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The Common Core to Common Folks: An Exploration of the Perceptions of High School Mathematics Teachers of the Common Core State Standards in Mathematics

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ACCEPTANCE

This dissertation, THE COMMON CORE TO COMMON FOLKS: AN EXPLORATION OF THE PERCEPTIONS OF HIGH SCHOOL MATHEMATICS TEACHERS OF THE COMMON CORE STATE STANDARDS IN MATHEMATICS, by ALFRED TAYLOR, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education and Human Development, Georgia State University.

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“THE COMMON CORE TO COMMON FOLKS”: AN EXPLORATION OF THE
PERCEPTIONS OF HIGH SCHOOL MATHEMATICS TEACHERS OF THE COMMON
CORE STATE STANDARDS IN MATHEMATICS

by

ALFRED TAYLOR

Under the Direction of Dr. Janice B. Fournillier

ABSTRACT

The authors of the Common Core State Standards in Mathematics (CCSSM) contend that the implementation of this framework is a much needed step towards the ability of the United States to remain globally competitive. This study examined the perceptions of mathematics teachers regarding the CCSSM, as well as the implementation of those standards and the implications for school leaders. Thirteen high school mathematics teachers in three different high schools in a large suburban school district in Georgia were involved in the study. An embedded single case study design was utilized to explore this issue. Data were collected from focus group interviews and document reviews of the CCSSM and other state standards in order to provide opportunities to triangulate the data. The triangulation process allowed for the crosschecking of data from multiple sources in order to increase the accuracy of the results and conclusions. The findings indicated that while the teachers were in favor of the CCSSM, there were several challenges with the implementation that skewed their perceptions and receptiveness of the standards.

INDEX WORDS: Common Core, Mathematics, Suburban, High School Teachers, Perceptions

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Alfred Taylor

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in

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Georgia State University

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2017

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DEDICATION

This work is dedicated to my wonderful wife, Erica, and two wonderful girls, Jeniah and Elon.

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There are a number of individuals who deserve to share in my success in both my professional and personal lives. The first is my mother. Even though she never achieved a college degree, she made it very clear that our destiny contained that achievement. Each degree I've earned has been a realization of her dream. The next acknowledgement is my wife. We met during the toughest time in my life as I was pursuing my first college degree. It is only fitting that she is by my side supporting me as I complete my final degree requirements. I would also like to acknowledge Dr. Hayward Richardson for encouraging me to continue. His encouragement initially triggered the desire in me to complete the degree requirement. My colleagues Drs. Tommy T. Welch, Dana Pugh, and Gene Taylor are also very much deserving of some recognition for their individual efforts to support my completion of this dissertation. Further, I would like to thank my focus group participants for their willingness to give their time and expert insights.

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LIST OF ACRONYMS

CCSS	Common Core State Standards
CCSSM	Common Core State Standards in Mathematics
CCSSO	Council of Chief State School Officers
ELL	English Language Learners
EOC	End-of-Course Assessment
GPS	Georgia Performance Standards
GSE	Georgia Standards of Excellence
GSU	Georgia State University
IRB	Institutional Review Board
MCPS	May County Public Schools
NGACB	National Governor’s Association Center for Best Practices
NCEST	National Council on Education Standards and Tests
NCTM	National Council of Teachers of Mathematics
NESIC	National Education Standards and Improvement Council
QCC	Quality Core Curriculum
RTTT	Race to the Top
SBR	Standards-based Reform
U.S.	United States

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1 THE PROBLEM

Recognizing the importance of ensuring that the United States (U.S.) produces high school graduates who are college and/or career ready, representatives from forty-eight states and the District of Columbia, convened for a joint effort to develop a comprehensive solution to address that need (Zimba, 2014). Participants at this convention included members of the National Governor's Association Center for Best Practices (NGACB) and the Council of Chief State School Officers (CCSSO) (Burks, Beziat, Danley, Davis, Lowery, & Lucas, 2015; Conley, 2014; Kornhaber, Griffith, & Tyler, 2014; Main, 2012; Robbins, 2013; Rothman, 2011; Zimba, 2014). The premise was to "anchor U.S. public education in a shared set of high academic standards" (Kornhaber et al., 2014, p. 3). The result of the collaborative effort of these school teachers, leaders, governors, and state commissioners was the launch of the Common Core State Standards (CCSS) in 2009 (Common Core State Standards Initiative [CCSSI], 2014; Conley, 2014; Kornhaber et al., 2014; Main, 2012; Zimba, 2014). The convention recognized that an apparent disconnect existed between our current, collective educational system and our intended student achievement outcomes, especially from a global competitiveness perspective (Kornhaber, Barkauskas, & Griffith, 2016; Rothman, 2011).

Despite the significant political uproar regarding the CCSS, this was not a clear cut "left versus right" issue. Initially, there was very mixed support and opposition that transcended political party lines (Henderson, Peterson, & West, 2015; Peterson, Barrows, & Gift, 2016; Peterson, Henderson, West, & Barrows, 2017; Rothman, 2011). As Henderson et al. (2015) suggested, however, the initial support for the CCSS has become more polarized along political lines. As Peterson et al. (2017) continued:

In 2012, the first year EdNext inquired about Common Core, 90% of those who took one side or the other said they favored the standards. But as shown in Figure 1a, it fell to just 50% in 2016. Republicans have made the largest shift. Their backing plummeted from 82% in 2013 to 39% in 2016. Democratic support has fallen to 60%. Still, Democrats, unlike Republicans, are more likely to back than to oppose Common Core. (p. 10)

Interestingly, despite being vocal supporters of the CCSS, the Democrats and President Obama's administration made an intentional effort to limit or at least distance their involvement in the development and the implementation of the standards (Lavenia et al., 2015; Rothman 2011).

Proponents for the CCSS claimed that because the standards would be the same across the states, it would help to promote improved equity in educational opportunities and outcomes for all students (Burks et al., 2015; Kornhaber et al., 2014). As Kornhaber et al. (2014) contended, "The policy entrepreneurs argued that students from lower-performing states, poverty, urban or rural environments, minority backgrounds, lower tracks, transient situations, and those who were English language learners should not confront education disadvantage in school" (p. 12). Zimba (2014) added, "the governors and state superintendents who joined in 2009 to create the Common Core State Standards wanted to adopt standards that could serve new purposes, principally, fostering college and career readiness and setting a globally competitive standard" (p. 1). However, Noddings (2007) stated, "Children are not equal in most capacities, and surely not in interests. Their educations, then, should differ. Plato, Rousseau, and Dewey all agreed on this. Indeed, we might argue that there is nothing so *unequal* in education as sameness" (p. 29).

Equity in educational opportunities was also linked and intertwined with economic vitality. As Kornhaber et al. (2014) stated, "policy entrepreneurs indicated that educational

equity was vital to economic well-being at the individual, national, and/or international level” (p. 12). Further, as they argued, this impact would create a positive domino effect that would reverberate across the country.

...the Common Core standards would spur economies of scale by enabling collaborations across states and districts. Such collaborations could produce aligned curriculum and professional development materials. In turn, because individual districts and states did not have to develop these resources, such resources might be more affordable and more accessible across disparate schools. (Kornhaber et al., 2014, p. 13)

Essentially, the “sameness” resulting from standardization was characterized by supporters as a panacea for the longstanding ills that have plagued our educational system. This idea was a central theme for the proponents and was used very effectively to garner a broad range of support for the CCSS (Kornhaber et al., 2016; Kornhaber et al., 2014).

However, the equity argument has significant inadequacies. Citing her own study of the national curriculum in Kenya, Branyon (2013) suggested that while the goals outlined by the CCSS create a consistent structure across all of the states that can enhance student learning outcomes, it “does not guarantee common educational experiences for all children” (p. 40). Further, Walker, Haiyan, and Shuang (2011) and Wanzare and Da Costa (2001) found similar evidence in their studies of the national curricula in China and Norway, respectively. Thus, even if standards are the same, their implementation differs across classrooms. As Branyon (2013) continued, this disconnect is primarily because despite having national standards, “Teachers still determine what types of learning opportunities students experience in the classroom” (p. 40). Further, as Darling-Hammond, Banks, Zumwalt, Gomez, Gamoran, Griesdorn, and Finn (2005)

found, “there is evidence that what occurs in different classes and schools in courses with similar names is substantially different in content, emphasis, and method” (p. 182).

There is another, separate layer to the issue that is tangentially related to fueling both of the debates above—the incorrect usage of the terms *curricula* and *standards* as interchangeable. There are frequent references to the CCSS and other standards as curriculum in the literature. In fact, Branyon (2013) opened by suggesting, “The introduction of the Common Core Curriculum in the United States has some worried that the country will have a national curriculum and remove control of education from the states” (p. 40). Conversely, as Calkins, Ehrenworth, & Lehman (2012) added, “Whereas national *standards* are helpful, our country is by no means ready for a national *curriculum*” (p. 68). But, what is the distinction? Curriculum, as defined in the literature by Darling-Hammond et al., (2005), refers to the “learning experiences and goals the teacher develops for particular classes” (p. 170). As they continued:

This conception of curriculum includes the *formal curriculum*, which outlines topics or concepts to be taught; the *enacted curriculum* as it occurs in the activities, materials, and assignments teachers select and develop, and in the interactions that occur between and among teachers and students. (Darling-Hammond et al., 2005, p. 170)

Conversely, standards, as defined in the literature, are “a list of learning goals” (Zimba, 2014, p.

1). As evidence of the disconnect in the literature, Noddings (2007) added:

Readers who look carefully at current standards will spot an important problem almost immediately. Instead of naming a topic or area of subject matter, standards specify exactly what teachers are expected to teach, and there is little acknowledgment of differences in students’ abilities or interests. (p. 50)

Noddings' (2007) assessment seems to suggest that standards should not only specify what teachers should teach but should have reverence for individualized students. Conversely, Jenkins and Agamba (2013), in alignment with Darling-Hammond et al. (2005), offered a succinctly stated and more widely accepted conception of the standards versus curriculum debate. They suggested, "Fundamentally, the CCSS identify *what* should be taught (learning objectives), not *how* the standards should be taught (methods and curriculum)" (Jenkins & Agamba, 2013, p. 71). Interestingly, the architects of the Common Core State Standards in Mathematics (CCSSM) concur with this sentiment as well (CCSSI, 2017; Rothman, 2011; Schoenfield, 2014). As they contended, "These standards do not dictate curriculum or teaching methods. For example, just because topic A appears before topic B in the standards for a given grade, it does not necessarily mean that topic A must be taught before topic B" (CCSSI, 2017, p. 5).

This distinction is relevant and informative to my study for two primary reasons. First, because curricula and standards are inherently different, without a prescriptive curriculum, the CCSS can never fully achieve the equity in access and outcomes that has been the main driver for its support. Even under the CCSS, states reserve the right to construct their individual curricula. As such, the learning experiences that are the most impactful on educational outcomes may vary significantly depending on the state's construction of its curriculum (Noddings, 2007). As Branyon (2013) suggested, Kenya's national curriculum "consists of detailed guidelines, syllabi, schemes of work (a year-long plan), and a comprehensive national exam" (p. 40). Conversely, the CCSS only identify the learning goals and provide no specific guidance as to how to get there (CCSSI, 2014). Secondly, because my study examined teacher perceptions of

the CCSSM, distinguishing between curriculum and standards isolates the CCSSM as the subject of study apart from any connected or related curricula.

Further, as Branyon's (2013) research demonstrates, even with a high level of prescription, eliminating all of the equity concerns is not possible. The two schools in her study were diametrically opposed in many areas (Branyon, 2013). As she described, "The first school was a for-profit, elite school located opposite the golf club and on a grand boulevard. The second school was run out of a church in a walled compound found on a dirt alleyway lined with garbage and rummaging goats" (Branyon, 2013, p. 41). In addition to access to vastly different resources, the schools, as she continued, were most different in terms of the teachers' expectations of the students. As is often the case, the teachers in the second school held much lower expectations for their students and subsequently created a much different learning experience (Branyon, 2013). She warned against attempting to generalize the findings of this study beyond the schools and teachers within the study, but a striking finding in her examination of Kenya's national curriculum has direct implications for the CCSSM as well:

Ultimately, all teachers should consider what beliefs and biases may drive them to perceive themselves or their students wrongly and whether they truly believe all children can learn. Simply implementing a common core curriculum will change very little until teachers determine that all children should have the same access to important content and support to learn. (National Governors Association, 2009, as cited in Branyon, 2013, p. 45)

Central to the notion of the CCSS is equity; however, the standards alone cannot reverse the disparate and unequal conditions evident in many of our nation's schools. As Noddings (2007) concluded, "At the very least, addressing the problem of poverty and its attendant ills should be

considered as one powerful (and perhaps orally obligatory) approach to reducing the achievement gap” (p. 35).

According to the Program for International Student Assessment (PISA) mathematics results from the 2015 administration, approximately 6% of students in the U.S. scored at the top levels of proficiency and approximately 29% performed at levels below basic proficiency (Kelly & Xie, 2013; National Center for Education Statistics, 2016). Mathematics performance of U.S. students, in large part, has illustrated significant deficiencies in sound conceptual understanding and the ability to take learned skills and apply them to solve problems (CCSSI, 2017; Rothman, 2011). However, a key component of the CCSSM is its claim to be more rigorous than previous state standards (Common Core, 2014; Conley, 2014; Robbins, 2013; Zimba, 2014). One of the primary distinctions of the expectations of the CCSSM as compared with previous standards is the shift towards skill application and away from just content memorization (Burks et al., 2015; CCSSI, 2014; Christinson et al., 2012; Zimba, 2014). The authors of the CCSSM suggest that to meet the rigor expectations of the standards, teachers will be required to alter and transform their instructional practice significantly (Burks et al., 2015; CCSSI, 2014; Rothman, 2011).

With arguably the most sweeping and far-reaching educational reform initiative in our nation’s educational history now in the hands of educators to move forward, the ultimate fate of the decades of work leading up to the CCSSM rests solely on how well the reform is translated into instructional practice. The central argument of the authors of the CCSSM is its claim to be more rigorous than most current standards and a step towards improving achievement in mathematics. The authors’ contention is that the CCSSM’s shift from content memorization to skill application is what is needed to improve our math achievement and ultimately our global competitiveness. They also contend that the CCSSM will promote equity in educational

opportunities for all students across the country and across all demographics. However, standards do not implement themselves; teachers, as the implementers of the standards, are central to the success of this initiative. So, how do teachers' perceptions of the standards influence their interaction with the standards in the classroom?

Research Questions

- 1) What are high school mathematics teachers' perceptions of the CCSSM and previous or other state standards in mathematics?
- 2) How do high school mathematics teachers perceive the level of rigor in the CCSSM as compared to previous or other state standards?
- 3) How do high school mathematics teachers perceive the appropriateness of the CCSSM for their students?
- 4) How do these perceptions influence their teaching and learning practices and behaviors in the classroom?

Purpose

The purpose of this study was to examine the perceptions of high school mathematics teachers regarding their valuation of the level of rigor inherent in the CCSSM, and how their perceptions of the appropriateness of the standards influenced their implementation of the standards. Further, this study examined the implications these perceptions posed for school leaders.

Significance of the Study

The significance of my study was multi-faceted. First, as Stronge, Richard, and Catano (2008) suggested,

One major emphasis in the educational arena in the early 21st century has been the continuing demand for greater accountability to increase student performance. National and state expectations require schools to ensure that all students achieve mastery of curriculum objectives, and local schools focus on implementing those requirements to the best of their ability. School accountability has transformed over the years and so have the expectations for student achievement and outcomes. (p. 3)

Matusevich, O'Connor, and Hargett (2009) (as cited by Hart Research Associates, 2005) suggested, "almost 90% of high school students stated that they would work harder if more was expected of them and less than 33% said their school set high academic expectations" (p. 45). The authors of the CCSSM crafted them as a response to the demand for the increase in student achievement and performance, and make the claim of providing a marked increase to the level of rigor present in most state standards (Peterson et al., 2016). This study examined teacher perceptions of that claim.

Secondly, in their study of middle school mathematics teachers' perceptions about the CCSSM, Davis, Choppin, Drake, and McDuffie (2014) noted that further research should be conducted relative to the CCSSM authors' assertions and claims about the rigor of the standards. Further, they call for more research on middle school teachers, as well as incorporating the perspectives of elementary and high school teachers for context and to explore differences (Davis et al., 2014).

Thirdly, in a similar study, Choppin, Davis, McDuffie, and Drake (2016) examined the impact of the CCSSM at the classroom level and examined the "association between district-adopted curriculum programs (e.g., *the designated curriculum*) [Remillard & Heck, 2014] and instruction that resulted when teachers used those programs to plan and enact lessons (e.g., *the*

enacted curriculum)” (p. 58). The Choppin et al. (2016) study focused primarily on the interaction between the teacher and her curriculum, programs, and materials, and how they influenced classroom implementation. However, my study concentrated on the teachers’ perceptions of “what” was expected to be taught (standards), instead of focusing on how the standards were to be taught (curriculum) (Darling-Hammond et al., 2005; Jenkins & Agamba, 2013; Noddings, 2007; Zimba, 2014). This nuanced difference was significant because without intentionally separating standards and curriculum in the conversation, it would be difficult to isolate and draw conclusions about teachers’ perceptions of the CCSSM, specifically. Thus, my study sought to add to the literature about how a teacher’s interpretation of his or her standards influences how he or she may interact with the curriculum.

Additionally, my study might benefit research participants’ self-reflection of how their perceptions/biases of the standards influence their implementation in their classrooms. For example, if teachers have negative perceptions of the standards, their level of interaction with the standards and the subsequent implementation in their classroom may be significantly impacted. As Choppin et al. (2016) suggested, teachers, under the CCSSM, have a significant role in the implementation of the standards as they work through the process to “interpret and implement the standards” (p. 58). As Darling-Hammond, Chung, and Frelow (2002) suggested in their study of teacher preparation programs, “Teachers who felt better prepared were significantly more likely ($p < .001$) to believe they could reach all of their students, handle problems in the classroom, teach all students to high levels, and make a difference in the lives of their students” (p. 294). Additionally, a teacher’s sense of preparedness correlates with his or her sense of self-efficacy (Darling-Hammond et al., 2002). For the purpose of this study, I defined self-efficacy as

“a teacher’s ability to achieve teaching goals” (Darling-Hammond et al., 2002, p. 296). As a result, a shift in their self-reflective practice might impact their future classroom practices.

Finally, the data collected from this study might influence policy-makers’ understanding of the importance of considering teacher perceptions in the construction of standards. Specifically, this study may broaden their understanding of how teacher perceptions impact the actual implementation in the classroom. Further, district and local school leaders might benefit from the data collected in the study as they craft implementation plans and professional development opportunities. Waters and Cameron (2007) suggested, “...simply knowing *what* to do is often not enough to transform schools and classrooms. Leaders also must know *why* certain practices are important, *when* they should be used, and *how* to apply them skillfully in their own schools and classrooms” (p. 1). Stronge et al. (2008) added that principals, as the instructional leaders in their respective buildings, carry an enormous burden of responsibility of not only monitoring the implementation of the CCSS, but also leading teachers through the instructional sea change. If the role of the principal as a change agent is a significant determinant for the successful implementation of the CCSS, the better principals understand how teachers interact with the standards, the better they can support their teachers (Stronge et al., 2008).

Assumptions and Limitations

As Rubin and Rubin (2005) suggested, “living and working together or even routinely interacting in a neighborhood or profession, people come to share some meaning, some ways of judging things” (p. 28). Because standards require teachers to first interpret them, their derived meaning is subject to that interaction. As such, this dynamic will be examined through a symbolic interactionism theoretical lens. Citing a postulation from Blumer, Crotty (2003) outlined “three basic interactionist assumptions”:

- ‘that human beings act toward things on the basis of the meanings that these things have for them’
- ‘that the meaning of such things is derived from, and arises out of, the social interaction that one has with one’s fellows’
- ‘that these meanings are handled in, and modified through, an interpretive process used by the person in dealing with the things he encounters.’ (p. 72)

To the first assumption, the CCSSM articulate the expectations for what teachers are responsible for and held accountable to teach. Consequently, teachers initially respond to the standards based on what they represent for them on a personal and professional level. To the second assumption, the meaning derived is influenced in part by other actors in a teacher’s circle, such as colleagues, administrators, students, etc. These interactions can be markedly different in terms of their realm of influence. For example, a teacher’s social interactions with colleagues that inform how meaning of the standards is constructed may produce a different result than interactions with his or her supervisor. Finally, to the third assumption, as a result of the aforementioned contexts, the teacher will interpret and act according to that interpretation. The symbolic interactionism theoretical lens opened the opportunity for me to understand how the teachers’ perceptions of the CCSSM influence their interpretation of the standards, and how they “act” or implement the standards. Bogdan and Bilken (2007) suggested,

A high school may have a grading system, an organizational chart, a class schedule, a curriculum, and an official motto that suggests its prime purpose is the education of the ‘whole person.’ People act, however, not according to what the school is supposed to be, or what administrators say it is, but rather, according to how they see it. (p. 28)

It is also worth noting that researchers using the interpretive constructionist approach naturally carry their own assumptions and biases. As opposed to expecting them to abandon those assumptions, Rubin and Rubin (2005) advised that researchers be “cautious lest they fail to hear the meaning of what the interviewees have said because their own cultural assumptions get in the way” (p. 29).

As my study examined teacher perceptions, another assumption is that the data collected from the participants was honest and truthful. As Rubin & Rubin (2005) suggested, “Interviewees should be *experienced and knowledgeable* in the area you are interviewing about” (p. 64). To that end, all interview participants included in this study were employed as high school teachers. To ensure that the data collected reflected a broad range of perspectives, the experience levels of the participants ranged from teachers in their first year and those who have taught for more than thirty years. Because this study was about mathematics specifically, to ensure that the participants were adequately knowledgeable, only current or former high school mathematics teachers were invited to participate. To further improve the credibility of the data, great lengths were taken to protect and to preserve participant confidentiality and anonymity. The specific procedures are outlined in chapter three. Participants were also informed and regularly reminded that they were volunteers and permitted to withdraw from the study at any time with no consequences.

Limitations

My role as a principal posed the most significant limitation to my study. Because of my experience as a principal, there was the high likelihood that I would be invited into discussions, be asked to share opinions and perspectives, and be asked to offer suggestions based on my personal experiences implementing the CCSS in my school (Bogdan & Biklen, 2007; Rubin &

Rubin, 2005). As such, it was of utmost importance that I placed an intentional focus on maintaining the balance between participation and observation as separate processes (DeWalt & DeWalt, 2002). Further, there was also the concern that there would be hesitation amongst the participants to share their open and honest perceptions from fear of reprisal if their principals were to learn of their thoughts. My position in the “ranks” of principals may have also heightened their anxiety in that regard. As such, participants were assured that they would not be directly identified in the study, and although their principals would have access to the finalized copy of the study, great lengths would be taken to protect their confidentiality. To further address this concern, teachers were interviewed in a group interview setting as opposed to being interviewed individually to create a more comfortable environment (Cheng, 2007; Cyr, 2016; Onwuegbuzie, Dickinson, Leech, & Zoran, 2009; Then, Rankin, & Ali, 2014). Study participants were reminded that their participation was entirely voluntary, and they were free to withdraw from the study at any time.

Finally and tangentially related to the limitation imposed by my role as a principal, a sharp criticism of qualitative research, specifically case studies, is that the data has the potential of being corrupted by the researcher’s biases and preconceived notions (Rubin & Rubin, 2005; Starman, 2013). As a principal with extensive knowledge of the CCSSM and responsible for ensuring and overseeing the implementation of the standards within my school, this limitation posed a serious threat. Citing findings by Sturman (1997), Starman (2013) provided safeguards that researchers could employ to improve the credibility of the study:

- Procedures for data collection should be explained, data collected should be displayed and ready for reanalysis;
- negative instances should be reported;

- biases should be acknowledged;
- fieldwork analyses need to be documented;
- the relationship between assertion and evidence should be clarified;
- primary evidence should be distinguished from secondary evidence, and description and interpretations should also be distinguished;
- diaries or logs should be used to track what was actually done during different stages of the study; and
- methods should be devised to check the quality of the data. (p. 41)

Using these guidelines, an intentional effort was taken and each of these points was thoroughly addressed to ensure that the study retained credibility despite the issues created by my biases and preconceived notions. The specific procedures utilized to address this limitation are outlined in chapter three.

Overview of the Study

In chapter two, I present a synopsis of relevant literature. I begin with a brief exploration of the history of the Common Core. While not directly connected to teacher perceptions, I contend that it is important to understand the rationale behind the previous efforts to develop state and national standards that influenced the creation of the CCSSM. Further, teachers' reflective perceptions of previous state standards may influence their interaction with the CCSSM. Thus, examining the history of the CCSSM provides a broader context in which to situate the teachers' perceptions. I also present a thorough review of the CCSSM that includes an evaluation of the claims of the authors and the prevailing critiques.

I present the conceptual framework and elaborate on the theoretical lens that informed my study in chapter three. In this chapter, I also explain the rationale for my chosen

methodology, case study, and expand on its use by providing additional supportive literature. I then detail the specific procedures followed during the study to close the chapter.

The findings from the study are presented in chapter four. In this chapter, I begin by revisiting the research questions and use them as a template for the analysis of the transcribed text from the focus group interviews. Where appropriate, data from the document review analysis is included to triangulate the focus group interview data.

In chapter five, I discuss the findings as they relate to the relevant literature and my research questions. I follow by providing conclusions and communicating gaps in my research findings that should be explored in future studies.

2 REVIEW OF THE LITERATURE

Historical Context

There is precedence in the history of the educational system in the U.S. highlighting both successful and unsuccessful attempts at developing nationally normed educational initiatives or standards-based reforms (SBR) (Conley, 2014; Kornhaber et al., 2016; Mulcahy, 1994; Rothman, 2011). One example of a successful attempt, interestingly, also provides insight as to why school buses are yellow. In 1939, a Columbia University Teachers College professor, Dr. Frank Cyr, convened a meeting with education and transportation officials from forty-eight states to review and refine standards for school transportation (“Why they aren’t purple,” 2013; Rothman, 2011). A national study of transportation options conducted at the time revealed significant threats to student safety as some students were transported in buses while others were transported in covered wagons (Rothman, 2011). Working through details outlining common size, safety requirements (i.e. the yellow color), etc., each of the states quickly adopted the newly

created standards (“Why they aren’t purple,” 2013; Rothman, 2011). These standards ultimately improved access to schools and led to changes making the school bus an easily and near automatically recognizable staple of public education (Rothman, 2011). The results of the transportation standards have had a tremendous impact on the opportunities for rural, special needs, and minority students’ educational opportunities. As Rothman (2011) suggests, the transportation standards, arguably “transformed American education” (Intro section, para. 6).

Academic standards began to appear in education discourse after *A Nation at Risk* in the early 1980s to serve as a call to action for educators that all children can learn (Gamoran, 2015; Hamilton, Stecher, & Yuan, 2012; Kornhaber et al., 2016; Lavenia, Cohen-Vogel, & Lang, 2015; Mulcahy, 1994; Noddings, 2007). In 1989, President George H. W. Bush convened the nation’s governors to discuss the current and future state of education and to set common goals (Kornhaber et al., 2016; Mulcahy, 1994; Rothman, 2011). Although the participants in this meeting acknowledged that education was the responsibility of the state and local jurisdictions, they also recognized the national implications of our educational system as it relates to our position in the global market (Kornhaber et al., 2016; Mulcahy, 1994; Rothman, 2011). Though there was a general mixed reaction to the attainability of the six proposed goals, the third goal significantly influenced the dominant narrative about national standards: “All children will leave grades four, eight, and twelve having demonstrated competency in challenging subject matter” (Rothman, 2011, Ch. 2, para. 4). The significance of this goal is that it opened a conversation regarding defining what constitutes a “challenging subject matter” or rigor (Lavenia et al., 2015, Rothman, 2011). Rothman (2011) added that the panel realized very early on that “they were not in a position to determine the status of the third goal” without the development of standards and assessments to measure progress (Ch. 2, para. 4). Thus, in April of 1991, President Bush

convened a separate advisory panel to explore the development of national standards and a national assessment (Kornhaber et al., 2014; Lavenia et al., 2015; Mulcahy, 1994; Robbins, 2013; Rothman, 2011).

This effort was initially met with significant resistance because of a variety of concerns, including how assessments had historically posed academic barriers to minorities (Darling-Hammond & Adamson, 2010; Gamoran, 2007; Rothman, 2011). As a result, Congress charged a commission, the National Council on Education Standards and Tests (NCEST) with the task of further exploring national standards and assessments (Lavenia et al., 2015; Mulcahy, 1994; Rothman, 2011). Interestingly, the culminating report not only affirmed the feasibility of national standards and assessments, but the commission also found that “high standards and assessments tied to them can promote educational equity, preserve democracy and enhance the civic culture, and improve economic competitiveness” (Rothman, 2011, Ch. 2, para. 22). However, before the report was published affirming support, the Bush administration commissioned funding grants and sent his America 2000 plan to the Democratic-led Congress in April of 1991 (Hamilton et al., 2012; Mulcahy, 1994). As a result, opponents to the idea of national standards began to gain traction in circles in- and outside of Congress, and were ultimately able to end the discussion (Kornhaber et al., 2016; Lavenia et al., 2015; Robbins, 2013; Rothman, 2011).

Using the America 2000 plan as a springboard, President Bill Clinton enacted his Goals 2000: Educate America Act in March of 1994 (Hamilton et al., 2012; Lavenia et al., 2015; Mulcahy, 1994; Robbins, 2013; Rothman, 2011). The Act added two goals to Bush’s America 2000, allocated monies for states to develop and measure progress towards standards, and was the “first to establish the idea of standards-based reform as the centerpiece of state and national education policy” (Rothman, 2011, Ch. 2). The act also authorized the creation of the National

Education Standards and Improvement Council (NESIC), which was charged to oversee the development and implementation of the standards (Mulcahy, 1994; Rothman, 2011, “National Standards,” para. 7). Before the NESIC was even able to assemble members, Republicans regained control of the House and Senate, and were able to obtain a repeal of the council (Rothman, 2011). In 1997, President Clinton staged a final attempt at developing a national test to “measure students in any part of the country against national standards” (Rothman, 2011, “Last Try,” para. 2). This effort, again, was stymied by opposition from both sides (Lavenia et al., 2015; Mulcahy, 1994; Rothman, 2011). These efforts have been credited with paving the way for President George W. Bush to develop and implement No Child Left Behind (NCLB), which expanded the federal reach by adding accountability measures to ensure that students were progressing appropriately (Hamilton et al., 2012; Kornhaber et al., 2016; Kornhaber et al., 2014; Robbins, 2013; Rothman, 2011).

Another example of a SBR movement, specifically related to mathematics, can be found by examining the efforts of the National Council of Teachers of Mathematics (NCTM) (Conley, 2014; National Council of Teachers of Mathematics [NCTM], 2014; Rothman, 2011; Schoenfield, 2016). Fueled by fervor to reform Mathematics instruction in schools in the 1960s and 1970s, the NCTM published, *An Agenda for Action: Recommendations for School Mathematics of the 1980s* (Madison, 2015; NCTM, 2014; Schoenfield, 2016). This publication outlined eight recommendations aimed at improving the quality of math instruction, and suggested that the proposals represented the beginning of a movement (NCTM, 2014; Schoenfield, 2016). As they suggested, “These recommendations are not the end of our efforts but a beginning. They represent an agenda for a decade of action, and we call on all interested

persons and groups to join us in a massive cooperative effort toward better mathematics education for all of our youth” (NCTM, 1980, intro).

Using *An Agenda for Action* as a catalyst, the NCTM later released a report in 1989 that attempted to promote “quantitative literacy” or the ability to apply “simple mathematical methods to the solution of real-world problems” (Madison, 2015, p. 3). Their efforts ultimately provided a framework for the development of national standards (Madison, 2015). While not to be mistakenly construed as a curriculum, the NCTM standards and recommendations were highly controversial and credited with sparking “math wars” due to the belief that they were unfocused (Rothman, 2011). However, they directly challenged the existing sentiment toward national standards, and were credited as being the catalyst and the model for as many as forty states to revisit their curricula and assessments (Education Next, 2012; NCTM, 2014).

The CCSS were developed as two exclusive components that were merged and integrated into the final product. Developed from an “end in mind” perspective, the standards that would be used to define college and career readiness were developed first, and ultimately became the anchor for the CCSS (Conley, 2014; Lavenia et al., 2015; Rothman, 2011; Zimba, 2014). Noddings (2007) suggests that “Policymakers and educators today often claim that all high school graduates should be ‘ready for college or work,’ as though preparation for the two very different worlds should be identical” (p. 32). The development of the college and career readiness standards was intended to address that prevailing criticism (Kornhaber et al., 2014; Rothman, 2011; Zimba, 2014). The authors then created a carefully crafted framework in English language arts, mathematics, and literacy in social studies, science, and technical subjects (Jenkins & Agamba, 2013). This framework specified the learning objectives per grade level based on “learning progression” research that describes “knowledge and skills within a subject area and

the sequence in which they typically develop over time” (Rothman, 2011, Ch. 4, para. 4). The published version of this framework was developed through committee and group work, and represents the final product of the CCSS (Rothman, 2011).

States were incentivized to adopt the CCSS with a couple of initiatives. First, interested states were being provided an opportunity to compete for a share of the Race to the Top (RTTT) grant funding (Kornhaber et al., 2016; Lavenia et al., 2015; Peterson et al., 2016). Private and nonprofit organizations such as the Bill and Melinda Gates Foundation also made substantial contributions to the effort to encourage states to adopt the CCSS, and also worked with states on the completion of their RTTT applications (Kornhaber et al., 2016; Rothman, 2011). Aside from monetary or consultation support, these organizations were involved and had influence in the RTTT process. For example, several staffers from the Bill and Melinda Gates Foundation received appointments to top policy advisor positions under Secretary of Education, Arne Duncan (Kornhaber et al., 2016). Kornhaber et al. (2016) added, “This alliance between philanthropic and government sectors was furthered by waivers from ethics rules issued by the Obama administration to allow the new federal appointees to continue conferring with their former employer, the Gates Foundation” (Kornhaber et al., 2016, p. 5). Secondly, interested states were also provided with waivers from the overbearing NCLB requirements (Peterson et al., 2016).

The interplay of private and public sector organizations, funding opportunities for already cash-strapped states, and federal incentives such as waivers from NCLB requirements raised suspicion and fueled the arguments of the opponents of the CCSS that there was too much federal involvement and coercion (Henderson et al., 2015; Lavenia et al., 2015; Peterson et al., 2016). Opponents argued that these measures proved that the suggestion that the CCSS was state

led and adopted voluntarily was a veiled attempt to actually push the adoption of federally constructed national standards (Lavenia et al., 2015; Peterson et al., 2016; Rothman, 2011). However, as Peterson et al. (2017) found, there has been insufficient evidence to support that states that won the RTTT had an unfair advantage and were able to develop higher standards than those who did not win the funding. Instead, as Lavenia et al. (2015) opined, proponents of the CCSS contended that “the momentum behind common education standards reflected states’ desires to ensure that their standards were internationally benchmarked, aligned with the knowledge and skills necessary to be college and career ready, and common across states, rather than the result of federal coercion” (p. 151).

Examining the Common Core Standards in Mathematics

Mathematics performance of U.S. students, in large part, has illustrated significant deficiencies in true conceptual understanding and the ability to take learned skills and apply them to solve problems (Conley, 2014; Rothman, 2011; Schoenfield, 2014). As it relates to our nation’s ability to remain globally competitive, the “evidence from international studies suggested that, compared to standards from high-performing countries, U.S. standards were ‘a mile wide and an inch deep’: they included a large number of topics without getting into any depth” (Rothman, 2011, Ch. 4, “Mathematics Standards” section, para. 1).

The NCTM rewrote their standards in 2000, attempting to address some of the criticisms of the first iteration with the inclusion of process standards (Madison, 2015). There is evidence in the CCSSM that the authors constructed them with the intention of ameliorating the deficiencies of the NCTM standards while continuing the conversation for national standards (Education Next, 2012; Rothman, 2011). The CCSSM were constructed by a three-person writing team that included Phil Daro, a longtime math educator and the 2014 recipient of the

Taylor/Gilbert award; William McCallum, a 2010 honoree by the American Mathematical society; and Jason Zimba, a former mathematical physicist and founding partner of a nonprofit organization, the Student Achievement Partners (Zimba, 2014). The writers were charged with using research and evidence of best practices when constructing the standards, and reviewing multiple data sources including the standards of high performing countries (Conley, 2014; Rothman, 2011; Zimba, 2014). Zimba (2014) outlined three significant differences of the CCSSM from previous attempts at the development of common state standards:

1) a clearly defined return of a focus on arithmetic in elementary as opposed to multitasking time with other areas thus better preparing students for future success, 2) a closer alignment to the standards of high-performing countries, and 3) a more authentic combination of “mastery of procedures, understanding of math concepts, and the ability to apply math to solve problems.” (p. 5)

The CCSSM are broken down into two main components: standards for mathematical content and standards for mathematical practices (Christinson et al., 2012; Davis et al., 2014; Larson, 2011; Lavenia et al., 2015; Rothman, 2011; Schoenfield, 2014; Zimba, 2014). The standards’ writers concentrated on the topics that were most important for students to learn, and left out peripheral topics to provide focus (Rothman, 2011; Zimba, 2014). To achieve coherence, the standards laid out a logical sequence of student learning from grade to grade that was intended to lead to college and career readiness by the end of high school (Rothman, 2011, Ch. 4, “Mathematics,” para. 1).

The standards for mathematical content represent the mathematics concepts students would need to master in order to be college and career ready. As Christinson et al. (2012) suggested, “Today, the term ‘college-and-career-ready’ is an educational ‘buzzword’” (p. 16).

Students who are college and career ready “should be successful in post-secondary studies, regardless of enrollment in a four-year university, a community college, or a career training program” (Christinson, 2012, p. 17). The standards for mathematical content are arranged by broad themes of mathematical skills and concepts that collectively provide a balanced college and career ready set of standards (Christinson et al., 2012; Madison, 2015). The domains, or conceptual categories, are number and quantity, algebra, functions, geometry, statistics and probability, and modeling. The domains are organized by grade level from grades kindergarten through eighth grade, and by conceptual categories in high school (Christinson et al., 2012; Rothman, 2011; Zimba, 2014).

The standards of mathematical practice “define what students should understand and be able to do in their study of mathematics” (Larson, 2011, p. 14). The standards of mathematical practice came about after the authors of the CCSSM conducted extensive research attempting to fully understand how students think and “learn mathematics and what that determination has on classroom practices” (Christinson, 2012, p. 47). The standards of mathematical practice are: 1) make sense of problems and persevere in solving them, 2) reason abstractly and quantitatively, 3) construct viable argument and critique the reasoning of others, 4) model with mathematics, 5) use appropriate tools strategically, 6) attend to precision, 7) look for and make use of structure, and 8) look for and express regularity in repeated reasoning (Christinson et al., 2012; Jones, 2016; Larson, 2011).

These standards were not intended to be mutually exclusive of the standards of mathematical content; the authors of the CCSSM intended for them to be integrated into the standards of mathematical content (Zimba, 2014). Further, the inclusion of the standards of mathematical practice represents an important and dramatic shift in instructional expectations.

This component adds an intense focus on the “soft skills” (i.e. communication, argumentation) that have largely been overshadowed by content mastery (Rothman, 2011; Zimba, 2014). As Christinson et al., (2012), suggested,

Before writing the Common Core State Standards for Mathematics, the authors had to examine research and come to an agreement as to how they think students learn mathematics and what impact that determination has on classroom practices. The Common Core’s standards for mathematical practice were a result of that process. (p. 47)

Critiques of the Common Core

The rallying cry or mantra of the CCSS has been that the standards are fewer, clearer, and higher than those existing currently in the overwhelming majority of state standards (Kornhaber et al., 2014; Rothman, 2011). This mantra served as the guiding principle when the standards were constructed. The first goal was to have fewer standards that teachers and students were accountable for in each grade level. Citing a study conducted by professors from the University of Pennsylvania, Education Next (2012) suggested that the goal to include fewer standards in mathematics than what states currently had was accomplished in the kindergarten through fifth-grade levels, but not in grades six through twelve. However, as outlined in a recent Fordham Institute report, although it does not directly refute the assertion, the report describes a number of instances that is seemingly contradictory to the claim of having fewer standards (Education Next, 2012). As noted in the report, “If one compares them to the better state mathematics standards like those of Minnesota or California, they are more numerous. Minnesota’s standards fill 42 pages and California’s 59 pages, while the Common Core takes 79 pages” (Education Next, 2012, p. 45).

The second goal of the CCSS was to provide a clearer understanding of the learning expectations of standards by adding more specificity in the language. The specific nature of the language was intended to reduce the likelihood of any misperception or misunderstanding that often arises from individual interpretations (Haager & Vaughn, 2013). Providing teachers with clear and specific language addressing the learning expectations of the standards is paramount. Merely reducing the number of standards without first effectively addressing the specificity of the language within does not necessarily mean teachers will have a “clearer” understanding. As Darling-Hammond et al. (2005) suggested,

standards articulate what children are expected to know and be able to do but do not typically set out how these goals might be achieved. Teachers need to be able to figure out how to organize their curriculum around the most important learning elements implied by the standards. (p. 184)

However, a study conducted by the dean of the University of Pennsylvania’s Graduate School of Education, found that, “Only one of our criteria for measuring focus found that the Common Core standards are more focused than current standards...Some state standards are much more focused and some much less focused than is the Common Core” (Education Next, 2012, p. 46). Further criticism related to the number of standards has been targeted at the perception that the standards are often presented in a disjointed manner. Another similar analysis found “the Common Core mathematics standards similarly repetitive, and hence as unfocused across elementary grades as the state content standards they attempt to replace, with only somewhat less redundancy in the middle grades” (Education Next, 2012, p. 46).

The third, and arguably most critical goal, was to ensure that the CCSS reflected a “higher” or more rigorous standard than what currently existed. As Rothman (2011) concluded,

the rationale was two-fold where the authors wanted to: 1) ensure they garnered sufficient support for their adoption, and 2) demonstrate a genuine commitment to adequately preparing students for college and career readiness, because proponents argued that a primary catalyst for the CCSS was the fact that most state standards were not rigorous enough. As Zimba (2014) suggested,

Critics of the standards make unscientific claims that the standards are ‘two years behind’ high-performing countries. But peer-reviewed research by a leading expert on international mathematics performance has compared the grades and topics on the Common Core to high-performing countries in grades 1-8. The agreement with high-performing countries was very high. Moreover, no state’s previous standards were as close a match to the high-performing countries as the Common Core. (p. 5)

Fraser (2015) offered a critical perspective to the true purpose of the third goal. He contended that the true intent was not to improve educational outcomes for students, but instead to merely transform schools into “publicly subsidized job training programs” (p. 111). He continued, “In calling for states to ‘fully adopt and implement’ the Common Core, the Business Roundtable speaks hardly at all about improving the quality of the country’s failing schools or even closing the so-called achievement gap, but rather of establishing a ‘pathway toward a more skilled, prepared workforce’” (Fraser, 2015, p. 110). He suggested that the solution to addressing our low ranking on international assessments is not through standards as the “United States has consistently placed ‘in the middle or bottom quartile’ on international tests of student reading and math skills ever since such tests were first created fifty years ago” (Fraser, 2015, p. 111). He suggested that the explanation for the performance is economic, not academic.

It is not incidental, in other words, that the countries where students consistently score higher than American students on international assessments are also the countries that consistently have lower relative rates of child poverty than the United States. But this is not an issue the business community wants to engage. (Fraser, 2015, p. 111)

However, the rigors, as the authors of the CCSS contended, allow for a focus on the content rather than the test. Although it remains a highly debated topic in current educational circles, the concept of increasing academic rigor is not a new idea, and was even prevalent in Dewey's work during the 1930s (Matusevich et al., 2009). Yet, the precise or exact definition of the concept of academic rigor is not readily available in the literature (Draeger, del Prado Hill, Hunter, & Mahler, 2013; Maye, 2013; Steinberg & Waspe, 2009). Further, what rigor explicitly means as the authors of the CCSS intended is ambiguous in the standards.

Towards Defining Rigor

Academic rigor, as inferred from the literature, is achieved when students are presented with a curriculum that provides them with an opportunity to develop the 21st-century core competencies and skills necessary to be successful in a global environment (Boston & Wolf, 2006; Matusevich et al., 2009). Specifically, as Boston and Wolf (2006) suggested, "This curriculum should provide students with regular opportunities to pose and solve problems, formulate hypotheses, justify their reasoning, construct explanations, and test their own understanding" (p. 5). MacLean and White (2013) provided a practical and theoretical definition of rigor. As they posited, "An example of practical rigor would require students to learn lists of definitions and concepts that must be repeated on a fill-in-the-blank or multiple-choice test. An example of theoretical rigor would require students to use a set of data or information to make inferences and interpretations regarding a particular topic" (MacLean & White, 2013, p. 103). As

Draeger et al. (2013) suggested, academic rigor is the byproduct when “academic rigor, active learning, meaningful content, higher-order thinking, and appropriate expectations” overlap (p. 272). However, as Wolfe (2015) opined (as cited in Zhao, 2012),

Freire (2000) warned homogenizing education, as now being seen as a result of the Common Core, will create an oppressing system in which the teacher becomes the depositor and constantly makes deposits of information students must receive and regurgitate in the formats instructed on the date and time of the depositor’s choosing. As students are trained to be passive learners and store more and more deposits, critical thinking, application, creativity, innovation, entrepreneurship, passion and the promotion of diversity are minimized. (p. 42)

Additionally, while the Fordham Institute’s review of the Common Core suggested that they may be higher than some state standards, it does not definitively endorse that claim altogether (Education Next, 2012).

Role of the Instructional Leaders

As the instructional leaders, principals take steps and processes to implement the CCSSM which will have an indelible impact on the success of the initiative. As Stronge et al. (2008) suggested, “leading instructional efforts in a school has evolved into a primary role for school principals” (p. 3). Marzano, Waters, and McNulty (2005) added that “Perhaps the most popular theme in educational leadership over the last two decades has been instructional leadership” (p.18). Because the CCSSM provide such a stark paradigm shift with regards to teaching and learning expectations, sound instructional leadership from the principal is paramount. In order to effect the much needed change in instructional practice, and meet the expectations for students

learning the CCSSM demands, the principal should apply a transformational leadership style through the Balanced Leadership Framework (Waters & Cameron, 2007).

Marzano et al. (2005) noted that transformational leaders are able to develop “a relationship of mutual stimulation and elevation that converts followers into leaders and may convert leaders into moral agents” (p. 14). Transformational leadership is characterized by four specific behaviors commonly referred to as the four I’s: individual consideration, intellectual stimulation, inspirational motivation, and idealized influence (Marzano et al., 2005; Stronge et al., 2008; Waters & Cameron, 2007). As Marzano et al. (2005) suggested,

The Four I’s of transformation leadership identified by Bass and Avolio (1994) are necessary skills for school principals if they are to meet the challenges of the 21st century. For example, the school leader must attend to those who seem left out (individual consideration). The effective school administrator must help staff members think of old problems in new ways (intellectual stimulation). Through a powerful and dynamic presence, the effective school administrator must communicate high expectations for teachers and students alike (inspirational motivation). Finally, through personal accomplishments and demonstrated character, the effective principal must provide a model for the behavior of teachers (idealized influence). (p. 15)

Transformational leadership will provide the principal with the foundational element to provide the structure for implementation of the CCSSM. Placing focus on the right work is critically important to ensuring schools are moving in the right direction (Marzano et al., 2005; Stronge et al., 2008; Waters & Cameron, 2007). In their meta-analysis of 69 leadership studies, Waters and Cameron (2007) found “a negative correlation between leadership and student achievement” due to a lack of focus on the right things (p. 21).

With regards to implementing the CCSSM, the principal must first focus attention on working with and providing ongoing professional development for teachers, to assist them with clarifying the expectations of the standards. Peery, Wiggs, Piercy, Lassiter, and Cebelak (2011) suggested that this is a critical first step as “‘Unwrapped’ standards provide clarity as to what students must know (concepts) and be able to do (skills)” (p. 8). Before teachers can effectively plan for instruction, they must first be clear about what they are expected to teach. Ideally, the principal should participate with teachers at the departmental or subject team level to evaluate, discuss, and “unwrap” the standards. By doing so, the principal should be attuned to all of the transformational leadership characteristics (Waters & Cameron, 2007). He or she must be sensitive to individual consideration as some staff, especially veteran staff, may be overwhelmed by the notion of the CCSSM. He or she must impart intellectual stimulation to help teachers to identify and understand where and how the shift in the standards could address current deficiencies and gaps. He or she must employ inspirational motivation to communicate confidence in the standards and confidence in the teachers. Finally, by participating in the unwrapping of the standards with the teachers, the principal is demonstrating idealized influence (Marzano et al., 2005).

Once the standards are unwrapped and teachers are clear on the “what,” the next step in the process is to shift focus to developing ongoing professional development opportunities for teachers on the “how.” As Rothman (2011) concluded, “the Standards in many cases call for quite different instructional expectations than teachers are accustomed to, so enabling teachers to understand what students will be expected to learn and how they can structure classrooms to bring about that learning will be critical to the success of the Standards” (Rothman, 2011, Ch. 4, para. 1). Keeping in mind the transformational leader characteristic, idealized influence, it is

important that the principal be a participant in the professional development. As Stronge et al. (2008) suggested, “effective principals don’t just arrange for professional development; rather, they participate in the staff training provided to their staffs” (p. 8).

However, Waters and Cameron (2007) suggested,

Simply knowing *what* to do is often not enough to transform schools and classrooms.

Leaders also must know *why* certain practices are important, *when* they should be used, and *how* to apply them skillfully in their own schools and classrooms. (p. 1)

Further, Walker et al. (2011) added that not clearly communicating this to principals will only “confuse the why and how of their application of leadership to the task of improving student learning outcomes” (p. 399).

One of the primary distinctions of the expectations of the CCSS when compared with previous standards is the shift towards skill application and away from just content memorization (Christinson et al., 2012; CCSSI, 2014; Marzano, 2012; Marzano, 2013; Perry et al., 2011; Rothman, 2011). This critical and necessary shift is not something teachers will inherently know how to do. As instructional leaders, principals must be properly prepared to lead the classroom transformation and be well-versed enough in the standards to ensure that they can appropriately monitor the implementation. As Germenten (2011) concluded, “The principals are school leaders, and the teachers are dependent upon how the principals interpret the manner in which the developmental and curriculum work should be carried out in the schools” (p. 18).

Interestingly, Walker et al. (2011) found hesitancy from some principals in their study of the national curriculum reform in China because their schools were relatively successful. The pressure from the accountability measures led them to attempt to preserve as much of their instructional programs as possible. Further, as Wanzare and Da Costa (2001) suggested, a “lack

of specific training and exercise in the techniques of instructional supervision presents a further constraint to the principal's role as instructional leader" (p. 278).

The final and ongoing step in the process is to develop a system of monitoring progress towards the implementation goals. This includes collecting and analyzing assessment data to benchmark progress on specific standards in relation to school, county, or state progress; visiting classrooms and providing immediate feedback to teachers; and using all of the available qualitative and quantitative data to inform the ongoing professional development (Stronge et al., 2008). Although some school cultures relate this type of monitoring as scrutiny, "effective leaders can raise the level of importance by looking for evidence that curriculum standards are taught through the review of formative assessments, grade books, team lesson logs, and student work" (Stronge et al., 2008, p. 11).

Ultimately, the leader has to understand that a dramatic transition such as the CCSS will be an ongoing task requiring not only a shift in classroom instruction, but also a shift in leadership. As the building leaders, principals are expected to set the vision, tone, and direction of the instructional program within the school (Germenten, 2011; Marzano et al., 2005; Stronge et al., 2008; Walker et al., 2011; Wanzare & Da Costa, 2001). However, as Germenten (2011) found in a study of the new national curriculum in Norway, principals are not inherently wired to understand their role in the implementation process of a curriculum reform movement. Germenten (2011) suggested that because "principals did not see it as their responsibility to implement the intentions of the new school reform," they merely "transferred the responsibility of the implementation and the efforts to work with the new curriculum to the teachers" (p. 21).

Summary

Several researchers, including the architects of the CCSSM, define standards as what should be taught and curriculum as how the standards should be taught (Calkins et al., 2012; CCSSI, 2014; Darling-Hammond et al., 2005; Jenkins & Agamba, 2013; Noddings, 2007; Zimba, 2014). For the purpose of this study, this distinction is relevant and informative as it isolates the CCSSM as the subject of study apart from any connected or related curricula. This will be elaborated on in a later part of this study.

Two past studies of the CCSSM found that there have been significant shifts in teacher perceptions of the CCSSM as more rigorous than previous iterations of standards. Both studies also called for additional research of the rigor claim to include other levels beyond just middle school (Choppin et al., 2016; Davis et al., 2014). Aside from calling for additional research on the assertions of the authors of the CCSSM (Choppin et al., 2016; Davis et al., 2014), these studies are important to my study as they focused on the interaction between the teacher and his or her curriculum resources, not on the standards themselves. As such, there is a significant gap in the literature as it relates to the intersection of standards and curriculum. Because standards and curriculum have been identified as connected but separate entities in the literature, and curriculum explains how standards are to be taught, my study sought to add to the literature about how a teacher's interpretation of the standard influences how he or she may interact with the curriculum.

Examinations of some countries, specifically Norway, Kenya, and China, that have national standards, have found that the standards themselves did not guarantee a common educational experience even in instances where there were high levels of prescription from syllabi, resources, instructional calendars, etc. (Branyon, 2013; Walker, Haiyan, & Shuang, 2011; Wanzare & Da Costa, 2001). The most influential factor in the process was the teacher because he or she

controls the learning opportunities for students (Branyon, 2013; Walker, Haiyan, & Shuang, 2011; Wanzare & Da Costa, 2001). These studies were important as they accentuated the importance of the teacher in the process and underscored the need for further exploration of how teachers interpret standards and form perceptions.

3 METHODOLOGY

Schwandt (2001) characterized methodology as the catalyst, the roadmap, and the glue of a study. As he suggested,

Methodologies explicate and define the kinds of problems that are worth investigating; what comprises a researchable problem, testable hypothesis, and so on; how to frame a problem in such a way that it can be investigated using particular designs and procedures; how to understand what constitutes a legitimate and warranted explanation; how to judge matters of generalizability; how to select or develop appropriate means of generating data; and how to develop the logic thinking problem-data-generation-analysis-argument.

(Schwandt, 2001, Methodology section, para. 2)

From this perspective, researchers should be intentional and thoughtful when selecting their methodology. Because the methodology serves as the source of stability, the researcher should consider if and how the methodology will be able to carry the study (Schwandt, 2001). With these considerations in mind, I chose to employ embedded single-case methodology to guide my study.

The goal of this study was to explore how teacher perceptions of the CCSSM influenced their classroom implementation. As Yin (2014) suggested, case study is designed to address “how” and “why” questions as it seeks to examine how a phenomenon exists within its real-world context. As he continued, “the central tendency among all types of case study, is that it

tries to illuminate a *decision* or set of decisions: why they were taken, how they were implemented, and with what result” (Yin, 2014, Definition of the case study section, para. 1). In this study, the “decision” or “set of decisions” is related to how teachers implement the CCSSM, which is ultimately influenced by how they understand and perceive the standards.

Yin (2014) identified five circumstances where a single-case design is warranted: 1) critical case—a case that represents a critical test of a theoretical proposition to determine if the proposition is correct; 2) unusual—a case that represents an extreme deviation from theoretical norms; 3) common—a case that reflects the occurrences of an everyday situation in order to add to the understanding of social processes; 4) revelatory—a case that exposes a phenomenon previously inaccessible to researchers; and 5) longitudinal—a specific case studied at two or more different points in time. The case being investigated in this study is how the teachers’ construction of meaning informs their perceptions and influences the implementation of the CCSSM in their classrooms. In an embedded single-case study, attention is given to a specific subunit or subunits within a case (Yin, 2014). Thus, the “case” being investigated is how this decision or set of decisions occurs in three different locations (Schwandt, 2001; Yin, 2014). Figure 1 is an illustration of my study design.

I initially considered using grounded theory as my methodology, but decided on case study because of its conception of theory development (Yin, 2014). Yin (2014) suggested that a preliminary theory is constructed first in case study, which distinguishes it from grounded theory. From the research that informed this study, there was strong evidence that theories regarding teachers’ perceptions and the influence on the interpretations of standards had already been developed (Choppin et al., 2016; Davis et al., 2014). Case study, then, allowed me to test and explore the nuanced details of this dynamic (Yin, 2014).

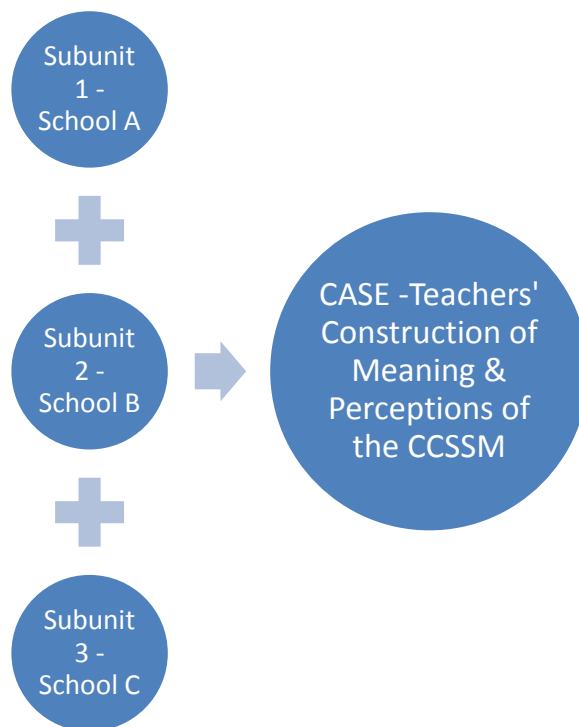


Figure 1. Embedded single-case study design.

A general limitation associated with case study is the concern that it is not rigorous (Yin, 2014). To address this limitation and the threat it poses to my study's validity, Yin (2014) suggested that researchers follow systematic procedures. He did, however, acknowledge that there is not an abundance of texts that cover case study research available (Yin, 2014). As such, I used the prescriptive design elements of his work in the model I emulated. Another limitation of case studies is that they are not perceived as generalizable (Yin, 2014). As Yin (2014) countered, case studies are generalizable to theoretical propositions but not to populations. The goal of case study research is to expand upon and generalize theories, and not represent a sample (Yin, 2014). Yin (2014) suggested generalizability is possible if the researcher commits to following prescriptive case study research designs. As such, I followed his design for my study. Case studies are also mistakenly considered as massive undertakings that require significant amounts of time to conduct (Yin, 2014). As Yin (2014) suggested, case studies are not bound by time. As

he continued, case studies, in this sense, are often confused with ethnographies (Yin, 2014). However, a high quality case study could be conducted without leaving the telephone or the internet, depending on the topic being studied (Yin, 2014).

I chose to use an embedded single-case study design as opposed to a multi-case study for a number of reasons. First, Yin (2014) suggested that single case can represent the critical test of a theory. In this instance, the symbolic interactionism theory is being tested as it relates to the meaning of the CCSSM constructed by the teachers. Yin (2014) also suggested that by definition, single-case designs are more appropriate for critical cases. Secondly, the embedded case study design places the focus on the larger unit of analysis and not on the subunits of study (Baxter & Jack, 2008; Yin, 2014). In this instance, the focus was on testing the theory against the case and not on the particular subunits. Data in a multi-case design would be presented with the site as the focus as opposed to the focus being on the larger unit of analysis (Baxter & Jack, 2008; Yin, 2014). Finally, the focus of the study was not for replication as is often the purpose of multi-case studies. Yin (2014) highlighted a critical limitation and potential threat to a study's validity using this design model. Specifically, researchers using this design inadvertently make the subunit of analysis the focal point of the study and fail to relate the data back to the larger unit of analysis (Yin, 2014). To address this potential threat, careful attention was paid to not bring undue focus and attention to the particular sites, and the results were communicated through the lens of the case.

Data collection methods for this study included focus group interviews and document reviews. However, the primary data collection method was focus group interviews. I chose to employ focus group interviews as my primary data collection method for a number of reasons. First, the theoretical framework used to guide my study suggests that meaning is constructed

socially. As found in the literature, one of the advantages of focus group interviews over individual interviews is the social dynamic present in a group setting (Cheng, 2007; Connelly, 2015; Cyr, 2016; Onwuegbuzie et al., 2009; Then, et al., 2014; Yao, 2015). Connelly (2015) suggested that it is a preferred method to examine a phenomenon within the context of a social experience. Cyr (2016) suggested participants in a focus group work together to make meaning of more complex or cognitively challenging concepts. Yao (2015) (as cited in Carey & Asbury, 2012, p. 17) posited, “Focus groups ‘capitalize on the interaction among the group members to enhance the collection of deep, strongly held beliefs and perspectives’” (p. 52). Utilizing focus groups, then, provided me an opportunity to also collect data on the interactions of the group during the interviews.

Secondly, a focus group structure addressed a concern raised by the Georgia State University (GSU) Institutional Review Board (IRB) regarding my study. The GSU IRB initially responded with some concerns about the unnecessary risk my study could place on the participants. Focus group interviews have been found to provide a safer and more comfortable environment for participants (Cheng, 2007; Cyr, 2016; Onwuegbuzie et al., 2009; Then et al., 2014). Further, as Then et al. (2014) suggested, because focus groups can facilitate greater anonymity, they may invite participants to open up more.

Finally, focus group interviews have been found by several researchers as strong enough to stand independently as a data collection method or can be used as an auxiliary method (Cheng, 2007; Connelly, 2015; Onwuegbuzie et al., 2009; Then et al., 2014). However, there is strong opinion in the literature that while it can be used as a primary method, it is best used in conjunction with other data collection methods (Cheng, 2007; Connelly 2015; Onwuegbuzie et al., 2009; Then et al., 2014). There were approximately fifty pages of transcribed data collected

over the three subunits used to inform the case. Because Yin (2014) suggested that using a singular data source is not recommended with case study, the focus group interviews were paired with document analysis.

As is a general limitation with focus group interviews, there was the potential for the particular group dynamic to influence the data and overwhelm individual perspective and insights (Bogdan & Bilken, 2007; Cheng, 2015; Corbin & Strauss, 2015; Yao, 2015). This limitation was further complicated because the interviewees at each site were, at least, acquaintances as they were coworkers within the same department at the same school. As Cheng (2015) suggested, “There is no principle defining whether all the participants involved should be completely strangers or acquaintances” (p. 382). He continued, “If the subjects required by a research purpose are people in the same institution or organization, it will be hard to avoid acquaintances” (Cheng, 2015, p. 82). Because the purpose of this study was to explore the perceptions of high school mathematics teachers of the CCCSM, it was, as Cheng (2015) suggested, difficult to avoid acquaintances as teachers were recruited for participation in the focus groups in their respective schools. As such, deliberate efforts were taken to triangulate data with the document review and the data from the other focus groups during the data analysis segment.

The study included three sets of focus group interviews of high school mathematics teachers during the fall semester of 2016 at three different schools in a large, suburban district in Georgia. There were a total of thirteen high school mathematics teachers of varying levels; each focus group had between four and six teachers. There is much debate in the literature regarding the appropriate number of sites in a case study, as well as, the appropriate number of focus group participants (Cheng, 2007; Cyr, 2016; Onwuegbuzie et al., 2009; Then et al., 2014). Case study

data is not intended for the purpose of generalizing to a population as would be the case in a quantitative study. As such, there is not the necessity of a substantial pool of study participants (Connelly, 2015; Then et al., 2014; Yin, 2014). Additionally, while there is much variation in the literature regarding the ideal focus group size, the consistent range is between four and fourteen individuals (Cheng, 2007; Connelly, 2015; Onwuegbuzie et al., 2009; Then et al., 2014).

As Then et al. (2014) offered, "A group that is too large often prevents individuals from participating and sharing while a group too small may not provide enough diversity within the group to gather useful information" (p. 18). Thus, a study with a total of thirteen participants over three different sites could adequately address the consideration mentioned above. To further address this concern, a semi-structured interview protocol was developed and implemented (see Appendix B) (Cheng, 2007; Then et al., 2014). Because the session was being recorded for transcription at a later time, I served as the moderator to ensure that the conversation stayed on task and that introverted individuals were invited into the conversation when and where necessary (Connelly, 2015; Onwuegbuzie et al., 2009; Then et al., 2014). Each focus group interview was transcribed with the individual participant's dialogue recorded (Cyr, 2016; Onwuegbuzie et al., 2009). Onwuegbuzie et al. (2009) suggested that most focus group theorists use the group as the unit of analysis, but "Focus group data can arise from one of the following three types: individual data, group data, and/or group interaction data" (p. 5). The transcription of each participant's responses allowed the participants to have an opportunity to address any miscommunicated thoughts or perspectives. It also allowed me to examine a specific participant's comments in relation to other comments he or she and other interviewees made throughout the focus group interview (Cyr, 2016; Onwuegbuzie et al., 2009).

The document analysis data collection method consisted of reviews of the current and former mathematics standards in Georgia, as well as mathematics standards from other Common Core and non-Common Core states. The documents from Georgia included the Quality Core Curriculum (QCC); the Georgia Performance Standards (GPS), which replaced the QCC; the Georgia Standards of Excellence (GSE), which is Georgia's adoption of the CCSSM; and the instructional calendars and pacing guides from the local school district in the study. The current mathematics standards from other Common Core states including Alabama, Florida, Louisiana, Mississippi, and North Carolina were also analyzed. For additional context, the mathematics standards from some non-Common Core states including Indiana, South Carolina, and Virginia were also included. The primary purpose of the document analyses was to provide triangulation for the data collected during the focus group interviews. Yin (2014) suggested:

First, to cover the complexity of a case and its context, a case study evaluation should rely on multiple sources of evidence, which may include interviews, documents, field observations, archival records, physical artifacts, and participant-observation. A case study evaluation should deliberately triangulate the evidence from these multiple sources, to confirm and corroborate the findings. (Ch. 1, "Case Study Research as an Evaluation Method section," para. 3)

The analyses of the documents was done to corroborate specific claims made by the authors of the CCSSM and from the focus group participants. For example, claims that the CCSSM have more standards than other iterations were frequently made throughout the study and were the subject of a specific document review focus. To assist in the document review process, a spreadsheet was developed to organize the data for easier comparisons across the different sets of standards (see Appendix A).

Conceptual Framework

My study was framed by a constructionism epistemological view. As Crotty (2003) explained, “What constructionism claims is that meanings are constructed by human beings as they engage with the world they are interpreting” (p. 43). A salient theme found in the research studies that informed this study was the role of the teacher and how his or her interpretation of the standards influenced the implementation in the classroom. A constructionist view, then, would frame focus on how the teachers’ perceptions of the CCSSM informed the meaning they constructed. Thus, a constructionist epistemology allowed the perspectives of the teachers to be accurately captured and provided them agency and a voice as their “truths” were explored. With regards to this study specifically, “truth” is related to the perceptions of whether the CCSSM provide more rigor than previous standards and whether the standards are appropriate for their students. As Davis et al. (2014) suggested,

Standards do not implement themselves in classrooms (CCSSI, 2012). Teachers must read these standards, interpret them, and with questions around the alignment of curriculum materials and the standards (Sawchuk, 2012; Wu, 2011) they must locate, adapt, or create activities that are designed to provide students with opportunities to learn both content standards and the standards for mathematics practice. (p. 12)

Thus, the teachers’ perceptions of the CCSSM and the subsequent quality of their implementation in the classroom were predicated on this interaction.

The theoretical framework used to inform my study is symbolic interactionism. As defined by Blumer, symbolic interactionism suggests that people are active participants in the shaping of their world and not just subjects of predetermined realities (Crotty, 2003). Instead, people exist in a world with physical, social, and abstract objects to which we assign meaning

through our interaction (Crotty, 2003). It also suggests that the construction of reality is not an isolated, independent phenomenon; it is social and developed through interaction with others (Crotty, 2003). In other words, a person's conception of reality or meaning is not directly developed through his or her own, individual interaction with an object. It is contrived indirectly through the lens of different perspectives (Crotty, 2003). Applied to my study, symbolic interactionism illustrates that the perceptions a teacher garners from interaction with the CCSSM standards is not an individual construct but a social one. Citing Blumer, Crotty (2003) identified "three basic interactionist assumptions":

- 'that human beings act toward things on the basis of the meanings that these things have for them'
- 'that the meaning of such things is derived from, and arises out of, the social interaction that one has with one's fellows'
- 'that these meanings are handled in, and modified through, an interpretive process used by the person in dealing with the things he encounters.' (p. 72)

To the first point, teachers act towards standards from the basis that they serve as the guide or roadmap for their particular subject and as the source of their accountability structures (i.e. standardized assessments, evaluations, pay). To the second point, the social interaction includes interactions and shared interpretations with state and local officials, colleagues, administrators, instructional coaches, students, etc. Finally, these meanings are filtered through an interpretive process. As such, although standards are constant, the meaning derived as a result of this interpretive process is variable.

There are a few other theories that guided specific elements of my work. First, because I sought to understand how teacher perceptions ultimately influenced teaching and learning

behaviors in the classroom, it was important to situate the data collected around a learning theory related to the CCSSM that would contextualize specific, expected classroom behaviors and practices. The Five Properties of Powerful Mathematics classrooms (Schoenfield, 2014) was used both in the data collection process to inform the construction of the focus group protocol and in the data analysis process. Although not a specific research question or objective, there are natural implications for school leaders of this work. As such, the Balanced Leadership Framework (Waters & Cameron, 2007) was utilized to explain critical leadership functions that would have an impact on the implementation of the CCSSM.

Participants

Each of the 13 participants recruited for this study were high school mathematics teachers employed at three different schools in a suburban school system near a major city in Georgia. Table 1 illustrates the breakdown of the study participants. The participants who volunteered for potential inclusion in the study represent a wide array of experience levels and high school mathematics subjects. The individuals were selected for inclusion if they met the following criteria: 1) they were a current mathematics teacher or taught mathematics within the past two years in any instructional setting (regular education, special education, etc.); 2) they were currently employed in a high school or had high school teaching experience within the past two years; and 3) they were in a mathematics teaching role under the CCSSM. There were a total of 16 volunteers for the study, of which 13 met the criteria and were selected for inclusion.

The pseudonym for the school system is May County Public Schools (MCPS). MCPS is a large, majority minority school district that has received numerous accolades for closing the achievement gap and sustaining high levels of student achievement across subgroups. Demographically, May County is 32% Black, 30% Hispanic, 24% White, 10% Asian, and 4%

Multi-racial. With regards to specialized program enrollment, 13% receive special education services, 17% are English Language Learners (ELL), 14% are gifted, 55% qualify for free and/or reduced lunch, and 46% of the schools in MCPS have Title I designations. My initial selection of sites was randomized among the high schools in the county. Each school was assigned a number and three schools were selected using an online, random number generator. The first three schools selected came back as Title I schools. However, because MCPS IRB suggested having at least one school that was not Title I to prevent poverty level from skewing the results, an additional randomized selection was made for the addition of the non-Title I school using the non-Title I schools as the pool.

Table 1

Study participants and school locations

<u>Participants</u>	<u>High School</u>	<u>Experience (years)</u>	<u>Subjects taught</u>
Abel	Hilltop	30	Algebra II
Amy	Ridgeway	14	Algebra I, Algebra I Strategies
Camila	Hilltop	3	Algebra I
Erica	Eastside	12	Special Education Math
Jack	Ridgeway	< 1	Geometry
Jasmine	Hilltop	26	Algebra I
Marcus	Hilltop	16	Algebra I
Mary	Eastside	13	Algebra II
Morgan	Eastside	28	Precalculus, AP Statistics
Pamela	Eastside	4	Algebra II
Phoebe	Ridgeway	10	Algebra I, Geometry, Algebra II
Tammy	Eastside	19	Geometry
Vanita	Ridgeway	6	Algebra II

Sites and Study Participants

Ridgeway High School is a Title I high school near the central part of MCPS. This study included four staff members from Ridgeway High School's mathematics department: Phoebe, Vanita, Jack, and Amy. Phoebe is a ten-year veteran and teaches Algebra I, Geometry, and Algebra II. Vanita has been teaching for six years and teaches Algebra II. Jack is a first-year teacher and teaches Geometry, and Amy is in her fourteenth year of teaching and teaches Algebra I and Algebra I Strategies. Hilltop High School is a Title I high school in the southwestern portion of MCPS. There were four participants from Hilltop High School's mathematics department included in this study: Camila, Jasmine, Marcus, and Abel. Camila is a third-year teacher and teaches Algebra I. Jasmine has been teaching for twenty-six years and also teaches Algebra I. Marcus has been teaching for sixteen years and teaches Algebra I, and Abel is in his thirtieth year of teaching and teaches Algebra II. Eastside High School is a non-Title I high school located in the southeastern section of MCPS. This study included five participants from Eastside High School: Tammy, Morgan, Erica, Pamela, and Mary. Tammy is in her nineteenth-year of teaching and teaches Geometry. Morgan has been teaching for twenty-eight years and teaches Gifted Precalculus and AP Statistics. Erica teaches special education math and has been teaching for twelve years. Pamela is a fourth-year teacher and teaches Algebra II, and Mary also teaches Algebra II and is in her thirteenth year of teaching.

Instruments

The primary instrument used in my study was a predesigned interview protocol for the focus group session (Cheng, 2007; Then et al., 2014). The protocol consisted of three primary components: 1) Questions about the CCSSM, 2) Questions about Rigor, and 3) Questions about Classroom Implementation. The focus group protocol can be found in Appendix B. The

“Questions about the CCSSM” section was intended to examine the general perceptions of the CCSSM in relation to previous state or other standards. As Choppin et al. (2016) found, “Teachers’ initial interpretations of the CCSSM, when compared to previous state standards, were that the CCSSM required a greater emphasis on problem-solving, discovery, communication, and conceptually-driven instruction” (p. 58). This replicative set of questions was intended to expand upon their study’s data set to compare and contrast the perception data collected in mine (Choppin et al., 2016).

The “Questions about Rigor” section was intended to assess teachers’ general perceptions about what rigor is and what it looks like in instructional practice. Mixon and Stuart (2009) opined that America’s public schools have not responded to the increased challenges of the global market by adequately preparing students for those demands. At the root of the issue, they contend, is the lack of rigor in state standards (Mixon & Stewart, 2009). Additionally, these questions were intended to determine how closely the teachers’ perceptions of rigor aligned to practices where “students are expected to make decisions about the implementation of procedures, determine points of view, evaluate and critique these points of view against specific criteria, and create alternative perspectives based on conceptual understandings” (Maye, 2013, p. 30).

The “Questions about Classroom Implementation” section was intended to assess how, if at all, the teachers altered their instructional practices as a result of the CCSSM. The quality of the opportunities and experiences that teachers are able to create for students who struggle and grapple with mathematical concepts is commensurate with the growth they will demonstrate. As Schoenfield (2014) articulated, there are five properties generally associated with classrooms that produce the strongest mathematically-minded students:

- *High quality content and practices.* Students have the opportunity to grapple with powerful ideas in meaningful ways, developing and refining skills, understandings, perseverance and other productive “habits of mind” as they do.
- *Meaningful, carefully structured challenge.* Solving complex problems takes perseverance; students should neither be spoon-fed nor lost. In powerful classrooms, students are supported in “productive struggle,” which helps them build their mathematical muscles.
- *Equitable opportunity.* We’ve all seen the classroom where the teacher moves things along by calling on the few kids who “get it,” leaving the rest in the dust. It shouldn’t be that way. In the kind of classroom that lives up to the standards, all students are productively engaged in the mathematics.
- *Students as sense-makers.* In powerful classrooms, students have the opportunity to “talk math,” to exchange ideas, to work collaboratively, and build on each other’s ideas (just as in productive workplaces). In contrast to classrooms where students come to learn that they’re not “math people,” students in these classes come to see themselves as mathematical sense makers.
- *A focus on building and refining student thinking.* In powerful classrooms the teachers know the mathematical terrain and how students come to understand that content so well that they can anticipate common difficulties, look for them, and challenge the students in ways that help them make progress, without simply spoon-feeding them. (p. 738)

These five priorities were intended to provide a framework for analyzing the data about this set of questions.

Procedures

With prior approval from the Georgia State University (GSU) Institutional Review Board (IRB) and the MCPS IRB, the principals of each of the study sites were emailed to receive approval to include their teachers in the study. The email included my permission forms from GSU and MCPS and a basic overview of the study's purpose and goals. Once each principal granted approval to use his or her school, participants were recruited with an email announcement forwarded by each of the site principals to their respective mathematics departments. The same recruiting template email was sent to each of the site principals on November 17, 2016. The email outlined the exact date and time for each site's focus group interview. A screenshot copy of both of the actual emails sent to the principals with identifiable names and locations redacted can be found in Appendix C. Attached to the emails were both the official copies of my MCPS IRB approval letter as well as the approved Informed Consent form from GSU. The Informed Consent form can be found in Appendix D.

All focus group interviews took place at the participants' school location at 2:30 pm, after school hours, during the first 2 weeks of December. Respondents were requested to reply to the invitation to participate by November 30, 2016, approximately 2 ½ weeks after the invitation to participate was sent out. Each principal was asked to secure a location in his or her schools for me to conduct the focus group interview; all three sessions were held in small conference rooms located near or in the front office. While volunteers were not offered an additional incentive for their participation, light refreshments (i.e. pastries and soft drinks) were provided during each of the interview sessions.

Before the start of each session, I collected signed Informed Consent from participants and answered general questions if posed. To prevent anyone from being denied permission to

participate, extra Informed Consent forms were brought for participants that may have forgotten to bring along a signed copy. Signed Informed Consent forms have been filed in a locked cabinet in my home office. I also provided the participants with an overview of the purpose of the study, basic procedures for the interview regarding my role as the moderator, the steps that would be taken to protect their confidentiality, and the next steps after the interview ended.

With regards to what was shared concerning the purpose of the study, I read the purpose of the study as explained in the script of the focus group protocol (see Appendix B). I also encouraged the participants to share their open and honest feedback to ensure that the purpose of the study was fully realized. I reminded the participants that the session was being audio recorded and explained that a transcribed copy of the interview would be provided for their review. I also explained that several measures had been employed to protect their confidentiality and anonymity: 1) site principals were neither provided a list of the confirmed participants at their schools nor permitted to participate in the interview; 2) each participant would be assigned a pseudonym; and 3) each participant had an opportunity to review the interview transcript and request edits of any of the transcribed text. A screenshot copy of the Participant Pseudonym Information form with identifiable names and locations redacted can be found in Appendix E. Finally, participants were informed that they would receive a copy of the transcribed interview within one week and would be provided an additional week to review the content and request any edits. A screenshot copy of the email with the transcribed focus group interview sent to each school with identifiable names and locations redacted can be found in Appendix F.

The interviews were recorded using an Olympus WS-852 digital voice recorder. An additional Olympus voice recorder and batteries were brought in the event that technical issues developed during the course of the interviews. Each of the 3 focus group interviews lasted

approximately 45 minutes. Ridgeway High School's interview, labeled as tape ID "File A #1," was approximately 46 minutes in length. Hilltop High School's interview, labeled as tape ID "File B#1," was also approximately 46 minutes long, and Eastside High School's interview, labeled as tape ID "File C#1," lasted approximately 45 minutes. No software was used during the transcription process; I did all of the transcription by hand. Each individual interview took approximately 5 ½ hours to transcribe. Once all edit requests to the transcript were completed, the audio data on the digital voice recorder was destroyed. Hard copies of each interview transcript have been filed in a locked cabinet in my home office and will be kept for five years before they are destroyed as well.

A cross-subunit analysis of the focus group data was conducted using the constant comparative analysis (Corbin & Strauss, 2015; Glaser & Strauss, 1967; Onwuegbuzie et al., 2009). Onwuegbuzie et al. (2009) suggested that although the method was originally used in Grounded Theory, it has applicability in various arenas including focus group data analysis and is generally structured into three stages. A list of coding categories was developed including codes for settings, perspectives, structural codes, etc., to provide a "means of sorting the descriptive data" (Bogdan & Bilken, 2007, p. 189). A flowchart illustrating the data analysis process utilized is found in Figure 2. As Onweugbuzie et al. (2009) (as cited in Corbin & Strauss, 1989) explained,

During the first stage, (i.e. open coding), the data are chunked into small units. The researcher attaches a descriptor, or code, to each of the units. Then, during the second stage (i.e., axial coding), these codes are grouped into categories. Finally, in the third and final stage (i.e., selective coding), the researcher develops one or more themes that express the content of each of the groups (pp. 5-6)

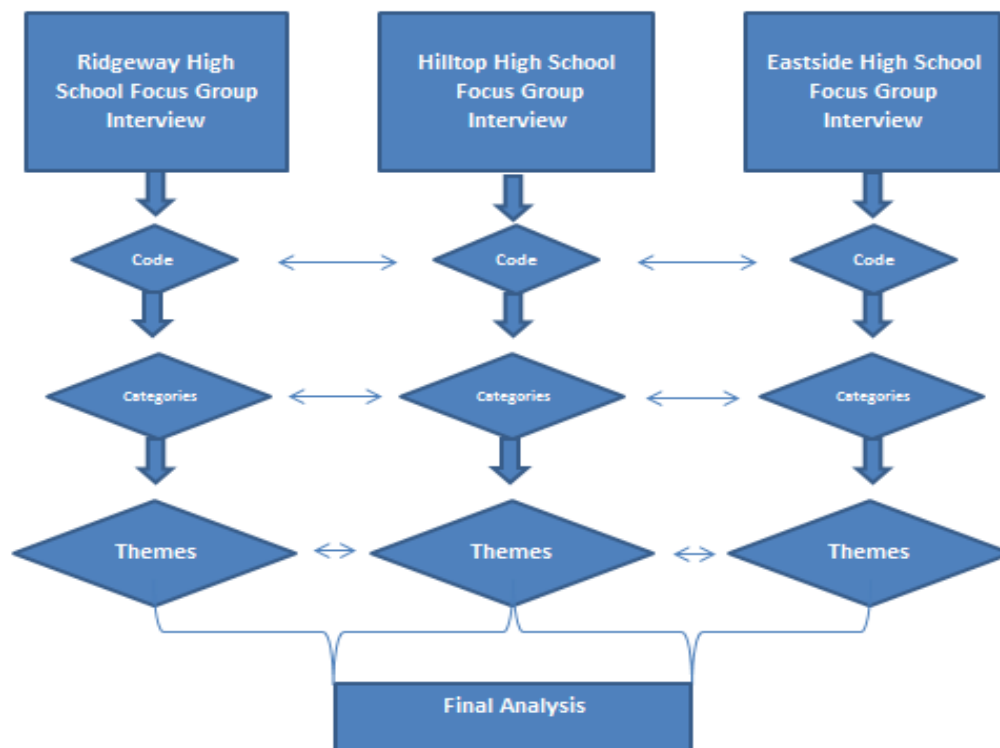


Figure 2. Constant comparative analysis method flowchart of focus group interviews within an embedded single-case study.

To further assist in the data analysis process, a tool (found in Appendix G) adapted from one created by Onwuegbuzie et al. (2009) was used to graphically organize the data collected by juxtaposing the posed questions with the responses from each of the focus group participants per school. This tool was used to facilitate and ease the data comparison process. As Corbin and Strauss (2015) suggested, “comparisons allow researchers to reduce data to concepts, to develop concepts in terms of properties and dimensions, and to differentiate one concept from another” (p. 94).

In order to be able to draw conclusions induced from the data, an extensive data analysis was conducted. DeWalt and DeWalt (2002) contended that “there is no substitute for reading and rereading field notes and transcripts, each time with a particular question in mind” (p. 163). As

such, an extensive overview of all of the notes and transcripts was conducted to not only identify themes, but also to reduce the data to focus on the most relevant strands. While there are a number of software programs that can be used to facilitate the process, I chose to do all the analysis myself to improve my familiarity with the data and the subsequent themes that were extricated (Bodgan & Bilken, 2007). However, to ensure the validity of the data, I employed a delicate, intentional focus on mitigating my personal subjectivities to present an objective perspective. Further, as Crotty (2003) suggests, “meanings are thus at once objective and subjective, their objectivity and subjectivity being indissolubly bound up with each other” (p. 48).

During the open-coding stage, the data were coded into units and placed in the data analysis tool as found in Appendix F. During the axial-coding stage, three categories were developed: perceptions of self-efficacy, perceptions of professional pressures and expectations, and perceptions of the impact on students. During the selective-coding stage, themes that were interwoven throughout the cross-case comparative analysis were culled out. As Corbin & Strauss (2015) contended, “The purpose of within-code comparison is to uncover the many different properties and dimensions of a concept” (p. 94). The perceptions of the self-efficacy dimension includes concepts such as the teachers’ familiarity with, knowledge of, and comfort with the CCSSM; their ability to modify their instructional practices; and other perceived barriers to success. The perceptions of professional pressures and expectations include concepts such as the role of assessment and teacher accountability, the relationship between curricula and standards, and the integration of rigor. The perceptions of the impact on students include concepts such as the implementation plan for the CCSSM, the appropriateness of the standards, and the effect on

mathematical fluency. Results of the study are presented in chapter four followed by a discussion of the results in chapter five.

Expectations

With teachers being subjected to more and higher levels of accountability for the implementation of the CCSSM, my expectation was to contribute a thorough representation of their voices and perspectives. As Rothman (2011) concluded,

the Standards in many cases call for quite different instructional expectations than teachers are accustomed to, so enabling teachers to understand what students will be expected to learn and how they can structure classrooms to bring about that learning will be critical to the success of the Standards. (Rothman, 2011, Ch. 4, para.1)

The claim and charge to increase rigor in the classroom is a very broad and complex concept. I also expected to open an authentic discourse about what rigor is and how it is defined in the practice of classroom teachers. As an educator and school leader, I believe that if teachers are to be held accountable for the successful implementation of the CCSSM, their perspectives, insights, and considerations should be considered and addressed appropriately. Given the limitations outlined in the study, however, I expected my role to have some bearing or influence on the data collected. I, therefore, employed a number of measures to mitigate any undue influence and expected that those safeguards would ensure the qualitative validity of the data collected.

As opposed to acquiescing to the notion that a reality exists outside of our perception of it, many qualitative researchers ascribe to an alternative measure of validity (Trochim, 2006). As Trochim (2006) contended, “Guba and Lincoln proposed four criteria for judging the soundness of qualitative research” (Trochim, 2006, “Qualitative Validity”). The four criteria are

credibility, transferability, dependability, and confirmability (Trochim, 2006). Credibility relates to the assurances that the data accurately reflect the participants' perspectives and that meaning is derived from the data and not assigned to it. To this end, participants were provided transcripts of the data to review and edit as necessary. Transferability relates to the practicality that the findings can be generalized in a larger or different context. To enhance the possibilities for transferability, I included a robust examination of the assumptions that were drivers in the research to provide a deeper context for anyone wishing to engage in an application of the findings. Dependability relates to the qualitative researcher's ability to accurately capture and communicate the ever changing dynamics at play. As such, mitigating factors and potential limitations are explored and fully articulated as they relate to their impact on future studies. Finally, conformability relates the likelihood that the results could be repeated in future studies by different researchers. While I expected the participants to be honest with their feedback and understand that a focus group structure could stymie individual perspectives, document analyses were imperative as a strategy to ensure that the data collected was triangulated and verified when and where possible (Trochim, 2006).

Summary

This embedded single-case study was framed by a constructionist epistemological view and guided by a symbolic interactionism theoretical framework. The case or the larger unit of analysis investigated was how teachers constructed the meaning of the CCSSM, and how their perceptions influenced the implementation of the standards in their classrooms. The subunits of analysis that informed the case were three schools in MCPS. Because symbolic interactionism suggests that meaning is constructed in social contexts, the primary data collection method

employed was focus group interviews. For data triangulation purposes, document reviews of the CCSSM and previous and other state mathematics standards were conducted.

4 RESULTS

The results of this study are presented through the lens of the three categories coded during the data analysis: perceptions of self-efficacy, perceptions of professional pressures and expectations, and perceptions of the impact on students. In this section, the data collected from the subunits of analysis are presented through these categories, and a cross-subunit analysis (see Figure 2) of the common and prevailing themes is also included in this section. Further, some of the data from the document review analysis of the CCSSM is interwoven in this section for the purpose of triangulating some of the data presented in the focus group data. A more in-depth discussion of the findings and triangulated data from the document review analysis is included in chapter five.

This study sought to answer the following questions:

- 1) What are high school mathematics teachers' perceptions of the CCSSM and previous state standards in mathematics?
- 2) How do high school mathematics teachers perceive the level of rigor in the CCSSM as compared to other state standards?
- 3) How do high school mathematics teachers perceive the appropriateness of the CCSSM for their students?
- 4) How do these perceptions influence their teaching and learning practices and behaviors in the classroom?

Perceptions of Self-Efficacy

The data indicate that a teacher's perception of self-efficacy and readiness to implement the standards significantly influenced the teaching and learning practices and behaviors in his or her classroom. Teacher perceptions of self-efficacy manifested in several ways in the study: 1) perceptions of self-efficacy were highly correlated with a teacher's years of experience, 2) there was general confusion regarding the role of the teacher under the CCSSM, 3) there are now new and different methods teachers are expected to use to teach mathematical concepts, and 4) external barriers impact a teacher's perception of self-efficacy.

At Hilltop High School, conversations around the comfort level of veteran teachers versus teachers who have only taught under the Common Core framework bubbled up explicitly. For example, Jasmine, Marcus, and Abel openly admitted that some of their struggles with the transition to the CCSSM have been with the expected shift in instructional practice. Specifically, they struggled with reconciling what the CCSSM expect and how to make those shifts evident in their classrooms. As Marcus suggested, the primary point of contention is the expectation that students be provided with context or a "real-world" application prior to being provided the methods and procedures for solving the problem. The goal of this inversion is so students have an opportunity for "productive struggle" as they are forced to think critically about a particular problem (Marcus, personal communication, December 5, 2016). As he continued,

You go into it thinking, 'Okay, yeah, I need to teach the student the skill, how to solve the problem, how to solve this equation first—this multi-step equation—and then give them the word problem.' Where[as] [with]Common Core, you start with the word problem and you give it to the student to have them make sense of it. So, it's a big

emphasis on students knowing how to make sense of the problem first and then coming up with their own strategies to solve the problem. (Marcus, 2016)

A document analysis of the CCSSM to triangulate this conception revealed that Marcus was referencing standard 1 from the Standards of Mathematical Practice – Make sense of problems and persevere in solving them (CCSSI, 2017). As communicated in the standard, “Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution” (CCSSI, 2017).

Jasmine and Abel agreed, and expanded on Marcus’ thoughts by adding that teachers who were in the profession prior to the CCSSM were traditionally trained to focus on practice through drill and repetition (Jasmine & Abel, personal communication, December 5, 2016). As Jasmine concluded, this transition has required teachers to shift instructional practices away from the traditional drill and repetition. It has also required them to reexamine their questioning techniques and how they implement vocabulary (Jasmine, 2016). As she elaborated, “They’re working the problem and they’re discovering the answer first. Then, you have to change the way you question them about their work” (Jasmine, 2016). However, the expectations and shifts in instructional practice are not as easy to achieve as suggested. As Jasmine continued, “I mean, we did math, you know, you went over vocabulary, but now there is a real emphasis on that vocabulary because if you don’t understand the vocabulary, you can’t understand the word problem or the application part, so it’s a big change from way back” (Jasmine, 2016). As Marcus added, “It’s easy to just drift back to the way that you were used to, you know, just get up there and start solving problems and put a student up, ‘Okay, now you try it’” (Marcus, 2016).

At Eastside High School, the teachers affirmed the responses from the group at Hilltop, and also indicated both confusion regarding the direction of the CCSSM and how the role of the

teacher fits into that equation. The confusion seemed to be more about the teachers questioning why the expected instructional shifts are more appropriate than their current teaching methods. As Tammy suggested, “Before Common Core, it seemed like we were able to do our own thing as far as teaching, and it just made it more fun to teach...but it seems like when we got to the Common Core, everyone had to agree on the way that we were going to teach it, and it just took away a lot of the enjoyment of teaching” (Tammy, personal communication, December 8, 2016). As Morgan suggested, “I’m not really sure what my role is anymore. Am I supposed to be preparing them for future careers, or am I supposed to be preparing them for a test that’s going to determine where they go next?” (Morgan, personal communication, December 8, 2016). Pamela concurred by suggesting, “I didn’t get to see where they came from so I’m kind of going with the Common Core group. So, I’m like, ‘This is just how it goes. I don’t really understand what the difference is!’” (Pamela, personal communication, December 8, 2016). Continuing to expand on the discussion about the confusion regarding the direction of the CCSSM, Morgan offered,

I’ve probably second-guessed what goes where more often in the last two years than I have in twenty-eight years, because I mean, twenty-eight years of teaching math—like I know...I think I know the order that you should teach something. Yet, just this year, I sat down with the calendar to try to plan a unit on conic sections. And, within the standards, it said to teach mathematical induction. That’s not where it goes! Makes no sense there! So then I start questioning, Why? Why you put, why am I putting this here? And I don’t understand why...I don’t like questioning why something is there. (Morgan, 2016)

A document review of the CCSSM revealed that Morgan’s critique, in this instance, was not substantiated in the standards themselves. This critique, instead, is of her curriculum (May County Public Schools [MCPS], 2017).

The findings also illustrate how teachers' perceptions of other state standards connected to their perceptions of self-efficacy with regards to the CCSSM. Recounting another specific content example, Mary offered a more nuanced perspective related to her disconnect from the CCSSM and connection to the more familiar pre-CCSSM instructional expectations. As she opined, "So, the overall topic could be long division. I have no idea of how to teach partial quotient, how to read partial quotient, what partial quotient is. It makes absolutely no sense to me, and I think it's a waste of time to teach it when old school, long division works every time" (Mary, personal communication, December 8, 2016). A document review of the CCSSM suggested that Mary was referencing the concept of standard algorithms (CCSSI, 2017). Standard algorithms "rely on the particular mathematical approach of decomposing numbers into base-ten units and then carrying out single digit computations with those units" (Fuson & Beckman, 2012, p. 15). While the final answer is the same using this approach, there are more steps and more thinking involved (Fuson & Beckman, 2012). Conversely, Morgan offered a similar yet conflicting position contending that while she is not in objection of the Common Core, she struggled with balancing the external pressures. As she elaborated, "I want my students to do that kind of math; I do. But, not within the constraints that we've been given. The expectations are not reasonable for success" (Morgan, 2016).

At Ridgeway High School, participants shared subtle inferences in this dimension. For example, several teachers commented on structural barriers beyond their control that ultimately influenced their perceived effectiveness. These findings also illustrate how some of the variance in instructional shifts can be explained by the hesitancy teachers feel to change their current practices when change is so frequent. As Jack suggested, the fact that the math curriculum has

changed frequently over the past four years presents significant challenges for teachers (personal communication, December 1, 2016).

How can you even do something effectively if it's constantly changing all the time? That doesn't even give you time to really gather and reflect to inform your instruction in the coming year, because the next year, you're having to completely change and do something completely different again. So, it makes it hard to drive your instruction the next year, because to be an effective educator, you have to look at what the end goal is and then work backwards and plan that way. Well, if it's completely changing again, you don't even know if you were effective in the year prior. (Jack, 2016)

This concept was met with immediate agreement by the other members. Phoebe suggested that the frequent changes often leave teachers feeling unclear about what they are teaching from year to year, even if they do not change subjects (personal communication, December 1, 2016). As she explained, the changes to the curriculum left many teachers who taught the same subject last year questioning the topics they were expected to cover this year (Phoebe, 2016). A document review of the CCSSM revealed that since their inception and subsequent adoption in Georgia, the CCSSM have not changed or been edited (CCSSI, 2017). Conversely, document reviews of the Georgia Standards of Excellence (GSE) and the MCPS instructional calendars for Algebra I and Geometry revealed that several CCSSM standards were significantly reworded, had varying number of associated standards, and were often presented in a different order (MCPS, 2017; Georgia Standards of Excellence [GSE], 2016).

Perceptions of Professional Pressures and Expectations

The teachers' perceptions of their levels of preparedness also directly correlated to their perspectives of how professional pressures and expectations influenced their performance. The

data indicate that a teacher's perception of professional pressures and expectations impacted how the CCSSM were implemented in his or her classroom. There were some very consistent professional pressures and expectations communicated by the teachers: 1) accountability measures and high-stakes assessment are highly influential, 2) teachers feel additional pressures to accurately interpret the meaning of the standards, 3) there is substantially more work required to meet the instructional expectations expected under the CCSSM, and 4) there is often tension between the expected instructional requirements of the CCSSM and a teacher's curriculum pacing guide.

At Ridgeway High School, Phoebe suggested that a primary driver for teachers is accountability measures including high-stakes assessments (Phoebe, 2016). This naturally creates tension between expected instructional practices under the CCSSM and external pressures. As Phoebe continued, "You want us to teach inquiry, exploration and all of this stuff, but here's the kicker: make sure they have passed the [End of Course Assessment] EOC or make sure they pass the high standards test" (Phoebe, 2016). As the Ridgeway teachers suggested, this tension is only increased when consideration is given to the pace that teachers are expected to maintain to cover all of the content expected with the CCSSM. Vanita suggested that the pace and amount of content often cause teachers to choose between those competing demands. As she suggested,

I was just thinking about Algebra II right now...like we, we have fallen so far behind trying to teach them the conceptual stuff or make the connections, or, or teach them the application aspects of Common Core...So we end up getting so far behind just to make sure we touch on a little bit of what they want in the Common Core. (Vanita, personal communication, December 1, 2016)

Jack expounded on this thought by explaining how this type of situation significantly increases the pressure that teachers feel. As he offered, “Honestly, there is not enough time to even get the students to conceptually understand the material that you have to teach them in the timeframe you have, especially in order to prepare them for these, these big state tests” (Jack, 2016).

Jasmine from Hilltop High School offered a similar position that creates an additional layer of complexity. Her contention was that there was often ambiguity with regards to the exact meaning of the standards and what would appear on the various EOC assessments. Recounting a specific example of a topic in Algebra I, Jasmine explained how there was significant confusion between what they thought they were expected to teach and what the assessment would actually present. As she continued,

We see in the book where it says they actually want them to calculate these, you know, for accuracy and calculate for precision when according to what we have for the county, all they really want to know is do they know appropriate units. Does this unit actually match the type of the question? So, it’s like, you know, until you ask someone or you read it here, you’re not really sure. You teach it this way and we’re hoping it’s going to be the same at the state level when they take their EOC. (Jasmine, 2016)

As the teachers all agreed, this type of disconnect is not considered when teacher effectiveness is measured in relation to the high-stakes accountability assessments.

Further, this disconnect also creates tension with regards to what a teacher focuses on in class and how they choose to teach the content. Abel, also in line with the Ridgeway High School teachers, offered some additional insight into the professional challenges teachers of the CCSSM face with both the amount of content, as well as the ambiguity of the standards. As he described the CCSSM, “It’s broad. It’s a big, big umbrella and sometimes I have difficulties

finding out what are the specific standards that you want me to teach under this big, huge umbrella” (Abel, 2016). Conversely, Marcus offered a differing perspective on the relatively broad nature of the standards. As he suggested, the broad scope of the standards provides teachers with critical “wobble room” to make adjustments as needed dependent upon student need (Marcus, 2016).

The teachers at Eastside High School all agreed that the CCSSM were broad in scope but did not respond as favorably to that concept as Marcus. As they described, the CCSSM standards are broad, but that allows students to explore multiple entry points and methods to solve various problems. While these standards are intended to develop students’ ability to critically analyze problems and recognize that there may be more than one appropriate method to solving them, the pressures for performance on the assessments often trumps everything else. As Erica suggested, she is compelled to purposely not allow her students to be exposed to those multiple methods, because they are usually already lacking basic skills, and this just adds to their confusion (Erica, personal communication, December 8, 2016). Pamela concurred and added,

One thing that I’m noticing is it’s also like all the routes are getting crossed, because there’s so many like we saw with factoring. There would be one way to factor if you had a trinomial that you could pick between three to four different ways. And then when it came down to it, they were trying to combine different ways and would be so far off the grid! (Pamela, 2016).

Another consideration expressed in all three schools was how the CCSSM ultimately created or demanded more work for the teachers. At Ridgeway High School, Vanita (personal communication, December 1, 2016) suggested that the amount of work placed on high school teachers now versus previous workloads has increased substantially. Expanding on Vanita’s

thoughts to provide more specific context regarding the workload, Amy offered that teachers under the CCSSM are now expected to teach “them what it means more than just how to do it” (personal communication, December 1, 2016). For example, Phoebe offered an anecdote of a situation she witnessed with her fourth-grade niece. While exploring fractions and exploring the concept of “parts to a whole,” her niece spent more than five minutes illustratively solving the equation “ $4 \times \frac{1}{4}$ ” despite acknowledging that she immediately knew the answer (Phoebe, 2016). Her justification for doing it the “long way” was that she was simply following the method her teacher taught her. This, as Phoebe suggested, is a familiar story for teachers trying to plan lessons and now having to take into account the additional layers of steps that have to be taught even for solving simple concepts (Phoebe, 2016). Jack concurred and suggested that teaching these methods in the early grades has weakened the foundation in basic arithmetic that they need to be successful in high school. High school teachers have to frequently reteach concepts as a result. As he continued,

We probably went through school, like in third grade, you memorized the multiplication tables. You didn’t learn the methods behind it. It was, you memorized it and then the pieces fell into place. And in teaching kids now that have come through the Common Core and learned it the other way, there’s not the background. There’s really struggle with knowing the multiplication facts. (Jack, 2016)

At Hilltop High School, Camila relayed a similar experience as Jack, trying to contend with students who have substantial foundational gaps in basic arithmetic, such as multiplication tables. These gaps make it difficult for a teacher to implement the instructional shifts expected under the CCSSM. As she elaborated,

They still come to me and they don't know their multiplication tables, and I'm like, 'How did you make it past eighth grade without your multiplication tables?' When you're talking about simple [sic] solve this equation, interpret, what's happening step-by-step, they can't get to the interpret part if they can't even solve, and they can't solve, because they can't multiply or divide; they don't know their factors. (Camila, personal communication, December 5, 2016).

As each teacher subtly conceded, they recognized that they are ultimately responsible and held accountable for student achievement regardless of any foundational gaps their students may possess. However, as Camila communicated, even though teachers are aware that these foundational gaps have to be addressed, finding time to do so and to cover the material for which they are accountable is not an easy task. As she concluded, "I cannot stop class to teach you multiplication; it just cannot happen" (Camila, 2016). Abel offered a perspective in line with Camila. As he suggested, "The question then is, 'Is teaching the concept beneficial to *us* if they don't know the basic skills?'...I'm like Ms. Camila is, 'I'm sorry. I can't tell you what two minus three is. We're past that.' But then the child is left behind" (Abel, 2016).

At Eastside High School, the prevailing consensus was much in line with Jack, Camila, and Abel. As Erica contended, finding time to reteach, considering the tremendous pressure to stay on pace with the instructional calendars, is incredibly stressful (Erica, 2016). Tammy offered a similar experience, recounting numerous times that under the CCSSM, she was unable to go as deep with the content as she would have preferred from fear that students would not be adequately prepared to demonstrate their mastery. As she recalled, thinking throughout numerous lessons where she wanted to go deeper, "I just don't have time, because the test is next week and we got this, this, this, and this to get through" (Tammy, 2016).

Perceptions of the Impact on Students

The degree of the perceived appropriateness of the standards, the perceived rigor or cognitive demand of the standards, and the perceived potential implications for students were evident in every conversation at every site. The data indicate that a teacher's perception of the implications of the CCSSM for his or her students was the most influential factor. Support for the CCSSM was primarily centered on the rigor of the standards and the subsequent cognitive demand for students, while the concerns were mainly related to the implementation plan of the Common Core.

Table 2

Comparison of responses to questions assessing rigor of the CCSSM vs. other state standards and the appropriateness of the CCSSM for students

<u>Participants</u>	<u>High School</u>	<u>Experience (years)</u>	<u>More Rigorous?</u>	<u>Appropriate for your students?</u>
Abel	Hilltop	30	No	Yes
Amy	Ridgeway	14	Yes	Yes
Camila	Hilltop	3	Yes	Yes
Erica	Eastside	12	Yes	Yes
Jack	Ridgeway	< 1	Yes	Yes
Jasmine	Hilltop	26	Yes	Yes
Marcus	Hilltop	16	Yes	Yes
Mary	Eastside	13	Yes	Yes
Morgan	Eastside	28	No	Yes
Pamela	Eastside	4	Yes	Yes
Phoebe	Ridgeway	10	No	Yes
Tammy	Eastside	19	Yes	Yes
Vanita	Ridgeway	6	Yes	Yes

Interestingly, despite the commonly shared difficulties, the teachers in the study were largely very positive about the benefits of the CCSSM for students, as illustrated in Table 2. For example, ten of the thirteen participants in the study believed the CCSSM to be more rigorous than previous state standards, and that it provided the type of cognitive challenge students need to develop critical thinking for success in college and/or in the workplace. Of the three who offered contrary opinions regarding the rigor of the standards, Abel from Hilltop High School took issue with the lack of a clear definition of rigor as espoused in the standards. Phoebe and Morgan, from Ridgeway and Eastside High Schools, respectively, suggested that if the CCSSM are more rigorous, it is because of the quantity of content and standards, not the quality. Conversely, all thirteen participants agreed that the standards, as constructed, were appropriate for their students. Further, all thirteen participants suggested that they believed the rationale or idea driving the CCSSM was well-intended for the academic development of students.

At Hilltop High School, the benefits for students of the CCSSM were explicitly communicated. As Jasmine offered, “When you read the standards, many of them will say, ‘Interpret.’ It will say, ‘Compare and contrast.’ It will say, ‘Analyze.’ So I think [it’s] more rigorous in that it’s not just the computation, it’s the application” (Jasmine, 2016). Marcus and Camila both suggested that research has indicated that students benefit greatly from the type of experiential learning that the CCSSM demands. As Camilla suggested, “I think that for our kids who may not be math people, they have to have an experience, and research shows that the experience helps with retaining the information” (Camila, 2016). Abel, who offered the only contrary opinion at Hilltop regarding the rigor of the standards or the anticipated cognitive demand, suggested that the CCSSM pose challenges in that it requires everyone to be at the same level. His perspective is that some students may be strong enough with a mathematical

foundation to benefit from a rigorous task, but others needing procedural repetition and basics are likely not to gain the full benefit from that type of cognitive task (Abel, 2016). “If this is the Common Core for the whole country, our school wasn’t at that level yet to begin at that point that they wanted us to begin at, so we were behind” (Abel, 2016).

At Ridgeway High School, Jack offered a position very much in line with Abel’s thoughts. Jack surmised that the CCSSM and the resulting course sequence advocate more of a “college-bound” preparation track than a “work-ready” track and does not appropriately provide a support structure for all students. As he elaborated,

We have a policy that everybody is going to be college-ready, okay? So everybody’s on a certain track, okay? Every student takes Geometry, every student takes Algebra II, so on and so forth, but what we’re not doing is we’re not looking at individual students, you know. Some students, not every student, are going to go to college. Let’s just face it; face the reality there. Those students aren’t at that level of rigor that those standards are trying to address there, so I think it kind of works counter to what we are trying to go to towards. (Jack, 2016)

While not disagreeing with Jack’s perspective, Vanita and Amy offered a more positive long-term outlook for students in the CCSSM. Amy suggested that she has seen evidence of her adopted daughter’s improvement in mathematical reasoning. As she contended, “I realize our kids live, you know, in a household with a math teacher, but my daughter has only been with me for two years, and I can see that her reasoning has improved in math just in that short time. And it’s not necessarily the fact that she lives with a math teacher, it’s just simply that she’s understanding it” (Amy, 2016). Vanita concurred by adding that there would likely be a few “batches” of kids that struggle with the CCSSM because of the initial implementation (Vanita,

2016). However, she and the other Ridgeway teachers were confident that, in time, students would adapt and do well under the CCSSM.

Teachers at Eastside High School also shared in the belief that the implementation plan for the CCSSM has created gaps in student knowledge but will be beneficial for students in the long-term. As Morgan suggested, “The students who had, who came into the Core, I think, have the potential to be better students” (Morgan, 2016). Pamela concurred and added by sharing a personal anecdote about her daughter,

She’s in the fourth grade. I’m showing my juniors what she’s doing with fractions, and they’re like, ‘In the fourth grade?’ Yes, she’s having to add equivalent fractions and explain why this fraction is bigger than that, and it’s more than just—like the level of thinking that they’re calling out of a fourth grader is the level of thinking that we’re trying to call out of a junior. (Pamela, 2016)

Summary

The data indicate that the perceptions teachers have of their self-efficacy as it relates to the instructional expectations of the CCSSM, correlated with their experience level, their conception of the role of the teacher under the CCSSM, and their ability to manage external barriers. High-stakes assessments and other accountability measures, a teacher’s ability to accurately interpret the meaning of the standards, and his or her ability to manage the increased workload required under the CCSSM were the most consistent perceptions of the professional responsibilities and expectations that impacted how they implemented the standards. Finally, with regards to the implications of the CCSSM for their students, the study participants responded favorably to the CCSSM, and suggested that the standards were appropriate for their students. However, the majority of the teachers expressed some degree of challenge with the

amount, pace, implementation, changes, and the expected instructional shifts. Further, while the personal and professional pressures were somewhat influential with regards to how the teachers responded, the teachers' perceptions of the implications for their students was the single most influential factor.

There were four primary findings in the study. These findings are discussed in chapter five.

- The teachers consistently suggested that the CCSSM were much broader, more disconnected, and more subject to change than previous or other standards.
- The teachers largely perceived that the CCSSM were more rigorous than previous standards. They also considered the standards to be appropriate for their students.
- The impact on instructional behaviors and practices was directly aligned with how meaning of the standard was constructed.
- The role of the curriculum was far more influential with regards to teacher perceptions and the construction of meaning than were the CCSSM.

5 DISCUSSION

In this chapter, I discuss the findings by situating them in the context of relevant literature and discussing the implications of the findings for instructional leaders. I also relate the findings back to my theoretical framework, symbolic interactionism. I close this chapter by providing a summary and implications for future research.

Finding #1 - The teachers consistently suggested that the CCSSM were much broader, more disconnected, and more subject to change than previous or other standards.

During the course of the study, there were several terms that were used to describe the CCSSM and implementation plan. The term “broad” was used fourteen times across the three sites when the teachers described the CCSSM as compared to previous or other state standards. The terms “disconnected,” “disjointed,” and “gaps” were used twenty-two times across the three sites when the teachers described the results of the implementation or phase-in plan for the CCSSM. Further, although the specific phrase, “more work,” was only used six times across the three sites, there were numerous instances of inferred descriptions of how the teachers’ workloads had increased. For example, the teachers frequently described having to embed content that students missed because of the implementation plan, that they had to spend more time and effort determining what a particular standard meant, and that they had to spend additional time planning how to connect to real-world examples and application-based problems.

With regards to the standards being perceived as broader than previous state standards, I conducted a document analysis of the QCC, the GPS, and the GSE. The progression of a randomly selected topic from Geometry, “Circles,” was followed from the QCC to the GSE. Under the QCC, the language used in the standards provided an overview of what students should be taught about circles (i.e. center, chords, tangents, inscribed) (Georgia Standards, 2002). As the QCC was replaced by the GPS, the structure of that particular standard became a bit more explicit. Under that standard, specific indicators of achievement were included to provide a bit more clarity, but the language of the content expected to be taught (i.e. center, chords, tangents, inscribed) was consistent with the QCC (Georgia Department of Education, 2011).

A similar trend can be observed as the GPS was replaced with the GSE (GSE, 2016). The document analysis revealed several instances across content areas and grade levels that both followed and refuted this pattern. Further, examinations of the mathematics standards in some of the non-Common Core states (i.e. Indiana, South Carolina, Virginia) revealed that there was also little variation in the language of those standards as it relates to content mastery objectives (Indiana State Department of Education, 2015; South Carolina Department of Education, 2015; Virginia Department of Education, 2009). Thus, while it is not within reason to dismiss the notion that the CCSSM are, in fact, broader, a conclusion regarding whether they are broader than previous or other state standards cannot be drawn.

This finding is very important for leaders to consider. The teachers repeatedly expressed concerns that the CCSSM were disjointed, broader, and more work to implement than other state standards. While not every claim could be triangulated, these perceptions ultimately influence how the standards are implemented. As Marzano et al. (2005) expounded on the concept of individualized consideration, the leaders must attend to the needs of those who feel “left out” (p. 15). Because the teachers in this study expressly articulated sentiments of being subjected to the demands of the CCSSM without any say, these sentiments could pose a significant barrier to a successful attempt to implement the standards, and should be fully recognized and addressed before any attempts are made at the actual implementation.

Finding #2- The teachers largely perceived the CCSSM to be more rigorous and appropriate than previous or other state standards.

The overwhelming majority of teachers in the study believed that the CCSSM were more rigorous than previous state standards. Many noted that there was a higher level of cognitive demand expected in the CCSSM that had not previously been evidenced in previous state

standards. Interestingly, the three teachers in the study who differed from the rest with regards to their conception of the rigor level in the CCSSM were all relatively experienced teachers with at least ten years of experience each. Upon further examination of the reasoning behind their dissension, two shared perspectives that were directly connected to the amount of content they were expected to teach emerged. Herein lies another area of misdirected animus as the amount of content is determined by the curriculum implemented in a particular course (CCSSI, 2017; Darling-Hammond et al., 2005; Jenkins & Agamba, 2013; Noddings, 2007; Rothman, 2011; Schoenfield, 2014). Further, the overwhelming majority of study participants agreed that the CCSSM are more rigorous, and there was no opposition to the notion that, as constructed, the CCSSM were appropriate for their students.

While there are not any substantial differences in the language relating to the content objectives of the CCSSM, there are key differences in the progression of the verb choice that communicates what a student should be able to do to demonstrate mastery of the standard (CCSSI, 2017). For example, the QCC standards are often anchored by verbs such as “Identify,” “Recognizes,” and “States” (Georgia Standards, 2002). These words are generally associated with basic or lower levels of cognitive demand and rigor (Boyles, 2016). They only require a student to be able to retain and recall information, but can fail to access higher levels of cognitive demands (Boyles, 2016). Although the GPS includes some of the verbs used with the QCC, a dramatic shift in the anchor verbs can be found embedded in the language of the standards such as “Use,” “Determine,” and “Discover” (Georgia Department of Education, 2011). This shift requires students to not only be able to retain and recall the information, but also to apply their learning and make decisions about the content (Boyles, 2016). The GPS and the GSE are comparable with regards to increasing the level of rigor demand, but the GSE consistently

reaches higher levels of cognitive demand by requiring students to “Construct,” “Give an argument,” and “Apply” (GSE, 2016). These verbs provide students with an opportunity to explore the content at a much deeper level and engage in highly cognitive demanding tasks (Boyles, 2016).

The conversations surrounding rigor present a unique challenge for the leader. As Marzano et al. (2005) suggests, the leader must encourage his or her staff to find ways to examine old problems in new ways. As communicated in the research, the debate regarding what rigor is and is not is a long-lasting one. The leader, then, through intellectual stimulation must present the CCSSM in such a manner that it highlights the opportunities for staff to reexamine and re-norm their conceptions of rigor (Marzano et al., 2005). The participants overwhelmingly agreed that the CCSSM are, in fact, more rigorous than previous state standards. Thus, a leader who is able to leverage the potential promise of a more rigorous set of standards would have an advantage with the implementation efforts.

Finding #3 - The degree to which classroom practice was impacted correlated with how a teacher’s perception influenced how meaning was constructed.

As Schoenfield (2014) communicates, there are five properties associated with classrooms that produce the most mathematically-minded students. The first property is that students have an opportunity to grapple with the material, or as it is commonly referred to in the CCSSM literature, engage in “productive struggle” (CCSSI, 2014). While most of the teachers in the study acknowledged the role of productive struggle in terms of processing content, there was a pervasive hesitation on their behalf to allow for it to happen in their classrooms. While there were a number of reasons for this, the primary or most consistent reason provided was that given the inordinate amount of pressure teachers are under to ensure that their students perform well on

standardized assessments, there is not enough time to allow for that type of cognitive engagement. Interestingly, the overwhelming majority acknowledged that productive struggle was important for students' mathematical thinking, but they would still forgo those opportunities for the sake of staying on track with their pacing guides.

The second property is that classroom instruction and activities are appropriately structured and scaffolded to support all students with developing the confidence and stamina to complete complex problems (Schoenfield, 2014). Several teachers in the study discussed concerns about students not necessarily being ready for the level of the rigor of the CCSSM, and that the CCSSM seemed skewed towards students who were on a college preparation trajectory. The notion of scaffolding, in this instance, was highly dependent upon the teachers' perceptions of where they believed the students' ability and trajectory to be. For example, a consistent theme repeated throughout the study was that many students lacked the foundation and basic skills necessary to be able to demonstrate mastery of the CCSSM. Consequently, the teachers consistently suggested that they did not have time to engage those students with instruction and tasks that are highly cognitively demanding for the sake of ensuring minimal competency for their assessments. In short, the degree to which scaffolding exists in the classroom is directly correlated with the students' readiness level. This is appropriate and in line with the general expectations of scaffolding. However, from what the teachers suggested throughout the study, it appears that the initial decision is binary. If the students had the requisite skills and knowledge and are on the college trajectory, they would scaffold instruction on an individual basis towards mastery of the higher cognitively demanding tasks (i.e. real-world application) in the CCSSM. If the student did not have the requisite skills, they did not do this, even though the CCSSM are intended for all groups of students.

Considering the data from this study, the third and fourth properties seemed highly aligned and dependent upon the teachers' decisions regarding the level of challenge provided to their students. The third property is that all students should be engaged in the content, and the pace of the class should not be dictated by the fastest and most able students (Schoenfield, 2014). The fourth property is that all students should have the opportunity to "talk math" and build upon each other's experience and knowledge (Schoenfield, 2014).

Many of the teachers, especially veteran teachers, suggested that they struggled to allow the type of instructional shift expected under the CCSSM for a number of reasons. First, the teachers communicated repetitive concerns about their students' lack of basic numeracy skills. As a result, the teachers suggested that they felt inclined and that it was their responsibility to ensure that students were able to master the procedural elements regardless of whether or not they could articulate a real-world application of a particular standard. From this, it can be suggested that the teachers' perceptions of their self-efficacy and the purpose of their role were highly predictive of the type of classroom structure they provided. For example, the teachers in the study who communicated lower levels of self-efficacy also communicated employing instructional practices focused on drill and repetition.

Secondly, the pressures of high-stakes accountability were a deterrent for a teacher to relinquish control of the classroom and serve more as a facilitator for instruction. Many perceived an organic development of skills to be a threat towards their professional responsibility to *teach* math, as opposed to, allowing student to *discover* math on their own. Finally, and arguably most importantly, as with the notion of providing students with a structured and scaffolded challenge, the primary determinant of how classroom instruction was structured correlated with the teachers' perceptions of how students would be impacted. For example, if the

teachers perceived that the students' cognitive ability was not at the level of the CCSSM, the rigor and pace were adjusted to ensure equitable opportunity for them to make sense of the content. More often than not, the rigor and pace were lowered and slowed, respectively. However, as communicated in a myriad of ways throughout the study, this was not done with ill intentions. Instead, the teachers perceived that it was their responsibility to ensure that the students did not become overwhelmed and disillusioned with mathematics.

The fifth and final property is that teachers are able to anticipate problems where potential barriers for success and mastery will occur within the content, and are able to mitigate the impact of the rough patches for students without "simply spoon-feeding them" (Schoenfield, 2014, p. 738). To this end, the teachers in this study seem to have been especially adept. All of the teachers were able to recount specific examples of content where students were going to experience difficulties, because their students had not received various skills during the implementation of the CCSSM. Although many shared concerns and frustrations regarding this reality, each responded that they recognized that it was not the student's fault, and accepted the responsibility to do what was in the best interest of the students. Each also discussed strategies they used to fill in those gaps, and how they chose to engage students at the level most appropriate for them. Additionally, each suggested that the challenges due to the implementation have caused short-term problems, but they communicated hope in the long-term possibilities for significant student development through the CCSSM.

There are profound implications for the leader as they relate to the classroom implementation of the standards. Inspirational motivation suggests that the leader is able to effectively communicate expectations for the staff and students alike (Marzano et al., 2005). With all of the competing influences (i.e. perceptions of self-efficacy, perceptions of professional

pressures and responsibilities, and the perceptions of the impact on students), it is of critical importance that the leader explicitly communicates the expectations as they relate to the implementation of the standards. Staff, who are under realized or perceived pressures, may take the implementation process as an optional activity. However, the leader must find ways to inspire his or her staff through the difficulties that they may encounter.

Finding #4 - The teachers' interactions with and perceptions of the curriculum were considerably more impactful on the construction of meaning.

With regards to the perceptions that the CCSSM were somehow disjointed and frequently changed, this seemed to be highly correlated with the pervasive misuse of the term “curriculum” as interchangeable with the term “standards” (CCSSI, 2017; Darling-Hammond et al., 2005; Jenkins & Agamba, 2013; Noddings, 2007; Rothman, 2011; Schoenfield, 2014). During the course of the study, the word “standard” was used in conversations about concerns involving the specific course curriculum nine times over the three sites. As communicated on the CCSSI website, “The Common Core is *not* a curriculum. It is a clear set of shared goals and expectations for what knowledge and skills will help our students succeed. Local teachers, principals, superintendents, and others will decide how the standards are to be met” (CCSSI, 2017). This distinction is far more than a semantical debate. For example, many of the teachers across the three sites made references to the number of changes to the math standards in recent years, how content units were frequently and unexpectedly moved to different grade levels, and how those changes created significant gaps in student learning. Specifically, the term “change” was used twenty-six times in the interview data. Conversely, as illustrated through the document analysis, the CCSSM, as a set of standards, have not changed since their inception. As such, the

criticisms related to the frequent changes and the subsequent disjointed nature of the implementation of the standards were mistakenly attributed to the CCSSM.

Because education is reserved as a state power, even the states that elected to adopt the Common Core retained the authority to implement them as they saw fit (Conley, 2014; Rothman, 2011; Zimba, 2014). As evidenced by a document analysis of several Common Core states including Alabama, Florida, Georgia, Louisiana, Mississippi, and North Carolina, some states used the CCSSM as a template and adapted all or parts of the language of the standards (Alabama Department of Education, 2012; Florida Department of Education, 2017; Georgia Department of Education, 2011; Louisiana Department of Education, 2017; Mississippi Department of Education, 2012; North Carolina Department of Public Instruction, 2017). Regardless of the level by which they mirrored the original CCSSM, states were also responsible for developing the curriculum aligned with those standards (Conley, 2014; Rothman, 2011; Zimba, 2014). The GSE is a prime example as it has undergone a number of revisions over the past few years. As such, whether valid or not, the criticisms regarding the changes and the implications of the CCSSM should be directed towards the state and local school districts.

The concept of idealized influence suggests that the leader be the “model” and example of the expected behaviors for his or her staff (Marzano et al., 2005, p. 15). This would include being a participant in training or professional development, working alongside teachers as they work through strategies and interventions for students who may have content gaps due to the implementation, and also providing support and specific strategies for teachers who are struggling with making the needed instructional shifts (Stronge, 2008; Waters & Cameron, 2007). It is also important for the leader to be cognizant of what the teachers’ concerns are and what they specifically relate to so that proper support can be provided.

Suggestions for Further Research

There are several gaps in my study that need to be explored further with additional research. First, there was an evident difference between how teachers whose only experience in the classroom was under the CCSSM and how veteran teachers respond to the CCSSM. Some of the variance may be explained by the difference in years of experience, but some may be attributed to differences in education preparation programs. Additional research exploring if and how teacher education programs have adjusted to the CCSSM would be beneficial. As Graybeal (2013) found, “many teachers of mathematics are unprepared to implement the CCSSM and most teacher education programs have not yet adapted to help prepare teachers to meet these challenges” (p. 8). Further, because all of the participants in my study were classically trained as teachers, an exploration of the perceptions of teachers who were career changes and not trained in education preparation programs would provide rich context regarding the CCSSM’s ability to address career readiness.

Secondly, one of the most frequent but inaccurate criticisms of the CCSSM was that it was in constant flux and changing all of the time. However, as illustrated by the document review of the CCSSM, the standards have not changed. Instead, as the individual states adopted them, some changed the language and content of the standards as necessary to fit within their current structures and curriculum guides. Further research is needed to examine how the Common Core has been implemented in each state and how they compare from state to state. Additionally, some of the non-Common Core states currently have standards that are similarly aligned to the language of the CCSSM. An exploration of whether their standards were influenced by the CCSSM or were in place before the CCSSM would be of benefit as well.

Thirdly, the overwhelming majority of the participants agreed that the standards were appropriate for their students, were more rigorous than previous standards, and were capable of producing high-quality mathematics students. However, at the time of this study, there was not an extensive, longitudinal data set to examine to see if an entire cohort of students under the CCSSM has better results than other cohorts. As such, future research should include examining the data from students who have gone through K-12 under the CCSSM. Further, additional research should be conducted along this line comparing the success of the students in the CCSSM with the success rates of English language arts.

Because there is much debate surrounding the notion of rigor in the literature, more research is needed with regards to what teachers consider to be rigorous and how they use that understanding to transform their instructional practices. More research is also needed on examining how schools can develop a learning environment that encourages this type of cognitive demand, considering the parameters set by district and state educational leaders. When longitudinal data for the first full cohort of students that have been educated under the CCSSM becomes available, more research will be needed to explore post-secondary outcomes for these students, especially compared to students in non-Common Core states.

Finally, as it relates to a general limitation of focus group research, my study only reflected the lived experiences of thirteen teachers. Although much of what was shared was able to be triangulated with the document review and across the three different sites, more research should be conducted at all levels (elementary, middle, and high) and across all types of schools (i.e. charter, public, Title I, non-Title I, urban, rural) to provide more confidence for generalizability of the findings.

Summary

It was consistently demonstrated throughout the study that the teachers

- act toward things on the basis of the meanings that these things have for them;
- that the meaning of such things is derived from, and arises out of, the social interaction that one has with one's fellows; and
- that these meanings are handled in, and modified through, an interpretive process used by the person in dealing with the things he encounters. (Crotty, 2003, p. 72)

The findings related to the teachers' perceptions of the rigor and appropriateness of the CCSSM and how their classroom practice was influenced as a result were in line with findings in previous studies (Choppin et al., 2016; Davis et al., 2014). These findings illustrate how the initial perception and construction of meaning of the standards inform how the subsequent actions are influenced. For example, teachers that communicated a perception that the CCSSM had more standards were more likely to confess not fully implementing Common Core expectations such as incorporating real-world applications and activities as outlined in the Five Properties of the Powerful Math Classrooms (Schoenfield, 2014).

As illustrated in this study and previous studies, a teacher's interpretation of standards and their subsequent construction of meaning is highly influential with regards to classroom implementation. However, as illustrated in this study, the perceptions were highly centralized around the themes of self-efficacy, professional responsibilities and pressures, and the impact on students. Each theme has its own specific challenges. As such, this knowledge can allow leaders to differentiate their strategies to address concerns and effectively support their teachers through this process.

The other findings also illustrate that there was not a direct interaction between the teacher and standard. In these instances, the path from the teacher to the standard is indirect through the curriculum outlined. For example, the fact that teachers suggested the CCSSM were broader, more disconnected, more inconsistent, and required much more work, yet were simultaneously considered to be appropriate for students and of higher rigor, highlights the differences between the curriculum and the standards. Their critiques and concerns about the CCSSM being broader, disconnected, and so forth, were not about the standards; they were about the outlined curriculum. The teachers communicated that the standards were appropriate because they have not been altered since their inception. States were responsible for adopting the standards and developing their own curricula for their implementation. The pacing, the placement of particular standards and courses, the language used or altered, etc., are all related to the adopted curriculum of the state. In other words, the developers of the curricula at the local and state levels directly interacted with the CCSSM, and constructed meaning from them prior to the teacher's interaction.

Understanding the nuanced difference between curricula and standards is of utmost importance. Teachers often express that they feel overburdened with the amount of content that they are expected to teach. Leaders should be aware of the relationship between standards and curriculum, and understand how to help teachers to critically examine a standard to determine key learnings vs. non-essential elements. As illustrated in the study, because states were not required to adopt the CCSSM as they were, the Common Core may not be as *common* as we think. The more that a leader understands the process by which teachers interact with their standards, and are cognizant of the multiple layers and levels of influence, the better he or she will be able to help teachers navigate the challenges they endure.

While the implementation of CCSSM has caused some problems at the local school level, the promise of the standards themselves with regards to elevating the rigor in classrooms and producing higher quality students was largely realized during this study. However, it was also made clear in the study that the standards themselves will not alter instructional practice; the teacher and his or her perceptions of self-efficacy, professional responsibilities, and of the implications for their students are the primary determinants of a successful implementation of the standards. As Crotty (2003) suggested, “human beings act towards things on the basis of the meanings that these things have for them” (p. 72). As illustrated throughout the study, teacher perceptions are highly influential in determining what “meanings,” literal and figurative, teachers derive from standards, and how those meanings inform how they “act” with regards to implementing them in their classrooms.

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APPENDICES

APPENDIX A – Document Review Analysis Tool

	CCSSM	sub standards	GA	sub standards	Notes	GCPs	sub standards	Notes
Interpret the structure of expressions.	2	2	2	2	Same language in main standards. Language is less specific on 1 substandards			
Write expressions in equivalent forms to solve problems.	2	3	1	2	1 less standard & substandard. Language basically the same			
Arithmetic with Polynomials & Rational Expressions								
Perform arithmetic operations on polynomials.	1		1		Reworded but same language	1		longer and more complex, 1st unit for study

APPENDIX B – Focus Group Protocol

FOCUS GROUP PROTOCOL

Date_____ School Pseudonym_____

I) Welcome/Introduction

Good afternoon/evening. Thank you for taking the time to participate in this study and discussion of the Common Core State Standards in Mathematics (CCSSM).

My name is Al Taylor, and I am currently the principal of Berkmar High School. I will serve as the moderator for this focus group session.

The purpose of this study is to gather your perceptions of the CCSSM with the intention of learning how your perceptions of the standards influences your teaching and learning practices and behaviors. The data from this study might help policy-makers, as well as, district and local school leaders better understand how teachers approach the implementation of standards in their classrooms.

Before we begin, I'd like to set sound norms for our time together to ensure that we both maximize our time and make our discussion more productive. First, because we will be recording this session, please be sure to speak up and only speak one at a time so that we can ensure that we capture everyone's voice. Secondly, there are some safeguards in place to protect your confidentiality so feel encouraged to be completely honest with regards to your perceptions of the CCSSM. Further, we will only use first names in here. There will be a coding system developed that conceals your identity and removes any links from what you said to your name. Finally, to protect everyone else's confidentiality, please remember that what is said in here, stays in here.

During our time together, I will ask you a series of questions. Other than occasionally inviting an individual who has not shared a lot to respond to a question or asking someone who has shared a lot to hold off for a while, I will not participate in the discussion. Please be mindful that every opinion is important to the study. Feel free to respond to each other and share your opinion even if it conflicts with others' thoughts and perspectives. In order to have a comprehensive data set, majority and minority perceptions and common and uncommon experiences are welcomed. I will be taking notes so please do not take my head down or lack of constant eye contact as a sign of disinterest.

If there are no questions regarding procedures for today's focus group and barring no objections, I would like to begin recording now.

II) Focus Group Interview Session

This focus group session is being conducted as part of the dissertation, "The Common Core to Common Folks: An Explorations of High School Math Teachers of the Common Core State

Standards in Mathematics,” conducted by Al Taylor under the direction of Dr. Janice Fournillier of Georgia State University.

Today’s date is [date], the tape ID number is [ID number], the start time is [start time], and the focus group session is being moderated by Al Taylor.

Let’s begin with introductions. Please tell us your first name, the subject(s) you teach, and the number of years that you have been teaching.

Now that I know a little about you, I want to shift gears and pose some questions regarding the CCSSM.

Questions about CCSSM

- a. Think back to when you first were exposed to the CCSSM, what was your first impression of the standards?
 - i. What stood out (positively or negatively) about the standards?
- b. How, if at all, has your impression changed since your first interaction with the standards?
- c. In relation to previous state standards (i.e. QCC, GPS), how would you describe the CCSSM?

Questions about Rigor

- d. How does a teacher increase rigor in his/her lessons?
 - i. Can you provide specific examples of how you have increased rigor in your lesson?
- e. React to this statement by the authors of the CCSSM - The CCSSM is far more rigorous than previous state standards. Please provide specific examples to support or reject this claim.

Questions about Classroom Implementation

- f. Considering your involvement with the CCSSM and previous state standards (i.e. QCC, GPS), tell me about your experiences with each and how they impacted your teaching and/or student learning.
 - g. How would you characterize the appropriateness of the standards for your students?
 - i. Can you provide me some examples and be specific about the students and the content knowledge?

III) Focus Group Interview Conclusion

To summarize the major points of what was shared today, we discussed

(summarize the prevailing themes and conflicting opinions)

Does this capture the essence of what was shared?

As was shared at the beginning, the purpose of this study is to accurately capture your perceptions of the CCSSM and how those perceptions influence your teaching and learning practices and behaviors. Is there anything that has been left out?

Barring any further comments, questions, or concerns, we will now conclude this focus group session. I'd like to remind you all again that we keep the conversation today confidential. I sincerely thank each of you again for participating today, and I will follow up with you with a transcribed copy of today's interview within the next 2 weeks.

End time: [end time]

Focus group protocol adapted from protocols created by Cohoon (2001) and Eliot & Associates (2005).

APPENDIX C – Email Requesting Site Principal Permission to Conduct Study



{In Archive} Assistance needed

Al Taylor to: [REDACTED]

11/17/2016 08:10 AM

[Show Details](#)

Archive: This message is being viewed in an archive.

Good morning!

I am in need of your assistance. It has been an unbelievably long journey, but I have finally received both GCPS and GSU IRB approval to conduct my study to finally be a bit closer to finishing my doctoral degree requirements. There is no way to tell the "reader's digest" version of that story so I'll avoid it for now.

At any rate, my study involves examining of the perceptions of HS Math teachers of the rigor of the Common Core as opposed to previous standards. I will be doing focus group and individual interviews of teachers. I'm reaching out to the two of you to first gain permission as required by GCPS to interview your teachers, but also to try to leverage the fact that some of your teachers *may* still know me and *may* be willing to help me out! I'm looking for about 4-5 teachers from each school. If you give the okay, I will prepare a formal request for participation that I would ask you to forward.



2017-18 (Taylor, Alfred).pdf



Approved Informed Consent.pdf



{In Archive} Invitation to Participate in a Research Study

Al Taylor to: [REDACTED]

11/17/2016 01:10 PM

[Show Details](#)

Archive: This message is being viewed in an archive.

Please forward to your Math department.

Greetings,

My name is Al Taylor, and I am conducting a study of high school Mathematics teachers' perceptions of the Common Core Standards in Mathematics (CCSSM) with the approval of the Georgia State University and the GCPS Institutional Review Boards (permission forms are attached).

You are receiving this email because you are a high school Mathematics teacher and your perspectives as such are important and valued. Your participation is completely voluntary and will entail a focus group and a possible individual interview if needed for clarification. The focus group meeting will take place on [REDACTED] at a time and on a date that best meets your needs (i.e. during planning period, after school). If you are interested in participating in this study and sharing your perspectives, please contact Al Taylor by email by the end of the day on **November 30, 2016** for more information and for next steps. All experience levels and instructional settings (i.e. Gifted, Special Education, ESOL, Regular Education) are welcome and encouraged to participate.

Thank you in advance for your time and assistance and look forward to hearing from you soon.



2017-18 (Taylor, Alfred).pdf



Approved Informed Consent.pdf

APPENDIX D – Approved GSU Informed Consent Form

Georgia State University
Department of Educational Policy Studies
Informed Consent

Title: Common Core to Common Folks: An Exploration of the Perceptions of High School Math Teachers of the Common Core Standards

Principal Investigator: Dr. Janice Fournillier

Student Principal Investigator: Alfred Taylor

I. Purpose:

You are invited to participate in a research study. The purpose of the study is to investigate high school Mathematics teachers' perceptions of the rigor of the Common Core State Standards in Mathematics. You are invited to participate because you are a high school Mathematics teacher. A total of 10-15 participants will be recruited for this study. Participation will require approximately 2.5 hours of your time over the course of 1 month.

II. Procedures:

If you decide to participate, you will be included in a focus group interview with 4-6 other participants. The interview will consist of planned interview questions and will be audio and/or video recorded. Student principal investigator, Alfred Taylor, will conduct the focus group, and the interview will take place at your school after school hours during a date and time approved by your principal. The focus group interview will take approximately 1.5 hours to complete. Within 1 week after the interview, you will receive a hard copy of the interview to review. You will be asked to offer feedback and/or corrections to the hard copy of the interview within 2 weeks after receiving it. In all, you should expect to spend approximately 2.5 hours between the focus group interview and reviewing the hard copy.

III. Risks:

There is the possibility that participation in this study may cause you some level of discomfort as you will be sharing your thoughts and opinions about state standards that you are required to teach. Further, you may experience some pressures from coworkers to share their perspectives also or from their questions about your participation with this study. We will take several steps to prevent this. First, the focus group interview will take place after school hours and all participants will be asked to not share with others what is said or done in the interview. Secondly, we will not use real names or anything that can be used to identify participants. Finally, all participants will receive a hard copy of the interview to review and edit if they are uncomfortable with something recorded or feel that they could be identified by something said. If you experience any level of discomfort at any time during the study, you will be free to remove yourself from participation.

IV. Benefits:

Version Date:

Participation in this study may not benefit you personally. Overall, we hope to gain information about teachers' perceptions about the Common Core Standards in Mathematics and how those perceptions impact how you teach.

V. Voluntary Participation and Withdrawal:

Participation in research is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or stop participating at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled.

VII. Confidentiality:

We will keep your records private to the extent allowed by law. Student Principal Investigator, Alfred Taylor, and Principal Investigator, Dr. Janice Fournillier, will have access to the information you provide. Information may also be shared with those who make sure the study is done correctly (GSU Institutional Review Board, the Office for Human Research Protection (OHRP)). We will use a false name rather than your real name on study records. The information you provide will be stored on a jump drive or audio recorded stored in a locked cabinet in my home. Once the study is over, the data on the jump drive and audio recorder will be destroyed. We will also have a "code sheet" that contains your real and assigned names that will also be kept on the jump drive in my locked storage cabinet. Your name and other facts that might point to you will not appear when we present this study or publish its results. The findings will be summarized and reported in group form. You will not be identified personally.

VIII. Contact Persons:

Contact Dr. Janice Fournillier by phone at (404)413-8262 or by email at jfournillier@gsu.edu, or Alfred Taylor by phone at (770)689-6714 or by email at al_taylor@gwinnett.k12.ga.us if you have questions, concerns, or complaints about this study. You can also call if you think you have been harmed by the study. Call Susan Vogtner in the Georgia State University Office of Research Integrity at 404-413-3513 or svogtner1@gsu.edu if you want to talk to someone who is not part of the study team. You can talk about questions, concerns, offer input, obtain information, or suggestions about the study. You can also call Susan Vogtner if you have questions or concerns about your rights in this study.

IX. Copy of Consent Form to Participant:

We will give you a copy of this consent form to keep.

If you are willing to volunteer for this research and be audio and/or video recorded, please sign below.

Printed Name of Participant

2

Version Date:

APPROVED
FOR 1 YEAR BEGINNING

NOV 9 2016

GSU IRB

Signature of Participant

Date

Principal Investigator or Researcher Obtaining Consent

Date

Version Date:

3

APPROVED
FOR 1 YEAR BEGINNING

NOV 9 2016

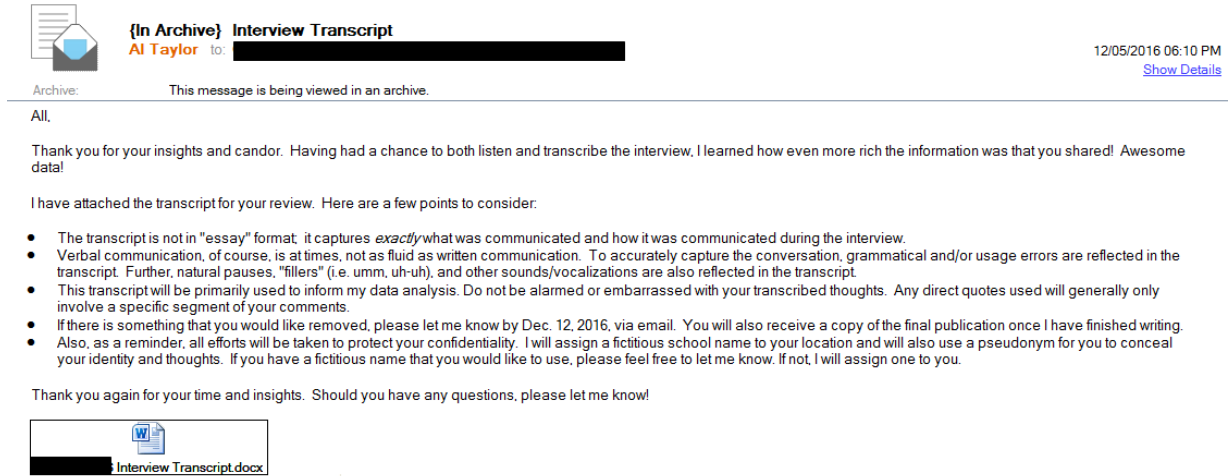
GSU IRB

APPENDIX E – Participant Pseudonym Information Record

Participant Pseudonym Information

Actual Name	Pseudonym	Years of Teaching Experience	Subject(s) Taught
[REDACTED]	Ridgeway High School		
[REDACTED]	Phoebe	10	Algebra I, Geometry, Algebra II
[REDACTED]	Vanita	6	Algebra II
[REDACTED]	Jack	1	Geometry
[REDACTED]	Amy	14	Algebra I, Algebra I Strategies
[REDACTED]	Hilltop High School		
[REDACTED]	Camila	3	Algebra I
[REDACTED]	Jasmine	26	Algebra I
[REDACTED]	Marcus	16	Algebra I
[REDACTED]	Abel	30	Algebra II
[REDACTED]	Eastside High School		
[REDACTED]	Tammy	19	Geometry
[REDACTED]	Morgan	28	Precalculus, AP Statistics
[REDACTED]	Erica	12	Special Education Math
[REDACTED]	Pamela	4	Algebra II
[REDACTED]	Mary	13	Algebra II

APPENDIX F – Email with Transcribed Focus Group Interview Sent to Participants



APPENDIX G – Data Analysis Process Tool

QUESTION				
Questions about CCSSM				
First impressions of the CCSSM	Compared with her experience as student, emphasis on making connections between real world and math concepts; connections between concepts and other concepts for continual growth	Been through several changes, most recently with the integrated sequence, but was glad to see CCSSM separate out more; noticed that it was more the application of what they knew instead of skill & drill; it is difficult considering where it started with students that hadn't been in a while	More responsibility on teacher; increasing the rigor important focus; clear benefit for kids, streamlined standards so you can go more in depth. Building rigor was difficult; appreciated the rigor, in-depth, student focus	Initially excited that the same concepts would be taught across the whole country
How, if at all, has your impression changed?		Will be the case for a couple of more years as the kids come through before we will see results		Our school wasn't ready to start at the level the CCSSM expected; our school was behind the level and it's been difficult to catch up; having the kids under the same <i>curriculum</i>
If you taught under different standards, how would you describe the Common Core?		Working now to make sure we're teaching the standards how they've been broken down for Gwinnett; "I like this piece here, and we're gonna test them, but is it the same standard that the state is really expecting?" (<i>curriculum</i>); standards are broad so it's hard to know what they really want	Saw the same thing coming from Tennessee, teachers are challenged to know exactly what they were expected to teach	Have difficulties finding out what specifically is expected to be taught under the huge umbrella; sometimes it's difficult to build math skills when there is not a solid foundation