

Student Outcomes from Inquiry-Based College Mathematics Courses: Benefits of IBL for Students from Under-Served Groups

Contributed Research Report

Marja-Liisa Hassi, Marina Kogan, Sandra Laursen

Abstract

Our large, mixed-methods study examines cognitive and affective outcomes of inquiry-based learning (IBL) in a variety of undergraduate mathematics courses at four universities. Student outcomes are measured by pre/post-survey items, self-reported gains and historical transcript data. Students in IBL courses report higher cognitive and affective gains than do non-IBL students. IBL students also report increase in motivation and interest, whereas non-IBL students' motivation drops after mathematics courses. The historical transcript data also shows IBL students' higher interest compared to their non-IBL peers. These benefits of IBL instruction are especially important for women and low achieving students, who are often under-served by the traditional college mathematics courses. Our findings suggest that IBL instructional methods support positive learning outcomes in various groups of students, including those under-served and under-supported by the traditional college mathematics courses.

Keywords: inquiry-based learning, mixed methods, learning outcomes, undergraduate students