Winter Colloquium Series

Teacher Change in the Context of a Proof-centered Professional Development

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Abstract:

Though it is widely acknowledged that teachers' knowledge of mathematics is a cornerstone on which their teaching practice is based, little research exists documenting the impact of changes in teachers' mathematical content knowledge on their teaching practices. Given the centrality of proving in mathematics, examinations of teachers' proof schemes (in the sense of Harel and Sowder, 1998) and their relationship to teachers' teaching practices are of particular interest. For professional developers hoping to better understand the impact of teachers' proof schemes on their teaching practices, examinations of specific cases, with special attention to the nature and mechanisms of change in proof schemes and teaching practice, provide insight into the organization of effective professional development (PD) for teachers in the domain of proving.

The case study reported here examines the development of proof schemes and teaching practices of one in-service secondary mathematics teacher who participated in an off-site PD for two years. Though she showed evidence of a transition from empirical to deductive proof schemes, the more noteworthy observation was an increased ability to identify pivotal statements in her own proofs that had previously been left unattended. The greatest developments in teaching practices were observed in the practices of handling students' solutions by encouraging student-to-student talk, asking students to prove conjectures, soliciting alternative solutions in the presence of correct solutions, and attending to mathematical detail in correct solutions. The study includes theoretical connections (using Harel's DNR Theoretical Framework) between developments in the teacher's proof schemes and teaching practices.

Wednesday, January 28, 2:05 - 2:50pm in 4-1-314