

Proposal

Title

Yes, I Can: Perceptions of African American Students Regarding Their Academic Performance in Ninth-Grade Advanced Mathematics

Purpose

If the United States is to remain competitive in the global economy, there must be aggressive efforts made to promote minority involvement in all educational opportunities (Baldwin, 2004; Ford, 2011; McBee, 2006). One approach to increase minority involvement is to expand their enrollment in advanced educational programs. Advanced programs tend to cultivate students' critical and creative thinking skills that lead to improved performance and ultimately routing more young people at the K-12 level into the STEM career pipeline. This study sought to document the perceptions of African American students who gained and sustained access to the opening of the mathematics pipeline thereby making them more likely candidates for high-quality jobs in the future.

Theoretical Framework

The self-efficacy framework guides this study. Bandura (1997) posited that individuals with a strong sense of efficacy approach challenges as tasks that can be conquered and confront the tasks with a high degree of determination rather than viewing them as personal threats that should be avoided. According to Bandura, mastery experience, indicated by past accomplishments on specific tasks, is the most influential source of efficacy perceptions. The impact of self-efficacy on academic achievement has been documented, but few studies have explored its impact on successful African American students.

Methods

This qualitative case study utilized in-depth interviews and document analysis to investigate and describe the perceptions of African American students who successfully completed ninth-grade advanced mathematics. Specifically, semi-structured interviews were conducted with four identified gifted students and four non-gifted students as well as two teachers of advanced mathematics. In addition to interviews, student transcripts were retrieved and utilized in order to provide a complete picture of the perceptions of successful gifted and non-gifted African American students regarding their academic performance. Student and teacher responses were transcribed verbatim, responses were coded, themes were analyzed, and five themes were reported. The data analysis involved the creation of individual student and teacher profiles. These data were used to compare student perceptions regarding their performance, and to determine whether teachers' perceptions echoed or differed from the perceptions of students.

Data Sources

Sources of data included semi-structured interviews and student transcripts.

Results

Results revealed that the majority of students attributed their success to the overarching theme of mastery experience. Specifically, seven out of eight students reported that hard work is the factor that contributed to their positive self-efficacy beliefs. Student and teacher participants understood the importance of prior math experiences and how those experiences shape current self-efficacy beliefs. Additionally, both groups of participants referenced the value of peer interactions during instruction, which serves as evidence that vicarious experiences and social persuasion were also important to the success of these student participants. Finally, the findings

overwhelmingly indicated that students and teachers perceived effective educators of advanced mathematics as balancers of high student support and high demand for accuracy.

Implications

The implication here is a need for educators-at-large to make concerted efforts to help African American students understand the interconnectedness of their advanced mathematics course taking, future career options, the STEM pipeline, the innovation pipeline, and their contribution to economic growth in the United States. Although this work specifically examines the perceptions of ninth-grade advanced math students, there is a great deal of overlap between this study and other research that explores issues of equitable access in education.

Recommendations

This study is a natural fit with the conference theme: The Power of Education Research for Innovation in Practice and Policy. Studies, such as this one, have documented the underrepresentation of African Americans in STEM-related careers. This underrepresentation in scientific careers is the result of a historical plight that must be addressed if the United States is to remain positioned as leaders in research science and engineering (Johnson & Watson, 2005). In order to improve the representation of African Americans in scientific careers, additional studies exploring positive factors that promote the success of African American students are needed. Future studies should also explore the essence of flow theory in the classroom environment as well as the impact that social and emotional intelligence has on the performance of African American students in the advanced mathematics classroom. Finally, further research is needed on teacher perceptions regarding student skills and student behaviors that influence African American students' performance in advanced mathematics.

References

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