



Meaningful Urban Education Reform: Confronting the Learning Crisis in Mathematics and Science. Borman, Kathryn M. et al. Albany, New York: State University of New York Press, 2005. 285 pp.

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Meaningful Urban Education Reform: Confronting the Learning Crisis in Mathematics and Science describes an ambitious longitudinal study of the National Science Foundation's Urban Systemic Initiative Program (USI) established in 1993. In focusing on mathematics and science education in urban schools, this strong contribution to the systemic reform literature gets to the heart of the USI focus—to determine and disseminate ways to systemically and powerfully improve mathematics and science education for our nation's most underserved students. Borman and Associates use a mixed methods approach to analyze USI's impact in four urban districts, Chicago, El Paso, Memphis, and Miami-Dade County. These districts share similarities but also have important differences in student population, administrative structure, and stakeholder involvement in their respective USIs. To analyze data from these sites, the authors use, in part, the USI framework comprising six "drivers" necessary for systemic education reform—four process drivers focus on reform implementation, policy development, resource convergence, stakeholder support and two outcome drivers aim at increasing achievement for all students and narrowing the achievement gap between advantaged and disadvantaged students.

The authors' extensive data collection and thoughtful analysis strategies are apparent. They institute data "checks" to confirm findings (e.g., using observations as well as self-report instruments) and develop rich case narratives to illuminate statistical analyses of teacher practice and student engagement. They do not restrict their data gathering and analyses to the existing USI driver framework. Rather, because their data suggest it, the authors develop a seventh driver, "school culture," considered integral to the USI model.

The authors report several major findings, of which the most important may well be those centered on the classroom experience for teachers and students. Despite the USI's emphasis on reforming instruction by using inquiry-based learning (as suggested by NCTM and NRC standards documents), most teachers participating in the study use teacher-centered pedagogical principles (e.g., explaining a procedure and then having students practice the procedure individually)—despite receiving professional development advocating a shift to student-centered, content-focused pedagogy.

Notably, the authors make it clear that this finding is not necessarily about a lack of teacher capacity but rather reflects a lack of district capacity to provide meaningful professional development and resources for teachers to implement what they have learned in their own classrooms. Furthermore, competing missions at the state and/or district level vis-à-vis assessment mean that teachers and principals receive mixed messages about how best to structure learning opportunities for students. On one hand,



teachers are encouraged to use innovative methods to improve student understanding and achievement, but on the other hand teachers are expected to prepare students for narrowly focused standardized tests that resemble the required curriculum.

The researchers show that the USI six-driver model (and their modified seven-driver model) have an effect on narrowing achievement gaps between USI and non-USI districts. In their case studies of two districts, path analysis was used to quantify relationships among the drivers. Clarifying information about sample size and data sources for composites constructed using factor analysis would have been useful. Also, little information was provided about the effects of the driver model on race/ethnicity and gender gaps in mathematics and science attainment. In one district case study, the findings suggest that the model is differentially effective for students who belong to Latino/a, White female subgroups versus Black male subgroups. These possible interaction effects should be illuminated. The authors acknowledge that the study was hampered by the available data. The inability to link students to teachers and schools, precluding the use of hierarchical linear modeling, would have provided very useful answers to critical questions about the effects of teacher practice on student achievement within teachers' classes and students' schools. Although the authors reported that teachers perceive a district emphasis on mathematics in professional development and policy, how they might differentiate between mathematics and science as content areas for reform was not a focus of this study. This intriguing differentiation was not explored.

The authors strongly make the case that policy and cultural contexts of districts and schools are crucial to reform success. Their data show that the ways in which district leaders and school principals consider strengths and needs of teachers are critical, in that teachers are the primary change agents for enhancing teaching-learning experiences for students, which clearly affect achievement. The perceived "muddle" of district reform priorities often results in teachers maintaining the status quo, even under the guise of innovative organizational policy. For example, in many schools, block scheduling became a venue for more individual student seat work rather than the project-based learning it supposedly facilitated.

This study clearly demonstrates how the implementation dynamics, strategy, and culture of reform in each district affect outcomes. It is a cautionary tale about the inappropriateness of a "one size fits all" reform strategy for urban districts which are often considered to be identical, although they face different challenges. It demonstrates that the two most successful districts improved student achievement largely because their coherent, targeted reform agenda aligned with NCTM and NRC standards was also more aligned with state, city, and district mathematics teaching and learning goals. This book provides extensive knowledge to educators and researchers interested in implementing process- and context-based models for education change and analysis. In considering the "drivers" as necessary and critical to reform, it is clear that they operate as gears to drive the main goal of improving student achievement. This book teaches a powerful and fundamental lesson that without leverage on all gears, true reform will not occur.

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