JPUR
JOURNAL OF PURDUE
UNDERGRADUATE RESEARCH

EDUCATION

What Do I Do With "X" Once I Find it? An Investigative Study of Algebraic Opportunities in Teacher Education

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As most states currently require completion of an algebra course for high school graduation, teaching algebra to a diverse population of students is a priority across the U.S. The high failure rate for students taking algebra raises concerns about how teachers are prepared to teach algebra. Algebra has been viewed as the gateway to higher mathematics, post-secondary educational opportunities, and scientific or technically skilled jobs. Given the importance of teaching algebra, this study seeks to answer the question "What opportunities do secondary mathematics teacher preparation programs provide to learn about algebra, algebra teaching, and issues in achieving equity in algebra learning?" Our data sources include a national survey, transcripts of instructor interviews of algebra-related courses, and corresponding course materials collected from five universities housing secondary mathematics teacher education programs. We are currently tagging the transcripts and course materials using a framework that focuses on a wide range of aspects of teaching and learning algebra, and instructional activities used to accomplish this learning.

Our preliminary findings from the survey showed the programs require a significant number of mathematics courses and general education courses, but few courses linking the two domains. There is also variation in the opportunities to learn about algebra and algebra-related concepts within topics as well as across topics. On completion of the analysis, we hope to gain insight into the various opportunities provided by secondary mathematics teacher programs in diverse contexts. This analysis will provide a snapshot of what algebra-related opportunities are provided in secondary mathematics education. It also has the potential to inform efforts to better prepare algebra teachers. In addition, this may serve to initiate conversations among institutions and across departments about how teachers can meet the challenge of providing equitable opportunities to diverse student populations in algebra classrooms. Put simply, this study can be used as a tool to enable more students to find "x" and to know what to do with this newly found value.

Research advisor Jill Newton writes, "Anavi has engaged, for two years, in many aspects (e.g., data collection, survey design, data analysis) of an NSF-funded study in which we are investigating the preparation of algebra teachers; the study is a collaborative effort between faculty and students at Purdue University and Michigan State University."

Nahar, A. (2014). What do I do with "X" once I find it? An investigative study of algebraic opportunities in teacher education. *Journal of Purdue Undergraduate Research, 4,* 74. http://dx.doi.org/10.5703/1288284315435