Mathematicians on the Common Core State Standards for Mathematics: A Panel Discussion

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NCTM Mtg., April 17, 2015

Overview

Nearly all good jobs in the U.S. require a college degree, and many of the best jobs require strong math skills. Yet, as Uri Treisman points out [1]

- 54% of the college math courses taught in 4-Year U.S. Colleges in 2010 were College Algebra or below.
- 80% of the courses in 2-Year U.S. Colleges in 2010 were College Algebra or below.
- "we are noticing in state data sets that failure rates in freshman mathematics courses typically are 30 to 35 percent, and in spring semesters they are often as high as 45 percent."

In summary: True college readiness is a serious issue.

The CCSSM, which systematically develops *both* computational strength and conceptual understanding, has the potential to significantly improve K-12 math outcomes.

[1] National trends in collegiate mathematics: The structural forces shaping our future, 2015

Four Parts to Strong K-12 Math

There are four parts to a strong K-12 math.

1. Specify *what* to teach—CCSSM. Note: "what" includes the mathematical practices that go *hand in glove* with the content strands.
2. Implement the CCSSM. Implementation includes:
   - Curricula and textbooks that truly fit the CCSSM.
   - Day-to-day materials such as lesson plans, sample activities, and HW that may be used by teachers as they work in their own classrooms.
3. Support teachers in their teaching of math.
   - Thorough preparation for new teachers at the university level.
   - High quality PD for in-service teachers.
   - Support teachers in talking to parents.
   - Give teachers more time for lesson study.
4. Assessments which are tied to the CCSSM and are used wisely.

Advantages of the CCSSM

- Coherently organized topics with systematic and thorough coverage of the math students need to learn.
- Based on research, internationally benchmarked.
- Chooses a middle ground among a range of options for pacing.
- Prepares all students to use math in the workforce.
- Emphasizes both mathematical skills and mathematical understanding.
- If implemented as written, should lead to significantly fewer students needing remedial instruction in college.
- Together with the plus standards, prepares students for Calculus.
- If implemented as written, should prepare more students for success in STEM disciplines.

Challenges of the CCSSM

- Finding the right textbooks. Putting a "Common Core Compatible" sticker on a textbook does not make the sticker accurate.
- Successfully interweaving the Standards for Mathematical Practice and the Content Standards.
- Suitable PD. Implementing the CCSSM requires sustained PD focussing on content. The efficacy of many present short term workshops is doubtful.
- Implementation is a moving target.
- Assessment is a moving target.

Conclusion

The CCSSM has the potential to truly advance math education in the United States. Its successful implementation requires the expertise of our country's math professionals — especially its teachers.