Lesson Study Mathematics Professional Development in an Urban Elementary School: Sustaining a Promising Practice

IMPORTANCE
Increasing teachers’ use of Common Core State Standards requires educators to be comfortable with important concepts in mathematics. Lesson study is a promising approach to sharpen the focus of professional development on mathematics teaching and learning via collegial collaboration around the design and delivery of, and reflection on meaningful lessons. The purpose of this case study research is to 1) explore the nature of and extent to which a teacher professional development program based on lesson study is improving the teaching and learning of mathematics in one urban K-8 school, and 2) highlight associated challenges and successes likely to affect the transferability and sustainability of this model in other Ohio schools.

BACKGROUND
Mathematics and education faculty from an Ohio university introduced teachers from an urban K-8 school to an intensive school-based professional development program modeled after the lesson study process that is prevalent in Japanese schools. This professional development project has been evaluated by external evaluators since 2010. Prior to the 2010-2011 school year, teachers participated in a week-long summer immersion into lesson study processes and mathematics content. During the 2010-2011 school year, teacher teams engaged in several lesson study cycles that included identifying, designing, teaching, re-designing, and re-teaching meaningful lessons. The week-long summer sessions and school-year lesson study cycles continued during 2011-2012 and 2012-2013.

The primary goal of the lesson study professional development is to improve teachers’ lesson planning and implementation skills by increasing teachers’ abilities to observe, predict and react effectively to students’ mathematical thinking. The theory of change underlying this professional development effort includes four important suppositions: (1) when teachers work collectively and collaboratively to design, implement, and improve their lessons, they will focus more deliberately on important mathematics and pedagogy in the lessons; (2) when students are provided with focused mathematics lessons, they will be more engaged in the lessons and increase their understanding of mathematics; (3) over time, teachers working on meaningful mathematics lessons will contribute to the collective knowledgebase about mathematics curriculum and supporting resources; and (4) as teachers become more engaged in the process of lesson study, teachers will become more aware of and advocate for the support needed to ensure the sustainability of this teacher-led professional development.

RESEARCH QUESTIONS
This OERC case study focuses on a single school site engaged with lesson study professional development over three school years to describe how the lesson study process has influenced 1) culture and collaboration, 2) teacher practice, 3) mathematics focus, and 4) support needed for sustainability. Questions focusing the research include:

1) **Culture and Collaboration.** How do teachers describe the impact of the project on the school building culture and authentic teacher collaboration? To what do they attribute any perceived change in culture and/or teachers’ collaborative practices?
2) **Teacher Practice.** What is known about the nature and extent to which teachers’ lesson study experiences transfer to teacher practice outside of implementation of the research lessons? What aspects of lesson study are most directly associated with observed and/or self-reported change in teacher practice?

3) **Mathematics Focus.** How has lesson study influenced teachers’ development of mathematics lessons and their location within the broader school curriculum? In what ways have students’ experiences with mathematics changed as a result of their teachers engaging in lesson study professional development?

4) **Support and Sustainability.** What do teachers suggest are necessary supports to ensure sustainability of this work following the conclusion of project support? How do teachers perceive the discussion facilitation aspect of lesson study when they are asked about the sustainability of this model?

**DATA**

Between 2010 and 2013, three years of data have been collected from multiple sources including 1) teacher questionnaires about preparation for teaching mathematics and beliefs/attitudes regarding professional development, 2) teacher content knowledge assessments in mathematics, 3) district student mathematics assessments, 4) protocol-based classroom observations, and 5) observations of professional development. Additional data collected and analyzed during the 2012-2013 school year comes from 1) interviews with teachers, 2) expanded teacher questionnaires about lesson study, and 3) artifacts from teacher practice.

**PRELIMINARY FINDINGS**

Preliminary findings are from the first two years of data collection and initial interviews with participating teachers.

1) Participating teachers indicated that they were more prepared for mathematics instruction from Summer/Fall 2010 to Spring 2011 and from Summer/Fall 2011 to Spring 2012. Teachers’ self-report of their gains in understanding of the methods necessary to teach mathematics concepts effectively were greater in year 2.

2) Across both years, a majority of teachers agreed that lesson study improved their teaching.

3) Teachers also reported that they learned inquiry-based activities, shared what they have learned with colleagues, and had observed an improvement in the quality of their students’ work.

4) Teachers reported that collaboration has emerged from the creation of lesson study cycle teams. In many cases, collaboration materialized among vertical groups of teachers that would not naturally occur.

5) Teachers reported that the lesson study professional development grounds them as active participants in their daily practice, with their instructional materials, their students, and their contexts.

6) Teachers emphasized the importance of collegial and administrative support to sustain the practice of lesson study and that the majority of that support should be to establish and protect designated times within the school day to conduct lesson study activities.

**Suggested Citation**