How the Common Core

The Common Core State Standards address two tenacious problems in U.S. education.

William H. Schmidt and Nathan A. Burroughs

The adoption of the Common Core State Standards by 46 states and the District of Columbia represents a dramatic departure in U.S. education. In the past, national efforts to improve education have been directed by the federal government and have emphasized resources or organizational structure. In contrast, the Common Core State Standards in math and language arts were developed under the leadership of state governments to improve the content of instruction.

A tremendous commitment of time, money, and human resources has gone into creating the new standards—and even more will go into implementing them. If the ambitions of the Common Core initiative are realized, for the first time almost every public school student in the United States will be exposed to roughly the same content, especially in grades 1–8.

All of which raises the question, Is all this effort worth it? In the case of mathematics, we think the answer is yes because the new math standards will address two long-standing problems in U.S. education: the mediocre quality of mathematics learning and unequal opportunity in U.S. schools. In short, the Common Core State Standards have the potential to improve both quality and equality in mathematics education.

The Quality Issue

Extensive evidence points to the inadequacy of mathematics education in the United States. Only 26 percent of U.S. 12th graders reach the threshold of proficiency in math on the National Assessment of Educational Progress (National Center for Education Statistics, 2010). Moreover, U.S. 8th graders posted a mediocre performance on the 2007 Trends in International Mathematics and Science Study (Gonzales et al., 2008) and scored below average on the 2009 Programme for International Assessment (Fleischman, Hopstock, Pelezar, & Shelley, 2010). The need to improve mathematics learning in the United States has been a primary driver of education reform efforts, including the Common Core initiative.

What New Research Shows

Although one can’t say for certain what the effects of any policy will be, empirical research suggests reasons for optimism regarding the Common Core standards. A recent study examined the likelihood that the new mathematics standards
would improve student achievement (Schmidt & Houang, in press). This study involved (1) comparing the Common Core State Standards in mathematics with the mathematics standards of the countries with the highest mathematics achievement on international assessments, (2) estimating how close each state’s previous math standards were to the Common Core standards, and (3) exploring whether states with standards more like the Common Core standards did better on the 2009 National Assessment of Educational Progress (NAEP) in 8th grade mathematics.

The Trends in International Mathematics and Science Study (TIMSS) demonstrated that the mathematics standards of the world’s highest-achieving nations have three key characteristics: rigor, focus, and coherence. A rigorous curriculum covers topics at the appropriate grade level; a focused curriculum concentrates on a few key topics at a time; and a coherent curriculum adheres to the underlying logic of mathematics, moving from simple to more complex topics.

After identifying the common characteristics of the standards of those countries that did best on the TIMSS, the study compared the duration and sequence of topic coverage across grades in these “A+” standards with the Common Core State Standards for mathematics. This comparison revealed an overlap of about 90 percent. If the standards of the world’s top-achieving nations are any guide, the new math standards are of high quality.

As we might expect, comparing preexisting state mathematics standards with the Common Core standards revealed wide variation in the quality of state standards. Many states will have to undertake major changes in how they’re implementing their curricula if they’re to faithfully execute the vision of the Common Core standards. More important, statistical analysis of the relationship between the proximity of a state’s standards to the Common Core standards and that state’s average performance on the NAEP uncovered a positive relationship between the quality of a state’s curriculum standards and that state’s 8th grade mathematics performance.

However, some states with high standards that look very similar on paper to the Common Core standards register middling or even low NAEP scores; in contrast, other states with only average
standards post higher mathematics scores on NAEP. At first glance, this might suggest that the Common Core State Standards will have little effect on student achievement—that high standards don’t ensure high achievement. But such a simplistic comparison of standards to test scores neglects the crucial role of implementation (Schmidt & Houang, in press).

For example, each state has its own standards—but also its own assessments and cut scores. States with low cut scores devalue the worth of what could otherwise be strong standards, implicitly telling schools not to take the standards seriously. Once proficiency cut scores are accounted for, there’s a statistically significant and positive relationship between the similarity of state standards to the Common Core State Standards and average student achievement.¹

One of the aims of the common assessments currently under development is to establish a common proficiency cut point across states, which should reduce the likelihood that states will devalue the new standards as many did their previous standards.

**The Equality Issue**

Much of the debate about the Common Core State Standards has focused on their potential to improve the overall quality of U.S. education. However, we have not paid enough attention to their capacity to ensure greater equality in content coverage among students.

We most often equate education inequality with inequality in the resources available to poorer school districts, unequal education outcomes on student assessments, the fact that underprivileged students are most likely to have inexperienced or underqualified teachers, and the fact that children from impoverished or otherwise difficult home lives are much less likely to have the same kind of supports or enrichment opportunities that their luckier peers do. All these facets of inequality are crucial for policymakers to address.

A Focus on Instructional Equality

However, what’s lacking in all these discussions is any concern for inequality in instructional content. The U.S. education system is rife with curricular inequalities, by which we mean inequalities in the opportunity to learn challenging content (Schmidt & McKnight, 2012). If a student is never exposed to a topic, he or she can hardly be expected to learn it—a problem that’s especially acute in mathematics. The mathematical content that students have an opportunity to learn varies wildly across schools, districts, and states.

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The continuing variation within states effectively rebuts a common criticism that asserts that because existing state standards have had no discernible effect on student achievement, we shouldn’t expect the Common Core standards to have an effect either. This claim seems to assume that the content taught at a particular grade in any given year is essentially the same in any classroom in the state.

But that’s not what we find. Rather, what students have a chance to learn will be based in large measure on what community they happen to live in and what school they happen to attend. In fact, the mathematics content offered in low-income districts is more similar to that of low-income districts in other states than to middle- and high-income districts in the same state.

Whether the Common Core standards will mitigate these within-state inequalities remains an open question. The seriousness of purpose accompanying the advent of the Common Core movement—with its new assessments, new textbooks, and the sheer national scope of the enterprise—is a hopeful sign. However, success will depend on effective implementation.

A Widespread Problem

When education inequality becomes a subject for public discussion, there’s a strong inclination to suppose that inequality is restricted to minority and low-income children. However, data from the Promoting Rigorous Outcomes in Math and Science Education (PROM/SE) project (Schmidt & McKnight, 2012) revealed that the greatest variation in opportunity to learn mathematics content was among middle-income districts. There was greater variability in what topics were covered at what grade level among districts that had neither high nor low socioeconomic status (SES) than among the much more homogenous high- and low-SES districts. Inequality of opportunity to learn is a problem for every student, and for the United States as a whole.

The problem of curricular inequality goes much deeper than differences among schools or districts. The greatest source of variation in opportunity to learn mathematics is actually between classrooms (Schmidt & McKnight, 2012). Students living in the same district, attending the same school, and...
enrolled in the same grade can have very different classroom experiences. This problem manifests itself in several ways. Often, classes with identical course titles and textbooks have different instructional content. The level of teacher preparation as well as teacher expectations for the student will vary (Cogan, Schmidt, & Wiley, 2001).

There’s also the widespread use of tracking, a process by which students are assigned to classrooms on the basis of perceived ability. Once students are assigned to lower tracks, they almost never move up to higher ones (Schiller, Schmidt, Muller, & Houang, 2010).

Despite the fact that tracking has been roundly criticized by many scholars, policymakers, and activists, the practice remains quite common. Surveys of school administrators and teachers conducted as part of the 2011 NAEP (National Center for Education Statistics, 2011) suggest that three-quarters of 8th graders are assigned to mathematics classrooms on the basis of ability. Even more shocking, nearly a third of 4th graders are assigned in this way. Thus, many students have their long-term academic futures determined for them when they are only 9 or 10 years old.

What the New Standards Can Do
The Common Core State Standards for mathematics represent an opportunity to broaden access to rigorous educational content. Having a common set of standards certainly promotes higher-quality textbooks and assessments and makes it easier for students moving between states to fit into their new schools. However, the greater effect of the standards may be that they alter our approach to teaching mathematics.

The new math standards offer the possibility of a common curriculum within states, districts, and schools. The vision of the Common Core initiative is that teachers will cooperate across classrooms and grades in determining how they’ll teach math so that there’s a clear, logical progression as a student moves through school. If effectively implemented, the new standards could reduce within-state inequalities in content instruction.

The new math standards enable teachers to deepen their teaching. The new focus should shift the teaching of mathematics from a “spiraled curriculum” approach, in which too many topics are shallowly covered year after year, to one in which a few important topics are mastered at each grade level. For example, the Common Core standards call for focused instruction on fractions in grades 3–5 and on linear equations in grade 8. Because teachers will have more time to teach each topic, they should be more able to ensure that their students understand the material instead of having to cling to the vain hope that struggling students will figure things out in later years.

The new math standards discourage tracking. By insisting on common content for all students at each grade level and in every community, the Common Core mathematics standards are also in direct conflict with the concept of tracking. If the new standards were to do no more than sharply reduce this practice, the policy would be well worth the effort.

What the New Standards Don’t Do
Support for the new standards cuts across ideological lines, but so does opposition. In evaluating potential benefits, it’s useful to clarify what the standards don’t do.

The new math standards don’t hold teachers responsible for students’ poor math performance. The fact that the greatest source of variation in opportunity to learn is in the classroom doesn’t mean that teachers are to blame for curricular inequality. Currently, teachers are deluged with competing signals about what content to teach. State standards, state assessments, and textbooks provide conflicting guidance; and teachers receive neither the preparation nor the support they require to make effective curricular decisions. Easing this situation is one of the key objectives of the Common Core movement.

The new math standards don’t end the autonomy of local schools or teachers. Curriculum is only one component of schooling, defining what schools should teach, not how. Under the present system, teachers and school districts are expected to decide both the content of instruction and the best means for helping students learn that content (along with many administrative and community responsibilities). Instead of teachers having to spend time inventing which content to teach and in what sequence, the new standards help schools and teachers focus their efforts on their core competencies and devise the best means for helping students achieve the standards.

The new math standards are not part of “market-based” education reform. Some advocates of the Common Core standards also support a range of other education reform policies, such as No Child Left Behind, merit pay, and the use of value-added models to assess teacher performance. Although there’s no real inconsistency between such reforms and the Common Core State Standards, it would be a mistake to lump them together. The aim of the Common Core initiative is not to introduce market mechanisms in education but to institute high-quality standards that promote equality of opportunity to learn for all students.

The Road Ahead
A recent survey conducted on behalf of the Center for the Study of Curriculum
at Michigan State University reveals both positive signs and potential pitfalls in efforts to realize the new standards.

Positive Signs
In our representative sample of more than 12,000 mathematics teachers in the 40 states that had adopted the new math standards as of January 2011, more than 90 percent said they liked the idea of having Common Core State Standards for mathematics because they provide “a consistent, clear understanding of what students are expected to learn” and “a high-quality education to our children.” After reading a sample of the standards for the grades they teach, virtually 100 percent of the teachers said they would teach the new math standards. The challenges teachers identified differed little from those that educators so often express with any curriculum—lack of supporting curriculum materials and lack of parental support.

Luckily, parental support may not be an obstacle to implementing the Common Core standards. In our representative sample of more than 6,000 parents of K–8 students, most viewed math as the most important subject for their children, and nearly 70 percent thought that the Common Core State Standards for mathematics were a good idea. More than 90 percent endorsed the idea that math is important for their children’s success and that their children should take math every school year, including all four years in high school.

Potential Pitfalls
The survey also suggested areas of concern. Teachers may not have a clear grasp of what’s in the new math standards or how the standards differ from the status quo. Most teachers (80 percent) thought that the new standards were “pretty much the same” as previous standards, a belief that research (Schmidt & Houang, in press) shows to be grossly mistaken. Also, many teachers believe that the new standards may require them to add new topics to their current math curriculum. Rather, the

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Common Core standards call for greater focus on fewer topics at each grade level.

To effectively implement the Common Core State Standards for Mathematics, teachers are going to have to be much better prepared. Fewer than half of elementary teachers we surveyed felt well prepared to teach Common Core math topics at their grade level, compared with 60 percent of middle school teachers and 70 percent of high school mathematics teachers. As for parents, those we asked still knew very little about the Common Core standards (even whether their state has adopted the standards). Moreover, a distressingly large percentage of parents (36–38 percent) believed that some children just can’t “get” mathematics.

Cautious Optimism
Inadequate teacher preparation, lack of parent involvement, and insufficient resources and planning could all derail implementation efforts. Realizing the vision of the standards represents a tremendous challenge, but the potential benefits—higher mathematics achievement and greater equality of education opportunity—make it well worth the effort.

1Schmidt and Houang (in press) weighted the congruence scores (the similarity of state standards to the Common Core standards) using a ratio of the state’s proficiency cut point to the NAEP benchmark for proficiency. Doing so generated a much more robust estimate of the relationship between state curriculum and achievement.

References


William H. Schmidt (bschmidt@msu.edu) is university distinguished professor at Michigan State University. He is coauthor, with Curtis C. McKnight, of Inequality for All: The Challenge of Unequal Opportunity in American Schools (Teachers College Press, 2012). Nathan A. Burroughs (burrou25@msu.edu) is a research associate at the Center for the Study of Curriculum at Michigan State University.