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## The Challenges of American Education Reform: The Common Core Standards for School Mathematics

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The Challenges of American Education Reform: The Common Core Standards for School

Mathematics

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A Thesis Submitted to Fulfill the Requirements of the Honors Program at Assumption College

## THE CHALLENGES OF AMERICAN EDUCATION REFORM: THE COMMON CORE STANDARDS FOR SCHOOL MATHEMATICS

When we think about The United States education system, we think of achievement and promise, with the goal of preparing our young adults for “the real world.” Then why is it that, today, our country is moving in a direction that puts our youth at a disadvantage in one of the biggest fields that is practiced professionally? Let’s look back at the history of United States education reform in order to see how we got to where we are today.

### Historical Background of Educational Reforms

One of the biggest initializers of America’s first education reform is a result related directly to the space race, in 1957. During this year, Russia was able to send the first artificial Earth satellite, Sputnik, into space. This meant that Russia had won the space race and because of this, there was a perception that the United States was not able to keep up with the technological advancements of the rest of the world. The blame was directed at the country’s ability to establish mathematical and scientifically knowledgeable high school and college students. As a result, “Significant federal resources were redirected toward producing more rigorous curricula and better serving gifted students who would bring ideas to help their country thrive” (Fritzberg, 2018). The United States, at this time, aimed to strengthen national security by utilizing its gifted students. As a result, this subgroup received a more challenging curriculum. Despite this new emphasis on gifted students in the United States, Russia continued to become an even stronger rival. In 1983, the United States responded impulsively again.

Almost two and half decades after Russia’s space victory, the United States released a federal report that was known as “A Nation at Risk.” This report raised questions about American education again, but instead of comparing ourselves with Russia, we focused on a new

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rival. The United States was looking at Western Europe and Japan as more of a threat due to economic pressures. Additionally, the United States was dealing with civil rights issues at home. According to Fritzberg (2018), “There were two decades of civil rights legislation addressing inequality of access to resources and programs across racial, gender, linguistic, socio-economic, and ‘ability’ groups.” As one would imagine, the relationship between civil rights and educational equity works in harmony. This is especially true when trying to get the country to match up educationally with the rest of the world, causing a dramatic reform. The Clinton and Bush administrations both “attempted to bridge the concerns about both quality and equality in public education through promoting statewide standards and assessments that all children should achieve” (Fritzberg, 2018). The goal, for both presidential administrations, was to establish public education where all children, not just gifted children, would be able to succeed academically. To achieve this goal the Clinton administration created both statewide standards and assessments that individual states could imitate. When Bush was elected, his administration was determined to further Clinton’s efforts by increasing government involvement in education. Specifically, he called for the “tying” of federal and state in terms of assessment and examination. This resulted in the ordering of school and district examinations for grades 3-8. To maintain federal Title I funding, schools needed to boost the performance of disadvantaged students on these exams. Thus, the No Child Left Behind Act was enacted.

After the No Child Left Behind Act was established and carried out at the beginning of the 2000s, the perception that the United States was moving in a direction that was not promising in the area of mathematics continued. Students were still behind in national and state test qualifications, lagging far behind the level of higher achieving countries. At the end of the 2000s,

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after observing the immediate failures of the new act under President Bush, the Common Core frameworks were then released and states began adopting them in 2010.

The goal of the Common Core standards is to establish readiness and proficiency in reading and in math, as the standards describe student outcomes as opposed to content or curriculum (Center for College and Career Readiness, 2011). The Common Core State Standards for Mathematics (CCSSM) delineate standards that ask students to utilize thinking, more specifically, “they make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt.” (MCFM, 2017). The CCSSM outlines eight mathematic practices that call for students to build a profound understanding of problem solving. These practices include making sense of mathematics, reasoning abstractly, and constructing viable arguments to name a few things (CCSSI, 2019). Looking more closely at what the CCSSM calls for through its standards and practices, we examine how this actually looks in a classroom.

For instance, when students are learning numbers, they will not just learn the numbers by rote. Rather, they will look at them strategically and build a deeper understanding of ‘number’ than is gained from pure memorization. When learning how to count, students are asked to specifically look at the way the number can be composed and decomposed. For example, if a student is trying to learn the number eight, that student will come to understand that eight is composed of  $7+1$ ,  $6+2$ ,  $4+4$ , etc. Even more specifically, students can visualize certain numbers, by using a ten frame (Rinke, 2016). This strategy involves using different colors and symbols to look at the composition and decomposition of the number with relation to 10, a benchmark number useful for future place value understandings. Considering multiplication, the Common Core requires students to make sense of multiplication through representation and application of

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the distributive property. Students expand factors by place value and then multiply to utilize a process referred to as partial products (Rinke, 2016). According to Hilsabeck (2019),

Upper-grade students who are using Common Core standards in the classroom should be able to take an ad from a local store and analyze prices, determine unit rate, organize the information into measurable data and create their own math problems with solutions, all using the mathematical knowledge they have gathered and applied throughout the year.

(p. 1)

This, again, shows how Common Core puts meaning and application into learning across all the grades.

The goal of the implementation of Common Core was to provide uniform readiness for all of life's schooling and career paths, once students have obtained their high school diploma or GED. To ensure this outcome, the standards were developed based on and supported by evidence.

Building on the best of existing state standards, the Common Core State Standards provide clear and consistent learning goals to help prepare students for college, career, and life. The standards clearly demonstrate what students are expected to learn at each grade level, so that every parent and teacher can understand and support their learning.

(CCSSI, 2019, p.1)

The CCSSM across the grades are consistent, clearly defined, and comprehensible, in addition to being positioned with career expectations. The standards are designed to be rigorous and to develop higher-order thinking skills. The aim was to strengthen the standards that were previously upheld in individual states, as well as to develop a new curriculum inspired by the

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efforts of the top performing math countries worldwide (CCSSI, 2019). The Common Core, for mathematics specifically, was created on the foundations of specific countries that share in a successful mathematical education history, as well as the expertise of educators, students, parents, the public and other professional organizations. Within the document, the standards are arranged by grade-level for preschool through eighth grade, while the high school standards are arranged according to two different pathways: traditional and integrated. The traditional pathway breaks the standards into “two algebra courses and a geometry course, with some data, probability and statistics included in each course” (CCSSM, 2019). The integrated pathway provides standards separated into “a sequence of three courses, each of which includes number, algebra, geometry, probability and statistics” (CCSSM, 2019). One important takeaway about the CCSSM is that:

While the standards set grade-specific goals, they do not define how the standards should be taught or which materials should be used to support students. States and districts recognize that there will need to be a range of supports in place to ensure that all students, including those with special needs and English language learners, can master the standards. It is up to the states to define the full range of supports appropriate for these students. (CCSSI, 2019, p.1)

It is up to educators to teach the content specified in the standards. The standards do not describe methods for teaching the material. Before we attempt to assess the effects of the Common Core, it is also important to look at how the curriculums changed for various states when they shifted to the Common Core curriculum.

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When looking at previous state standards and the practices that emerge from the implementation of those standards, it is important to see where the differences lie with that and the newly developed CCSSM. “Traditional approaches to the teaching and learning of math have relied heavily on memorization, step-by-step procedures, and ‘plug and chug’ approaches to solving math problems” (Rinke, 2016, p. 1). Previously, most states had standards in place that called for classroom learning revolving around memorization and application of procedures. Evidently, the previous standards missed out on the idea of clarification and dissection of content. The CCSSM calls for more student thinking on the underlying mathematical concepts that are used. When looking at classroom instruction, previous state standards have created an environment of direct instruction by teacher. The CCSSM advocates for instruction that involves the eight mathematical practices deemed essential for every math lesson:

1. make sense of mathematics,
2. reason abstractly,
3. construct viable arguments,
4. model with mathematics,
5. use appropriate strategies,
6. attending to precision,
7. making use of structure, and
8. expressing regularity in repeated reasoning.

Students are expected to “justify their conclusions, communicate them to others, and respond to the arguments of others” (MCFM, 2017). The CCSSM is emphasizing instruction that puts students’ brains together, changing traditional instruction that has more-so revolved around the individual student. Under the CCSSM students are using deep-thinking to discover their learning



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while students under the previous standards were generally taking facts as they were given, with no dissection (Lawrence, 2014). As a result, the focus has shifted from the teacher as the authority figure who gives academic instruction to now a shared authority model. Instead of traditional teaching methods, students are learning in a more student-centered environment. For example, instead of learning things such as addition and multiplication through automaticity, lower elementary pupils are moving towards learning through investigation (Lawrence, 2014).

Historically, societal problems have motivated every educational reform. This typically led to polarizing viewpoints on these reforms. The Common Core reform is no different. Public opinion is split between those in favor of the change and those who oppose. Speaking for those who are for the CCSSM, their support trickles down from the 'New Math' Movement of the 1950s. Up until this point, the United States had been getting away from the idea of progressive education and New Math was a democratic showing of the best way to teach mathematics. At that point in the 1950s, like today in 2019, the ideas were polarizing. "The inception of the New Math was the collision between skills instruction and understanding" (Klein, 2003). Some of the differences of opinion were profound between clashing sides. According to Klein (2003), whenever mathematicians would meet with psychologists, it was common that the meeting was pointless, as the two parties had nothing to say to one another once the meeting began. Even with great disagreement, came success. Harvard psychologist, Jerome Bruner, goes on to say "I am struck by the fact that certain ideas in teaching mathematics that take a student away from the banal manipulation of natural numbers have the effect of freshening his eye to the possibility of discovery" (Loveless, 2005). He is saying that the idea of breaking down concepts and making discoveries allows for deeper learning. "New Math was clearly a move away from the anti-intellectualism of the previous half-century of progressivist doctrine" (Klein, 2003). For the first

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time, mathematicians were actively involved in contributing to K-12 school mathematics curricula (Klein, 2003). These same supporters, the democrats, mathematicians, and school leaders, are here in 2019 supporting a similar means to curriculum standards, just like they were in the 1950s through New Math. People such as Barack Obama, Michelle Rhee, GOP (Grand Old Party) governors, and the NPTA (National Parent Teacher Association) are all supporters of the CCSSM (Williams, 2014b). This is due to its ability for international benchmarking, college readiness, use of higher thinking skills, multi-assessment models, uniformity across state lines, and ability for teacher collaboration (Meador, 2019). Tyrone Howard, education professor at UCLA, sees that 21<sup>st</sup> century skills are gained through the CCSSM's call for problem-solving and critical thinking (Williams, 2014b). Although there is great support for the CCSSM, there is also great skepticism.

Individuals who are against Obama, usually are against the Common Core as well, such as Senator Charles Grassley or Lindsey Graham. Many conservative groups and Republicans have criticized the Common Core. Senator Marco Rubio even went on to say that the Department of Education was being turned into "a national school board" and that it was being forcefully implemented onto the rest of the states (Williams, 2014a). Many opponents of the CCSSM have jumped into the argument, based on their political standing. Parents and some teachers believe that the CCSSM will bring down test scores and harm their children's futures, while also distancing students from elective classes that promote creativity. The most interesting argument against the CCSSM relates to its implementation and involves a common misunderstanding. As stated previously, the CCSSM is a list of outcomes for students to meet, not a tutorial on lessons and how to teach it to students. Some teachers have been against the CCSSM, not because of the standards, but because of misalignment of the standards with their previous

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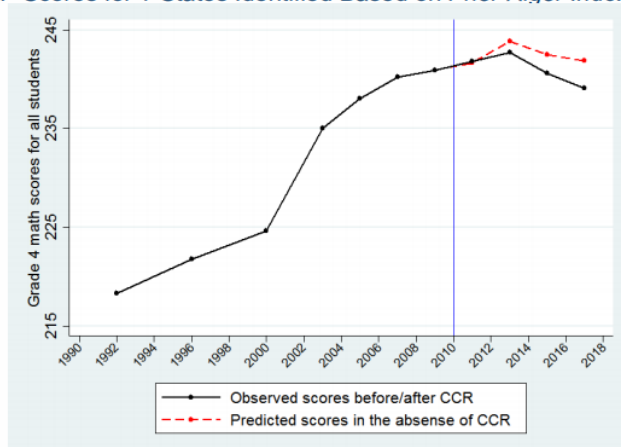
methods of teaching. Opponents of the Common Core also say that it creates a difficult transition for students and teachers, takes away creativity, has a focus on standardized testing and is more/less rigorous than previous state standards. Most striking is that there are people that are so uninformed about the Common Core yet they are hopping on the criticism bandwagon. When questioning the Common Core, “it is interesting to note, however, that when Education Next framed the question in more general terms that omitted the label ‘Common Core,’ 68% of the public supported the use in their state of ‘standards for reading and math that are the same across the states’ and ‘will be used to hold public schools accountable for their performance’” (Center on Educational Policy, 2014). In 2013, 53% of the public was in favor of the use of the standards within their own state, under the name Common Core, but when the same principals of Common Core, such as standards that cross state lines or holding public schools responsible for their success, were introduced without the name, the public support was at almost 70%! This shows that rhetoric and stigma caused by political parties and teachers who struggle to implement CCSSM have caused a greater disposition against CCSSM than is actually true.

In each passing year we are better able to measure the impacts of the Common Core, by looking at data and statistics from the National Assessment of Educational Progress (NAEP). The NAEP is utilized because it is the only common assessment that can be measured nationwide. We can first look at NAEP scores for Grade 4 nationwide, in the years from 2010 to 2017.

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### Effects of CCR Standards: Grade 4 Math

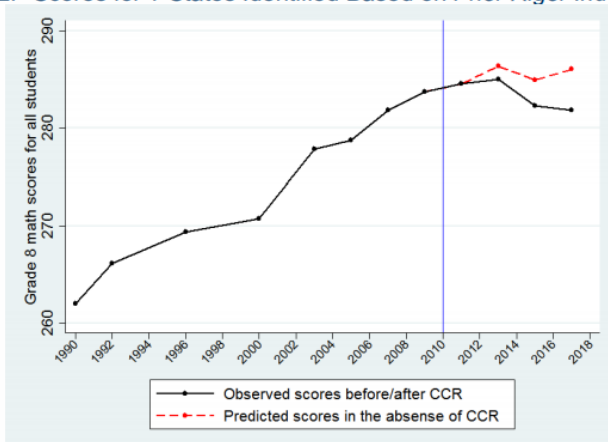
NAEP Scores for T States Identified Based on *Prior Rigor Index*



ES: 1-year effect = 0.01; 3-year effect = -0.04; 5-year effect = -0.06; 7-year effect = -0.09

### Effects of CCR Standards: Grade 8 Math

NAEP Scores for T States Identified Based on *Prior Rigor Index*



ES: 1-year effect = 0.00; 3-year effect = -0.04; 5-year effect = -0.07; 7-year effect = -0.11\* (p < .05)

Graphs taken from (American Institutes for Research, 2018)

According to the Prior Rigor Index, Grade 4 NAEP Scores were at about 241 in 2010 (Song, Yang, & Garet, 2018). The Prior Rigor Index measures the rigor of each state's 2010 standards prior to adopting the Common Core Standards. After the implementation of the CCSSM, expectations of the CCSSM lined up with results after year 1 at about a national average score of a 241 in 2011. In year 3 (2013) scores were below an ambitiously projected 244.5 scoring

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average, at 243, but were still the highest in national history for the NAEP test. So although the scores were lower than initially projected, they were the highest scores recorded ever for the United States. In year 5, scores dropped and were back to approximately where they were when the CCSSM was first implemented in 2010, at about a 240. In year 7, the scores dropped yet another point to around 239. Clearly there was a decline in scores over the five year span from 2013 to 2018, but this could be due to a number of factors.

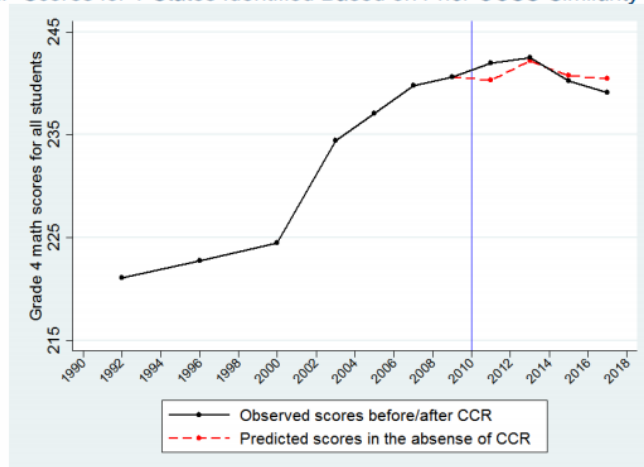
Song et al. (2018) have defined t-states to be states that were lowest in rigor and furthest away from the standards of the CCSSM. Kentucky would be one example of a t-state. The CCSSM are rigorous and are much more thorough with its standards than the standards of the t-states. Unfortunately, the immediate success of the common core standards shown by the highest national scoring average ever on the NAEP was not seen as a success, as scores were projected to be even higher in the absence of the CCSSM. It is foreseeable that perhaps the implementation had not been efficient in states defined as t-states. The scores trending upwards immediately after the 2010 implementation could have been due to the continued upward trend that was previously seen in the NAEP scores. The system, in each t-state, was working somewhat well at the time and the scores from 2010-2013 being high but not high enough could potentially be due to the after-effects of the system already in place within those states. On the other hand, although 2010 was the year of adoption by most states, those states did not deem the CCSSM fully implemented until three to five years later on average. The CCSSM need more time to be developed and improved upon nationwide, especially for the t-states to be at the starting point of the c-states. Massachusetts was an example of a c-state, a state whose previous standards were considered close in rigor to the Common Core. One could hypothesize that the drop in NAEP scores after year 3 of implementation was possibly due to the continued effort of states to best implement the

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standards set by the CCSSM, where states can be strengthening in some areas and weakening in others. There has not been enough time to see the recent decline definitively being a result of the CCSSM.

### Effects of CCR Standards: Grade 4 Math

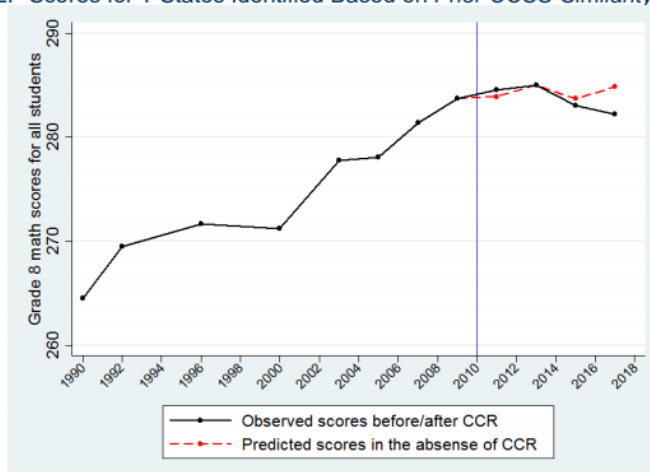
NAEP Scores for T States Identified Based on *Prior CCSS-Similarity Index*



ES: 1-year effect = 0.06; 3-year effect = 0.01; 5-year effect = -0.02; 7-year effect = -0.04

### Effects of CCR Standards: Grade 8 Math

NAEP Scores for T States Identified Based on *Prior CCSS-Similarity Index*



ES: 1-year effect = 0.02; 3-year effect = 0.00; 5-year effect = -0.02; 7-year effect = -0.07

Graphs taken from (American Institutes for Research, 2018)

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Based on the Prior CCSS-Similarity Index, which is “a measure of the similarity between each state’s 2009 math standards and the CCSS for math,” trends are the same as the previous, but with the big difference being the immediate trajectory of the potential scores in the absence of the CCSSM (Schmidt & Houang, 2012). The trajectory is created in relevance to the upward trend in NAEP scores, before common core adoption in 2010. The trajectory is actually below what the results were from 2010-2013, meaning that students actually performed better than expected. This further proves that the immediate success and then quick, steady decline after 2013, is due to the slowly growing system observed in each of the t-states before the CCSSM. The effects of previous educational systems lingered through these states and their previous successes up to 2010, but in 2013 when most of these t-states’ standards are being better implemented with rigor and difficulty in the classroom, it can be expected that scores could be lower than that of the c-states, as the c-states had previous state educational systems in place that were more closely aligned with the CCSSM. It will take longer periods of time for the t-states before the system is efficient as possible. Song et al. (2018) argues that the lack of significant positive effects of CCSSM standards are due to implementation issues, including that the timeline is typically three to five years to reach full implementation but even that seems ambitious for 20 t-states. Another reason for why scores declined after 2013 is that NAEP standards and CCSSM standards are not necessarily closely aligned (Song, Yang, & Garet, 2018).

Grade 4 and 8 math findings from this study show only t-states. Given the definition of t-states, the data shown should not be surprising. T-states are the states that had systems in place that were much different than the system created by CCSSM. Thus, these states had much more to change in terms of rigorousness of curriculum, than say the c-states whose standards were

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more closely aligned to the CCSSM, based on their previous systems. Grade 4 Math peaked nationwide for NAEP scores a year after CCSSM was implemented in most states, declined after 3 years, and has, from 2015-2017, evened back out to the average right before the CCSSM was implemented. Hopefully, now in 2019, the scores should begin to slowly grow in the positive direction as this will now be nine years of the newly established system. In saying this, it is also important to say that it has not yet been nine years of full implementation. Because the CCSSM takes about three to five years to implement fully, it makes sense that at the 5-year and 7-year mark, the scores evened out. Grade 8 has shown an immediate decline over the 7-year effect but can once again be attributed to difficulty of curriculum and challenges of implementing the CCSS at higher grade levels. It can be concluded that Grade 4 mathematics NAEP scores have followed an approximate three to five years of reaching full implementation and scores will remain around the same or slowly trend upwards in the coming years. In fact, the scores went up by a point in 2019. Grade 8 mathematics NAEP scores continue to trend downwards, and improvement is needed, as scores are down another point in 2019 (American Institute for Research, 2018). When assessing data for the Common Core, it is also important to look at teacher opinions of their support for Common Core.

Aside from test score data, we can examine the research on how states, districts, and teachers feel about CCSSM and the impact that it is having on student learning. Several studies have asked school and district leaders to give their ideas on how the CCSSM have been working on a classroom level. It's foreseeable that the immediate years after implementation of the standards would be challenging at a state level, but districts in more recent years are seeing how much more work still needs to be done, mainly in the teaching of the more rigorous content standards of the CCSSM. In 2011, the opinions of district leaders were more fixed towards CCSSM



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implementation, while in 2014, the opinions of district leaders were more informed, acknowledging that changes are necessary. The Center on Education Policy (2014) says, “We speculate that these changes in districts leaders’ views between 2011 and 2014 are likely the result of three additional years of first-hand experience with implementing the CCSSM in classrooms and with gaining a deeper understanding of the content of the CCSSM.” A deeper understanding will be able to be had by students, teachers, and all people that come into contact with the standards, as years come. Withholding judgments to allow a full adjustment period, where teachers and schools can become more comfortable with the teaching of the content aligned to the Common Core is a more optimistic approach, as opposed to tearing it down in essential growing years. Responses from district leaders indicate a desire for schools to grow under CCSSM.

In addition, a greater proportion of district leaders in 2014 than in 2011 agree that changes will be needed in curriculum and instruction to fully implement the standards. We speculate that the 2014 responses represent a more informed view of the magnitude of changes that will be required, based on additional years of working with the standards in classrooms.

(Center on Education Policy, 2014, p.5)

It has become clearer, in recent years, that changes need to be made in order to better the outcomes of the CCSSM. Before going into the argument of implementation and how it is a major part of the immediate troubles of the CCSSM, it is important to note that almost half of the states that have adopted CCSSM do not believe that their current systems will be able to meet “important milestones of CCSS implementation” until 2015 or later. It should also be noted that in 2014, “...many districts did not expect to have the key elements of a fully-aligned system in place before districts and schools are held accountable for student performance” (Center on

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Education Policy, 2014). One should expect the initial struggles of student performance and implementation at the classroom level to contribute to an adjustment period with any new curriculum and standards. The data on tests scores, along with school and district data, show a growing system that states have put in place. District and school leaders recognize that adjustments need to be made to better the educational system set in place. When looking at the adjustments to be made, it is important to look at changes districts are making present day.

District and school leaders nationwide have been able to look at the spots where help is needed implementing CCSSM. Professional development at the district level is needed to strengthen the “specificity, consistency, and authority” of the CCSSM. “More than 80% of district leaders agree that implementing the CCSS will require new or substantially revised curriculum materials and new instructional practices” (Center on Educational Policy, 2014). There is overwhelming agreement that changes in instructional materials are an essential component to implementing the CCSSM standards more efficiently and effectively. It is also significant to know that more school leaders have bought in to this philosophy since 2011, showing a growing trend in the belief of the educational opportunity for students created by CCSSM. The Center on Educational Policy has been able to survey and learn that district leaders believe that the CCSSM will run under a more rigorous curriculum that will further benefit student skills in math disciplines. Leaders also showed a deeper understanding of content and implementation, than was had in 2011. It takes time for district leaders and schools to get comfortable with it all. The greatest finding is that “in more than half of the districts in CCSS-adopting states, leaders do not expect their district to complete important milestones of CCSS implementation—such as adequately preparing teachers to teach the Common Core and implementing CCSS-aligned curricula—until school year 2014-15 or later” (Center on

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Educational Policy, 2014). A lot of the key foundations that are in direct relation to teacher preparation and curriculum are not being met. This will presumably continue to negatively effect the growth of assessment scores, as was seen with the NAEP from 2011-2014. Districts do not foresee a fully-aligned system to be in place until more responsibility is had in accounting for student performance.

The summative view of the findings of these district leaders is that more preparation is to be had at district, school and teacher level. There are problems that are occurring across the board. Many districts nationwide are having problems and challenges stemming from trying to implement the CCSSM efficiently. Problems that exist “include providing professional development, securing CCSS-aligned curricula, preparing for CCSS-aligned assessments, and finding enough resources to support all of the activities associated with implementing the CCSS” (Center on Educational Policy, 2014). Professional development, rehearsed CCSSM curriculum material, preparation for construction of assessments under CCSSM, and creation of materials that fit best in instructing CCSSM are needed. In summarizing the NAEP data that was previously stated, “it is not surprising that the attachment of consequences to performance on CCSS-aligned assessments presents a challenge for the vast majority of districts” (Center on Educational Policy, 2014). All the pieces of the puzzle need to be in place for students to succeed. What is promising is that leaders are already collaborating and aiming to find better ways to implement CCSSM. Specifically, “75% of districts are collaborating with other partners to create CCSS-aligned curricula, and 65% are working with partners to develop interim and benchmark assessments to measure student mastery of the CCSS” (Center on Educational Policy, 2014). Seeing that three out of four districts are working with other professional partners in the creation of CCSSM aligned curriculum is promising. Districts are trying to see how they can best

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work together in creating effective benchmark assessments for students, as benchmark assessments will help better prepare students for the challenges they will face on tests such as the NAEP. In 2014, 88% of district leaders agreed that new or revised curriculum was necessary for implementation, compared to 64% three years prior. Similarly with teacher instruction of CCSSM, as 89% of districts believe foundational changes in instruction are needed, as opposed to only half agreeing with that statement in 2011. Thus, as school personnel have had more exposure to and time to work with CCSSM, they have become increasingly aware of the need for more time, resources, and training to meet the full implementation benefits of the standards.

**Table 1. School year in which districts expect to complete key implementation milestones**  
*Percentage of respondents, 2014*

	SY 2013-14 or before	SY 2014-15	SY 2015-16 or later	Not sure
Implement CCSS-aligned curricula in math in all schools	37%	32%	27%	4%
Implement CCSS-aligned curricula in ELA in all schools	36%	36%	23%	6%
Adequately prepare all principals to be instructional leaders around the CCSS	36%	34%	23%	8%
Adequately prepare all ELA teachers to teach the CCSS	33%	36%	24%	7%
Adequately prepare all math teachers to teach the CCSS	30%	34%	30%	7%
Adopt CCSS-aligned textbooks and other instructional materials*	21%	29%	34%	16%
Have the necessary technological infrastructure to administer CCSS-aligned assessments†	32%	29%	26%	14%

Chart taken from Center on Educational Policy (2014)

It is important to note from the above table, that the implementation of CCSS-aligned curricula, the adequate preparation for teachers of the CCSSM, technology for the CCSSM, and textbook/instructional materials of CCSSM will take more years to develop than what was previously thought. Particularly, 27% of districts do not expect a CCSSM aligned curriculum until 2015-16 or later and that 30% of districts do not see teachers being adequately ready until 2015-16 or later. From this, it can be concluded that the timeline is being pushed further than what was previously expected to have the curriculum fully-implemented. “With nearly 90% of

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district leaders citing challenges regarding the timeline for implementation and the related consequences for student performance, the question of what constitutes a reasonable timeline for implementation and improved student performance looms large for local leaders” (Center on Educational Policy, 2014).

Another overarching issue that exists is the durability of the State Education Agency (SEA). “A state education agency ... means the state board of education or other agency or officer primarily responsible for the State supervision of public elementary schools and secondary schools, or, if there is no such officer or agency, an officer or agency designated by the Governor or by State law” (Cornell, 2019). What is good, is that most districts with CCSSM in place have received implementation assistance from the SEA in at least one regard. Implementation assistance is defined as either professional development or informational meetings for teachers or for principals. What is worrisome is that of the districts that reported receiving assistance from the SEA, only approximately one-third found these services to be very helpful (Center on Educational Policy, 2014). It is not encouraging that SEAs nationwide have only been to get one out of three district leaders to say that their assistance was very helpful. SEAs are providing assistance to districts, whether this assistance is actually helping districts with their implementation challenges is unclear. An even more alarming statistic is that only 1 out of 8 states from the 2013 CEP survey have said they have adequate staff expertise, staffing levels and resources in place.

In general, state officials in most of the CCSS-adopting states reported that their state lacked one or more elements of capacity, which we defined as having adequate staff expertise, staffing levels, and resources, to carry out various CCSS implementation activities. (Center on Educational Policy, 2014, p.7)

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The SEAs need to strengthen their support system so that all states, not just 1/3 of them, find what they deemed as essential CCSSM implementation professional development, beneficial.

There are two potential reasons why we are not seeing the full implementation effects on student achievement levels. First, full implementation did not occur until later than originally expected which pushes out the timeline for when we can reasonably anticipate changes in student achievement. Second, districts are lacking the tools, materials, and resources necessary to fully implement the CCSSM to the highest fidelity.

Californian districts, as well as others, have taken big steps in recent years to ease the implementation process. One district in California developed modules and “trained Common Core fellows” for schools. These modules were essentially professional development workshops, that highlight the shifts in the mathematic curriculum. Additionally, Common Core fellows have undergone “extensive training in the standards at the central office so they could become ‘experts’ in the schools” (C-Sail, 2018). Common Core experts within the school environment can help teachers as they grapple with learning the most effective ways teaching in alignment with the CCSSM. California is taking these steps at the district level because they want to bring attention to the high expectations of the CCSSM and as well as increased communication between the school and district levels, to ensure better implementation of the CCSSM as a team.

Texas, like California, is another CCSSM-adopted state that is also making strides to better support their teachers in aligning with the CCSSM through instructional coaches. “The coaches therefore realized they needed to increase the specificity and consistency of teachers’ understanding and enactment of the standards, and they decided to focus on student engagement as the mechanism for supporting this goal” (C-Sail, 2018). These instructional coaches are pushing teachers away from the assigning of textbook-based worksheets and are rather trying to

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get them to deliver content that syncs in with high expectations of CCSSM. School leaders are seeing the need to learn through investigation and not memorization, a key component of CCSSM aligned curriculum. “In one district, the instructional coaches realized that when they asked teachers— ‘What is our curriculum?’—their responses included the names of various textbooks rather than the state’s standards and how they influenced the curriculum” (C-Sail, 2018). Getting teachers to think more about how the standards are influencing the content they are teaching is taking teachers away from simple textbook-based instruction. Another state taking big steps in professional development is Ohio.

Ohio school districts have implemented the Ohio Improvement Process (OIP) which is a professional development process that looks to make informative changes to the lowest performing schools statewide. The OIP is said to be a “continuous improvement process” that includes “district leadership teams, building leadership teams, and teacher-based teams that assess student proficiency levels based on the standards, determine students’ needs, design lessons and interventions, and see how students improve based on their interventions” (C-Sail, 2018). Developing leadership teams will create an environment that ensures goals are produced with high expectations. Looking to see how students improve based on particular lesson designs, will help show the impact of materials that align best with CCSSM-based instructive practices. Encouragingly, even schools that have been not been deemed low performing are implementing OIP because teachers are noticing where student learning and engagement has taken place in their classrooms. The fact that schools are looking to implement professional development, even when it is not deemed a requirement, is very encouraging.

One state that has provided exemplary Common Core implementation support is Massachusetts. For example, one district has teachers attend a month-long professional

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development conference in which teachers teach designated topics. The goal is in “showing their peers how they implement the district’s standards in various concrete ways” (C-Sail, 2018).

Teachers in the state of Massachusetts

...are even having professional development where teacher teams devoted several weeks to unpacking the revised MA content standards, creating instructional resources that helped teachers understand the academic vocabulary and student discourse that should be occurring at each grade level (specificity), and using rubrics to make sure their interim assessments are aligned to the revised standards (consistency). (C-Sail, 2018)

Enabling teacher teams to truly dive into these standards has enabled them to create instructional materials aligned with the CCSSM. Additionally, having a summer program like this one, has allowed teachers to develop their understanding of the CCSSM. In turn, they can bring that knowledge into the coming school year, to be shared with other teachers, furthering the spread of CCSSM-aligned materials more.

In conclusion, the CCSSM is a 21<sup>st</sup>-century educational reform that aims to engage students in developing a true understanding of the big mathematical ideas.

Students who meet the standards develop persistence, conceptual understanding, and procedural fluency; they develop the ability to reason, prove, justify, and communicate. They build a strong foundation for applying these understandings and skills to solve real world problems. These standards represent an ambitious prekindergarten to grade 12 mathematics program that ensure that students are prepared for college, careers, and civic life. (MCFM, 2017)



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The data thus far on student achievement does not show the gains we were hoping for after the Common Core was implemented. Unlike previous educational reforms, we should not act impulsively in the response to the latest NAEP scores. As I have pointed out, it may be too early to truly judge the impact of the Common Core. According to the Center On Educational Policy, key milestones for full CCSSM implementation were expected to be completed by the 2014-2015 school year, but some states have taken longer than this. Although CCSSM were adopted by most states in 2010, district leaders have indicated that full implementation was not achieved until near or after 2015. That means that perhaps we should postpone judgements of impact until full implementation has been achieved and sustained or improved over time, which would mean we have a few more years to wait. I hypothesize the CCSSM will continue to grow under recent state actions. In reaction to the discouraging NAEP scores from 2011-2014, districts and school leaders sought methods of professional development for their schools in order to improve implementation of the CCSSM. Teachers need a succession of materials that align with CCSSM, as well as increased comfort with the rigorous content they are now expected to teach. NAEP scores should begin to trend in the upward direction in years to come, with the continuation of advanced professional development. Leadership teams, at the school and district level, are being developed in order to focus student engagement on the standards and develop student foundations of success in school, careers and in life. Thus, proper actions are being taken to fully implement CCSSM, and with more time, will come more results.

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