Naming the Space Between: Struggling to Describe Preservice Teachers' Negotiation of Reform-Based Mathematics Teaching

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Reform-based mathematics calls for teachers to engage students in the practices of a mathematical community while simultaneously promoting a strong conceptual understanding of and appreciation for mathematics content (NCTM, 2000). Many elementary preservice teachers entering mathematics methods courses have only been exposed to traditional mathematics instruction, namely teaching-as-telling. Learning to teach reform-based mathematics is a complex endeavor (e.g., Davis, 1996). This requires a significant epistemological change, from a mechanistic approach to teaching, in which the teacher "causes" learning to occur, and instead to engage in self-reflexive questioning in moments of teaching, based on input and feedback from students as they express their understandings of mathematics.

For preservice teachers, learning to teach reform-based mathematics is about becoming a member of a community (Lave & Wenger, 1991). As a teacher educator, I examine the following categories with respect to this transition:

- How do changes in beliefs and practice occur?
- What is the role of context in the process?

The study that transpired over a two-year period with elementary preservice teachers revealed that this process "becoming" exists as the space between, the space in which preservice teachers negotiate and re-negotiate their role as mathematics teachers over time.

In my analysis of the data collected during the study, I looked at how preservice teachers were participating during problem-solving and the meaning they made of that participation for their role as teacher in that particular time and setting. I then looked at these "moments in context" across time to better understand how preservice teachers are becoming as mathematics teachers, how they are navigating the space between. I devised descriptions of the preservice teachers' "positionings." Based on the patterns that emerged, I recognized four typical ways of engaging with the community during problem-solving: resisting, acknowledging, embracing, or creating complexity. Some moved from one position to another during the course of the study, but others remained fixed. Progression is evident, but not necessarily in the linear fashion in which these four positionings are currently represented (See Figure 1).

My struggle with my analysis is how to present my findings about the differences among groups of preservice teachers their paths to reform-based teaching without labeling them in a static

category on a continuum (a linear trajectory). I subscribe to a more open, dynamic interpretation, much like the Pirie-Kieran Model (Pirie & Kieran, 1994), but I find that words and images are failing me. I wish to have a conversation with other educational researchers about my struggle and for a space to reconsider the "positions" to create a more complex description of what I believe are significant movements/moments in preservice teachers' transitions.

Figure 1
Positionings of Preservice Teachers in Relation to Reform-based Mathematics Teaching