nation at Risk* was written by the eighteen members of Ronald Reagan's National Commission on Excellence, and reported that schools in America could not compete globally; therefore, the overall quality of the curriculum being taught in schools was inadequate (National Commission on Excellence in Education, 1983). The National Commission on Excellence in Education members pointed out that the path to a quality education for all students was not through lowering academic standards. In fact, publication of the report marked the beginning of the recommendations to establish standards-based education and the use of standardized assessments to monitor the learning (1983). Following *A Nation at Risk*, George H. W. Bush, Bill Clinton, and George W. Bush continued the goal of increasing rigor in schools through common standards and assessments (Wallender, 2014). In 2001, President George W. Bush strengthened requirements for state standards and challenged schools to improve achievement for all students by signing the No Child Left Behind Act (NCLB). The NCLB Act allowed individual states to create sets of standards which, in turn, resulted in states having different academic expectations. This freedom widened the gap in

expectations for student achievement between the states (Wallender, 2014). Students who moved from one state to another encountered differences in state standards and experienced a gap in academic expectations. Due to the differences between state standards, policymakers announced the need for creating national educational standards (Wallender, 2014).

### **The Purpose of a Common Curriculum**

Common Core State Standards (CCSS) were jointly derived in 2008 by the National Governor's Association (NGA) and the Council of Chief State School Officers (CCSSO). The goal of the two organizations was to create a uniform set of comparable standards in Mathematics and English Language Arts for grades K-12, which would set expectations for what students should know and be able to do at the end of each grade level. The U.S. businesses wanted to ensure the students had the necessary knowledge and skills upon the completion of high-school to work in companies and make them globally competitive (Richmond, 2015). Students who successfully completed the Common Core Mathematics and English Language Arts rigorous coursework were more likely to achieve at higher levels and be adequately prepared for future jobs (Schmidt & Burroughs, 2012).

More specifically, the Common Core Standards for Mathematics K-12 provided teachers with an outline of what the students should have learned in a given year in mathematical practice and content through integrating measurement and geometry as early as K-5, with algebraic expressions laced in the 6<sup>th</sup> grade curriculum (Powell, Fuchs, & Fuchs, 2013; Rust, 2012). Furthermore, the high-school content was divided into six rigorous categories: Number and Quantity, Modeling, Geometry, Statistics and

Probability, Algebra, and Functions (Achieve, Inc., 2010; Richardson & Eddy, 2011). Student success in mathematics was positively impacted by 1) the amount of time spent teaching and learning the mathematics content and 2) the rigor of the mathematics content taught (Ediger, 2011; Parke, 2011; Patterson, Mattern, & Swerdzewski, 2012). Consequently, if the Common Core mathematics curriculum was going to be the method to help America's students graduate and be more competitive the job market; assessment outcomes for students completing more rigorous coursework should reveal an increase in achievement (Loveless, 2012; Schmidt & Burroughs, 2012).

### **Measuring Student Performance**

Due to the Common Core State Standards being more difficult, the summative assessment to be administered by the states to determine proficiency had to be deliberately more challenging (Gewertz, 2014). Mathematics summative assessments contained rigorous math tasks that involved solving real world problems based on the combination of multiple math standards (Sawchuck, 2014). In addition, all states used a common cut score, which allowed for a comparison of performance (Schmidt & Burroughs, 2012). With the implementation of a more rigorous curriculum and achievement tests aligned, educators and leaders expected an increase in the mathematics scores (Adams, 2014).

### **Monitoring the Common Curriculum**

After the National Governor's Association decided to improve America's education system with the Common Core Standards, a monitoring system was needed. Students, teachers, and leaders were held accountable for the students' performance through assessment scores and other evaluation measures (Kober & Riddle, 2012;

Popham, 2014; Senechal; 2013). With this in mind, educators, parents, and other stakeholders questioned the student's performance on the state assessments. In order to ensure the assessment scores were valid, tests needed to be created carefully, the scoring reliable and accurate, and testing environments fair to all, with appropriate administration of the test (Sireci & Padilla, 2014).

There were also issues with the testing administration and environmental conditions (Stephens, 2014). In order for the tests to be valid, the tests, scoring, and testing administration procedures needed to be established for all testers (Sireci & Padilla, 2014). Testing validity was questionable when the test setting was unsuitable for test administration. The level of noise, the temperature of the room, and the comfort of seating were all the factors effecting the testing setting. It was necessary for administrators and teachers to understand the assessment data, as well as be able to use the data for instructional decision-making (Hoover & Abrams, 2013; von Frank, 2014).

### **Teacher Perception of the Common Curriculum**

Educators voiced different perceptions regarding the CCSS; in fact, Murphy and Torf (2014) reported a decline in teachers' perception of their classroom effectiveness, due to teacher accountability mandates. Murphy and Torf (2014) suggested that even though teachers were working hard toward instructional competence and improvement, the accountability mandates were adding teacher stress. Teachers surveyed in Murphy and Torf's 2014 study, with 370 teachers from the North Eastern United States, reported that teachers expressed little confidence in their ability to instruct students using the CCSS standards and objectives. Nadelson, Pluska, Moorcroft, Jeffery, & Woodard noted a connection between negative perceptions of the Common Core curriculum and the lack

of professional development, as reported by teachers (2014). The researchers studied educator perceptions along with knowledge of the standards and concluded that if the teachers did not know how to implement or instruct students to complete a task, teachers had a negative perception of the standards (Nadelson et al., 2014).

Five key studies concerning teacher perception of the CCSS were conducted from 2012 to 2016. The first of these studies, Sanchez (2016), focused on teacher perceptions of the CCSS in California. Sanchez found teachers reflected positively about the student learning as a result of the CCSS; however, teachers' feelings were both positive and negative concerning adequate instructional resources and time provided by the district to plan and prepare (2016).

Another key study, by Cochrane and Cuevas (2015), explored teacher perceptions of the Common Core Georgia Performance Standards (CCGPS). Cochrane and Cuevas (2015) noted teacher training, teacher workload, and teacher morale impacted how teachers rated CCGPS and how the curriculum impacted teacher practice. When teachers did not feel prepared to implement new curriculum or were overwhelmed (due to a heavier work load), there was a decline in morale and a decline in their image of the CCGPS.

Similarly, Cheng (2012) also conducted a mixed methods study in California with 333 teachers. Responses reported teacher perceptions about the quality of the curriculum and testing accountability. K-12 participants represented three elementary schools, two middle-schools, and one high-school, and reported the need for time (to prepare and to implement) and instructional resources.

Davis, Chopin, McDuffie and Drake explored over 400 middle-school mathematics teachers' perceptions of the Common Core State Standards for Mathematics (CCSSM) in 43 out of 45 states that had chosen to adopt the CCSSM as of 2013. The results of the quantitative survey noted a more rigorous curriculum and a lack of resources for the middle-school teachers who responded to the survey.

Lastly, Burks et al. (2015) surveyed 35 secondary mathematics teachers (6<sup>th</sup> through 12<sup>th</sup> grade) based on their perceptions of implementing the Common Core State Standards. Although results confirmed over 50 percent of the participants were comfortable teaching the Common Core in mathematics, 55 percent stated they did not receive adequate training for standard implementation (Burks et al., 2015).

### **Statement of the Problem**

The implementation of the Common Core Mathematics curriculum was initiated in Georgia in 2012. With the change in curriculum there were expectations for changes in teacher practice, testing, student performance expectations, and teacher accountability measures in middle and high-school mathematics. In February 2015, The State Board of Education (SBOE) added another change. The SBOE voted to rename the CCSS to the Georgia Standards of Excellence (GSE). The change was the result of a review of the Common Core Standards and included surveys, legislative sessions, and a 60-day window of time for the public to comment (Downey, 2015). The release of the GSE included revisions to be implemented beginning in 2015-2016 school year. The researcher proposed to study teacher perceptions regarding the implementation of the Georgia Standards of Excellence Mathematics curriculum in the state of Georgia.

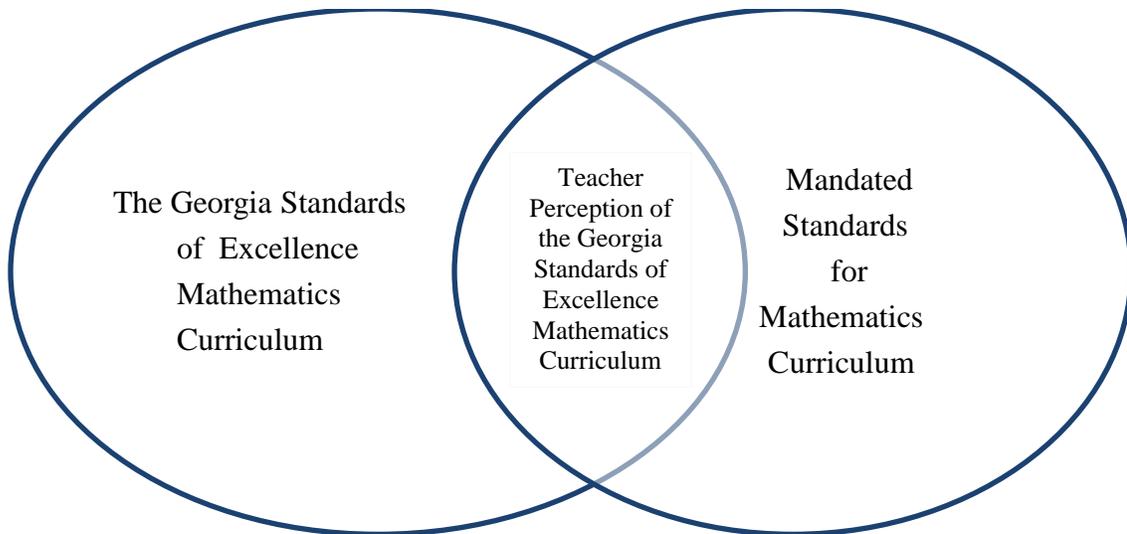
## Research Questions

The researcher proposed to answer the following research questions:

1. What were the perceptions of middle and high-school mathematics teachers regarding the Georgia Standards of Excellence Mathematics curriculum?
2. To what extent did the middle and high-school mathematics teachers perceive the Georgia Standards Mathematics Curriculum has impacted their classroom practice?
3. To what extent was there a difference between middle and high-school teachers' perceptions of the Georgia Standards of Excellence Curriculum?

## Conceptual Framework

The first element of study, Georgia Standards of Excellence Mathematics Curriculum, depicted the recent change in mathematics curriculum implemented in Georgia schools. Mandated standards for all mathematics curriculum was the second element of study in the conceptual framework (see Figure 1). The new standards have had (1) an increase of content complexity, (2) require restructuring of lessons, (3) had new pacing guides to follow, (4) new assessments to measure student knowledge, and (5) new accountability measures for districts, schools, and teachers. Given this information, Figure 1 illustrated the elements of the current study the researcher proposed.



**Figure 1 Conceptual framework**

Figure 1 illustrates the elements of the current study.

### Importance of the Study

The purpose of this study was to explore perceptions of middle and high-school mathematics teachers regarding the Georgia Standards of Excellence Mathematics curriculum and how the perceptions impacted the implementation in the classroom. The result was important to teachers, administrators, instructional coaches, and other curriculum personnel. There was much recorded research based on teacher perceptions of the Common Core Mathematics curriculum; however, since the Georgia Standards of Excellence Mathematics curriculum was new to teachers in Georgia, the researcher found a gap in the research on this specific topic. Consequently, researching math teacher perceptions of the mathematics CCSS could possibly assist school and district curriculum leaders in determining what was needed to support the teachers through the current curriculum change. Additionally, teachers had a voice concerning what factors they considered to be important when teaching the Georgia Standards of Excellence

Mathematics curriculum, and be able to describe how this change in mathematics curriculum has impacted their classroom practice.

## Procedures

The teacher perception of the Common Core curriculum summarized by Cheng (2012), Sanchez (2016), and Cochrane and Cuevas (2015), led to the design of this research study. The researcher sought to gain a current understanding of middle and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum during the early stage of implementation. The interview protocol used by Cheng (2012) was utilized in the collection of qualitative data by the researcher in this current study.

## Limitations

Limitations were factors the researcher cannot control, which could possibly have an impact on the current study. Limitations could impact the internal validity of the study. Some limitations of this study were:

1. A bias could exist due to the researcher working within the district employing the interview participants. That being stated, the researcher had established relationships with teachers, which may add to the quality of the interview responses.
2. The possibility of participants not willing to interview did exist. This occurrence was out of the researcher's control, yet could have an impact on the study results.
3. For the purpose of this study, the researcher did not interview sixth grade teachers from the Intermediate School (which employed fourth, fifth, and sixth grade teachers).

4. The researcher did not interview the middle-school (7<sup>th</sup> and 8<sup>th</sup> grade) teachers from the Charter School because this school was under a different governance than the other schools in the district.

## Delimitations

Delimitations of a study were decisions made by the researcher that could have an impact on the current study results. Some delimitations of this study were:

1. The researcher proposed to use a convenience sampling method to select the focus group interview participants.
2. The study was similar to previous studies, therefore the current study is an extension of the prior studies related to teacher perceptions of curriculum change.

## Definitions

Standards based education: Standards based education defines clear expectations and identifies what students need to know to receive a high-school diploma (Sanchez, 2016).

Georgia Standards of Excellence Mathematics Curriculum: A revised version of the Common Core State Mathematics Standards. The revisions were based on a review of the Common Core and included feedback from educators and the public (Downey, 2015).

Phenomenology: In research, the practice of understanding the meaning of the participants' experience with or due to an event, topic, or happening (Hays & Singh, 2012).

Middle-school: In this study, middle-school were grades seven and eight.

High-school: In this study, high-school were grades ten through twelve.

Georgia Milestone: A comprehensive summative assessment system for students grades

three through high-school in Georgia (Georgia Department of Education, 2017).

Cut score: The minimum score required for a certain level of mastery. On the Georgia Milestone, cut scores were set for four levels: Beginning Learner, Developing Learner, Proficient Learner, and Distinguished Learner (Georgia Department of Education, 2017).

## Summary

The Common Core State Standards (CCSS) was a set of standards jointly created by the National Governor's Association (NGA) and the Council of Chief State School Officers (CCSSO). The introduction and adoption of the CCSS caused some controversy due to the complexity of the curriculum delivery needed for teachers and students to be successful with the implementation of the standards. Although teachers were responsible for implementing the curriculum changes through instructional practice, teachers were rarely given the opportunity to participate in the development of the changes. If teachers were going to be supported through the curriculum changes, researching math teacher perceptions could provide information about how local school and district administrators can support teachers through a successful implementation. In February 2015, The State Board of Education (SBOE) added another change. The SBOE voted to rename the CCSS to the Georgia Standards of Excellence (GSE). The release of the GSE included revisions to be implemented beginning in 2015-2016 school year. Consequently, this study aimed to explore perceptions of middle and high-school mathematics teachers regarding the Georgia Standards of Excellence Mathematics curriculum, and how the perceptions impact teacher practice in the classroom.

## CHAPTER II

### LITERATURE REVIEW

#### Introduction

To understand twenty first century curriculum it was important to review the standards-based reform historical timeline (Cheng, 2012). On October 4, 1957, Russia launched Sputnik into space ahead of the United States (Hewitt, 2006). Russia's scientific accomplishment caused much consternation and led to questions about who or what was to blame. Claims from critics in the science field stated the emphasis educators placed on the math and science curriculum was not adequate. A progressive approach to education was in place, which focused on the learner's interests and needs (Hewitt, 2006). Russia's space launch was a turning point in the control of educational policy, specifically curriculum development (Hewitt, 2006).

#### **The Progressive Influence on Curriculum**

The turn of the twentieth century was named *The Progressive Era*, which was a time when America was transitioning from agriculture to industry (Kretchmar, 2015). Education reform was a part of the societal change taking place; and John Dewey, named the father of Progressive Education, was a major influence in American education during the era. Progressive education advocated the individual and tailored instruction based on the interests and development of the child. Additionally, ability grouping and vocational education were influenced by progressivism (Kretchmar, 2015).

Progressive theories and strategies impacted career and technical pathways, social education, and promoted learning through experiences of interest to students (Wegner, 2013). Thirty years were spent on the progressive approach to education; however, Sputnik's launch in 1957 caused the traditionalist educators to become critical of progressive practices. The traditionalists argued for American educators to emphasize traditional, teacher-centered learning environments with a focus on math and science (Kretchmar, 2015).

### Common State Standards

In 2012, a U.S. Department of Education report entitled *Meeting the Nation's 2020 Goal: State Targets for Increasing the Number and Percentage of College Graduates with Degrees*, stated that in the population of 25-34 year olds earning a college degree, the United States ranked 16<sup>th</sup> based on information from 36 developed nations while in previous years, the United States ranked number one, dropping to 12<sup>th</sup> in 2010, and then to 16<sup>th</sup> (U. S. Department of Education, 2012; Lewin, 2010). Based on the data, President Barack Obama set the *College Completion Goal*, which stated that by the year 2020; the United States would lead the nations in the number of college graduates.

In his first joint address to Congress on February 24, 2009, President Obama set a goal that the nation should once again have the highest proportion of college graduates in the world by the year 2020. To reach this goal, the U.S. Department of Education projects that the proportion of college graduates in the U.S. will need to increase by 50 percent nationwide by the end of the decade. Translated into additional degree-holders, eight million more young adults\* will need to earn

associate's and bachelor's degrees by 2020. To achieve this ambitious goal, the higher education system must undertake far-reaching reforms to widen college access, improve college readiness, ensure quality, and accelerate college completion. Colleges and universities in every state have a vital role and a unique opportunity today to help America again lead the world in college attainment. (U.S. Department of Education, 2011, para. 1)

The Department of Education was established in 1979, and schools became more accountable to the federal government (Robbins, 2013). Even though the states had been given control over local education districts, the federal government leaders decided state education funding should be linked to the state's adoption of equal opportunity policies (Arocho, 2014). The equal opportunity policies were intended to streamline equity in public school funding. Congress was able to encourage states to equally distribute finances among districts (Arocho, 2014). Likewise, the federal government had been implementing policies with the intention of an improved education system; however, the founders of the Constitution did not specifically establish education as the federal government's responsibility thus it was left to the states and local governments (Robbins, 2013).

In 1983 the National Commission on Excellence in Education decided America's schools could not compete globally and recommended a stronger curriculum (National Commission of Excellence in Education, 1983; Wallender, 2014). This declaration, *A Nation at Risk*, reported the educational system in America was behind the educational systems in other countries. *A Nation at Risk* recommended more rigorous standards for all schools and universities, which eventually led to federal support of states developing

standards (National Commission on Excellence in Education, 1983; Wallender, 2014). In 2001, the No Child Left Behind Act allowed individual states to create standards, which, according to the policymakers, had not set common academic performance expectations (Wallender, 2014). The policymakers decided common educational standards should be established (Wallender, 2014; Tienken, 2011). With this in mind, the National Governors Association and the Council of Chief State School Officers designed the Common Core State Standards in Mathematics and English/Language Arts (Bidwell, 2014; Giouroukakis & Cohan, 2014; Wallender, 2014). These two content areas were the foundation of the Common Core because the skills needed to excel in Mathematics and English/Language Arts were the foundational skills needed to be successful in other academic disciplines (Wallender, 2014). Rigor and high expectations were embedded in the Common Core with the intent of ensuring American students had the necessary skills to be workforce ready (Jerald et al., 2008).

Although the federal government could not require states to adopt the Common Core, monetary incentives were available for the states that chose to adopt the standards (Wallender, 2014). Some states adopted the curriculum intending to work with the federal government for the success of American students. Some states adopted the Common Core due to a neighboring state deciding to adopt (Lavenia, 2010). Consequently, forty-six states and the District of Columbia adopted the CCSS (Conley, 2011; Schmidt & Burroughs, 2012).

### **Common State Standards Today: The Effect**

The Common Core was designed for the purpose of preparing students to be workforce ready (Jerald et al, 2008; Robbins, 2013). Educators were presented with a

progression of learning expectations and goals, tools or methods for completing the goals (Neuman & Roskos, 2013). The success of the Common Core Standards was contingent upon how the curriculum was implemented, and if teachers were provided professional learning to teach the content (Neuman & Roskos, 2013).

The Common Core Standards for Mathematics K-12 provided teachers with an outline of what the students should have learned in a given year in mathematical practice and content (Powell, Fuchs, & Fuchs, 2013). A shift in instruction came from the integration of measurement and geometry as early as K-5, and algebraic expressions outlined in the 6<sup>th</sup> grade curriculum (Powell, Fuchs & Fuchs, 2013; Rust, 2012). In addition, the high-school content was divided into six rigorous categories: Number and Quantity, Modeling, Geometry, Statistics and Probability, Algebra, and Functions (Achieve, Inc., 2010; Richardson & Eddy, 2011). Furthermore, the rigor of the mathematical content, as well as the time spent on mathematics during the school day was altered due to the complexity of the content. To increase instructional time, schools of all grades embedded Increased Learning Time (ILT) during the school day which provided extra math support to the students who needed the support. At the high-school level, math support classes were offered as an extra course for students who needed to work on math skills. Increased content complexity and extended amounts of time spent on the content had a positive impact on student progress in mathematics. (Ediger, 2011; Parke, 2011; Patterson, Mattern, & Swerdzewski, 2012). One goal of the Common Core was an improvement of the assessment scores of the students completing the coursework. If the assessment scores improved, the improvement would have provided evidence of an increase in student achievement (Loveless, 2012; Schmidt & Burroughs, 2012).

## Student Performance Expectations: State Assessments

Students' performance were measured using some form of assessment throughout the history of education (Berger, 2012). In fact, the National Assessment of Educational Progress (NAEP) has assessed samples of students in grades four, eight, and twelve across states to compare American students' knowledge (NAEP, 2016). Assessments have also been used to compare student ability among nations (Berliner, 2011; Main, 2012). When the Common Core Standards were implemented, assessment methods also changed (Sawchuck, 2014). Although the authors of the Common Core assessments included some multiple choice type questions, open-response questions were also added to the assessments. The mathematics summative assessment contained rigorous math tasks that involved solving real world problems and using multiple math standards (Herman & Linn, 2014; Sawchuck, 2014). To allow for state-to-state comparison, cut scores were established. Cut scores were scores used to determine proficiency, and allowed for a comparison of student performance; however, in order for student performance to be compared, the assessment and the cut score had to be uniform (Schmidt & Burroughs, 2012).

Due to the Common Core State Standards being more rigorous, the summative assessment administered by the state to determine proficiency was made deliberately more difficult (Gewertz, 2014). With increased difficulty, the Smarter Balanced Assessment Consortium (SBAC) approved cut scores for each test based on field testing (Gewertz, 2014). The SBAC predicted more than half of the students tested would not be

proficient in English/Language Arts or Mathematics. The cut scores, which were used to determine proficiency, were formulated by a panel of educators who compared the field test item results on national tests, including the ACT college entrance exam. This comparison paralleled one of the primary objectives of the Common Core, which was to ensure all students are College and Career Ready (Schmidt & Burroughs, 2012). In addition, results on the ACT and Scholastic Aptitude Test (SAT) were intended to parallel the state assessment results well enough to allow for a comparison of academic performance (Adams, 2014; Schmidt & Burroughs, 2012).

One organization, The Partnership for Assessment of Readiness for College and Careers (PARCC), was a commercial partnership involving twenty-one states, The District of Columbia and Virgin Islands (Bowman et al., 2013). The team's purpose was to create rigorous assessments aligned to the CCSS English/Language Arts and Mathematics curriculum (Bowman et al., 2013). According to Bowman et al. (2013), PARCC's team of assessment developers created test items with a diverse student population in mind, and guidelines were in place to eliminate bias, using clearly stated directions, and consistent formatting. In addition, PARCC intended to create a general assessment designed to eliminate the need for assessment accommodations. The first of these assessments was administered in 2014-2015, and the results provided evidence both supporting and contradicting PARCC's claims (Sloven, 2013).

### **Student Performance Expectations: National Assessments**

With the implementation of a more rigorous curriculum and achievement tests aligned, educators and leaders expected an increase in the mathematics scores (Adams, 2014). Overall, in the past, students in the United States were not performing as well

when compared to students from other nations. These reports were based on results from the ACT assessment, which was a measure of what a student has learned in high-school, or a student's knowledge (Perez, 2002). More evidence was revealed when ACT, Inc. measured the college readiness of the Class of 2009. The ACT report pointed out that 23 percent of the American students tested met the College Readiness Benchmarks in all four content areas including English, Mathematics, Reading, and Science (ACT, 2009). On the other hand, 42 percent of the same population met the Mathematics Benchmark (ACT, 2009). In comparison, of the Georgia students tested from the Class of 2009, 19 percent met the College Readiness Benchmark for all four areas, and 38 percent met the Benchmark for mathematics (ACT). Assessment items were directly linked to the English, Mathematics, and Science standards taught throughout the state (Perez, 2002). Based on the comparison of the Georgia students tested from the class of 2009 to the national students tested from the class of 2009, reports suggested the need for a more rigorous curriculum in Georgia (ACT, 2009).

Not only was the ACT used to compare student performance, the Scholastic Aptitude Test (SAT) scores were also studied (Berger, 2012; Mickey, 2010). In contrast to the ACT, the SAT was used as a predictor of what a student was capable of learning, or aptitude. Students who completed a more rigorous, performance-based curriculum scored over 100 points higher on the SAT (Mickey, 2010). However, Shen et al. (2012) found differences in the validity of standardized assessments when predicting student academic performance. The study compared student SAT scores to freshman grade point averages, and concluded that overall, the validity of the SAT results was not consistent among the 110 schools that were studied, both public and private (Shen et al., 2012).

With this in mind, the president of the College Board announced changes to the SAT, effective 2016, which were intended to provide more valid data representative of what students have studied through the Common Core (Adams, 2014). The reformatted Scholastic Aptitude Test assigned students fewer math topics, but the each topic was assessed with a greater depth of knowledge. Adams reported, “A key priority of the math Common Core is to cover fewer topics in greater depth” (2014, p. 15). The College Board redesigned the math section of the SAT assessment to focus on the standards that were necessary for students to be college and career ready (Adams, 2014). Likewise, ACT, Inc. announced plans to improve the ACT assessment by the spring of 2015. With more rigorous curriculum and the achievement tests aligned to the curriculum taught, educators and leaders expected an increase in the scores, which provide the evidence of overall achievement in math (Adams, 2014).

### **Monitoring the Implementation: Accountability**

After the National Governor’s Association decided to improve America’s education system with the Common Core Standards, accountability measures were needed (Bidwell, 2014; Powell, 2013). At the time, students, teachers, and leaders were held accountable for the students’ performance through assessment scores and other evaluation measures; however, stakeholders did not know how to determine the validity and reliability of the test results (Kober & Riddle, 2012, Popham, 2014; Senechal; 2013). In order to ensure the assessment scores were valid, the tests were carefully constructed, the scoring reliable and accurate, testing environments were fair to all participants, and the administration of the test was appropriate (Sireci & Padilla, 2014). In addition, with the release of the more rigorous assessments in 2014-2015, there were also new cut

scores established for measurement of the student's academic proficiency (Gewertz, 2014). Due to the more difficult assessment and cut score adjustments, there were fewer students in the projected group of proficient students on the Smarter Balanced Assessments (Gewertz, 2014).

Consequently, some states with fully implemented Common Core Standards did not administer the Smarter Balanced Assessment. In fact, as of May 2014, only 34 percent of the fifty states were committed to the Smarter Balanced Assessment. In addition, 18 percent of the states along with the District of Columbia chose the Partnership for Assessment of Readiness for College and Careers (PARCC) testing, 34 percent chose different testing sources (all were varied), and 14 percent were undecided (Gewertz, 2015). There were some states planning to administer the same tests with the intention of comparing test data with other states (Gewertz, 2015). Since the Common Core Curriculum was adopted, common summative assessments were implemented in school districts across the nation to interpret and compare student assessment data (Popham, 2014; Schmidt & Burroughs, 2012).

Not only was the assessment format a question of validity, but also the testing administration and environment, or the location and conditions in which the students were tested (Stephens, 2014). In fact, districts were expected to test a percentage of the student body online and increase the percentage each year (Stephens, 2014). This technological demand sparked issues concerning the testing environment and potentially skewed results (Gewertz, 2014; Stephens, 2014). In order for the validity of the assessments to be secured, common requirements for administering the tests, scoring, testing environments, and administration procedures were necessary (Sireci & Padilla,

2014). Nevertheless, raising the bar and increasing expectations for the students on the assessment were expected outcomes to better prepare high-school graduates for post-secondary studies (Doorey, 2014; Gewertz, 2014).

### **Accountability in Education: Linking Past to Present**

Assessment scores were used to compare students across the states as well as among nations (Berliner, 2011; Main, 2012). The data collected from standardized assessment scores were used to determine if school districts in the United States met state and federal requirements (Murray, 2014).

Due to the national emphasis on student assessment data, school districts across the nation made data-driven decision making a central focus (Gullo, 2013). Through the movement to improve student achievement, school personnel discovered teachers and school leaders did not have the background knowledge and experience to adequately use the assessment data for school improvement (Hoover & Abrams, 2013; Murray, 2014). With this in mind, there was a national push for the most effective analysis of data resulting in school improvement (Gullo, 2013).

Leaders within districts worked to determine what data they needed to collect, created a common language for educators to use when describing data results, and determined what the data reports should look like (Gullo, 2013). Current classroom assessment data were ideal for revising instructional methods, yet longitudinal data was comprised of the information used to shape and change educational policy (Stone, 2014). Consequently, in a continued effort to utilize assessment data for school improvement, educational leaders in states such as Rhode Island, Delaware, Georgia, and Arizona discovered the importance of longitudinal data (Stone, 2014). When teachers viewed the

longitudinal data for a student, the data included all of the information collected on a student since the first day the student was enrolled. This included test data, attendance data, discipline data, and demographic information. Teachers in the participating states had electronic access to multiple forms of data including attendance, demographics, as well as assessment scores (Stone).

Data provided information to improve student's educational performance. Stone (2014) noted some student difficulties can be pinpointed through data in the child's early educational career. For example, a district in Illinois focused on ninth-grade data to predict possible graduation difficulties. With this in mind, the focus placed on ninth-grade students continued through tenth and eleventh grades and students who were struggling and offered remediation or other forms of support to graduate college and career ready (Stone, 2014).

### **Measuring Progress: Data Analysis**

One Texas school district reported a data analysis method which gave district leaders the information needed to make instructional changes and gradually improve (von Frank, 2014). According to von Frank (2014), the 72 schools in this Texas school district had a student body that was 70% Hispanic, with 86% of students eligible for free or reduced meals. Educational leaders from this district reported a steady increase in state test scores over a ten-year time span, a result of a state aligned curriculum that was continuously monitored by the school district (von Frank, 2014). Initially, the district leaders formed focus groups and created a common curriculum, K-12, used district-wide. The aligned curriculum was implemented in the classrooms, years of lessons created, and district-wide common benchmarks developed (von Frank, 2014). Classroom teachers

received and reviewed the results in a few hours after the assessment, which allowed the teachers to address concerns immediately and assist the students who needed concepts reinforced. Various forms of classroom data and state assessments provided longitudinal data on each student. The longitudinal data were charted for each student with a continuous record focused on standard mastery, with the information updated every three weeks allowing teachers and administration to monitor student progress systematically using current data.

According to Popham (2014), strong educational decisions were made when the strongest and weakest performing students were identified. Nevertheless, if teachers were expected to utilize the data effectively, teachers needed to receive the results in a timely manner (Matthews, Trimble, & Gay, 2007). Newly created state assessment available provided data differently. For example, students in the fifth grade took the assessment in Language Arts during the spring of their fifth grade year with the test results not available for data analysis until the fall of the sixth grade school year (Shearer, 2014). The annual summative data results were then used by the current instructional team (teachers and administrators), the previous team, and future teachers and leaders to determine student strengths and weaknesses (Gullo, 2013; Hoover & Abrams, 2013; Popham, 2014).

According to Popham (2014).

### Using the Data for a Purpose

Hoover and Abrams (2013) studied a Virginia school district's use of summative data. Hoover and Abrams surveyed over 600 teachers and found over 80% of those revised instruction based on assessment data. Teachers described modification techniques such as regrouping, changing the instructional pace, and remediation used to

assist students after the data was reviewed (Hoover & Abrams, 2013). In addition, some teachers described data analysis sessions where the data were interpreted (based on their teaching), test items validated, and instruction modified. Due to the content complexity and assessment differences, educators responsible for the CCSS mathematics courses had to make adjustments to instruction as well as pacing and alignment of tasks.

Nevertheless, any form of CCSS mathematics data were essential evidence when documenting the achievement of students; however, in order for student learning to increase at all levels, teachers had to learn how to effectively use the assessment data (Hoover & Abrams, 2013; von Frank, 2014). Hoover and Abrams' study suggested that teachers appeared to be revising instruction on the basis of assessment data.

Before teachers were able to use data effectively, they had to understand the assessment well enough to know what the results indicated (Matthew, Trimble & Gay, 2007). Even though data were presented to teachers in user-friendly formats, school districts showed a need for professional learning to make sense of the data, collaborate on the interpretation with colleagues, and make instructional adjustments necessary to make overall improvements (Murray, 2014). If teachers participated in job-embedded, small collaborative data sessions, the capacity for using data had a strong foundation (Murray, 2014). If data were utilized during these collaborative sessions, the professional learning was specific to the student population and the focus of the professional learning session was based on the data (von Frank, 2014). In this case, the CCSS benchmarks, classroom assessments, or Georgia Milestones was the topic of the data analysis session (Gewertz, 2014). For example, the math department from a grade level had the mathematics pre-test, unit classroom assessments, district benchmark assessments, and the state

summative assessment results. Each of these assessments were constructed from questions to assess the same standards and could be compared. On the other hand, the research reported a need for data analysis and interpretation skills (Cook & Bush, 2015; Murray, 2014).

Although the data sessions were organized and the assessment results available for use, teachers and administrators did not have the knowledge and skills necessary to effectively analyze the data (Cook & Bush, 2015). Furthermore, von Frank (2014) pointed out when the school staff had a plan for how the data was used, they had a better understanding and the link between the data and student achievement stayed in place.

Consequently, school districts utilized multiple forms of assessment data to modify instruction and work toward school improvement (Gullo, 2013; Hoover & Abrams, 2013; Murray, 2014; von Frank, 2014). Data analysis was reported as being effective if there was an organized, on-going professional learning session to systematically analyze mathematics data. As a result, data analysis created a more student-centered learning session for teachers. From these sessions, teachers were more knowledgeable of the data analysis process, and worked toward gathering evidence to determine if students were on the move toward higher achievement in mathematics due to the Common Core (Murray, 2014). Murray (2014) supported teachers participating in on-going professional learning to apply data-driven decision making skills. If teachers understand the interpretation of the data, then the data was useful.

## Curriculum Change

Forty-six states and the District of Columbia adopted the Common Core State Standards since the release of the curriculum in 2008; eight states (Indiana, Louisiana,

Michigan, Missouri, New Jersey, Oklahoma, South Carolina, Tennessee) withdrew from the Common Core adoption (*Common Core State Standards Adoption Map*, 2016; Schmidt & Burroughs, 2012). Throughout the adoption process, public awareness about the Common Core increased; due to media and other report sources, the perception of the Common Core was inaccurate (*Public Views of the Common Core*, 2015). Due to the inaccurate perceptions, public support declined since the college and career-based standards were implemented. In addition, the accountability system based on test scores has produced low teacher morale and resulted in a reduction of educators support (*Public Views of the Common Core*, 2015). Consequently, the Common Core State Standards (CCSS) lost perception points, and in order for a curriculum change to be successful, teachers, stakeholders, and students had to value the change (Nadelson, Pluska, Moorcroft, Jeffery, & Woodard, 2014).

### **The Perception of the Public**

First, according to 2015 PDK/Gallup Poll (Phi Delta Kappan), over sixty percent of the American public was not in favor of use of the Common Core (Foster, 2015). Each year, the PDK/Gallup Poll collected the nation's public opinion about public schools. The data reported the American public was not convinced the federal government should be participating in public schools (Foster, 2015). According to Foster (2015), the public opposition originated from the idea that the CCSS standards limited what teachers taught and did not allow them to teach what is best for the students. Not only was the CCSS curriculum criticized by the public, but the accountability system was criticized as well (Foster, 2015; *Public Views of the Common Core*, 2015). In fact, over half of Americans surveyed in the PDK/Gallup Poll stated standardized tests were not helpful (Foster,

2015). These complaints reported by stakeholders spread through the media and created a negative image of the CCSS to those who were not familiar with the curriculum.

Educators voiced a variety of perceptions based on the Common Core State Standards. Murphy and Torf (2014) reported a decline in teacher's perception of their classroom effectiveness. The 370 teachers surveyed from the North Eastern United States were not confident in their ability to instruct using the CCSS standards and objectives. Even though teachers were working hard toward instructional competence and improvement, the accountability mandates added more teacher stress (Murphy & Torf, 2014). Similarly, *Public Views of the Common Core* (2015) described a decline in educator support, with survey data reporting seventy-six percent of educators favored the Common Core in 2013 and forty-six percent supporting the standards in 2014. Since the public was critical of the Common Core curriculum change, it was possible the Georgia Standards of Excellence would not be favored.

On the other hand, Nadelson, Pluska, Moorcroft, Jeffery, & Woodard noted a connection between negative perceptions of the Common Core curriculum and the lack of professional development (2014). The researchers studied educator perceptions and knowledge of the standards, and concluded that if the teachers did not know how to implement or instruct a task, there tended to be a negative perception (Nadelson et al., 2014). In contrast, Achieve, Inc., an organization created by governors and leaders in the business industry and devoted to improving public schools, reported that teachers were aware of the Common Core, and sixty percent had favorable impression (2011). Although a majority of educators surveyed had a favorable impression of the Common Core, there was not as much support for using standardized test data for teacher

accountability (Achieve, 2011). These survey results pointed out only fifty-one percent of the teachers supported the use of test results for district and school accountability, yet thirty-nine percent of the teachers believed the data should be used for teacher accountability (Achieve, 2011). Overall, educators knowledgeable about the Common Core claimed to be confident and supportive of the change, yet they were not in support of a complete change in the system (Achieve, 2011).

The National Governor's Association, teachers, administrators, and content experts designed and reviewed the Common Core curriculum; however, there were conflicting views reported (Public Views of the Common Core, 2015). Researchers have noted a positive purpose of standards implementation, which was to increase student achievement resulting in a more globally competitive student population (Bidwell, 2014). As of 2016, eight of the original forty-six states and the District of Columbia who adopted the Common Core withdrew (*Common Core State Standards Adoption Map*, 2016). The true teacher perception of the curriculum changes was unclear.

### Teacher Perception

In addition to the national surveys collecting perception data, a dissertation study by Sanchez (2016) focused on teacher perceptions of the CCSS. Sanchez conducted a mixed methods design to gain a deeper understanding of each California teacher's viewpoint. For the quantitative portion, the researcher administered an online survey to teachers in a California school district. The survey had a filter embedded which screened and surveyed the teachers who taught English/Language Arts and Mathematics, since these were the Common Core subjects. Of the 236 teachers asked to complete the survey via email, 47 teachers responded (Sanchez, 2016). Sanchez (2016) made the qualitative

portion (interviews) optional by allowing participants to click a link within the survey. This link was created specifically to secure the anonymous survey responses of the participants.

Sanchez (2016) developed research questions based on the survey data. The researcher asked questions such as, “How has the CCSS impacted your students?” and “How did you feel about how the standards were going to be implemented?” (Sanchez, 2016, p. 148). In another part of the interview, the researcher stated, “Describe the implementation process of the CCSS by your administration” (Sanchez, 2016, p.148). These semi-structured interview prompts led to the researcher analyzing the data and four themes emerged.

One theme was student related and the other three were linked to implementation support offered by administration. The first theme was labeled “student benefits” (Sanchez, 2016). On the other hand, the other three themes based on interview responses were related to implementation time frame, district support through professional learning, or district support through distribution of resources. While the responses were positive concerning the administrative support of professional development trainings and professional learning communities, the teachers felt the amount of resources they received to teach the CCSS did not meet their expectations. Along with the perception of too few resources, the teachers also reported the use of personal time to develop aligned lessons. Overall, the teachers reflected positively about the student learning as a result of the CCSS, but the teacher’s feelings were both positive and negative when they were prompted adequate resources and time provided by the district (Sanchez, 2016).

A slightly different study of teacher perceptions of the Common Core Georgia Performance Standards (CCGPS) was conducted in 2015 by Cochrane and Cuevas. This study was designed to investigate teacher perceptions of the CCGPS after a year and a half of implementation (Cochrane & Cuevas, 2015). The researchers modified a survey instrument used by Cheng (2012) and surveyed two school districts in the northern region of Georgia (Cochrane & Cuevas, 2015). Cochrane and Cuevas (2015) chose the two districts due to the contrast in populations: one county was “suburban with an upper middle class population, while the other more rural with a population that fell into the middle class to lower class range” (Cochrane & Cuevas, 2015, p. 9).

Cochrane and Cuevas (2015) obtained permission from the superintendents and the principals in the school districts and attached a survey link through email communication. Of the 75 total responses returned, a small percentage were not complete, leaving 70 surveys to analyze (Cochrane & Cuevas, 2015).

Consequently, the survey results returned to Cochrane and Cuevas were developed into five categories (similar to Cheng). These five constructs organized the survey data into teacher training, impact on education, teacher workload, teacher morale, and standardized testing (Cochrane & Cuevas, 2015). After collecting the data in these areas, the researchers compared responses to determine teachers’ perception of the overall impact of the CCGPS curriculum on Georgia education (Cochrane & Cuevas, 2015).

Cochrane & Cuevas (2015) reported three of these categories teacher training, teacher workload, and teacher morale as “having significant, positive relationships with how a teacher rates the overall impact that CCGPS had on education” (Cochrane &

Cuevas, 2015, p. 19). Cochrane and Cuevas also reported when teachers do not feel prepared to implement new curriculum or are overwhelmed, there was a decline in morale and a decline in their image of the CCGPS.

The study led by Cochrane and Cuevas used a modified survey instrument used by Cheng (2012). Cheng (2012) conducted a mixed-methods design beginning with a survey (with quantified results) in the first phase, followed by a qualitative interview phase to expand the details of the survey results (Cheng, 2012).

Of the 333 teachers in California asked to participate, 95 responded. The responses represented teacher perceptions K-12, from three elementary schools, two middle-schools, and one high-school (Cheng, 2012). The principals of four schools surveyed allowed Cheng to attend a staff meeting and introduce himself, explaining the purpose of the study. Immediately following the face-to-face meeting, an email was sent with a link to the survey and an invitation to participate in the interview (Cheng, 2012).

Cheng's study occurred prior to full implementation of the CCSS; his survey questions were charted into four broad categories: "(a) familiarity within the CCSS; (b) overall impressions of the CCSS and the status quo; (c) beliefs about the goals behind the CCSS; and (d) questions about teacher morale" (Cheng, 2012, p. 43). From these categories, the responses revealed 64.9 percent of the teachers surveyed did not feel prepared to teach the CCSS. Additionally, 33.3 percent agreed the curriculum was a positive move in education reform, however, 41.4 percent of the same teachers reported the new curriculum would have very little or no impact on their classroom practice (Cheng, 2012).

Table 1

*Studies Related to Teacher Perception of the Common Core*

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STUDY	PURPOSE	PARTICIPANTS	DESIGN/ ANALYSIS	OUTCOMES
Sanchez (2016)	Explore teacher perceptions of the CCSS and their participation in implementation	47 teachers in a California school - district (out of 236 available)	<u>Mixed Methods:</u> Quantitative- survey Qualitative- Interview questions/ small sample population	<ul style="list-style-type: none"> <li>Four themes: student benefits, implementation support: time, professional learning support, and distribution of resources</li> </ul>
Cochrane & Cuevas (2015)	Determined teacher perceptions of the CCGPS after they had been implemented 1.5 years.	70 teachers of the CCGPS: Language Arts and Math Sample was from 2 school districts in Georgia.	Qualitative- survey which was analyzed Quantitatively: correlations between variables	<ul style="list-style-type: none"> <li>Survey data was analyzed using 5 variables; Correlations were found between variables. Teacher training, workload, and morale- positive relationship with how a teacher views the impact of CCGPS on education.</li> </ul>
Cheng (2012)	Examined teacher perceptions of the CCSS	95 (out of 333 invited to participate) 21 Elementary; 12 Middle School; 62 High-School	<u>Mixed Methods</u> Quantitative: Survey questions/survey monkey Qualitative: Interview questions	<ul style="list-style-type: none"> <li>Teachers voiced: School districts need flexibility when implementing curriculum to address the needs of the student population</li> <li>Need time to implement the new standards and determine effectiveness; need professional development</li> </ul>
Davis, Chopin, McDuffie, & Drake (2013)	Explored middle-school math teachers' perceptions of the Common Core State Standards for Mathematics (CCSSM)	Over 400 middle-school mathematics teachers employed in 43 states (out of 45 that chose to adopt the CCSSM)	Quantitative: A national survey was conducted using Likert-type questions.	<ul style="list-style-type: none"> <li>86.3 % of teachers stated the CCSSM were more rigorous than previous math standards</li> <li>Over 60 % of teachers were either 1) using online materials or 2) creating materials</li> <li>Middle-school teachers will incorporate CCSSM and SMPs</li> </ul>
Burks, et al. (2015)	Investigated 6 <sup>th</sup> -12 <sup>th</sup> grade (secondary) teachers' perceptions of implementing the CCSS.	35 in-service teachers from 6 <sup>th</sup> - 12 <sup>th</sup> grade schools responded to an online survey. The participants were recruited from four states.	Quantitative: Electronic survey responses were analyzed using descriptive statistics.	<p>Survey data results:</p> <ul style="list-style-type: none"> <li>Over 50% of teachers were comfortable adapting to the CCSS.</li> <li>55% of participants stated they did not have adequate training for implementation.</li> </ul>

Two themes were reported from the qualitative interview data (2012). On the first theme, relating to the quality of the curriculum, teachers reported that the curriculum

would unify what is taught, yet how it was to be taught was uncertain. Some standards were broad in terminology, leaving room for a variety of interpretation.

The second theme reported from Cheng's interview results pointed out teachers' concerns about testing. Common assessments and benchmark assessments were important to most of the teachers interviewed. Some teachers agreed with national testing. In contrast, teachers reported concerns reported about losing instructional time for testing, teachers teaching the test, and test results not revealing a true picture of what a student knew and could do. Cheng (2012) reported test scores could not "capture all the information that is necessary for understanding and meeting those needs (of students)" (Cheng, 2012, p. 54).

### **Teacher Perceptions across the States**

As the Common Core State Standards for Mathematics (CCSSM) was implemented in more states across the United States, more studies investigated teacher perceptions of the curriculum. In 2011, Cogan, Schmidt, & Houang surveyed teachers in 41 states concerning teacher perceptions of the CCSSM, teacher awareness of the standards, and the current teacher practices (Cogan, Schmidt, & Houang, 2013). The survey participants taught grades one through six (60 percent), seven and eight (20 percent), and high-school (20 percent). More than 90 percent of the participants agreed that a common curriculum was a positive change due to the increased equal learning opportunities provided by teaching a common curriculum (Cogan, Schmidt, & Houang, 2013). Additionally, some of the teachers surveyed across the 41 states voiced concerns about a lack of resources, specifically textbooks. The respondents also reported a shortage of aligned assessments (Cogan, Schmidt, & Houang, 2013). Each of these points

mentioned by the survey participants were described as challenges to implementing the CCSSM.

Furthermore, in 2013, Cogan, Schmidt, & Houang's study called attention to the Standards for Mathematical Practice (SMPs) that teachers were assigned the task of teaching along with the content standards. These SMPs are methods students used during their K-12 education career to solve mathematical tasks and problems (Middeton, 2016). More specifically, the *Eight Standards for Mathematical Practice* (SMPs) described ways in which students ought to work through the content as they learned in elementary, middle, and high-school (Middeton, 2016). Examples of the Standards for Mathematical Practice are (a) Use appropriate tools strategically, and (b) Attend to precision. The SMPs describe methods students learned to use throughout their K-12 education that helped them solve various mathematical tasks (Middeton, 2016). The teachers voiced a need for instructional support throughout the implementation of the content standards and the SMPs (Cogan, Schmidt, & Houang, 2013).

The teachers supported common standards, but approximately one-third of them reported a sense of unpreparedness. The increase in depth of content, the Standards for Mathematical Practice, and the difference between the CCSSM and what was taught in years prior contributed to why the teachers felt they were not prepared to teach the grade level assigned for the current academic year (Cogan, Schmidt, & Houang, 2013).

To further the research, Davis, Choppin, McDuffie, and Drake surveyed over 400 middle-school mathematics teachers in 2013 with regard to the CCSSM. As of May 2013, the CCSSM were adopted by 45 states and the District of Columbia. The teachers

surveyed in the 2013 study worked in 43 of the 45 states that had chosen to adopt the CCSSM (Davis, Choppin, McDuffie, & Drake, 2013).

In order to conduct the survey nationally, a commercial company was used and the survey invitations were randomized. From the survey results, Davis, Choppin, McDuffie, and Drake reported a high percentage of teachers stated that they understood the CCSSM and stated the curriculum was more rigorous than the previous mathematics standards taught. Davis et al. (2013) stated 86.1 percent of the teachers surveyed were familiar with the standards content. Likewise, 86.3 percent of the teachers felt the CCSSM content standards and the Standards for Mathematical Practice were more rigorous than their previous state standards. The teachers surveyed made the determination of rigor based on the curriculum requiring more conceptual understanding versus computation skills and mathematical fluency (Davis et al., 2013).

Despite the curriculum rigor, the teachers reported a lack of the necessary materials needed to support classroom instruction. Due to the lack of textbooks and other content-aligned teaching materials, over 60 percent of the survey participants were either 1) using online materials, or 2) creating their own materials (Davis et al., 2013). The researchers concluded with a recommendation for professional development (based on need) for teachers implementing the CCSSM curriculum. In addition, the researchers stated middle-school mathematics teachers could benefit from professional development focused on mathematical content while incorporating the Standards for Mathematical Practice.

## **More States Adopt the Curriculum**

As more states adopted the Common Core Standards, teachers' views about the curriculum were conflicting (Burks et al., 2015). Specific research investigating teacher perceptions expanded across the United States to determine the perceptions of more teachers throughout the country. Burks et al. (2015) surveyed in-service teachers across four states, which included: Alabama, South Carolina, Maryland, and Texas. Thirty-five teachers responded to the survey, and of those thirty-five, 71 percent had at least seven years of experience. The researchers reported all of the participants were teaching before the Common Core was implemented, and therefore were able to make comparisons. The results were reported based on two research questions. The first research question investigated whether the teachers were comfortable in adapting the new curriculum change. Over 57 percent of the respondents stated they were comfortable with adapting to the change (Burks et al., 2015).

Next, the participants' responses informed the research team that 55 percent of them did not believe they were trained adequately. Additionally, 47 percent received some professional development; yet the professional development may not have been what was needed to implement the change in mathematics curriculum. The researchers concluded by stating the teachers were determined to implement the CCSS, in spite of the fact that they had not received enough professional development (Burks et al., 2015).

## **Theory of Change**

Each evolution of common core based standards increased content complexity, restructured lessons, mandated new guidelines, provided new assessments to measure student knowledge, and outlined new accountability measures for districts, schools, and

teachers. The Theory of Change Model provided some insight into the methods teachers used to implement the Common Core State Standards (Sanchez, 2016). Weiss (1995) suggested there were four steps that need to take place in order for change to be successful. These steps helped to provide the walkway of expectations to follow that led to achieving the end result. After the expectations are clearly outlined, the vision became clear concerning the long term goals. Weiss also pointed out the need for a connection between the activities or programs and the desired results. For example, teachers implementing the CCSS needed to have clear expectations, clearly see the vision of the CCSS, and needed to be able to determine the connection between the implementation of the CCSS and an increase in student ability.

According to Sanchez (2016), all participants in a complex initiative needed to be realistic during the planning stage, and flexible during implementation and monitoring phases. The teacher perceptions of the CCSS were viewed through the series of steps Weiss outlined in the theory of change. First, teachers were responsible for the implementation of the curriculum and needed to know the CCSS, thus teacher's base of knowledge were a key component in the change. The role teachers had in the curriculum change process could be identified in steps one and two, knowing the key components of a program, and possible issues to be addressed (Sanchez, 2016). The third portion of Weiss's model (1995) stated the leaders and staff should agree on the implementation process implying that administrators and teachers agreed on the implementation methods (Sanchez, 2016). The last part of Weiss's model pointed to evaluation and the need for the evaluation of the specific change to contribute to the improvement of education (Sanchez, 2016).

## Summary

Changes take place every day in the classroom with the teachers providing the key to curriculum change and reform as the educational decision makers. The CCSS implementation changed what was being taught (a clear and viable curriculum) and how it was being taught (curriculum delivery) (Schmoker, 2011). Curriculum change altered teachers' everyday practice. According to Sanchez (2016) teachers needed to value the change if the change was to be implemented with fidelity (Sanchez, 2016).

In the state of Georgia, the mathematics curriculum changed three times in the last five years (2012-2017). Once called the Georgia Performance Standards, Georgia initiated the Common Core Mathematics Curriculum (CCSS) in 2012, with changed expectations for teacher practice, testing, and student performance. In 2015, the State Board of Education (SBOE) voted to revised the CCSS and rename the standards the Georgia Standards of Excellence (GSE). The subsequent introduction and adoptions of the GSE led to concerns among teachers due to the complexity of the curriculum and the classroom practices that needed to change for students to be successful. Although teachers were responsible for implementing the changes in the mathematics curriculum, teachers were not provided opportunities to participate in the adoption but were responsible for implementation.

## CHAPTER III

### METHODOLOGY

The purpose of this study was to investigate perceptions of middle and high-school mathematics teachers concerning the Georgia Standards of Excellence Mathematics Curriculum, and how their perceptions impacted the implementation in the classroom. Teachers, administrators, instructional coaches, and other curriculum personnel could benefit from the results of this study. Consequently, researching middle and high-school math teacher perceptions of the Georgia Standards of Excellence Mathematics Curriculum (GSE) could assist school and district curriculum leaders in determining what was needed to help teachers value the implementation. Additionally, teachers were represented and were able to describe how the change in mathematics curriculum has impacted their classroom practice.

In order to study the phenomenon of teacher experiences, the researcher facilitated two focus group interviews in a South Georgia school district; one group was composed of middle-school teachers (7<sup>th</sup> grade and 8<sup>th</sup> grade) and the other focus group was high-school teachers (10<sup>th</sup> grade through 12<sup>th</sup> grade). The researcher facilitated two focus groups to determine if there were any differences between middle-school teacher perceptions of the GSE and high-school teacher perceptions of the GSE. The interview protocol was constructed with the purpose of answering the research questions. The researcher used the same focus group protocol with each group. The outcome of each interview session was used by the researcher to collect the teacher perception data and study the middle and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum.

## Research Questions

For the purposes of this study, the researcher examined middle and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum.

The researcher collected data and answered the following research questions:

1. What were the perceptions of middle-school and high-school mathematics teachers regarding the Georgia Standards of Excellence Mathematics curriculum?
2. To what extent did the middle-school and high-school mathematics teachers perceive the Georgia Standards of Excellence Mathematics Curriculum has impacted their classroom practice?
3. To what extent was there a difference between middle-school and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum?

## Research Design

The research design was selected by the researcher in order to increase understanding of middle and high-school teachers' perspectives of a phenomenon. Onwegbuzie and Denham (2014) reported qualitative methods can lead to an understanding of experiences and connecting meaning to those experiences. The teachers experienced the change in the mathematics curriculum, and the researcher studied the teachers' perceptions of the experience. To investigate this specific phenomenon, the researcher selected the phenomenological research design.

Table 2

*Research Confirmation Table*

Research Question	Instrumentation/Analysis	How will the strategy answer the research question?
What are the perceptions of middle and high-school mathematics teachers regarding the Georgia Standards of Excellence Mathematics curriculum?	Focus Group Interviews	Responses from focus group participants will provide information on their perceptions about the curriculum.
To what extent do the middle and high-school mathematics teachers perceive the Georgia Standards of Excellence Mathematics Curriculum has impacted their classroom practice?	Focus Group Interviews	Responses will yield information concerning the Georgia Standards of Excellence and whether the teacher participants perceived a change in their classroom practice.
To what extent is there a difference between middle-school and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum?	Focus Group Interviews	Responses will show whether or not there was a difference between middle and high-school teacher perceptions of the Georgia Standards of Excellence Curriculum.

According to Hays and Singh (2012), the process of phenomenology begins with the attempt to understand participant experiences, as the experiences relate to some specific phenomenon. Phenomenological analysis allowed the researcher to transform the experiences into text, and provided a systematic process of reading, reflection, writing, and rewriting (Richards & Morse, 2013). The phenomenon studied was the requirement for Georgia mathematics teachers to teach the Georgia Standards of Excellence Curriculum (GSE), a change from the Common Core Mathematics Curriculum taught in years prior. Ultimately, teacher perceptions were reported as a key component to the implementation of curriculum reform, and were also noted as a possible factor in the success of implementation (Sanchez, 2016).

Studies by Cheng (2012), Sanchez (2016), and Cochrane and Cuevas (2015), Davis, Choppin, McDuffie, & Drake (2013), and Burks et al. (2015) led to the design of this research. Sanchez (2016) studied teacher perceptions of the Common Core Curriculum in California, and found teachers reflected positively about student learning as a result of the Common Core; however, teachers' responses were both positive and negative concerning (1) adequate resources and (2) adequate time to plan and prepare lessons. Cochrane and Cuevas (2015) collected teacher perception data based on a modified survey instrument used by Cheng (2012). Cochrane and Cuevas reported teacher workload, teacher training, and teacher morale impacted how teachers perceived the Common Core (2015). Similarly, Cheng's (2012) mixed-methods design beginning with a survey (with quantified results) in the first phase, followed by a qualitative

interview phase to expand the details of the survey results reported teacher concerns about the quality of the curriculum and the testing used to measure student progress (2012). The studies conducted by Cheng (2012) and Sanchez (2016) were conducted in California, and the Cochrane and Cuevas (2015) study was conducted in Georgia. Studies conducted by Davis et al., (2013) and Burks et al. (2015) investigated teacher perceptions across multiple states.

Cheng's interview protocol was revised and utilized in the collection of qualitative data. The researcher interviewed two focus groups from a school district in South Georgia. Permission was obtained from Cheng to use the interview protocol (see Appendix A). One focus group was composed of middle-school mathematics teachers (7<sup>th</sup> grade and 8<sup>th</sup> grade) and the other high-school mathematics teachers (10<sup>th</sup> grade through 12<sup>th</sup> grade). Each focus group was composed of mathematics teachers that were currently teaching or had taught the mathematics curriculum. The use of focus group interviews was proposed by the researcher for the purpose of using group interaction to gather a deeper understanding participants' knowledge and experiences (Kitzinger, 1995). Asking the focus group to respond to the open-ended questions encouraged group participants to talk to one another and comment. The two focus group interviews examined not only how the participants perceive the Georgia Standards of Excellence Mathematics Curriculum, but also why the participants have the perceptions of the GSE. Hays and Singh pointed out focus groups provide the most culturally appropriate and a richer picture of the phenomenon under review (2012).

## Population

A South Georgia school district was chosen as the district where the participants were selected for the interviews. This district was chosen as the population due to geographic accessibility and convenience; therefore, the researcher was able to select focus group participants from the population. The student population of the school district consisted of seven schools and one charter school with a total population of approximately 4,737 students (Georgia Department of Education, 2016). The district was comprised of an Early Learning Center (Pre K, K), a Primary School (1<sup>st</sup>, 2<sup>nd</sup> grade), an Elementary School (3<sup>rd</sup>, 4<sup>th</sup> grade), an Intermediate School (5<sup>th</sup>-6<sup>th</sup> grade), a Middle-School (7<sup>th</sup>- 8<sup>th</sup> grade), a Ninth Grade Academy (9<sup>th</sup> grade), a High-School (10<sup>th</sup> -12<sup>th</sup> grade), and a Charter School (Pre K-8<sup>th</sup> grade).

The student ethnicity of the school district was 10.02% Hispanic, 0.06% American Indian, 0.63% Asian, 73.27% Black, 14.03% White, and 1.98% two or more races (Georgia Department of Education, 2016). More specifically, the population of the students taught by the sixth through twelfth grade teachers was 2,240. The ethnicity of this selected population of students was 8.1% Hispanic, 0.67% Asian, 76.1% Black, 13.53% White, and 1.60% two or more races (Georgia Department of Education, 2016). The primary language spoken by the student population of middle and high-school students was English, however, there were 68 English Language Learners (ELL), 3.04% of this sixth through twelfth grade student population (Georgia Department of Education, 2016). Each student in the district was provided free meals (Georgia Department of Education, 2016).

The teacher population in the district was composed of 274 certified teachers. Of this total, there were 99 primary and elementary teachers, 38 middle-school teachers, and

82 high-school teachers. The sample population for this study was the middle-school and high-school teachers in this South Georgia school district who taught mathematics for three or more years. Since the middle-school employed eight seventh and eighth grade mathematics teachers, the middle-school focus group had five teachers as participants. The participants were chosen (a) on a volunteer basis, and (b) based on years of experience. The first five middle-school teachers that volunteered who had three or more years of experience teaching mathematics were chosen to participate in the middle-school teacher focus group interview. The ninth grade academy and the high-school had a total of twelve mathematics teachers. An invitation was sent to all teachers who met the criteria; however the first five high-school teachers who accepted the invitation and had been teaching mathematics for three or more years were selected to participate in the high-school focus group interview session.

## Participants

Prior to soliciting the participants for this study, the researcher wrote a letter to the superintendent of the school district requesting permission to conduct focus group interviews. The researcher delivered the letter in person in order to verbally explain the purpose and answer any questions the superintendent might have. After obtaining permission from the superintendent, the researcher constructed the letter to address individual school principals to conduct focus groups. The researcher followed the same procedure used with the superintendent, so principals were able to ask questions about the focus group interviews. Teachers who agreed to participate in the focus group interviews signed an informed consent letter immediately prior to the focus group session.

Teachers were chosen and selected to participate in the focus groups from the teacher population in the aforementioned district using a non-random sampling technique. Since the researcher proposed to investigate a phenomenon and there were mathematics teachers available, the participants were chosen because of convenience. The district had one middle-school, one ninth-grade academy and one high-school. Because mathematics teachers were the experts in relation to this phenomenon studied by the researcher and the teachers were in the same county as the researcher, the sample was selected from this district. Each focus group had five participants. The middle-school focus group was composed of seventh and eighth grade mathematics teachers, and the high-school focus group was composed of tenth through twelfth grade mathematics teachers. The teachers who participated in the focus group interviews participated on a voluntary basis.

### Instrumentation

The interview protocol used by Cheng in 2012 consisted of seven questions, however, the researcher revised the protocol to use five questions for both the focus group interview sessions (see Appendix C). In the original interview protocol the term *Common Core* was used, however, the term *Common Core* was replaced with the term *Georgia Standards of Excellence*. In February 2015, The State Board of Education (SBOE) made this change.

The protocol was used by Cheng in 2012, in a mixed-method design study where he conducted a survey before the interviews. After further review, the researcher noted the interview questions were utilized in another study in 2015 (Cochrane & Cuevas, 2015). The researcher contacted Cheng, and permission was granted for the use of the

interview protocol; however, the researcher modified the interview questions in order to guide the focus group participants in group dialogue.

## Data Collection

According to Kress and Shoffner (2007), the facilitators of focus group interview sessions had the obligation of facilitating meaningful dialogue and interactions among the participants, as well as keeping the participants engaged. The focus group interviews were facilitated by the researcher. Each focus group session was recorded using audio and video. The video camera was stationary and was placed in the interview area prior to the participants' arrival by the researcher. Interview sessions were held in a conference room with chairs around a large table. The organization of the room was set up by the researcher in order to make the environment as comfortable as possible for the participants.

When the participants arrived, each individual was given a participant number and were asked to respond to four questions so the researcher could collect individual demographic information. Next, the participants were asked to read and sign a consent form, which informed the participants that the focus group sessions were recorded. The questions the researcher asked were the following: (a) What is your gender? (b) What is your age? (c) What is your highest level of education? (d) How many years have you been in education? Specifically teaching mathematics?

Once the demographic information was collected at each session, the interview session began and the facilitator deliberately offered each participant an opportunity to

respond. The focus group interview sessions lasted less than forty-five minutes; the actual time depended on how the participants engaged in dialogue. Involving each participant assisted the researcher with collecting data to thoroughly answer the research questions.

## Analysis of Data

The data in this study was collected through focus group interviews. The two focus group interview groups were determined based on convenience. More specifically, the qualitative data analysis stages proposed by the researcher included the initial analysis of text (note taking, organizing, coding), and secondary data analysis or focus coding (patterns) (Hays & Singh, 2012; Saldana, 2015).

During the initial phase of data analysis, notes were taken from the transcript immediately following the focus group interviews. The two focus groups were recorded and the participant dialogue transcribed. Next, the focus group interview transcriptions were uploaded into NVivo 11 Starter for Windows Student software, and a word frequency analysis feature was used to determine repetitive words and phrases used by the focus group participants. The researcher chose the NVivo software program based on the years of reported dependability and reliability of the program. To ensure the program was used correctly and efficiently, the researcher used the online tutorials and sample data sets provided by NVivo.

After the word frequency analysis (first cycle of coding), the researcher used the text search feature for the second cycle of coding, which organized the common phrases in the interview data. The common phrases (or themes) were composed of phrases or segments of data that contained one or more main ideas (Hays & Singh, 2012). Once the

second cycle of coding was complete, the researcher used the word tree feature in the NVivo software, which provided a visual graphic organizer containing the connections between the words or phrases in the interview text. The researcher used the word tree feature because themes were found throughout the data and not specific to one specific topic or category (Richards & Morse, 2013). A frequently used word was added into the word tree analysis feature, and the researcher determined how that word was used in context. Next, the researcher examined whether the phrases surrounding the word were relevant to the study. The visual representation of the interview data allowed the researcher to quickly determine the most common, relevant themes in the interview data. Lastly, to ensure all data was analyzed, the transcripts were reviewed again, and the coding cycle continued until no new themes were identified. Once the data analysis was complete, the data analyzed in this study was reported according to the research questions.

In this chapter, the researcher described the methods used to study seventh through twelfth- grade teacher perceptions of the Georgia Standards of Excellence Mathematics Curriculum. The research design the researcher utilized consisted of two focus groups; one comprised of middle-school mathematics teachers and the other composed of high-school mathematics teachers. The targeted population and sample were teachers from one district in South Georgia. Focus group interview data was collected, transcribed, coded by the researcher, analyzed into themes, and the themes grouped into categories. The data analysis process organized the focus group interview data to answer the research questions.

## CHAPTER IV

### DATA ANALYSIS

In the state of Georgia, the mathematics curriculum has changed three times in the last five years (2012-2017). Before 2012, the curriculum was named the Georgia Performance Standards (GPS). Georgia initiated the Common Core Mathematics Curriculum (CCSS) in 2012, and there were expectations for teacher practice, testing, and student performance. In 2015, the State Board of Education (SBOE) voted to revise the CCSS and rename the standards the Georgia Standards of Excellence. The introduction and adoptions of the curriculum caused some concerns among teachers due to the complexity of the curriculum and the classroom practices that needed to change for the students to be successful. Although teachers were responsible for implementing the changes in the mathematics curriculum, teachers were not often given the opportunity to have a voice in the development of the changes.

Since most of teachers rarely have a chance to participate in curriculum reform, the researcher explored the phenomenon of teacher experiences with the change to the Georgia Standards of Excellence. The researcher conducted two focus groups in a South Georgia school district; one focus group of middle-school mathematics teachers (7<sup>th</sup> and 8<sup>th</sup> grade), and the other focus group high-school mathematics teachers (10<sup>th</sup>-12<sup>th</sup> grade).. Therefore, the interview data collected in this study set in South Georgia depicted perceptions of middle and high-school teacher perceptions of the Georgia Standards of Excellence Mathematics Curriculum, and how the curriculum change impacted the teachers' everyday classroom practice.

Three research questions formed the focus of the study:

1. What were the perceptions of middle and high-school mathematics teachers regarding the Georgia Standards of Excellence Mathematics curriculum?
2. To what extent did the middle and high-school mathematics teachers perceive the Georgia Standards of Excellence Mathematics Curriculum has impacted their classroom practice?
3. To what extent was there a relationship between middle-school and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum?

### **Research Design**

To gain an understanding of middle and high-school teachers' perceptions of the GSE, the researcher chose a phenomenological research design. According to Denham and Onwegbuzie (2014), qualitative methods help researchers understand and connect meaning to experiences. Teachers who participated in the focus group interviews experienced the requirement for Georgia mathematics teachers to teach the Georgia Standards of Excellence Mathematics curriculum (GSE). This requirement was a change from the Common Core Mathematics Curriculum taught in years prior.

### **The Respondents**

The participants were selected from a teacher population in a South Georgia school district. The district teacher population was composed of 274 certified teachers. The teacher population had 99 primary and elementary teachers, 38 middle-school teachers, and 82 high-school teachers. The middle-school math teachers who taught at the middle-school (7<sup>th</sup> and 8<sup>th</sup> grade) were invited to participate in the middle-school focus

group. Teachers from the Charter School (K-8) were under a different governance; therefore they were not included in the study. The sixth grade teachers who taught at the Intermediate School were not included because the school district did not consider the sixth grade teachers to be middle-school teachers. Five of the six teachers from the middle-school math department participated in the focus group interview (one math teacher was absent), and the middle-school group had four females and one male participant. All of the middle-school participants held a master's degree or specialist degree. The mathematics teachers ranged in age from 28 to 46 years and had taught mathematics for four years or more. None of the middle-school mathematics teachers had more than 16 years of experience.

Moreover, this school district did not operate in a traditional high-school setting. The ninth grade students attended a Ninth Grade Academy, which was in a separate building than the other high-school students. The researcher accepted teacher participant volunteers from the high-school (10<sup>th</sup>-12<sup>th</sup> grade school) based on convenience, the teachers' experience, and willingness to participate. The high-school focus group contained four males and one female. This group had credentials ranging from a bachelor's degree to a doctoral degree. The high-school mathematics teachers' ages were between 27 and 52 years of age, and the participants' teaching experience began at five years and extended to 30 years.

The middle-school and high-school teacher focus groups were conducted separately; however, the same interview protocol was used to guide the participants' dialogue. During each focus group, the questions were asked by the researcher for the

purpose of leading the discussion, and with an overall objective of answering the research questions.

Each interview session was recorded and then transcribed. Next, the researcher uploaded all transcripts into the NVivo software, and a word frequency feature was used to determine repeating terms and patterns. Following the word frequency analysis, the researcher utilized the text search query, a feature of the NVivo software program, which organized the common phrases (or themes) in the interview data. Finally, the researcher analyzed the common themes into a word tree format; which provided a visual representation of the connections between words or phrases in the interview text. A frequently used term was typed into the word tree analysis, and the researcher viewed how that term was used in context. Next, the researcher was able to determine if the phrases before or after the term were relevant to the research. The terms and phrases that appeared more often in the transcript appeared in a larger font size. The visual representation allowed the researcher to determine the most common themes in the interview data.

To ensure trustworthiness and credibility, the researcher used the strategies based on Guba's (1981) constructs. The focus group interview respondents were provided the opportunity to decline and not participate. The researcher also used iterative questioning by asking questions in different forms, or rephrasing.

Previous research findings were examined by the researcher on a regular basis to compare findings. The qualifications of the researcher also established trustworthiness. Lastly, the researcher shared the experience and educational qualifications of the respondents.

## Data Analysis

### Findings

When the interview data was analyzed, five findings (or themes) emerged. The first finding was content shifts, or content topics (standards) that moved from one grade level to the next (middle-school), or one subject to another (high-school). Teachers who taught a grade level (when Common Core Mathematics was taught) were responsible for teaching a different set of standards for that same grade level (when Georgia Standards of Excellence Mathematics was taught). The second finding was a change in what the curriculum was expecting the teachers to teach and the students to know, or curriculum expectations.

Another finding concerned resources. The participants discussed their perceptions of the availability of instructional resources (i.e. guided notes and pacing guides for instruction [which are also called frameworks in Georgia], math tasks aligned to the standard [GSE], textbooks, and summative assessment questions aligned to the GSE) for the Georgia Standards of Excellence Mathematics Curriculum. Time was an additional finding. The focus group participants reported planning time and instructional time as the two aspects of time that had an impact on classroom practice. Additionally, the topic of professional learning was a topic that was a key finding in the middle-school focus group data; however, the focus group participants' perceptions of professional learning was one of the differences between the middle-school and high-school focus group data.

The focus group interview results were grouped according to the research questions presented in this study. First, the data was organized into common patterns or themes. For each theme connected to research question one; the high-school teacher data was reported before the middle-school teacher data. Next, the themes the researcher

discovered in the data corresponding to research question two were grouped and represented with the high-school teacher data preceding the middle-school teacher data. Additionally, to cite the participant responses, each line on the transcript was assigned a numerical value. The same organizational pattern for data analysis was followed for all data.

Research Question One:

What were the perceptions of middle-school and high-school mathematics teachers regarding the Georgia Standards of Excellence Mathematics curriculum?

### Overall Perception of the GSE

Middle and high-school teacher perceptions of the Georgia Standards of Excellence Mathematics Curriculum were divided between positive and negative. Based on research question one, two primary themes were discovered from the collected data: (a) Theme I: Content Shifts and (b) Theme II: Curriculum Expectations.

Theme I: Content Shifts

When the Common Core began in Georgia classrooms, each mathematics concept taught in grades 6-12 was placed in a particular grade level. In 2015-2016, the GSE moved or shifted some content topics (standards) to another grade level (middle-school) or changed to another mathematics subject (high-school). The teacher participants voiced different perspectives based on the content shifts. One high-school teacher expressed, "They [took] some of the harder concepts and put them into the next grade" (Respondent 1, p. 1, line 6). Group members also discussed more course specific content shifts. Respondent one spoke again, "Specifically, they took complex knowledge and put that into Advanced Algebra standards which frees us up with more time" (p. 1, line 7). The

same teacher also noted, “From 10<sup>th</sup> grade to 11<sup>th</sup> grade. They took [the standard] from Analytic Geometry and moved it to Advanced Algebra” (p. 1, line 15).

In contrast, some of the middle-school focus group participants had a different view concerning the Georgia Standards of Excellence and content shifts. When the dialogue began, one middle-school teacher expressed, “I like that it [GSE] requires the teacher to use more hands-on activities” (Respondent 4, p. 1, line 5).

As the participants continued, one participant stated:

When we keep changing the standards, we’re going to have way too many gaps in the learning. So when the children get to the next grade level, the standards have changed, so they have a gap in what they need to know to be successful in that grade. Why do they have a gap? Because the standards keep changing. And so we, like she said, if we could leave them alone, then we would, I think we can close some of these gaps and make sure they’re successful all the way through (Respondent 1, p. 7, line 135).

Likewise, another middle-school participant said, “If it [GSE] was more narrow in its language, then you would know exactly what I need to teach these students so that they can be successful in the next grade” (Respondent 1, p. 5, line 105). The middle-school participants agreed that due to the rapid change in curriculum, there were concepts not being taught because some standards were no longer taught in that grade level. Overall, both middle and high-school teachers agreed that the Georgia Standards of Excellence Mathematics Curriculum changed (or shifted) some of the content; whether in a different high-school math course or a different middle-school grade level. The perceptions of these changes varied between positive and negative.

## Theme II: Curriculum Expectations

Another theme was curriculum expectations, or what the teachers were expected to teach and the students were supposed to learn. When the high-school group discussed the expectations of the GSE, respondent four commented, “Because I have seen GPS, these are more- they have more rigor and require more concept than procedure” (p. 2, line 24). The group agreed with this statement and the dialogue continued concerning the expectations of the GSE curriculum. A different group member stated, “First thing is, [there] is a lot to cover in a given semester. Expectations are higher. That’s good in one way, but we, as teachers, are not able to fulfill all of those things, requirements, sometimes we struggle” (Respondent 2, p. 2, line 33). This comment was a reflection on teaching the entire high-school mathematics course in one semester, or 18 weeks. Based on this scheduling concept, another participant added, “Yeah, and then these are standards that could be covered in 90 minutes, but some – there are more standards to be covered than blocks each year” (Respondent 3, p. 3, line 40). As the teacher dialogue continued, one high-school participant pointed out:

Of course, the rigor is different; the vocabulary is much different. And even from Common Core to Standards of Excellence, the vocabulary is a little simpler for GSE. They're more specific on GSE than Common Core. Common Core, some of the teachers really didn't understand what we were supposed to be teaching from the standard (Respondent 4, p. 4, line 74).

Also, the high-school teachers described the change in the curriculum expectations before the GSE as a shock for the students. One participant stated, “Going from GPS to Common Core was a shock for our students” (Respondent 1, p. 5, line 71). Group member number four added, “The transition wasn't smooth at all” (p. 4, line 72).

The same high-school respondent commented, "It [Common Core] wasn't really specific, now they give some examples within the standard, but before it was just do this and do that" (Respondent 4, p. 4, line 89). Although the high-school teachers indicated that the GSE had clear guidelines and a more simplified vocabulary to instruct, respondents voiced that each high-school course contained too much content to cover within the semester.

In comparison, the middle-school teachers described the curriculum expectations as being "too much" for the faculty and students in that particular grade level. One teacher stated, "It's all in the wording, you know, I think the wording is a little bit more difficult now, it calls for too much" (Respondent 5, p. 3, line 64). Likewise, another middle-school participant remarked:

I agree there is too much for the students to kind of grasp in a year and it's a lot of memorization as far as formulas that they- I think would be helpful for them to be given that are not. If you want them [the students] to be successful, I feel like some of those formulas that they need to be successful aren't on the formula sheet for the Milestone (Respondent 3, p. 1, line 22).

Moreover, one more teacher added:

I think it's too much information packed into the standards in order for us to teach the children. For example, one standard may have five different things to do in order to get the students to learn the standards, they just – there's too much information in one standard (Respondent 4, p. 1, line 18).

Each of the focus groups voiced concern about the GSE curriculum expectations being a lot to cover or "too much" (Middle-school respondent 5, p. 3, line 66) for the

teachers and the students. Both of the focus groups expressed negative feelings toward this theme.

Research Question Two:

To what extent did the middle-school and high-school mathematics teachers perceive the Georgia Standards of Excellence Mathematics Curriculum has impacted their classroom practice?

### The Impact on Classroom Practice

Similar to research question one, the researcher noted two themes related to the impact the GSE had on classroom practice. Two themes were noted based on research question two: (a) Theme III: Instructional Resources, and (b) Theme IV: Time (instructional time and planning time).

Theme III: Instructional Resources

The participants expressed the need for more instructional resources. The resources discussed included items such as: guided notes and pacing guides for instruction (which are also called frameworks in Georgia), math tasks aligned to the standard (GSE), textbooks, and summative assessment questions aligned to the GSE. Due to the multiple curriculum changes over a short period, the school district worked to purchase resources and then the next year, when the curriculum was different, some of the resources were not aligned to the standards.

As a group, the high-school teachers voiced the need for additional instructional resources so that the teachers could scaffold the lessons and concepts for the students. One high-school participant stated, “We just hope they [the standards] stay the same and update the material for the teachers” (Respondent 3, p. 11, line 235). The same high-

school teacher added one word, “Resources” (Respondent 3, p. 11, line 240). The group member from the high-school continued, “Updated frameworks, updated tasks, and updated summative assessment questions” (Respondent 3, p. 11, line 243).

While the group dialogue continued, the high-school teachers discussed a difference in the resources (i.e. math tasks and textbooks for the students) available to teach the GSE across the state. Some counties in Georgia have more funding and therefore have the ability to obtain new resources each year. A high-school participant finalized the topic by saying:

It's hard for us to get resources to teach because we jump from one thing to another and then after one year, this book isn't aligned, and the next year we need a new book, and it gets hard to fund all of these resources, and that's a huge problem (Respondent 4, p. 11, line 249).

Likewise, the middle-school group discussed instructional resources. There was also discussion regarding the alignment of the resources to the GSE curriculum. One middle-school teacher reported:

And then it puts pressure on us too- more work on us that we have to really look at the resources that they offer us to make sure that those resources match up with that standard because often times what they have on there saying it goes with – if you look at it, it really doesn't (Respondent 5, p. 7, line 142).

Other participants in the middle-school focus group agreed that the middle-school mathematics teachers did not have enough instructional resources aligned to the standards (GSE) which were negatively impacting classroom practice. One middle-school teacher added:

I don't think the companies like these new standards because the resources – they don't align with it. Like I said, there's too much in it. So the book may have it as – they may catch one part of the standard, but they're missing the other parts of the standard because there's so much in there. The companies are not- they can't see what they need to have in the books (Respondent 4, p. 7, line 148).

Not only did the group reflect on the current resources not being aligned to the GSE, but there was also other dialogue concerning the lack of resources. A middle-school teacher described an example:

When I got to the resources, the last part of that standard, I had to go and try to make up a blue print to go with the last part of the standard because the resources did not touch that part [of the standard], but touched the first two parts (Respondent 1, p. 7, line 155).

The same teacher added, "I hope the resource I created, you know, is feasible" (Respondent 1, p. 7, line 159).

#### Theme IV: Time

The participants discussed two different perspectives of time that have had an impact on classroom practice: instructional time and planning time. One of the high-school teachers stated, "We, as teachers, are not able to fulfill all of those things. You run out of time to teach" (Respondent p. 2, line 34). Another high-school group member added, "There are more standards to be covered than blocks each year" (Respondent 3, p. 2, line 41). In each of these statements, the high-school teachers voiced an issue with a lack of instructional time.

Furthermore, the high-school teachers requested more time to plan lessons and units. The group reported that not having enough time to prepare lessons as a team before teaching the material had a direct impact on classroom instruction. When the high-school teachers were asked to discuss factors that affected their classroom practice, one teacher stated, “time management” (Respondent 4, p. 3, line 50). Additionally, a participant expressed, “I think we just really needed time to get together and plan” (Respondent 4, p. 5, line 93). The dialogue continued with another response, “Teachers weren’t collaborating on the same subject” (Respondent 2, p. 5, line 95). The high-school teachers continued to share information based on the lack of time to plan with individuals who taught the same content.

Another issue concerning time discussed by the high-school teachers was the lack of time for the teachers to become familiar with the GSE curriculum before school started for the year. For this reason, one of the high-school teachers commented, “We just jumped from one thing to another, by the time we got to it, the school year was starting” (Respondent 4, p.5, line 96). The high-school teachers voiced both a lack of time to instruct the curriculum in the classroom and a lack of time for planning lessons had an adverse impact on their instructional practice.

Furthermore, the middle-school group of teachers also expressed a lack of time as a factor that affected daily classroom practice, or instructional time. One middle-school teacher stated:

Well, the teacher is in a rush to cover those standards, there may not be as much time for you to really kind of- I guess, you feel rushed, so you kind of feel like you've got to teach it and move on to the next standard, so there's not much time –

or time for students to really understand those standards. You feel kind of rushed in teaching and making them understand (Respondent 3, p. 3, line 46).

Similarly, a second middle-school teacher stated:

Sometimes you don't have enough time to give the children in-depth knowledge of what the standards are asking them to do because you want to make sure that you cover all of the standards so that you can at least have exposed the to the material. Because they will be tested on that material (Respondent 1, p. 3, line 53).

Moreover, as the middle-school group continued to discuss the lack of instructional time, a teacher stated that on a regular day, the teachers have, "Reality, about 50 minutes. 70 minutes on the book, but actually about 50 minutes by the time you get everything done" (Respondent 1, p. 10, line 123). One of the factors affecting middle-school mathematics classroom practice was trying to teach the GSE curriculum in the 50 minutes of class time allotted for math instruction each day.

Consequently, when the researcher analyzed the interview data with an attempt to determine how the GSE has impacted teacher practice, the responses were negative. Both middle and high-school teachers described a shortage of aligned instructional resources, along with a lack of instructional time and planning time.

Research Question Three:

To what extent was there a difference between middle-school and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum?

## Differences between Middle-School Teachers and High-School Teachers

Research Question three concerned the differences in the perceptions of the middle-school teacher and the perceptions of the high-school teachers regarding the Georgia Standards of Excellence Mathematics Curriculum.

### Difference One:

When analyzing the interview data, there were two differences in middle-school and high-school teacher perceptions. The first difference was the analysis of data related to research question one concerning content shifts. The high-school teachers reported positive attitudes when describing the mathematical concepts that had shifted, or moved from one subject to the next. More specifically, the high-school teachers noted some concepts had moved from Analytic Geometry to Advanced Algebra. A high-school teacher stated, "They took some of the harder concepts and put them into the next grade" (Respondent 1, p. 1, line 6). In contrast, the middle-school teachers did not agree with shifting the curriculum from one grade to the next. One middle-school teacher voiced, "because when we keep changing the standards, we are going to have way too many gaps in the learning" (Respondent 1, p. 6, line 135). The difference in perceptions concerning the content change was a noted difference in middle-school and high-school teacher perceptions of the GSE.

### Difference Two:

Professional Learning

When the middle-school teachers compared GSE to the prior mathematics content standards, the group discussed the topic of professional learning. The middle-school teachers discussed the professional education that was necessary to teach the middle-school GSE. A teacher remarked:

We have to take professional learning classes to decipher what the standards say. For example, yesterday we did a professional learning on a standard, and then the director/person over there in the lesson told us we didn't even have to teach the standard because it just says know and be able to eyeball on a graph what it means. So basically the standard didn't even have to be taught to the child (Respondent 4, p. 3, line 67).

The same middle-school teacher continued:

We didn't know what the standard was saying because it had so much in it, there was just too much going on in it. If we hadn't had that professional learning yesterday, we would be doing the same thing next year that we did today because we didn't know (Respondent 4, p. 4, line 74).

The high-school teachers did not discuss this need for professional learning due to the lack of content knowledge. There were two fundamental differences in perception of the focus groups: perceptions of (a) content shifts and (b) professional learning.

## Summary

In summary, the data collected by the researcher during two focus group interview sessions was included in this chapter. The researcher led each focus group interview; then recorded the interview sessions and transcribed the recordings. NVivo software was used to code the interview transcripts; and the researcher examined the

transcripts for repeating terms, themes, and patterns. The key themes noted by the researcher from the focus group interview data were: content shifts, curriculum expectations, resources, time, and professional learning.

When the respondents were questioned about their overall perceptions of the GSE (Research Question One) both middle and high-school teachers reported a noticeable shift in the curriculum content. The teachers reported some standard topics that were present in one grade level while the Common Core was taught, were now found in a different grade level in the Georgia Standards of Excellence. Teachers explained that this content shift caused gaps of knowledge for some students. Additionally, the respondents stated the Georgia Standards of Excellence was more rigorous, and the expectations set forth by the GSE Mathematics curriculum were challenging.

Furthermore, when the respondents were asked about the impact the changes from the GSE had on their classroom practice, both the middle and the high-school teachers expressed the need for aligned instructional resources (i.e. guided notes for instruction, math tasks aligned to the standard, textbooks, and practice problems with solutions). Since the math curriculum in Georgia has changed three times since 2012, districts worked to purchase instructional resources every year, and each year there was new curriculum, the resources from the previous year were not aligned.

Time was another theme. Both middle-school and high-school teachers stated there was a shortage of instructional time. The teachers noted there were too many standards and not enough class time to teach the students to the depth of knowledge necessary.

Research Question Three examined the differences between the middle-school and high-school teachers' perceptions. The differences were minimal; however, there was one topic discussed by the middle-school teachers that was not discussed by the high-school teachers. When the middle-school teachers compared the GSE to prior math standards taught, they discussed the professional learning required to understand the content. The teachers discussed the need for professional learning in order to understand the content.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Introduction

Public education in the United States had frequent curriculum changes throughout history. The curriculum initiatives of the past had a focus on improving education in schools based on one of four topics: (a) common standards, (b) preparing students for post-secondary education, (c) improving the quality of education, and (d) increasing the rigor of the content (Wallender, 2014). Although past curriculum change was a combination of some or all of the areas mentioned above, the Common Core State Standards was a mix of all four.

In 2012, Georgia implemented the Common Core Mathematics Curriculum. With this change, there were expectations for student performance, teacher instructional practice, testing, and teacher accountability in middle and high-school mathematics classrooms. Furthermore, as of the 2015-2016 school year, the CCSSM was renamed the Georgia Standards of Excellence Mathematics Curriculum (GSE). The GSE curriculum included revisions to the content and was the third change in mathematics curriculum within a five-year time frame (2012-2017). The researcher proposed to study middle and high-school teacher perceptions of the GSE in one South Georgia school district.

The researcher collected data by facilitating two focus group interview sessions; one composed of middle-school mathematics teachers and the other high-school math teachers. The data were analyzed for themes and patterns then reported based on the research questions. Results of the study will be discussed based on a comparison to the

past studies, as well as implications of the study results and recommendations for future research.

### Analysis of Research Findings

When the researcher analyzed the focus group data, five total findings (or themes) emerged. When the data was analyzed based on the teachers' overall perception of the GSE math curriculum, the first finding that emerged was content shifts. The respondents voiced a concern about the standards being shifted or changed from one grade level to another, which caused gaps in the learning for some students. The second finding, curriculum expectations, was also based on the teachers' general perceptions of the GSE. The respondents discussed the complexity of what they were expected to teach and the students were expected to learn.

Next, a lack of aligned resources (to the GSE) was the third finding. The respondents noted the need for updated instructional resources from the state (frameworks), updated math tasks for the students, and updated summative assessment questions. An additional finding was time. The teachers discussed two different perspectives of time that had an impact on their classroom practice: instructional time and planning time. Instructional time was described as the time needed to teach the standards, and planning time was noted by the respondents as the time needed for the teachers to plan and prepare lessons.

The middle and high-school teachers' perceptions were different concerning the topic of professional learning; which was the fifth theme. The middle-school teachers described a lack of content knowledge and the need for professional learning sessions. In contrast, the high-school teachers did not discuss the topic of professional learning due to

a lack of content knowledge. Five findings emerged from the data in this study; similar themes were found in the literature.

## Discussion of Research Findings

Five key studies related to teacher perceptions of the Common Core State Standards were in the review of the literature. Even though the research in the literature was based on teacher perceptions of the Common Core and the current study documented results based on teacher perceptions of the Georgia Standards of Excellence, there were similarities in the focus group participant responses. Table 3 reports the similarities and differences between the literature and the current study.

Research Question One:

What were the perceptions of middle-school and high-school mathematics teachers regarding the Georgia Standards of Excellence Mathematics Curriculum?

## Curriculum Expectations

Davis, Chopin, McDuffie, and Drake (2013) explored middle-school math teachers' perceptions of the Common Core State Standards for Mathematics in 43 of the 45 states that chose to adopt the curriculum. Over 400 teachers participated in the survey, and 86.3 percent stated the CCSSM were more rigorous standards and the expectations set for the students were higher than previous math standards (Davis et al., 2013). In comparison, the both focus groups in the current study referred to curriculum expectations when the GSE was discussed. The high-school teachers described the change in curriculum expectations as being a shock for the students. Likewise, when the focus group participants discussed curriculum expectations, they stated there was too much information in one standard to teach the students.

Table 3

*Findings*

RESEARCHER	SIMILARITIES	DIFFERENCES
Sanchez (2016)	Themes: (a) time (b) professional learning support (c) distribution of resources	Theme: Student benefits – teachers stated students benefited from the new standards due to solving real world problems and used critical thinking skills.
Cochrane & Cuevas (2015)	Correlations between the amount of teacher training provided and the teacher perceptions of the CCSS.	Correlations between: (a) Teacher workload and the teacher perceptions of the CCSS. (b) Teacher morale and the teacher perceptions of the CCSS.
Cheng (2012)	Themes: (a) time (b) professional development	Flexibility: Schools need more flexibility in standard adoption requirements to address the needs of the population.
Davis, Chopin, McDuffie, & Drake (2013)	Results: (a) Common Core State Standards in Mathematics were more rigorous (b) Teachers needed materials and resources	None
Burks, et al. (2015)	Results: Participants stated they did not receive adequate training for standard implementation.	Results: Teachers were comfortable adapting to the Common Core State Standards.

The focus group participants also noted the expectations were higher for the Georgia Standards of Excellence Mathematics Curriculum; there was more content to teach within a class session.

Research Question Two:

To what extent did the middle-school and high-school mathematics teachers perceive the Georgia Standards of Excellence Mathematics Curriculum has impacted their classroom practice?

## Resources

According to Sanchez (2016), teachers felt the amount of resources they received to teach the Common Core State Standards did not meet their needs. When Sanchez described the teachers' responses concerning resources; the participants voiced frustration regarding the need for time and resources necessary to align lessons with the CCSS (2016). Likewise, Davis et al. (2013) reported that over 60 percent of teacher participants were either (a) using online materials or (b) creating materials to use in the classroom. The teachers did not have the resources they needed to teach the Common Core State Standards for Mathematics (CCSSM). This lack of resources for classroom instruction had an impact on the teachers' perceptions of the curriculum (Davis et al., 2013).

## Time

Another connection between the literature and this study was time. According to Sanchez (2016), teachers had to use personal time to develop aligned lessons. Teachers stated the implementation period was rushed, and the district could have provided more time to implement the new content (Sanchez, 2016). Comments from focus group participants in this study noted the same concern regarding instructional time and planning time as two factors that had an impact on classroom practice. The focus group participants of the present study discussed collaborative planning time as a useful tool which helped the teachers save time by planning lessons together. Likewise, in Cheng's (2012) study, teachers requested time to implement the new standards (Common Core) to determine the results of the new curriculum (2012). The teachers noted the gains from the Common Core State Standards would not be evident for several years (Cheng, 2012).

In comparison, the current study pointed out instructional time (time to teach lessons) and planning time (time to plan and prepare lessons) as two factors that had an

impact on classroom practice. The focus group participants of the present study discussed collaborative planning time as a useful tool which helped teachers work to plan lessons aligned to the Georgia Standards of Excellence. Both the middle-school and high-school teachers requested more time to plan lessons and units. Moreover, the teachers of the current study voiced a lack of instructional time; or too much content to teach in the amount of instructional time allotted.

Research Question Three:

To what extent was there a difference between middle-school and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum?

## Professional Learning

Another corresponding theme between the five key studies and this research study was professional learning. Cochrane and Cuevas examined teacher perceptions of the Common Core in 2015 and noted the transition to a set of new standards required effort by administrators, teachers, and students. Teacher training needed to teach the new standards was described as having had an adverse impact on teacher perceptions of the Common Core State Standards. Cheng (2012) reported the need for professional development for the implementation of the Common Core State Standards. If teachers did not understand or prepare for the new standards, they felt overwhelmed (Cheng, 2012). Furthermore, when Burks et al. (2015) surveyed secondary teachers' perceptions of implementing the Common Core State Standards in four different states, over half of the participants indicated they did not receive sufficient training to implement the standards. In contrast, Sanchez (2016) interviewed teachers from one California school district, and

although the teachers were provided professional learning to assist with the new curriculum, there was a shortage of time to plan lessons collaboratively.

The middle-school participants in this study expressed the need for professional learning to ensure all teachers taught what the math standards intended. Much of the teachers' professional learning time had been spent on deciphering the language of the Georgia Standards of Excellence rather than other topics such as instructional strategies, or methods of instructional delivery. The middle-school teachers needed this professional learning to understand the content that was to be taught.

Based on the key studies in the literature and the current study, teachers expressed many of the same concerns about (a) the change from what was currently taught (in Georgia this would have been Georgia Performance Standards or GPS) to the Common Core State Standards or (b) the change from the Common Core State Standards to Georgia Standards of Excellence in Mathematics. All of the teachers noted curriculum expectations, time (instructional time and planning time), resources, and professional learning as key components that had an impact on the implementation of the new standards, and an impact on their perception of the new curriculum. Whether the teachers were discussing the change from Georgia Performance Standards to the Common Core State Standards or the Common Core State Standards to the Georgia Standards of Excellence, the common issues were evident: more rigorous curriculum expectations, a need for instructional resources, more time to plan lessons and with a collaborative team, and adequate training or professional learning.

## Conclusions

The goal of this study was to investigate middle and high-school teacher perceptions of the Georgia Standards of Excellence, which is the third curriculum change in Georgia since 2012. Data were collected from two focus groups to answer the research questions. Ultimately, the objective was to determine how the teachers perceived the Georgia Standards of Excellence Mathematics curriculum, and what impact the new curriculum had on their practices in the classroom on a daily basis.

### Research Question One

What were the perceptions of middle-school and high-school mathematics teachers regarding the Georgia Standards of Excellence Mathematics Curriculum?

The results from this study indicated both middle and high-school teachers reported multiple changes in the mathematics curriculum in a short amount of time. The continual change caused some standards taught within the math content to move from one grade level to another (in middle-school) or one course to another (high-school). When the content was shifted, teachers reported there were students who were not taught some mathematics standards. The content change created a gap in the learning for those students. Teachers were concerned about the gaps and were attempting to teach both (a) the curriculum the students missed (gap) and (b) the curriculum taught during that current year or current course.

Additionally, the respondents stated the Georgia Standards of Excellence were written based on students mastering math using conceptual understanding (problem-solving) rather than procedural mathematics (step-by-step process). Both focus groups noted the process of requiring the students to complete more mathematical application problems was already more complicated than what was taught previously. The teacher

participants in this study and prior studies emphasized the need for stability and consistency in the mathematics curriculum. Consequently, the overall perception of the curriculum was based on the change in expectations for the teachers and students, and the gaps in the curriculum which were created by shifts in the mathematical content.

#### Research Question Two

To what extent did the middle-school and high-school mathematics teachers perceive the Georgia Standards of Excellence Mathematics Curriculum has impacted their classroom practice?

The second research question addressed how the teachers perceived the GSE had impacted classroom practices, and from 2012 to 2017 teacher perceptions had multiple common themes. Three out of six studies reported the need for resources as being a factor that impacted mathematics teachers' classrooms due to curriculum changes. First, focus group respondents in this study expressed a need for updated instructional resources (instructional frameworks, math tasks, assessment questions) aligned to the GSE. The need for resources was not new; in fact, teacher participants in studies by Sanchez (2016) Davis et al. (2013) reported the need for instructional resources when implementing the Common Core Curriculum. Consequently, the data from these studies report teachers felt the need for more resources aligned to the mathematics curriculum.

Another factor that had an impact on classroom practice was time. Three out of six studies reported time as being a factor that impacted mathematics teachers' classrooms due to curriculum changes. Although time was used in different contexts (i.e. instructional time, planning time, time to implement the new standards), the teachers voiced the need for more time. The focus group respondents of this study discussed the

need for more time to teach lessons, more time to plan lessons, and more time to plan collaboratively. Teacher participants in the study by Sanchez (2016) reported the need for more instructional time; and the teachers in Cheng's (2012) study reported the need for time to implement the standards (to determine the effectiveness). Nevertheless, when the teachers were required to teach a new set of standards, they requested more time to plan, instruct, and implement the new curriculum.

### Research Question Three

To what extent was there a difference between middle-school and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum?

There were few differences between the middle and high-school teacher perceptions of the Georgia Standards of Excellence; however, the key difference reported by respondents were due to the decisions made by administration concerning professional learning. The high-school teacher participants differed in need for professional education because their high school offered continual job-embedded professional learning and classroom support. The middle school teachers discussed job-embedded professional learning; however, there was no discussion concerning assistance in the classroom when the professional learning topic was implemented in the classroom. The middle-school teachers attended some learning sessions; however, the respondents expressed areas of the curriculum where their content knowledge was weak. Therefore, the difference in the middle and high-school teacher perceptions was based on the decisions made by school or district administration concerning professional learning.

## Implications

Teacher perceptions in the current study corresponded with themes in the literature: (a) curriculum expectations, (b) the need for time to plan and teach the content, (c) resources that are aligned to the new curriculum and (d) professional learning. Even though the research in the literature was based on teacher perceptions of the Common Core and the current study documented results based on teacher perceptions of the Georgia Standards of Excellence, there were similarities in the focus group participant responses. While teachers did not specifically elude to the need to have a voice concerning the new curriculum, they did state they felt that the current study would help them (teachers) voice their concerns.

The data reported in this study can provide insight for administration and principals can be more aware of the teachers' need for planning and collaboration time, as well as the need for professional learning. Administrators need to consider effective methods to support teachers through curriculum change. Instructional coaches could use the results to provide an extra layer of support when curriculum change takes place. The instructional coaches could also provide some of the professional learning sessions, and model lessons for the teachers to provide classroom support.

Teachers can also benefit from the data collected in this study. When the teachers were interviewed, they discussed the factors (i.e. guided notes and pacing guides for instruction [which are also called frameworks in Georgia], math tasks aligned to the standard [GSE], textbooks, and summative assessment questions aligned to the GSE) they felt were important when teaching the Georgia Standards of Excellence. This information can be provided to policymakers and planners in order to benefit teachers by providing the necessary tools to implement new curriculum.

## Recommendations

If there is a change in curriculum, a step-by-step plan should be in place to facilitate the implementation process. Principals in school districts should be presented with not only what to do but a how-to-do-it manual or guide to assist with the process. The first year could be a year for partial implementation or a pilot year. A first year allows for trial and error with lessons, construction of common assessments, and mathematics tasks. Data from the pilot year would provide principals, instructional coaches, and teachers the information and the time needed to collaboratively determine common units, pacing guides, assessments, and develop resources. Professional learning time during the summer could also provide the time for teachers to collaborate and discuss all standard vocabulary, determine pacing, how and what is to be taught based on the standard, develop or obtain resources, plan strategies for teachers to use for students to be more proficient at tasks, address learning gaps, and demonstrate model lessons. Throughout the school year, content-based teacher teams could participate in collaborative planning sessions weekly; however, the sessions would be monitored by the school administration.

Vertical alignment teams (K-12) could possibly address the content shifts in the curriculum. During the vertical alignment team sessions, the past curriculum standards for each grade level could be compared to the new curriculum standards for each grade level and any movement of content (content shifts) or gaps in the learning would be addressed. The vertical alignment team members would be responsible for recommending solutions the school district could use to ensure all of the content was included in instruction.

Curriculum changes are continual and inevitably a top-down approach. The policymakers continue to make decisions about the curriculum even though they are far removed from the classroom. One high-school mathematics teacher stated, “The policy makers, they judge it from the top, but they don’t know what actually happens in theory” (Respondent 5, p. 7, line 143). A different approach would include stakeholder input to allow planning for curriculum changes.

### Future Research

Repeating this study with different populations over time could provide valuable insight to policymakers as they work with education policy and curriculum. This study was conducted in one school district in South Georgia; therefore, this study could be replicated in other regions. If this study is replicated in multiple regions in the state of Georgia, a comparative study could also be done to compare the results. Another study might investigate districts where curriculum changes were successfully implemented with stakeholder input. In addition, future research could include collecting data from the same participants in this study after a two-year time period and analyze the difference. When future research is conducted, the researcher should note that teachers’ perceptions concerning curriculum can change. Policy changes over time could also impact teachers’ perceptions of the curriculum.

## Summary

In February 2015, the Georgia State Board of Education approved revisions to the Common Core Mathematics Curriculum, which was the third set of mathematics curriculum standards implemented in Georgia since 2012. The standards were named The Georgia Standards of Excellence Mathematics Curriculum. With the change in curriculum, there were expectations for changes in teacher practice, student performance, testing, and accountability measures in middle and high-school mathematics.

For the purposes of this study, the researcher examined middle and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum. Three research questions formed the focus of this study:

1. What were the perceptions of middle-school and high-school mathematics teachers regarding the Georgia Standards Mathematics Curriculum?
2. To what extent did the middle-school and high-school mathematics teachers perceive the Georgia Standards of Excellence Mathematics Curriculum has impacted their classroom practice?
3. To what extent was there a difference between middle-school and high-school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum?

The researcher collected data by facilitating two focus group interview sessions; one session was composed of middle-school math teachers and the other high-school math teachers. The data were analyzed for themes and patterns and reported based on the research questions. When the data were analyzed, five themes emerged: (a) content shifts (standards taught in different grade levels), (b) curriculum expectations, (c) instructional resources (i.e. guided notes and pacing guides for instruction [which are also called

frameworks in Georgia], math tasks aligned to the standard [GSE], textbooks, and summative assessment questions aligned to the GSE), (d) time, and (e) professional learning.

Teacher perceptions in the current study corresponded with themes in the literature. Even though the research in the literature was based on teacher perceptions of the Common Core and the current study documented results based on the teachers' perceptions of the Georgia Standards of Excellence, there were similarities in the responses. The information in this study provided insight on teachers' perceptions of Georgia Standards of Excellence Mathematics Curriculum. With this knowledge of teachers' perceptions, policymakers and administration could possibly determine effective methods to support teachers through the process of curriculum change.

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## APPENDIX A

Mr. Cheng,

Greetings again! I emailed you in April requesting the use of the survey instrument you used in 2012 when you investigated teacher perception of the Common Core. Since that time, I have decided to collect qualitative data alone. In the previous email I did not ask permission to use (or partially use) your interview protocol from 2012. Would that be possible?

Thank you for your time and consideration,  
Marnie Dutcher  
Assistant Principal  
Americus-Sumter High School

Cheng, Albert <Albert\_Cheng@hks.harvard.edu>

Aug  
21

to me, Albert

Hi Marnie,

No permission necessary. Hope it's smooth sailing with your dissertation.

-----

Albert Cheng  
PEPG Postdoctoral Research Fellow  
Harvard Kennedy School

---

**From:** Marnie Dutcher [[dutcher\\_marnie@columbusstate.edu](mailto:dutcher_marnie@columbusstate.edu)]

**Sent:** Saturday, August 20, 2016 2:46 PM

**To:** Albert Cheng

**Subject:** Re: Thesis survey used in 2012

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Marnie Dutcher <dutcher\_marnie@columbusstate.edu>

Aug  
21

to Albert

Thank you so much!  
Have a great day!

## APPENDIX B

### Informed Consent Form

You are being asked to participate in a research project conducted by Marnie Dutcher, a student in the Doctoral Program at Columbus State University. This study is being supervised by Dr. Pamela Lemoine, the Dissertation Committee Chair.

#### **I. Purpose:**

The purpose of this project is to investigate middle and high school teachers' perceptions of the Georgia Standards of Excellence Mathematics Curriculum.

#### **II. Procedures:**

I will be interviewed with other members of a focus group on one occasion. The interviews will be recorded, and will last up to one or one and a half hours.

#### **III. Possible Risks or Discomforts:**

There is no more than minimal risk for the participants involved in this study. After the participants arrive to the focus group environment and sign the informed consent, each individual will be given a participant number. This will remove the participant names from the interview dialogue and transcripts.

#### **IV. Potential Benefits:**

The results of this study will be important to teachers, administrators, instructional coaches, and other school and district curriculum leaders in determining what is needed to support the teachers through the changes in the mathematics curriculum.

#### **V. Costs and Compensation:**

There will be no compensation for the individuals who participate in the focus group interview session, or assist in any manner.

#### **VI. Confidentiality:**

I understand that any information obtained as a result of my participation in this research will be kept as confidential as legally possible. Neither my name nor any information from which I might be identified will be published without my consent. The data will be discarded after the study is complete.

#### **VII. Withdrawal:**

Your participation in this research study is voluntary. You may withdraw from the study at any time, and your withdrawal will not involve penalty or loss of benefits.

For additional information about this research project, you may contact the Principal Investigator, Marnie Dutcher at 229-942-6140 or [dutcher\\_marnie@columbusstate.edu](mailto:dutcher_marnie@columbusstate.edu). If you have questions about your rights as a research participant, you may contact Columbus State University Institutional Review Board at [irb@columbusstate.edu](mailto:irb@columbusstate.edu).

I have read this informed consent form. If I had any questions, they have been answered. By signing this form, I agree to participate in this research project.

---

Signature of Participant

---

Date

## APPENDIX C

### Focus Group Interview Protocol

1. What are some positive aspects and strengths of the Georgia Standards of Excellence? (What do you like?) What are some aspects of the curriculum that concern you? (What do you dislike?)
2. What impacts you in the classroom every day? How do you think the Georgia Standards of Excellence have affected your everyday instructional practice?
3. If you experienced Common Core Mathematics curriculum, what were your experiences? Could you elaborate?
4. What would you say to an education policymaker regarding the Georgia Standards of Excellence? Did you have a voice in forming or responding to education policy, such as the Georgia Standards of Excellence? Why or why not?
5. What change has the Georgia Standards of Excellence brought about in your classroom?

## APPENDIX D

Institutional Review Board  
Columbus State University

Date: 1/18/17

Protocol Number: 17-047

Protocol Title: Middle and High School Teacher Perceptions of the Georgia Standards of Excellence Mathematics Curriculum

Principal Investigator: Marnie Dutcher

Co-Principal Investigator: Pamela Lemoine

Dear Marnie Dutcher:

Representatives of the Columbus State University Institutional Review Board have reviewed your research proposal identified above. It has been determined that the research project poses minimal risk to subjects and qualifies for expedited review under 45 CFR 46.110.

Approval is granted for one (1) year from the date of this letter for approximately 10 subjects. Please note any changes to the protocol must be submitted in writing to the IRB before implementing the change(s). Any adverse events, unexpected problems, and/or incidents that involve risks to participants and/or others must be reported to the Institutional Review Board at [irb@columbusstate.edu](mailto:irb@columbusstate.edu) or (706) 507-8634.

You must submit a Final Report Form to the IRB once the project is completed or within 12 months from the date of this letter. If the study extends beyond 1 year, you must submit a Project Continuation Form to the IRB. Both forms are located on the CSU IRB website (<https://aa.columbusstate.edu/research/irb/>). The completed form should be submitted to [irb@columbusstate.edu](mailto:irb@columbusstate.edu). Please note that either the Principal Investigator or Co-Principal Investigator can complete and submit this form to the IRB. Failure to submit this required form could delay the approval process for future IRB applications.

If you have further questions, please feel free to contact the IRB.

Sincerely,  
Amber Dees, IRB Coordinator  
Institutional Review Board  
Columbus State University

## APPENDIX E

## SCHOOL DISTRICT PERMISSION TO CONDUCT RESEARCH

November 17, 2016

Dear Institutional Review Board:

The purpose of this letter is to inform you that I give Marnie Dutcher permission to conduct the research titled *Middle and High School Teacher Perceptions of the Mathematics Georgia Standards of Excellence* at \_\_\_\_\_ High School, \_\_\_\_\_ Ninth Grade Academy, and \_\_\_\_\_ Middle School. This also serves as assurance that these schools comply with requirements of the Family Educational Rights and Privacy Act (FERPA) and the Protection of Pupil Rights Amendment (PPRA) (see back for specific requirements) and will ensure that these requirements are followed in the conduct of this research.

Sincerely,



APPENDIX F  
SCHOOL PERMISSION TO CONDUCT RESEARCH

November 17, 2016

Dear Institutional Review Board:

The purpose of this letter is to inform you that I give Marnie Dutcher permission to conduct the research titled *Middle and High School Teacher Perceptions of the Mathematics Georgia Standards of Excellence* at \_\_\_\_\_ High School. This also serves as assurance that these schools comply with requirements of the Family Educational Rights and Privacy Act (FERPA) and the Protection of Pupil Rights Amendment (PPRA) (see back for specific requirements) and will ensure that these requirements are followed in the conduct of this research.

Sincerely,

## APPENDIX G

## SCHOOL PERMISSION TO CONDUCT RESEARCH

November 17, 2016

Dear Institutional Review Board:

The purpose of this letter is to inform you that I give Marnie Dutcher permission to conduct the research titled *Middle and High School Teacher Perceptions of the Mathematics Georgia Standards of Excellence* at \_\_\_\_\_ Middle School. This also serves as assurance that these schools comply with requirements of the Family Educational Rights and Privacy Act (FERPA) and the Protection of Pupil Rights Amendment (PPRA) (see back for specific requirements) and will ensure that these requirements are followed in the conduct of this research.

Sincerely,

## APPENDIX H

### Demographic Questionnaire

- (1) What is your gender?
- (2) What is your age?
- (3) What is your highest level of education?
- (4) How many years have you been in education?

Specifically teaching mathematics?