

Global Problem-Based Learning in math

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ABSTRACT

In the high school of focus in this study, mathematics students struggle to transfer and apply skills to unfamiliar contexts. Also, minority students are underrepresented in advanced mathematics course enrollments. This two-part study consists of a longitudinal analysis of enrollment trends in mathematics courses as well as an action research study of the impact of Global Problem-Based Learning on achievement and attitudes in advanced mathematics classes. The study was conducted at a southern U.S. International Baccalaureate (IB) high school with an annual enrollment of approximately 1300 students. The longitudinal study examined three cohorts of high school graduates, 797 students, beginning with their enrollment in advanced Algebra 1. The sample used in the action research study was comprised of 25 IB Mathematical Studies students. A mixed-method structure including summative assessment scores, observations, questionnaires, discussion boards, and focus group interviews generated both quantitative and qualitative data. Enrollment data revealed a disproportional number of minority students do not sustain an advanced level of mathematics courses. The action research results indicate the use of Global Problem-Based Learning had positive impacts on both student achievement and attitudes. These findings suggest that incorporating Global Problem-Based Learning could improve access to advanced mathematics for all students as well as motivate mathematics students to persevere.