



The Common Core State Standards— Education Reform and Us

Solomon Garfunkel

We now live in a country with common core state standards (CCSS) in K-12 mathematics. While technically these standards were created by the National Governors Association and the Council of Chief State Officers and funded by private foundations, in reality they are a major part of the Obama administration's education policy. I don't mean to say that they were written by people in the administration—only that the idea of common standards is an article of faith of the U.S. Department of Education. And of course one can see the logic. With *No Child Left Behind* we had, for all practical purposes, fifty sets of standards and fifty sets of high-stakes tests. Students were being anointed as mathematically proficient in one state, when they couldn't score in the twenty-fifth percentile in another, or get a passing grade on more generic assessments such as the National Assessment of Educational Progress (NAEP).

As I write this piece forty-four states have agreed to abide by the CCSS, and the betting line is forty-five. In effect we now have a set of national standards. In addition, two major state assessment consortia have been funded by the Department of Education. They are charged with preparing a bank

of tests to be ready by 2014-2015; so in effect we will have national tests as well. In other words, we are within five years of standards, tests, and curricula all marching in the same direction.

What does all of this mean for the mathematics research community? Why should the community care? For one thing, today's K-12 students will be the college and university students of tomorrow. We care about their preparation and their motivation. For another thing, these students are the next generation of our citizens. We care about their ability to run the world (and pay for our Social Security). And we care about the future of mathematics. We want a mathematically literate student body that becomes a mathematically literate citizenry. We want more and better math majors and more and better majors in related scientific and engineering disciplines. Increased mathematical literacy will make the profession better and the world a better place. So it's important and it demands attention.

While it would be easy to find fault with the standards as written, one must recognize the difficult nature of the writing task. The standards authors had to appeal to many different constituencies in as many states as possible. And, given the push from the Department of Education, they were given much too short a timetable. But that is now quite clearly beside the point. We will be living

Solomon Garfunkel is executive director of COMAP. His email address is so1@comap.com.

with this version of the standards for at least the next ten years, and it will determine what and how K-12 mathematics is taught and tested.

Of course, you should read the standards for yourselves and draw your own conclusions. Here's my take. The content standards themselves are in part a list of mathematical topics that will seem quite familiar. In fact, they feel rather old-fashioned, more or less your grandfather's standards. At this writing there are no exemplary tasks contained in the document, which would have been of great help in making the meaning of the statements clearer to teachers. The high school standards in particular are written in a language many teachers simply don't speak.

But again, that is beside the point. These are our standards now. And there is some good news here. The Standards for Mathematical Practice are well formed and important. They require that students

- make sense of problems and persevere in solving them.
- reason abstractly and quantitatively.
- construct viable arguments and critique the reasoning of others.
- model with mathematics.
- use appropriate tools strategically.
- attend to precision.
- look for and make use of structure.
- look for and express regularity in repeated reasoning.

Moreover, states signing on to the CCSS are permitted to add up to 15% of their own standards. This flexibility is an opportunity for us to ensure that the mathematics taught K-12 contains the breadth of ideas and applications that demonstrate the importance and excitement of our subject. By getting involved at the school, district, and state level we can provide the examples so desperately missing—examples that challenge students to reason, connect, and communicate their understanding.

A conference was recently held in Washington, DC, to discuss the implications of living in this new standards-based world, especially for textbook and course development. Several important recommendations have come from a report of that conference. The two most important ones (to my mind) are the recommendations that the standards remain a living document and that the mathematical practices, as opposed to a laundry list of mathematical topics, remain prominent.

But the real question for the mathematics community is what is our role in all this; what do these standards mean to us? For some time, the

standards, the tests, and the curricula designed to prepare students for those tests will define K-12 mathematics. We need to be diligent—careful that our students' vision of mathematics does not become too narrow, too focused on algebraic symbol manipulation. This is where the practices must come in. Mathematics needs to make sense; mathematical modeling needs to be introduced early and often; we must make room for more recent mathematical ideas—graph theory, game theory, operations research, et al. As a nation we must not sacrifice our creativity for a higher ranking on skills-based tests.

Although college placement exams are heavy on checking that students can recall their high school algorithms, college faculty often decry their students' lack of content knowledge. We must demand more of students and of the education system we are revamping. During the last standards debate of the late 1980s and early 1990s, the research community was mostly silent and unaware. The voices that were heard were often strident, because the only people who seemed to care, cared too much. We can no longer afford mathematics education turning into a political campaign—big on slogans and all about how the message is framed.

It is worth noting that previous reform movements have come from inside. The mathematics and the mathematics education community decided on the need for change and the need for new standards. The funding for the curriculum development, staff development, and implementation work that followed came primarily from the National Science Foundation (NSF). Not this time. This time the impetus for change has come from outside—from the federal and state governments. And the funding for the follow-up work will not come primarily from NSF, but from the U.S. Department of Education.

The point of this piece is to simply say, “be aware of what's going on in mathematics education on the larger stage.” We are entering a new era of reform. If it is to be a successful one, then we all need to take part. If we don't, we risk having a small minority make decisions that will affect us all for years and years to come. We can't afford it.