

Interventions that Engaged Teachers with Developing Conceptual Maps of Mathematics Content

Excerpted from Clark, K. K. & Schorr, R. Y. (2000). Teachers' evolving models of the underlying concepts of rational number. *Proceedings of the Annual Meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education*, 22.

“This study examined three middle school mathematics teachers with varying levels of experience that were teaching in suburban schools. The three teachers involved in the study were enrolled in a master’s degree program in Atlanta, Georgia with one of the researchers serving as the instructor. The teachers volunteered to take part in this study with the understanding that they would consider meaningful forms of mathematics instruction, specifically model eliciting problems, to supplement their mathematics curriculum. They agreed to identify underlying concepts and skills of each model eliciting problem to begin mapping their curriculum for one year. Moreover, they agreed to focus their attention on their students’ mathematical thinking to better understand the nature of mathematics and their students’ perceptions of the skills and concepts in particular problems...

Teachers met weekly with researchers in workshop environments where they were presented with one model eliciting problem every other week for 14 weeks. They collaboratively grappled with solving the problems as well as identifying and visually mapping key concepts, skills and important mathematical ideas that were embedded within the rich problem. They used national, state and school standards to further document the types of concepts represented in each problem. They went on to categorize smaller problems sets and sets of symbolically represented problem that were aligned with the model eliciting problems that could serve as follow up problems or homework sets. Again these smaller problems were combined within the mapping as well. After sharing their own ideas and representations, they agreed to use these problems in their own classrooms.

During classroom implementation with researchers present, teachers were encouraged to recognize and analyze student interpretations as they were continually revised and refined. This in turn aided their understanding of the skills and concepts embedded within the model eliciting problem. Independently they would reflect, revise and refine their own thinking about the mapping of the concepts and skills found within the model eliciting problems. They would bring their thoughts and ideas back to share with their colleagues in subsequent workshop sessions. Studying each other’s mappings as a group afforded the opportunity to both consider the development of their ideas, to discuss students’ thinking in regards to particular model eliciting problems as well as discuss the pedagogical implications of using model eliciting problems in their classrooms.”