Investigating Outcomes for Students Repeating Calculus I

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In the undergraduate STEM research community, research has focused on interventions to decrease DFW (students earning grades of D, F, or withdrawing from a course) rates in introductory courses (Norton et al., 2018) or has delved further into why students leave STEM pathways in college. (Seymour & Hewitt, 1997). Johns Hopkins University (JHU), like many universities, has had a number of initiatives focused on supporting students taking introductory STEM courses, including the Gateway Sciences Initiative, and the To, Through, and Beyond initiative focused on students who are first generation and low-income students. Both initiatives focused on interventions to increase student success in introductory STEM courses including calculus.

One set of students we are specifically considering is students retaking calculus because they don't pass the first time. Work has been done studying students retaking developmental math at community colleges (Canfield, 2013; Bickerstaff et al., 2022) and those retaking calculus at a mid-sized public university (Dibbs, 2019). We hope to add to this growing literature by considering students retaking calculus at a small private and research-focused university.

At JHU, students can drop a course without a transcript mark until the seventh week of the fifteen-week semester, likely encompassing students facing challenges similar to those with DFW outcomes. To include this broader group, we will track these students as well, referring to them collectively as DDFW students. This approach represents a key divergence from existing literature, which typically focuses solely on DFW outcomes.

Through the examination of placement data, surveys, and interviews with DDFW students, we aim to describe the what, when and why of the DDFW students' experiences and gain insight into what helps these students succeed.

By documenting commonalities among students who successfully pass calculus on the second try, and identifying factors that contributed to failing, we hope to propose interventions to help increase the pass rate of calculus for both first time takers and repeating students. This poster will present an overview of the literature to date and research questions posed to investigate the outcomes for students who retake calculus.

References

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