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Benefits and Challenges of Teaching Undergraduate Mathematics Using the Flipped Method

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Abstract

The flipped classroom approach is reshaping pedagogical practices in higher education, offering an innovative way to engage students and enhance learning outcomes. This study investigates the implementation of the flipped method across undergraduate mathematics courses at Flagler College throughout the 2024 academic year. In this approach, traditional lectures were replaced with pre-class video content, while in-class sessions focused on collaborative problem-solving activities, peer discussions, and real-time instructor support. The results demonstrated notable improvements in student participation, critical thinking, and problem-solving skills, along with enhanced comprehension of complex mathematical concepts.

However, the transition was not without challenges. A key obstacle was motivating students to consistently engage with the preparatory materials before class, which initially led to disparities in participation and preparedness. These issues were addressed through structured interventions, including interactive video content, regular assessments, and continuous feedback to keep students accountable. The study also highlights the adaptability of the flipped model in accommodating diverse learning styles, fostering a more inclusive and personalized educational experience.

This research underscores the transformative potential of the flipped method in undergraduate mathematics education while acknowledging the logistical and pedagogical challenges it entails. By sharing practical insights and strategies, this study contributes to the broader discourse on active learning methodologies and provides a framework for educators aiming to enhance student outcomes through innovative teaching practices.

Keywords: active learning, flipped classroom, higher education, mathematics pedagogy, student engagement