

## Teacher learning through organized experiences

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*This study investigates mathematics teacher learning in a professional development environment called Elementary Mathematics Laboratory (EML). In the EML, teachers observe and participate in discussions about a grade 5 mathematics class, and engage in a special kind of collective co-planning with the teacher of the class. The authors analyze the evolution of the participating teachers' question, including what they notice and how they interpret significant features of the classroom interactions. Analysis for the study is based on data from one complete cycle of the program in which teachers met on consecutive days to watch and discuss the teaching they saw together. Their participation in the discussion before the class, to get a consensus on the plan for that day's class (pre-briefing), and after the class to discuss enactment (de-briefing) was found to influence the teachers' questioning of the content of the class and of the teacher's role in the classroom. The change in the focus of questioning by the teachers is a productive lens for investigating teacher learning as it provides us a window in their thinking about what counts as progress in a classroom. In addition, we provide here the description of the set-up of the laboratory, which in itself is a unique experience for teachers and provides a platform for professional development opportunities.*

### Introduction

The use of videotapes for the study of teaching in professional development has become increasingly common. Although a range of design principles guide these varied programs, a key assumption shared by many of them is that watching teaching and reflecting on it is thought to be a valuable activity for teachers, one that has the potential to foster teacher learning (Sherin & Han 2004). Although watching live teaching is much less common, there are potential affordances of studying live teaching. Among these are: being able to focus one's viewing without having it pre-focused by the cameraperson; the authenticity of not knowing what is going to happen; participating in aspects of the actual design and development of the instruction itself.

This paper investigates a program in which teachers watched and studied live teaching practice. The analysis has two goals: (1) to examine the learning opportunities that are made possible when teachers contribute to planning, observe the enactment, and analyze the enactment; and (2) to understand range of teachers' questions across the program about the content of the class and role of a teacher in the class. Although the time span is short, the discussions among teachers reveal a

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great deal about their ways of looking at teaching. We trace these ideas and changes in them across their participation in the Elementary Mathematics Laboratory, using their questions as the lens for analysis.

### **Teacher learning through reflection**

The recent emphasis on practice-based professional development (Ball & Cohen, 1999) has made popular the use of artifacts of practice in professional development. Many studies use videos of teaching as a record of practice for their study. The claim is that teachers learn significantly from the reflection based on authentic representations of practice (Borko, 2004, Santagata, Zannoni, & Stigler, 2005). In this study, an additional element was present -- namely, that the teachers engaged directly with practice, not only observing live teaching, but also co-planning the teaching with the teacher whose teaching they were observing. The process of co-planning happened in the pre-briefing and de-briefing sessions, organized around the teaching observation. Our research question was: How does the opportunity to engage directly with another teacher's live practice influence teachers' learning, and what evidence can we find of what they are doing and learning?

### **The professional development program setting and learning opportunities**

The EML is a two-week summer mathematics program at the University of Michigan School of Education. The laboratory is a special mathematics class for entering fifth-graders who have been struggling with math in school. The mathematics class is collectively planned and studied by a diverse group of professionals, including teachers, researchers, teacher educators, student teachers, and mathematicians. The learning opportunities for teachers are organized in three events: (1) a pre-briefing; (2) class observation; and (3) a de-briefing.

*Pre-briefing:* The EML teacher (the teacher who taught 5<sup>th</sup> graders<sup>3</sup>) presents the day's lesson plan, explains the goal and activities for the class, and raises any concerns she and other lesson-planners have about the lesson or particular students in the class. Observing teachers take active role in planning and suggesting changes in the planning from second day onwards of the program.

*Class observation:* During the two and a half hour instructional period, observers are seated either on risers in the back of the laboratory classroom or in an adjacent classroom where they can observe live video feeds from the class in a more relaxed setting that allows them to talk quietly among themselves.

*De-briefing:* After students leave the classroom at the conclusion of each lesson, the observers are invited to study the students' work in their notebooks and on the whiteboards. Everyone assembled analyzes the lesson they observed and makes preliminary suggestions for the next day. The discussion in the de-brief session is focused on various issues of teaching practice and led by the EML teacher.

### **Data analysis**

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<sup>3</sup> Prof. Deborah Ball is the EML teacher here – she taught mathematics to 5<sup>th</sup> graders and led pre-briefing and de-briefing sessions.

In this paper we present analyses of the teachers' discussions during the pre-briefing and de-briefing sessions. The analysis is based on the transcription of these discussions. We use two aspects of teacher talk to learn about teachers' concerns and images of teaching practice: the questions they asked the EML teacher and things they notice in the teaching. The final version of our paper will include detailed glossary of codes.

### **Results and discussion**

Our preliminary analysis of teachers' questions to the EML teacher and things they notice from the teaching yielded three categories: (1) what to tell or not tell your students (often focused on perceived student errors and misconceptions), (2) material used and ways it might be adjusted or modified; and (3) student engagement.

Three dimensions appear to be important with respect to what happened to these questions when they were asked in the de-briefing discussion: (1) how these questions were answered, (2) ways in which they were connected within the discussion, and (3) how they were considered in actual teaching of the next day's class. The ideas and suggestions that participant teachers gave to the EML teacher were based on their observation and experience, are often talked in length for clarification and connection with students' learning around the goals, which are pre-determined by the EML teacher. Across days, the teachers' questions became more direct and focused, and the three elements ((1) what to tell or not tell your students; (2) the material and ways to modify or adjust it; and (3) student engagement) became more visible in their questions.

An authentic source induces reflection as it has *the complexity and subtlety of classroom teaching as it occurs in real time* (Brophy, 2004, p. 287). The continuous force of identifying relevant teaching practices and changes in it, co-planning for those practices and observing the actual enactment of those practices creates a complex space for continuous reflection, leading to not only change in the discourse of the teachers' discussion towards the end of the program but also in how teachers question and what they notice from the class.

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