

Critical Consciousness Activation Through Undergraduate Mathematics Curriculum

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Critical consciousness (CC) has been advocated as a necessary part of mathematics learning through culturally relevant pedagogy (Ladson-Billings, 1995). The ways in which CC is conceptualized varies greatly (Freire, 1970; Ladson-Billings, 1995; Jemel, 2017; Watts, Diemer, & Voight, 2011). Furthermore, the idea of *critical* mathematics is also approached from various ways in literature (e.g., Gutiérrez, 2009; Skovsmose, 2013). Thus, operationalizing CC in mathematics education research can occur from a variety of lenses leading to challenges for researchers. In this poster we present our approach to identifying evidence of prospective mathematics teachers' (PTs) CC through a construct that we call *critical consciousness resources* (CCRs; Witt, Lozano, & Anhalt, 2024) as they engage with a culturally responsive precalculus curriculum. Our prior work (Witt, Lozano, & Anhalt, 2024) presented CCRs as, "ideas that elevate a person's awareness or sense of agency to 'engage the world and others critically'" (Ladson-Billings, 1995, p.162). In this poster, we present our expanded methodology for analyzing CCRs.

Methods

Prior work on CC in mathematics, and critical mathematics education have been primarily theoretical in nature. This study can be situated alongside others who have worked on critical mathematics curriculum (e.g., Brantlinger, 2013; Gutstein, 2006; Gutiérrez, 2013). However, we aim to contribute a conceptualization of what makes an emergent idea about contextually-rich mathematics *critical* while engaging with such curricula. Our poster will present our approach to analyzing how two cohorts of prospective mathematics teachers activated CCRs in various ways through engaging with a precalculus task *grounded in place* (Lozano, 2023). The task we feature comes from a place-based, mathematically authentic and rigorous curriculum that centers the identities and cultures of students from the Southwestern United States. Through PTs' "I-statements" (e.g., "I will try to inspire [my students] by talking about the possibility of change, and how they can better the world."), we coded whether the statement was *critical* or *dominant* (cf. Gutiérrez, 2009), centered mathematics or the context, and determined a level of agentic disposition (e.g., awareness or agency). Through a thematic analysis (Clark & Baun, 2017), we describe broader salient ideas represented in the CCRs across multiple PTs.

Findings and Discussion

We offer this conceptualization as an analytic tool to help mathematics education researchers consider the kinds of CCRs that may be activated while teaching with asset-based, contextually and culturally rich tasks such as those featured in our poster. Our findings indicate that several levels of agentic dispositions were uncovered as PTs engaged with the task. We argue that teaching to activate CCRs contributes to equitable and affirming learning environments in undergraduate mathematics classrooms. These are important research considerations for gaining insights into how mathematics curriculum can critically impact the students who engage with it.

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