

Examining the Effectiveness of Culturally Relevant Lessons within the Context of a College Algebra Course

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In an attempt to bring more realistic situations into college mathematics classroom environments, lessons were created that utilized culturally relevant pedagogy for a college algebra course at a large historically black college/university (HBCU) in the south. These lessons were aimed at the growing population of diverse students in an effort to gauge their effectiveness with students, in regards to achievement and self efficacy. This poster will illuminate the conceptual developmental process of four “experimental” lessons and provide some preliminary findings of the course that utilized these lessons in comparison with a control class that did not.

Keywords: College Algebra, Equity and Diversity, Student Affect, Curriculum

While algebra is a gateway course for high school graduation (Moses, Kamii, Swap, & Howard, 1989), college algebra is a gateway to graduation for many non-STEM college majors (Van Dyken, 2016). Each year, only 50% of students are successful enough to earn a grade of A, B, or C in their college algebra courses (Ganter & Barker, 2004). This means that half the students who are enrolled in this entry level mathematics course are receiving grades of D, F, or are withdrawing from the course. This is extremely problematic when we couple this with the fact that most college majors require students receive a C or better in this course to make adequate progress toward their degree. The purpose of this research study is to investigate the following hypothesis: Student outcomes, including self-efficacy, will be improved by participation in a college algebra class at a historically black university, where the instructor uses culturally relevant pedagogy (CRP) in the course. The effect of teaching with culture has been shown to have a substantial increase in self-confidence and self-efficacy; effectively replacing feelings of failure and alienation that is all too common with the subject of mathematics and students of color (Aronson & Laughter, 2016; Dover, 2013; Tate, 1995). CRP is founded upon three principles: academic rigor, cultural competence, and sociopolitical consciousness (Ladson-Billings, 1995a, 1995b). In accordance to the paradigms of CRP, four lessons were developed.

The four lessons were delivered in alignment of three of the units taught in this course: Functions and Graphs, Polynomials and Rational Functions, and Exponential and Logarithmic Functions. The CRP lessons were composed of Matthews, Jones, and Parker’s (2013) Culturally Relevant Cognitive Demand Mathematics Task Framework and its corresponding evaluation tool. Each lesson was designed to not only appeal to students’ racial backgrounds, but also their cultural backgrounds. The lessons attended to the issues of the urban city the students attend school in, and topics related to college-aged students and experiences that are relevant to them. Specifically, the lessons began with a guiding question that students investigated using mathematics. They were entitled: What does incarceration look like in County X [pseudonym], and the United States?. What are the ramifications of the collegiate ‘Cuffing Season’?, What is the true price tag of a college degree? and How is the population of the United States changing?

This poster will contain the conceptual developmental process of these four “experimental” lessons and provide some preliminary findings of the course that utilized these lessons in comparison with a control class that did not.

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