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Investigating students' progression through a mathematics course sequence based on instructional methods used in introductory calculus.

In this study we examined how students' progression through the mathematics course sequence of Calculus I, II, III, and Differential Equations is related to the instructional method they experienced in Calculus I and II. We tracked cohorts of students through the course sequence during three instructional periods, which correspond to departmental policy changes at our institution: Traditional (Fall 2003-Spring 2005), SCALE-UP (Active Learning) (Fall 2011-Spring 2013), and Return to Traditional (Fall 2014-Spring 2016). We calculated the number of students who progressed to the next course, repeated the same course, or left the course sequence the following semester. Only around 19% of students starting in Calculus I successfully progress "on-track" through the four-course sequence during subsequent semesters. Chi-squared tests revealed a significant difference in the proportion of students progressing through the course sequence between the traditional methods and active learning periods. Specifically, a higher proportion of students progressed to Calculus III in the SCALE-UP period. However, of those students who successfully progressed to Calculus III, a higher proportion progressed to and then completed Differential Equations in the traditional methods period. (Received September 25, 2018)