



Multicultural Mathematics: A Call to Rehumanize the Math Classroom

Elizabeth Wrightsman, *Ph.D. Student*

Mathematics Education, Texas State University

Mathematics has the reputation of being a neutral discipline infused with objective truths, unbiased algorithms, and impartial equations. It is perceived as a collection of rules to observe, defined steps to follow, and absolute right and wrong answers – no allowance for errors, subjectivity, or greyness. Consequently, it is unsurprising that math can be interpreted as inflexible, void of creativity, and dehumanizing. However, by its very design, mathematics is multicultural; it is a human construct to describe the world around us, invent efficiencies to benefit humanity, and solve problems that tax our society. Why should mathematics not be taught through a multicultural lens? Educators must assess and redefine what it means to “do mathematics” and adopt culturally relevant and responsive ways of thinking mathematically. Mathematics can and should empower, embolden, and enlighten students in a troubled world. Students are more likely to engage with content if they recognize its relevance to their lived experiences, communities, and culture. This article aims to motivate educators to embrace and apply this thinking regardless of their past knowledge or experiences with inclusive and transformative mathematics.

The National Council of Teachers of Mathematics (2000) recognizes that “all students need the opportunity to learn challenging mathematics from a well-qualified teacher who will make connections to the background, needs, and cultures of all learners.” All learners, not

some, need to experience mathematics enriched and entwined with multiculturalism. Most teachers are familiar with culturally relevant pedagogy, but few feel comfortable implementing it within their instruction (Brown et al., 2019). According to research (Gay, 2009; Ladson-Billings, 2014), teachers need more support and professional development in culturally relevant mathematics.

Gutiérrez (2018) initiated the call for mathematics educators to rehumanize and explains why this is important. Direction on teaching in a culturally relevant manner is needed, an approach that values the contributions of all ways of thinking mathematically. Practitioners should be provided with concrete examples of ways to implement multicultural approaches to teaching common math concepts (i.e., finding the midpoint). Understandably, it may be challenging for teachers to bridge theory and practice considering their vast teaching responsibilities and obligations. Therefore, one may argue that it is partly the responsibility of math education researchers to facilitate the construction of a bridge between theory and practice.

Students should see themselves in mathematics and learn math tools as skills inherent to their individual and collective agency in resolving inequities. Mathematical tasks and activities should vary depending on the students' lived experiences and their respective communities. Thus, it is crucial to critically analyze and question default textbook word problems and demonstrate how to modify modeling problems to suit better the cultures represented in the classroom and more significant societal problems rooted in inequities.

Textbook Example: Suppose you want to buy a boat in 5 years that costs \$7,500, so you deposit \$5,000 into a bank paying annual interest of 6.5%, compounded semi-annually. Will you have enough money? If not, how much are you short?

This is a typical problem that may be found in a traditional mathematics textbook. Instead of calculating interest on a boat or home, as in so many textbook examples, calculate student loan debt and talk about real-world connections.

While not many first-year college students think about saving to buy a boat in five years, applying college math to current borrowing practices to pay for college is highly relevant and uses the same mathematical concept as the textbook question. The reflective follow-up questions help them apply this same mathematical concept to their lives and future career choices. The reframed example aligns with the lived experiences of what postsecondary and adult students may encounter in their everyday lives.

Reframed Example: Suppose you want to pay back your student debt in 20 years for a borrowed amount that initially cost \$15,000 that is charging an annual interest of 6.5%, compounded semi-annually. How much will you pay back in total? Would that be realistic for you to pay off in 20 years?

We must part ways with thinking that mathematics is void of subjectivity. There is power in selecting tasks, activities, and problems that students encounter in the classroom. Students' work in the classroom has implications on framing how mathematics is all around us and who is capable of doing mathematics.

Reflection Questions

1. What does it mean to you to teach mathematics in a culturally responsive way?
2. In what ways is mathematics represented as culturally neutral and insensitive?

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BIOGRAPHY

ELIZABETH WRIGHTSMAN earned her B.S. in Mathematics from Texas State University where she is currently in her third year of the Ph.D. in Mathematics Education.

Elizabeth's primary research interest involves identifying and better understanding teaching practices that lead to equitable student outcomes in mathematics.