

Special Lecture

Student outcomes of inquiry-based learning in undergraduate mathematics

Wednesday, October 22 | LD 010 | 3 – 4:10 p.m.

By Sandra Laursen

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Mathematics serves as students' gateway to STEM majors and careers, but lack of success in their initial college math courses deters many STEM-intending students from progressing in their desired pathways. While studies across the STEM disciplines (science, technology, engineering, and mathematics) support the use of student-centered teaching and learning to increase student learning and persistence, there has been less previous research on these approaches in college mathematics. Our group's study of inquiry-based learning (IBL) as implemented in over 100 course sections at four universities shows that student-centered approaches can succeed when implemented on a departmental scale. Despite variation in how IBL was implemented, student outcomes are improved in IBL courses relative to traditionally taught courses, as assessed by general measures that apply across course types. Particularly striking, the use of IBL eliminates a sizable gender gap that disfavors women students in lecture-based courses. Other evidence suggests particular benefits to initially lower-achieving students. The study supports the application of IBL as a means to improve learning outcomes and, ultimately, student retention in college mathematics.

About the speaker: Sandra Laursen earned a Ph.D. in chemistry from the University of California at Berkeley and maintains interests in both research and practice in science education. As co-director of Ethnography & Evaluation Research (E&ER), she leads research and evaluation studies focusing on education and career paths in science, technology, engineering, and mathematics (STEM) fields. Particular research interests include the underrepresentation of women and people of color in the sciences, professional socialization and career development of scientists, teacher professional development, and organizational change in higher education.

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