

The Connection between Perception of Utility in Careers with Math and STEM Career Interest

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Undergraduate students pursuing STEM careers have varied perceptions of how mathematics is used in their careers. A survey of community college students enrolled in College Algebra measured interest in mathematics and interest in STEM-related careers, as well as a student's perception of how mathematics was used (or not) in their chosen career. Analysis revealed that students' beliefs related to the usefulness of mathematics in their chosen career predicted their interest in mathematics in general, and their interest in STEM careers in some cases.

Keywords: STEM, career interests, algebra

Mathematics courses have become barriers for undergraduate students, including those pursuing STEM-related majors (Harackiewicz et al., 2012; Olson & Riordan, 2012). One possible explanation for the difficulties that students have in mathematics coursework is the lack of perceived relevance, as students wonder, "When am I ever going to use this?" (Chazan, 1999). Maltese and Tai (2011) examined school-based factors influencing a student's choice of STEM majors, and discovered that *interest* in and perceptions of the *usefulness* of math and science, rather than achievement or course enrollment, was most predictive. Wang and Degol (2015) attributed gaps in male-female STEM attainment to differences in STEM task value (i.e., interest, utility value, attainment value, and cost). In the present study, we examined how a student's beliefs related to the utility of mathematics in their career interest is related to both their interest in math and their interest in their chosen major/career.

Students enrolled in College Algebra ($n = 475$) at a mid-size diverse suburban community college in the southern United States were surveyed regarding their STEM career interests, as well as their interest in mathematics in general. Students were also asked to respond to an open-ended prompt about how math was used in their chosen careers, and responses were coded on a 3-point scale based on whether they identified no connections, simple arithmetic or measurement connections, or more sophisticated connections like applications of algebra.

Regression analysis utilized math interest and career-math knowledge as predictors of interest in STEM fields. Results showed that math interest was a significant predictor of students' interest in STEM careers, but only moderately so for careers in healthcare, agriculture, nature/outdoors, and construction. A student's perception of how math was used in their career was a predictor of STEM interest in multiple fields, and also moderated the relationship between math interest and career interest for two career areas, mechanics/electronics and physical science. In all other career areas, knowledge of how math was used in the career did not impact the relationship between math interest and STEM career interest.

These findings reinforce the need to increase math interest among both high school and undergraduate students, especially those intending to pursue STEM majors. Additionally, increasing students' understanding of the importance and relevance of math in a student's intended career may help in boosting interest in mathematics in general and in STEM careers.

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