

PRESERVICE MATHEMATICS TEACHERS' PERCEPTIONS OF MATHEMATICAL DISCOURSE

Megan Staples
University of Connecticut, Storrs
megan.staples@uconn.edu

Mary P. Truxaw
University of Connecticut, Storrs
mary.truxaw@uconn.edu

Mathematics reform efforts emphasize the need for teachers to engage students in mathematical discussions. Discussions can support conceptual understanding and promote students' participation in valued mathematical practices such as communicating and reasoning (NCTM, 2000). However, not all dialogue is created equal. Some classrooms evince high levels of student participation but demand little of students in terms of cognitive press (Nathan & Knuth, 2003). Others have a more rigorous focus and allow for exploration and extension of ideas (Kazemi & Stipek, 2001). One challenge for the educators is to support preservice teachers in recognizing and valuing "high quality" dialogue as they work to make sense of their new roles as reform teachers. Given the continued prevalence of traditional modes of instruction (Stigler & Heibert, 1999), teacher education may be a critical intervention point to help shape future teachers' understanding of productive dialogue.

This poster presents results from an investigation of preservice teachers' perceptions of mathematical discourse and its relationship to student learning. Subjects included elementary and secondary preservice teachers enrolled in courses taught by the authors. The advanced methods' group (master's level) had completed student teaching. The second group was enrolled in their first mathematics methods course, allowing for comparison over time. Subjects read and responded to two excerpts of classroom discourse on fractions. One excerpt (Ms. C's class), from Kazemi & Stipek (2001), provided an example of "high press" discourse. The second excerpt (Ms. R's class), from Truxaw (2004), provided an example of "low press" or univocal discourse. We were interested in what the teachers noticed and how they derived their evaluative judgments of the dialogues in relation to student learning.

The advanced methods teachers gave overwhelmingly positive evaluations of the Ms. C excerpt, but were split in their evaluations of the Ms. R excerpt. Thus while the teachers articulated the value of reform-oriented discourse, nearly half still valued many aspects of the low-press discourse and found the exchanges productive for student learning. Evaluative comments clustered around themes of the mathematical focus of the discussion, levels of participation, quality of student thinking, and perceived affective support provided to the students. Comparisons between the elementary and secondary teachers, as well as between groups entering and finishing the program, will also be presented. Implications include the need for teacher educators to focus not only on the ways in which reform-oriented classrooms support student learning, but also the limitations of more univocal discourse, as preservice teachers seem to be able to hold simultaneously both forms of discourse as productive.

References.

- Kazemi, E., & Stipek, D. (2001). Promoting conceptual thinking in four upper-elementary mathematics classrooms. *Elementary School Journal*, 102, 59-80.
- Nathan, M. & Knuth, E. (2003). A study of whole classroom mathematical discourse and teacher change. *Cognition and instruction*, 21(2), 175-207

- NCTM (2000). *Principles and standards for school mathematics*. Reston, VA: NCTM.
- Stigler, J., & Hiebert, J. (1999). *The teaching gap*. New York: The Free Press.
- Truxaw, M. P. (2004). Mediating mathematical meaning through discourse: An investigation of discursive practices of middle grades mathematics teachers. *Dissertation Abstracts International*, 65(08), 2888B.