

Professional Development to Provide Access to Standards-Based STEM Education for All Learners

Background

Standards-based reform holds great promise for increasing the rigor and quality of mathematics education for students with disabilities. The recently released Common Core Standards in Mathematics (2010) and those of the National Council for Teachers of Mathematics (2000) clearly recognize that all students, including those with disabilities, “*must have the opportunity to learn and meet the same high standards if they are to access the knowledge and skills necessary in their post-school lives.*” (CCSSI, 2010). To date, however, this promise has not been readily fulfilled. Research shows that, while teacher quality is the single most powerful influence on student learning, teachers often are not well prepared to implement standards-based mathematics education with heterogeneous groups of students that include students with disabilities and students with different capabilities, needs, and learning styles.

To address the need for improved professional development for teachers, Bank Street College and Education Development Center, Inc. (EDC), with support from the National Science Foundation, have developed *Math for All*, a professional development program that enhances the preparation of both general and special education teachers to improve the mathematics education of students with disabilities in grades K–5. The program, which consists of five one-day workshops conducted over a period of 15–20 weeks, engages teams of general education and special education teachers in the analysis of video case lessons and collaborative lesson planning in an effort to improve their ability to adapt math lessons to meet individual students’ strengths and needs while maintaining the integrity of the mathematical goals of the lessons. The project has developed two sets of professional development resources (one focusing on grades K–2 and one on grades 3–5) to support district-based staff developers in implementing the program.

Documented Results

The *Math for All* program has been pilot tested and field tested in multiple school districts over an extended period of time. The purpose of this research was to establish the feasibility and usability of the program and to obtain some initial evidence of its impact on teachers. Our findings indicate that when implemented with fidelity, the *Math for All* program is successful in (1) improving teachers’ knowledge of mathematics content and pedagogy and (2) in increasing teachers’ use of informal assessment and of instruction that is tailored to individual students’ strengths and needs. These aspects of teachers’ knowledge, skills, and teaching practices have been linked in the research literature with improved learning outcomes for students with and without disabilities.

Potential Applications

The *Math for All* facilitator guides and participant books are designed to support district-based staff developers in their implementation of the program. The results from our field-tests show that the program still has a significant effect on teachers’ knowledge and classroom practices when it is implemented by facilitators other than the developers, a finding which attests to the scalability of the program. The model underlying the design of the *Math for All* program can be adapted to other grade levels and subject areas in STEM and beyond.

Resources

- Moeller, B., Dubitsky, B., Cohen, M., Marschke-Tobier, K., Melnick, H., Metnetsky, L., Brothman, A. & Cecchine, R. (2012). *Math for All Facilitator Guide Grade 3–5*. Thousand Oaks, CA: Corwin Press.
- Moeller, B., Dubitsky, B., Cohen, M., Marschke-Tobier, K., Melnick, H., Metnetsky, L., Brothman, A. & Cecchine, R. (2012). *Math for All Participant Book Grade 3–5*. Thousand Oaks, CA: Corwin Press.
- Moeller, B., Dubitsky, B., Cohen, M., Marschke-Tobier, K., Melnick, H., Metnetsky, L., Brothman, A. & Cecchine, R. (in Press). *Math for All Facilitator Guide Grade K–2*. Thousand Oaks, CA: Corwin Press.
- Moeller, B., Dubitsky, B., Cohen, M., Marschke-Tobier, K., Melnick, H., Metnetsky, L., Brothman, A. & Cecchine, R. (in Press). *Math for All Participant Book Grade K–2*. Thousand Oaks, CA: Corwin Press.

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