

HARMONIZING STEM AND SOCIAL JUSTICE MATHEMATICS: A PATH TO GLOBAL EQUITY AND EMPOWERMENT

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Abstract

This study delves into the interconnectedness of science, technology, engineering, and mathematics (STEM) and social justice mathematics (SJM) to address pressing equitable global sustainable development and social justice issues. The research aims to understand how educators can effectively use SJM in STEM teaching to empower students as change agents for global equity by aligning mathematical tasks with the United Nations' 2030 agenda for Sustainable Development Goals (UN, 2015) and using them to address real-world injustices. The study unveils educators' pedagogical strategies for creating supportive learning environments and nurturing students' emotional well-being in STEM subjects. Educators who are conscious of social justice must consider how their affective views relate to SJM and STEM pedagogical strategies and are more likely to be empathetic to their students' learning.

Methodology and Findings

This qualitative study occurred within the nine-month online Global Social Justice Mathematics Education experience. A central idea in this research is that SJM embedded in STEM has the potential to create equitable and just societies. Focusing on SJM tasks addressing the United Nations' 2030 Sustainable Development Goals, the course involved voluntary participation from mathematics educators across seven countries (Cameroon, China, Kenya, Nepal, Tanzania, U.S.A. Zambia). From 35 participants, three educators (Case 1, Case 2, and Case 3) were sampled based on consistent attendance and high-quality reflections. Through qualitative content analysis (Mayring, 2015), three affective views on social justice emerged: reporting a personal connection, expressing negative feelings linked to social justice issues, and reporting no change in feelings. Case 1 is an example of reporting a personal connection as they recognized the role of the socio-economic status during the COVID-19 pandemic and appreciated the role of mathematics in understanding its magnitude. The participant acknowledged the power of holding a high economic status as they were able to isolate the one person who had the virus without inconveniencing the entire family. Case 2 shared the injustice of quarantine conditions for ten people in three rooms, resulting in virus transmission to everyone in the house. Case 3 acknowledged living wage disparities but maintained that wages reflect worked hours. While Cases 1 and 2 expressed negative feelings concerning the living wages task, Case 3 reported no shift, showcasing diverse educator responses to SJM tasks and their engagement with social justice in mathematics education. The study highlighted integrating affective views in mathematics instruction to promote equitable teaching practices. Research has shown that educators who show positive emotions are most likely going to take care of their students' affective views and provide equitable learning environments (Lauermann & Butler, 2021).

References

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