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מתמטיקאים ומורות בית ספר יסודי לומדים אלה מאלה

Mathematicians and Primary School Teachers
Learning From Each Other

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Abstract

This dissertation reports on an unusual cooperation between communities - a professional development (PD) course for in-service primary school teachers that was initiated, organized, and run by research mathematicians. It might seem natural that mathematicians should cooperate with the community of Mathematics Education and teach mathematics to teachers, however tense interactions between the communities, nicknamed "Math Wars", make this far from obvious. My research is a case study of this PD, with the overarching goal of understanding how the PD came to be considered successful.

In order to gain a deep understanding of the mathematicians' work and of their interactions with the teachers, I took on the role of participant observer; I worked with the instructors on their planning of tasks and lessons, observed their lessons, and discussed them with them.

The parties' expectations and goals for the PD were different. The instructors intended to deepen teachers' understanding of mathematics, and the teachers expected the PD to address mainly pedagogical issues - classroom ready activities and teaching strategies. Furthermore the ways in which the communities conceived knowing, practicing, teaching and learning mathematics were so different that it seemed the PD was doomed to fail, yet it did not. My research questions (omitting theoretical jargon), were:

1. What aspects of the instructors' and the teachers' perspectives on mathematics and on teaching afforded opportunities for learning?
2. What was the nature of the learning that took place, on the part of the teachers and on the part of the instructors? What aspects of the PD supported this learning?

I found that differences in the parties' perspectives, though they often caused conflict, were what fueled the learning in the PD. The parties learned both *from* and *with* each other, often co-producing insights that were new to all. A mutual pursuit of relevance emerged as crucial for the success of the PD; instructors strove to design a PD that would be relevant for teaching, yet without compromising their own conceptions of mathematical depth, while teachers also took responsibility for relevance, through constantly seeking ways in which the mathematics that they were learning might contribute to their practice as teachers. This mutual responsibility for relevance permitted discrepancies between what the instructors were teaching and what the teachers were learning, which allowed the PD to be considered successful from different, sometimes conflicting perspectives.

Primary school PD seldom sets mathematical goals, assuming the content is straightforward, in spite of research to the contrary. This dissertation provides an "existence proof" for an alternative - a PD that addressed both mathematical and pedagogical goals, by capitalizing not only on the instructors' mathematical expertise, but also on the teachers' pedagogical experience. It also provides empirical evidence for the relevance of research mathematicians in teacher education, and suggests a model of cooperation between communities that do not usually get along, yet have much to learn from each other.