A Comparison of Four Pedagogical Strategies in College Calculus

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Thesis Abstract: The quality of education in introductory calculus classes is an issue of particular educational and economic importance. In work related to a national study of college calculus programs conducted under the auspices of the MAA, I report on a study of four different pedagogical approaches to Calculus I at a single institution in the Fall 2012 semester. Using statistical methods, I analyze the effects of these four approaches on students’ persistence in STEM major tracks, attitudes and beliefs about mathematics, and procedural and conceptual achievement in calculus. Using qualitative methods, I draw links from the statistical results to differences and commonalities in the four classroom strategies. I also discuss the implications for calculus curriculum redesign, as well as best practices for implementing the inverted model.