

An Examination of Preservice Mathematics Teachers Using Ratios and Proportions in a Social Justice Context

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This study examines ways in which preservice teachers use mathematics in a social justice context. Using a mathematical task and social justice activity adapted from Gutstein and Peterson (2005), participants were asked to respond to questions surrounding their experience with using mathematics topics such as ratios and proportions in a social justice context. Using the preservice teachers' responses from pre- and post-surveys, researchers compared participants initial conceptions of teaching mathematics using a social justice lens to their views after completing a mathematical task involving social justice topics of world wealth and population disparity using ratios and proportions.

Keywords: Algebra, Ratios, Preservice Teachers, Social Justice, Equity and Diversity

When helping develop the knowledge and skills that preservice mathematics teachers need, part of what is needed are mathematical modeling tasks that are designed to elicit thinking and mathematical discourse (Blum & Ferri, 2009; Doerr & English, 2003). There has been a general call for increased quality in science, technology, engineering and math (STEM) undergraduate instruction in the United States due to a fear that the US is falling behind as a professional leader in STEM (Henderson, Beach, & Finkelstein, 2011; Jones & Johnston, 2010). Jones and Johnston (2010) propose that this heavily relies on improved mathematics instruction.

While diversity increases among the student population in public schools, the population of preservice teachers remains homogenous -- predominantly White, female, and middle class (Barnes, 2006; Swartz, 2003). One of the challenges for teacher education preparation programs is preparing preservice teachers to teach diverse student populations. An attitude of *naive egalitarianism* is prevalent among preservice teachers. Causey, Thomas, and Armento (2000) define this as, "[when preservice teachers] believe each person is created equal, should have access to equal resources, and should be treated equally" (p. 34). Preservice teachers with these beliefs may lack an understanding of multicultural issues, as well as disregard effects of past and present discrimination (Causey, Thomas, & Armento, 1999; Finney & Orr, 1995). This study looks at the ways in which preservice teachers viewed mathematics in the context of social justice related issues.

Study Design

In this study, we provide mathematical tasks for preservice middle and high school teachers (N=40) that aligns with the ideals of teaching mathematics for social justice. We investigated the responses to the mathematical tasks centered around the topics of ratios and proportions. In this mixed methodological study, the researchers observed participants interacting with the tasks, and how they rationalized and reasoned with the material. There was a special emphasis on how the preservice teachers thought about students' misconceptions that the mathematics could possibly trigger and how they would guide these students. Through surveys, quantitative data was collected and will be reported on the poster. One major theme that arose was initial hesitation with the idea of teaching mathematics using a social justice lens, but this later evolved after having taken part in this study.

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