



Discussion and Takeaways

The CCSS-M are designed to support a more focused, coherent, and rigorous instructional program that places greater emphasis on conceptual understanding and real-world application, in addition to procedural fluency. But are these shifts occurring at the classroom level? Overall, the survey results suggest they may be, though there is still much work to be done and much about how the standards are being implemented that we don't yet understand. Below we consider what the results imply for each of the three CCSS-M shifts: focus, coherence, and rigor.

Focus

A primary goal of the standards is replacing the “mile wide and inch deep” mentality of yesteryear with an intense focus on the topics most essential for college and career readiness. Achieving this goal requires that teachers do at least two things effectively: cover the appropriate grade-level topics and devote the most time and attention to those considered most important.

On both of these counts, our results suggest that most teachers are succeeding. For example, across grades, thirty-seven of the forty-four major grade-level clusters included in the survey were identified by at least 90 percent of teachers from the appropriate grade as among those they would teach by the end of the school year. And in all but one grade, four of the five clusters that teachers were most likely to say they would focus on were major grade-level clusters.⁴⁵ Together, these results suggest that teachers, on the whole, are focusing on the most important grade-level topics, as described in the standards.

Encouragingly, two-thirds of teachers do *not* agree that “important math topics are being missed as a result of a narrower curriculum.” Yet some teachers express concern about the length of time required to teach multiple approaches to the same problem, suggesting that actually achieving a focused curriculum remains a challenge.

Slow Pressure

Teaching all the strategies makes for very, very slow teaching and with the pressures of getting through a curriculum it is hard to make it work. I didn't get through my entire curriculum last year also. A lot of other teachers in our school didn't because there's just no time with the way we teach math now. —GRADES 2 AND 3, MARYLAND

Coherence

Another goal of the CCSS-M is achieving greater coherence across grades by connecting the topics and concepts covered in one grade to those in the next (while avoiding unnecessary repetition). Yet achieving this degree of coordination across grades is tricky, as is assessing the progress that has been made on this front.

On the one hand, the fact that teachers are generally covering the appropriate grade-level topics has positive implications for coherence (as it does for focus). Similarly, it's encouraging that a majority of teachers say their math curriculum is consistent for all math classes in their grade. After all, if teachers in the same grade are using different curricula, or covering different topics, the task of "linking" becomes more complicated for their colleagues in the grades above.

On the other hand, because the term "curriculum" is open to interpretation, it's difficult to know what teachers mean when they say their curricula are or aren't the same, since they could be referring to the topics they cover, the textbooks they use, district- or school-provided resources, or something in between. Additionally, because linking concepts may require that teachers review material from previous grades, evidence that teachers are teaching topics that aren't on grade level must be interpreted cautiously, since linking is difficult to distinguish from "repeating." Most concerning is the lack of attention to working with colleagues at different grades. Knowing what has been taught (and how it was taught) requires more than a review of the standards or district curriculum; it requires collaboration with teachers in neighboring grades.

When asked directly, 38 percent of teachers report doing more "linking new math concepts to those taught in earlier grades" than before the CCSS-M were implemented, while just 5 percent say they do less of this—an encouraging ratio. Still, given the qualifiers outlined above, it's difficult to know if the level of coherence has actually increased. At the very least, the results don't raise red flags.

Rigor

Of the three shifts required by the CCSS-M, promoting rigor by pursuing conceptual understanding, procedural skill and fluency, and application with "equal intensity" may be the most challenging to implement—and the survey results reflect this tension.

On the one hand, there is strong evidence that teachers are attending more to applications of mathematics—a positive finding inasmuch as students need to be able to use what they know. Similarly, teachers seem to be attending to mathematical concepts more than they used to, often in ways that are likely to benefit students. For example, having students explain their thought process and use correct mathematical terminology can solidify important concepts. And talking with students about more than one approach to a problem can reinforce learning (especially if the emphasis is on how the methods relate to one another mathematically, rather than committing still more procedures to memory).

On the other hand, the survey responses also suggest that teachers may be diluting students' mastery by covering too many strategies. Knowing alternate strategies requires conceptual understanding and strengthens procedural fluency. When students know several ways to solve a problem, they are able to select the most appropriate and efficient strategy given the values that appear in it. Yet teachers nonetheless report frustration on the part of students who are taught multiple methods. As this discussion highlights, achieving rigor in the classroom means finding a useful balance between conceptual understanding, procedural fluency, and application—something the results suggest teachers are still grappling with.

Implications

The survey results and discussion above imply at least five takeaways for both teachers and other local and state education officials.

1. Stay the course—change takes time.

The changes that need to take place to implement CCSS-M with fidelity won't happen overnight. It will take time for teachers to understand and prioritize the new grade-level topics and fully familiarize themselves with the Standards for Mathematical Practice. Getting on the same page with grade-level colleagues—much less teachers in other grades and subjects—is a learned habit. And it can take years for teachers to get accustomed to the ins and outs of new curricula and instructional materials, which may also be changing.

The Real Foe

Common Core is not the enemy. The implementation and follow through is the problem.

—GRADE 7, UTAH

Overall, the results suggest the transition to CCSS-M has been hardest at the middle school level, where students actually did have to *transition*. Elementary teachers at the K–2 level (especially those working with children who have known only the CCSS-M) are more likely to describe positive outcomes. And teachers who have taught to the CCSS-M for longer are more likely to report having adjusted their pedagogy. These results suggest that both students and teachers will ultimately benefit from staying the course.

2. Increase the amount of time devoted to collaboration across grade levels.

Teachers are generally more likely to say that they are doing more linking math concepts across grades than before the CCSS-M—but it's hard to know whether these links are functioning as a bridge to grade-level content or if they are a repetition of what should have already been covered. Obviously, teachers who work closely together would know which of the two is occurring; yet the survey results suggest that collaboration among teachers in different grade levels has not been a priority during the implementation of the CCSS-M.

According to the CCSS-M architects, “the development of the standards began with research-based learning progressions detailing what is known today about how students’ mathematical knowledge, skill, and understanding develop over time.”⁴⁶ In other words, the design of the standards *assumes* that content taught in one grade will connect to content taught in the next, because this is how mathematics is learned. Given this central assumption of the standards, it seems even more essential that teachers across grade levels be granted structured opportunities to align their teaching with one another.

3. Keep parents informed, and make homework comprehensible.

It is no secret that the Common Core has generated pushback in some parts of the country, in part because of the perception that it represents a radical departure from the way math has traditionally been taught. A whopping 85 percent of teachers say that the statement “Reinforcement of math learning at home is declining because parents don't understand the way math is being taught” is very or somewhat close to their view. Regardless of whether this confusion is warranted, this perception must change if the standards are to have the desired effect.

On this front, two steps would make a world of difference: First, teachers and principals should keep parents informed about the purpose of the standards and engaged in their children’s math education. As Jason Zimba, lead writer of the CCSS-M, has suggested, there are many ways in which parents can be involved, even if math isn’t their strong suit, including helping with skill building and fluency practice.⁴⁷

Second, make homework assignments as straightforward and comprehensible as possible, so that parents can understand them. More important than *teaching a method* and *practicing a method* (especially one not familiar to families), is ensuring that a student selects *the method* that makes sense to her and from which she can efficiently and accurately reach a solution. Parents are then able to support the student with methods they know. If the goal of the homework is to provide practice with a *new method*, then teachers should support families by sending home worked examples of new methods or providing online links that explain the method, among other strategies.

4. Press curriculum developers not only for better-aligned materials but for those that help educators teach students who are below grade level.

Though the survey results suggest that most teachers now have access to materials that are aligned to the CCSS-M, we have a long way to go. And mere alignment is not enough. Teachers also need materials that can help them reach students who are below grade level, who may be even further behind than they were before the CCSS-M now that the bar has been raised. (It is likely no coincidence that teachers who teach below-grade-level students have a more negative view of the standards.) Educators have the contradictory task of getting these students up to speed (which requires moving quickly through the content) while teaching with increased rigor (which compels them to slow down). They will need help to square this circle.

The “K–8 Publishers’ Criteria for the Common Core State Standards for Mathematics”⁴⁸ envisions curricular materials that “manage unfinished learning from earlier grades inside grade-level work, rather than setting aside grade-level work to re-teach earlier content.” Further:

[U]nfinished learning from earlier grades is normal and prevalent; it should not be ignored nor used as an excuse for cancelling grade-level work and retreating to below-grade work. For example, the development of fluency with division using the standard algorithm in grade 6 is the occasion to surface and deal with unfinished learning about place value; this is more productive than setting aside division and backing up.

A curriculum that manages to accommodate struggling students without sacrificing on-grade-level work seems too good to be true, but it shouldn’t be. We should evaluate materials not only on their alignment to the CCSS-M, but on their approach to and success in bringing below-grade-level students up to speed.⁴⁹

5. When the CCSS-M are revised, work to address some of the problems identified here.

Our results reveal several challenges associated with implementing the CCSS-M. First, teachers are struggling to effectively pursue rigor. It is no easy task to balance the treatment of conceptual understanding, procedural skill and fluency, and application. Second, some teachers still think that the standards include more content than they have time to teach well. Third, achieving fluency requires a deep understanding of the content to be taught in other grades; the lack of cross-grade collaboration makes it harder for teachers to attain that. Fourth, though the CCSS-M specifies that young students will know from memory their addition and multiplication facts, it is not clear whether teachers understand the role memorization might play. We need to clarify the goals for basic fact instruction so there are clear connections between using mental strategies and reaching mastery. Finally, though they are generally on board with teaching students multiple methods to solve a problem, some teachers nonetheless think it confuses students rather than deepens their understanding.

There are no easy answers when it comes to addressing these challenges, some of which are likely best handled if and when the standards are revised. Given that this revision likely won't occur any time soon, curriculum designers and professional development staff have their work cut out for them in the interim.⁵⁰

Final Thoughts

For the first time in our nation's history, there is a high level of consistency regarding what's taught in American elementary and middle school math classrooms. Fewer teachers appear to be closing their classroom doors and doing their own thing.

Most teachers think the new standards are more rigorous than their old ones, are teaching the major CCSS-M topics at their grade level, and are incorporating different ways of teaching mathematics. Across grades, there is support for the vision of the Common Core State Standards, though not without concerns about student preparedness, especially at higher grade levels.

Meanwhile, students are being exposed to fewer topics in more depth, spending significant time on applications in mathematics, and learning in different ways. Much of that time is being spent on number and algebra-related content, as reflected in the design of the standards.

Yet eluding many teachers is the just-right balance between conceptual understanding, fluency of procedures, and the application of mathematics. Getting this balance right is key not only to ending the math wars but to developing mathematically proficient, globally competitive, college- and career-ready students—in other words, ensuring that the Common Core is properly implemented and accomplishes its intended purpose.