

Connecting Mathematics and Social Justice Goals in Preservice Mathematics Teachers' Lesson Plans

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As students in K-12 classrooms in the U.S. become increasingly diverse, it is necessary to prepare preservice mathematics teachers (PSMTs) to consider their students' learning needs, understand the nature of achievement gaps, and foster the development of their mathematics identity (De Freitas, 2008; Dunn, 2005; Koestler, 2012; Register et al., 2022; White, 2002). Designing and implementing mathematics lessons based on equity-based mathematics teaching practices can help PSMTs support their culturally and linguistically diverse students (Moldavan & Gonzalez, 2023). In particular, researchers (Aguirre & Zavala, 2013; Gay, 2000; Ladson-Billings, 1995) underscore the importance of attending to students' funds of knowledge and teaching mathematics for social justice in order to promote academic prowess and equity for marginalized students. Thus, it is important to understand how PSMTs connect mathematics to social justice (SJ) goals when designing lessons. The research question that guides this study is: *How do preservice mathematics teachers connect mathematics and social justice goals when designing lesson plans?*

Aguirre and Zavala's (2013) theoretical and analytic framework – culturally responsive mathematics teaching (CRMT) – forms the basis of this study to investigate how PSMTs make connections between mathematics and SJ goals in their lesson plans. CRMT informs PSMTs by helping them understand equity-based teaching practices and how to effectively teach culturally, ethnically, linguistically, and socio-economically diverse students. Thus, CRMT is useful to analyze teacher practices in their lesson plans to see if these plans meet diverse students' learning needs.

In this study, we collected and analyzed a total of 41 lesson plans designed by PSMTs in a middle school methods course throughout five semesters (Fall 2021–Spring 2023). In the lesson plans, PSMTs were asked to include both mathematics and SJ goals. PSMTs were particularly asked to choose SJ standards in a framework for anti-bias education (Learning for Justice, 2022). By using open coding, we analyzed which mathematical topics and SJ standards are frequently used as well as the relationship between them.

As a result, we found that the three most frequent mathematical topics are graphs, rational numbers, and linear equations; and the most frequent SJ standard is Justice 12 (Students will recognize unfairness on the individual level and injustice at the systemic level). Our findings imply that graphs, rational numbers, and linear equations are useful to express and recognize social issues (e.g., unfairness and injustice). Supporting PSMTs in connecting mathematics to SJ goals can help them learn about social issues themselves and equip PSMTs to support their future students' learning of critical issues.

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