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# Learning through/about Culturally Relevant Pedagogy in Mathematics Teacher Education

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## Introduction

This presentation is grounded in self-study research by two mathematics teacher educators' (MTEs) as we taught courses in culturally relevant pedagogy (CRP) in mathematics and engaged in research conversations to discuss our learnings from students and from each other. The research is situated in the nexus between prospective and practicing teachers' (PTs) expectations for classroom 'tips & techniques' and MTEs' desires to disrupt dominant discourses in mathematics. We collected data from PTs through their projects and reflections on course content during offerings of CRP courses in our two institutions. We analyzed that data through a themes-based approach focused on MTE learning which was fostered by tensions and dilemmas stemming from students' responses to the disruption of dominant discourses. In this presentation, we describe our research contexts and the learning stimulated from listening to our PTs' thinking.

## Research overview

Dominant discourses of mathematics have been well-established through a history of being "culturally defined as objective, value-free, logical, consistent and powerful knowledge-based discipline" (Burton, 1994, p. 207). Efforts to disrupt these dominant technical-rational traditions in mathematics classrooms are evident in research on power, privilege and oppression. For instance, Willey and Drake (2013) indicate that subtle signs of power and privilege are manifested in, for example, "neglecting students' cultural and intuitive mathematics knowledge" (p. 62). They urge us, as MTEs, "to sharpen our sociopolitical lenses in order to notice and disrupt manifestations of privilege and oppression in mathematics education" (p. 68).

We draw on the work of Ladson-Billings (1995), who defines culturally relevant pedagogy as "a pedagogy of opposition... not unlike critical pedagogy but specifically committed to collective, not merely individual, empowerment" (p. 160). In mathematics education, Aguirre & Zavala (2013) state that culturally responsive mathematics teaching "involves a set of specific pedagogical knowledge, dispositions, and practices that privilege mathematical thinking, cultural and linguistic funds of knowledge, and issues of power and social justice in mathematics education" (p. 167).

In general, MTE research on their instruction has focused on what PTs learn from their instructional approaches, rather than on their own learning as they conduct research (Chapman, 2008). Chapman (2008) offers that MTEs should study their teaching by reflecting on the thinking of their students/PTs, examining the conflicts between intent, thinking, and behaviors, and using them to inform MTE instructional approaches. In line with Chapman's advice, this research taught us to listen to our students and their thinking about CRP in mathematics classrooms; to understand and

work through students' questioning and resistance that emerges when dominant discourses of mathematics are disrupted in teacher education courses. Our research situates our learning and development as we struggle, in designing and teaching CRP courses, with questions of who and what is considered 'relevant,' and as we analyze how students respond to CRP in mathematics.

## **Discussion and results**

Three themes emerged from our data that capture our learning as MTEs. The first is our need to clarify our own ideas about CRP. We found ourselves repeatedly questioning how to define and teach CRP, underscoring our belief that "[c]ultural responsiveness is not a practice; it's what informs our practice so we can make better teaching choices for eliciting, engaging, motivating, supporting, and expanding the intellectual capacity of ALL our students" (Hammond, 2015, p. vii).

A second learning theme is the need to negotiate understandings of CRP with PTs. We take seriously the warning of Aronson and Laughter (2016) to not turn CRP into "a buzzword or checklist of steps" (p. 198), that CRP must "be embraced more fully as a guiding ethos for every aspect of the classroom" (p. 198). As MTEs, we learned to be careful that we do not teach CRP courses which will merely make the dominant (technical-rational) mathematics more accessible, but that our courses are disruptive enough to make mathematics different in an enduring manner.

Finally, a third learning theme is the value of learning from others - from tensions created in our work with PTs, but also from each other, as MTE colleagues. This additional layer of collaboration fosters our growth and development as MTEs. Without the opportunity to discuss the tensions and dilemmas emerging in our practices, we would have remained isolated in our own individual contexts, struggling on our own with similar tensions and questions about CRP in mathematics.

## **References**

- Aguirre, J., & Zavala, M. (2013). Making culturally responsive mathematics teaching explicit: A lesson analysis tool. *Pedagogies: An International Journal*, 8(2), 163-190.
- Aronson, B., & Laughter, J. (2016). The theory and practice of culturally relevant education: A synthesis of research across content areas. *Review of Educational Research*, 86(1), 163-206.
- Burton, L. (1994) Clashing epistemologies of mathematics education: Can we see the 'wood' for the 'trees'? *Curriculum Studies*, 2(2), 203-219.
- Chapman, O. (2008). Mathematics teacher educators learning from research on their instructional practices. In B. Jaworski & T. Wood (Eds.), *International handbook of mathematics teacher education* (vol. 4) (pp. 115-135). Rotterdam: Sense.
- Hammond, Z. (2015). *Culturally responsive teaching & the brain: Promoting authentic engagement and rigor among culturally and linguistically diverse students*. Thousand Oaks, CA: Sage.
- Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32, 465-491.
- Willey, C., & Drake, C. (2013). Advocating for equitable mathematics education: Supporting novice teachers in navigating the sociopolitical context of schools. *Journal of Urban Mathematics Education*, 6(1), 58-70.