

MATHEMATICS IDENTITY AND SENSE OF BELONGING OF DEVELOPMENTAL MATHEMATICS STUDENTS

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One of the significant challenges facing higher education is narrowing the educational attainment gap between students who are academically prepared and those who are not. Although the intention of developmental education is to help support underprepared students in achieving academic success, there have been disagreements among researchers on the effectiveness of achieving this goal (Goudas & Boylan, 2012). On one hand, developmental mathematics has the capability of providing the impetus that can propel students to their overall academic success. On the other hand, the long road the students have to go through in completing mathematics requirements causes many to give up before they can finish the sequence of courses (Rosin, 2012).

This study examines how developmental students' general and mathematical experiences help to shape mathematical identities they develop and how these identities in turn hinder or enhance their successful participation in mathematics. Also examined are the factors that influence students' mathematics identities after taking a developmental mathematics course. To this end, the following research questions guided this study of first year students taking a developmental mathematics course at a mid-sized, urban public university:

1. How do developmental mathematics students describe their mathematics identities?
2. What factors coalesce to influence students' mathematical identities after taking a developmental mathematics course?

Data was collected using pre-post surveys and semi-structured interviews. The analysis reported here is based on the data from the survey instrument. The statements in the survey were grouped into five aspects of mathematics identity; self-concept, self-efficacy, motivation, and anxiety, and value of mathematics. Qualitative data from the open-ended items of the instrument was systematically analyzed using grounded theory to uncover patterns and trends in participants' responses while descriptive statistics was calculated for the quantifiable portions of the surveys. Items were compared both within surveys and across surveys to identify correlations and trends, as well as to support qualitative themes.

Analysis revealed that differences of the overall mean scores of all five aspects of mathematics identity between females and males were not statistically significant. Further, students scored the lowest on self-concept while the highest score was on their perception of the value or importance of math in their lives. As Klinger (2004) pointed out there are many students who do not particularly enjoy mathematics and report a disliking for the subject (negative affect), even though they still respect the utility and importance of math in their future lives and careers. Also, the study revealed that students' self-efficacy and self-concept increased significantly over time.

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