A Mathematics Education Researcher's Travels: Perspectives on Mathematics Education Research from Academia, Government, and Professional Societies

Karen D. King, PhD
Association of Women in Mathematics Anniversary
September 17, 2011
Overview of Intersections

- Personal History
- Challenges for the Intersections of Mathematics and Mathematics Education
  - Perspectives from my past that echo today
  - Current Perspectives
- Q&A
• BS in Mathematics from Spelman College
• Started PhD in Mathematics at the University of Maryland
• Changed to PhD in Mathematics Education 2 years into the program
• Completed a dissertation on teacher thinking in an undergraduate mathematics class
• My primary interest has been in undergraduate mathematics education as it relates to the Mathematical Knowledge for Teaching (MKT) and how it develops
• Teacher Education and Mathematics departments at San Diego State
• Mathematics department at Michigan State
• Program Officer in Education and Human Resources at NSF
• Department of Teaching and Learning at New York University
• Currently the Director of Research at the National Council of Teachers of Mathematics
Early Intersections that Echo: My Transition from Math to Math Ed

- Reaction of the mathematics community when I changed from mathematics to mathematics education was not support
  - “You’re doing well, you don’t need to change”
  - “The field needs you”
  - “Don’t you want to do research?”
- How do these notions set the stage for positive intersections?
- Echoes into the future at NSF
• Draw from the same pool of students
  ◦ Cannot be in negative competition
• Need each other
  ◦ Future teachers are taught by mathematicians
  ◦ Future students are taught by mathematics teachers
• Can build a community that supports the work of each group
  ◦ MET II

Mathematics and Mathematics Education
Mathematical Education of Teachers (2001) – CBMS document written for mathematics departments with guidelines

Revision in progress
- Partially to respond to the Common Core State Standards

Writing team is a collaboration among mathematicians and mathematics educators
- Chaired by Jim Lewis

CBMS Forum on October 2-4, 2011 in Reston
Standards for Mathematical Practice

- 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.
From my prior research, undergraduate mathematics and graduate mathematics education students who had completed mathematics majors have difficulty with these practices

- All noted that they had not engaged in these practices in the mathematics courses
- Of those who had engaged in the practices, these experiences came from extra-curricular activities
• To teach to these new standards will require new demands on teachers
• The mathematics and mathematics education communities must work together to make the invisible visible for ourselves and for future teachers
  ◦ Work to make the mathematical practices explicit in undergraduate instruction

Mathematics and Mathematics Education Working Together to Fulfill the Vision of the CCSSM & MET II
Thank you
kking@nctm.org