

Calculus I Instructors' Desires to Improve Their Teaching

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As calculus is a course required for many undergraduate programs, several studies over the past decade have examined aspects that create successful calculus programs in the United States. While many of these studies have looked at the teaching practices and beliefs of calculus instructors, none have focused on instructors' desires to improve their teaching. The goal of this research is to examine how desires to improve teaching vary among different types of instructors (GTAs, instructors, tenured faculty, etc.), and how institutional or departmental expectations might influence those desires.

Keywords: Calculus, teaching practices, improving teaching, teacher beliefs and desires

Calculus is a common course required for many undergraduate programs, especially science, technology, engineering, and mathematics (STEM) majors, but is often connected to attrition from these programs. In light of this, mathematics education researchers have begun examining aspects that create successful Calculus programs throughout the United States (Bressoud, Mesa, Rasmussen, 2015). One important aspect that has been a focus of some of these studies is the calculus teacher, specifically their beliefs, teaching practices, and interest in teaching Calculus.

Several studies (e.g., Bressoud & Rasmussen, 2015; Sonnert & Saddler, 2015) have examined mathematics teachers' beliefs and instructional practices, including their impact on students' attitudes towards and success in mathematics, but none have looked at instructors' desires to improve their teaching, and the beliefs and institutional expectations that might influence those desires. For this study, we are particularly interested in calculus instructors' interest in improving their teaching and better helping students understand concepts in calculus. The specific research questions for this study are:

1. To what extent are graduate students, faculty, and instructors interested in improving their teaching of Calculus I, and their awareness of student learning of calculus?
2. What supports do they perceive from their institution and department in regards to the scholarship of teaching and learning?
3. Is there a relationship between institutional or departmental support and calculus I instructors' desires to improve their teaching?

To pursue these research questions, we make use of a 2010 national data set collected by the Mathematical Association of America (MAA), with support from the NSF, as part of the "Characteristics of Successful Programs in College Calculus" (CSPCC) study (Bressoud, Mesa, Rasmussen, 2015). We specifically use the pre- and post-surveys given to calculus instructors, focusing on the questions related to their desires to improve their teaching and questions that could conceivably influence those desires (such as institutional or departmental expectations). Our poster will share descriptive statistics to give an overview of which types of instructors of calculus I are most interested in improving their teaching, as well as correlations between variables that may affect instructors' interest in professional development. A future direction for this project is to run more statistical tests to investigate if there are connections between other components, such as gender and type of institution, on instructors' desires to improve their teaching of Calculus I.

References

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