

Math Teachers' Circles: The Effects of a Professional Development Community on
Mathematics Teachers' Identities

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Abstract

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Math Teachers' Circles are a form of content-focused professional development for K-12 math teachers that engage teachers and mathematicians in collaborative problem solving. This study explored the effects of participation on aspects of elementary and middle school mathematics teachers' identities: specifically, their mathematics identity, mathematics teaching identity, and the interaction of these identities.

This study used an explanatory multiple-case study methodology. Extreme cases were identified from first-time participants of three Math Teachers' Circle sites across the United States. Shifts in these teachers' identities were explored through open-ended interviews, pre- and post-workshop survey data, and written reflections.

The teachers' mathematics identities, viewed through the lens of productive disposition, evolved as a result of their participation in the Math Teachers' Circle. During the workshop, the teachers in this study experienced challenging open-ended questions, persevered to solve them with the help of their peers, and eventually felt successful in solving problems. The teachers attributed their increased confidence and motivation to this successful completion of problems. As a result, teachers' sense of self, including self-

concept and self-efficacy, became stronger, and their understanding of the nature of mathematics evolved.

The workshop also changed teachers' perceptions of effective mathematics pedagogy. The teachers in this study found their experience collaborating and struggling through problems to be useful, and they intended to use similar problems and teaching pedagogy in their classes. However, the teachers' perceptions of their teaching abilities, including self-concept, self-efficacy, and enjoyment of teaching mathematics, remained relatively stable after the workshop.

Teachers' experiences doing mathematics often influence their mathematics teaching identities, and their teaching experiences influence their mathematics identities. Thus, participating in the workshop as mathematics learners and experiencing challenging mathematics was beneficial to their evolution and growth as teachers.

These findings suggest that the role of identity may be critical to understanding the ways in which teachers learn from professional development and begin to enact new practices in the classroom. Teachers hold various identities that interact in complex ways. This study also suggests that teachers' experiences engaging with content as learners have implications for their teaching as those identities intersect.