

Chapter 17

A National Effort to Integrate Field Experiences Into Secondary Mathematics Methods Courses

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ABSTRACT

This chapter shares the experience and preliminary findings from a national collaboration to improve secondary mathematics teacher preparation programs in the United States. Specifically, the chapter focuses on a research group tasked with strengthening field experiences into methods courses. Two modules are shared that a group of methods instructors have developed and are implementing in their courses. Findings from the first module are explained with implications for continued module development. These findings show the impact of the module on mentor teachers as well as the benefit the module has demonstrated in relation to the preservice teacher-mentor teacher relationship. Challenges and lessons learned from this national effort are also included.

MATHEMATICS TEACHER EDUCATION PARTNERSHIP AND THE NETWORKED IMPROVEMENT COMMUNITY MODEL

United States (US) public school districts often face a shortage of highly qualified mathematics teachers who are proficient in both the content and practice standards of the Common Core State Standards for Mathematics (CCSS-M) (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). The Mathematics Teacher Education Partnership (MTE-Partnership) was

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formed to address the significant national shortage of well-prepared secondary mathematics teachers who can support their students in learning mathematics and achieving the state and national standards for mathematics. Organized using the Networked Improvement Committee (NIC) model, the MTE-Partnership consists of institutions of higher education, k-12 schools, school districts, and other stakeholder organizations with an aim to build a national dialogue around guiding principles for the preparation of secondary mathematics teachers through coordinated research, development, and implementation efforts to promote best practices in mathematics teaching and learning (Martin & Gobstein, 2015).

NIC is an “intentionally designed social organization” that focuses on a specific educational issue, the system that produced the issue, and a network of members (Bryk, Gomez, & Grunow, 2011, p. 10) who work collaboratively to address the educational issue or idea. NIC is especially powerful because it is organized around improvement science principles that include: 1) focusing on a well specified common aim; 2) understanding and specifying the problem or issue that needs to be addressed, the system that produces it, and a shared theory of practice improvement; 3) being disciplined by the rigor of improvement science and measuring for accountability and scale, and; 4) networking/coordinating to accelerate the development of interventions and carefully examining variation in educational contexts. Each member in the NIC actively contributes to improving an educational issue.

A major focus for the MTE-Partnership is the work of Research Action Clusters (RACs), smaller sub-groups focused on specific areas of research concern. Institutions within each RAC are developing, implementing, and revising interventions or modules that are created using a Plan-Do-Study-Act (PDSA) model. At the heart of the iterative PDSA model is data. For example, after identifying an appropriate plan of intervention and carrying out the plan, NIC members study the data to assess progress to determine if changes to the intervention should be made. Each cycle is essentially a mini-experiment where observed outcomes are compared to prediction, as discrepancies between the observation and the prediction become a major source of learning. As the interventions are shown to be successful, they are made available to other teams for implementation and adaptations that are needed in a local context. The overall process of change is data driven, intentional and coordinated, which leads to accelerated propagation of the intervention, module, or educational improvement (Bryk, Gomez, Grunow, 2011; Martin & Gobstein, 2015).

This chapter focuses on the work of the RAC focused on enhancing field experiences in secondary mathematics methods courses. The authors begin by sharing existing literature related to field experiences, methods courses and mentor teachers. Then, a description of the journey to improve field experiences for methods course students follows. The authors include examples of learning modules with key foci on field experience components and close by sharing next steps in this journey.

FIELD EXPERIENCES, METHODS COURSES, AND MENTOR TEACHERS

Methods coursework is the hallmark of effective secondary mathematics teacher education programs. It provides preservice teachers with the opportunity to develop pedagogical strategies to facilitate mathematics learning, and reflect on the role of a mathematics teacher in helping students learn (Grossman, Hammerness, & McDonald, 2009). However, there is great variation in structure, instructional methods, assignments, and activities covered within methods courses (Kidd, 2008; Taylor & Ronau, 2006; Yee, Otten, & Taylor, 2017). There is no common professional curriculum for teacher education; and while

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