Understanding Assistive Programs: Evaluating the Impact of Various Math Services on Student Performance

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Abstract

High school math performance has the potential to have a positive impact on later educational success. This project looks to determine the role of math services and intervention programs including online and in-person tutoring, workshops, coaching, physical tools, and other class services on students' performance in the North Carolina's High School Math 1 course. Data being used was gathered from rural North Carolina middle and high schools by the college access program GEAR UP (Gaining Early Awareness and Readiness for Undergraduate Programs). The effects of these services will be measured by End of Grade (EOG) test and course grades in the Math 1 course. This project will help develop a deeper understanding of how these types of intervention services impact students' performance in math courses and standardized test performance.

High school math achievement has been shown to be a strong predictor of high school and postsecondary success (Cimetta, 2012; Long, Conger, & Iatarola, 2012). Because of this, many middle and high schools offer additional educational services focused on math to help bolster students' learning, success, and achievement. These services include, but are not limited to, tutoring sessions, workshops, coaching, and physical tools to aid in improving educational outcomes. However, there still remains a lack of understanding on the extent to which these services actually benefit students and the level at which they are most effective in improving high school math performance.

Most commonly, schools turn to tutoring services as their main focus when attempting to enhance students' math ability. Previous research suggests that traditional math tutoring can vary in its effectiveness on students' academic performance (Ritter et al., 2009; Rothman & Henderson, 2011). Results of a meta-analysis on tutoring's effectiveness found that volunteer tutoring had a positive effect across multiple subject areas, yet there was no significant measurable improvement on student math achievement tests (Ritter et al., 2009). Historically, math intervention methods outside of math tutoring have not been addressed in this area of research. However, more comprehensive studies evaluating math intervention programs involving tutoring, coaching, planning, and college preparedness services led to positive impacts on students' course and test performance (Le, Mariano, & Faxon-Mills, 2015). Unfortunately, the data fails to address the question of which specific math focused services or exposure to those services are most effective in improving student performance.

Finding the answers to these questions is important since high school math performance has a strong relationship with high school and postsecondary performance (Cimetta, 2012; Long

et al., 2012). If students are given the resources to reach high levels of math achievement in middle and high school, they are more likely to enroll and succeed in postsecondary math courses (Le et al. 2015). Additionally, early math achievement leads to better performance in higher level math courses, such as courses taken at the college level (Long et al., 2012). Due to the lack of consistent information on the specifics of math intervention methods and its effectiveness, more research on the topic will develop a better understanding of this relationship.

Data from rural North Carolina schools participating in the college access program Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) will be used to examine how additional educational services focused on math relate to high school math achievement. The GEAR UP program includes over 20,000 students across 11 districts, with data from two years of course performance, math services received, and test scores. The study sample will include only students who took and completed Math 1, received educational services in grades 8 and 9, and took the End of Grade (EOG) math test in 9th grade. The services examined will range from in person and virtual tutoring, field trips, coaching, and additional math related competitions that students engaged with as part of the GEAR UP program. The data will be analyzed to determine which services and specific service exposure are related to Math 1 course grades and EOG performance. By comparing student involvement in math services to their performance in Math 1, this research will shed light onto the best method of implementation of math services in middle and high schools.

References

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