THE PERCEPTIONS OF ALIGNMENT BETWEEN ADVANCED PLACEMENT CALCULUS AB AND COLLEGE CALCULUS I: A MIXED METHODS STUDY OF INSTRUCTIONAL STRATEGIES, CURRICULUM, AND ASSESSMENT (163 pp.)

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Less than 40% of U.S. students who enter college pursuing a degree in a STEM field finish with that degree (Sonnert & Sadler, 2015). Calculus is considered to be a gateway course for many of these students. Advanced Placement calculus was created in order to provide students in high school with rigorous coursework and align with introductory calculus in college, yet currently the rigor of Advanced Placement is in question, and more universities are unwilling to award credit for students who pass the nationally credited exam. The findings from this comparative analysis of Advanced Placement calculus AB and college calculus I show that students in Advanced Placement Calculus scored statistically significantly better on assessments related to the Fundamental Theorem of Calculus than the students in college calculus I. They also exhibited a more conceptual understanding of the relationships between a function and its first and second derivatives. Additionally, instructors at the high school level were observed to be more engaging and provided more opportunities for exploration and collaborative group work, while the college professors showed little to no evidence of engaging their students and used lecture as their primary form of instruction.