



BEYOND THE NUMBERS CONVENING 2014

Plenary Session Summary

Lessons Learned from Instruction | Results from a Study of Upper-Elementary Mathematics Classrooms

In her keynote address, NCTE Co-Principal Investigator and Harvard Professor Heather Hill invited the diverse group of conference participants—state and local policymakers, researchers, and data strategists—to think deeply about how classroom math instruction can inform policy.

Hill began her discussion by acknowledging that scholars have described, measured, and correlated hundreds of variables representing key characteristics of mathematics teachers and teaching, and linked many of these key characteristics to student outcomes. Few studies have tested multiple aspects of teachers or teaching together as did the NCTE core study. Combining measures in this way may allow researchers to distinguish which elements of teachers and teaching may be particularly impactful on student learning, to identify how much these characteristics together contribute to explaining student outcomes, and to understand the degree to which these characteristics are related to one another.

Before presenting results, Hill anchored the audience in the classroom context by showing a video clip of a mathematics lesson that would have typically received an average score on the Mathematical Quality of Instruction (MQI) observation instrument. This average lesson, which included a mix of strong and weak instruction, was the type most prevalently observed in the study (see graphs below).

A particularly robust finding was the variation by district in the overall quality of the mathematics instruction. Figure 1 shows that District 11 had more teachers scoring above-average on the Mathematical Quality of Instruction (MQI) observational instrument while District 13 had very few teachers scoring in the high range of the quality of math instruction.

Other significant findings shared:

- The degree of alignment between teacher scores on the MQI and value-added measures also varied across districts.
- Having a bachelor's degree in education predicted higher scores in classroom organization.
- Teachers' knowledge of their students' mathematical capability appears especially correlated with improved student outcomes.

See the next page for a spotlight story on District 11.

PARTNER SPOTLIGHT: The District 11 Story

Upon discovering the difference in results for District 11, Hill investigated by interviewing the District 11 math coordinator. When asked about what may have contributed to the strong instruction, the math coordinator responded that she secured a sizable grant in 2000, which has supported a coordinated effort to professionally develop math teachers through seminars, summer institutes, and coursework. These professional learning opportunities all focused on improving both teachers' mathematical content knowledge and new instructional practices. During this time, the district mathematics office also supervised the math coaches, who implemented the district plan at the school-level by working directly with individual teachers. The math coordinator also shared that the district uses NSF-funded curriculum materials which, in general, support more ambitious math instruction. Finally, she acknowledged that her district was fortunate because the state math test was in line with the type of Common Core instruction that the math department was trying to promote.

Figure 1. Quality of Teacher's Math Instruction by District

