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Pairing Mastery-based Testing and Active Based Learning to Improve Student Performance and Persistence in the Calculus Sequence.

Mathematics education research has provided data supporting the claim that student engagement is correlated with persistence through STEM courses. The effect is greater for students with test anxiety and groups historically under-represented in mathematics. Mastery-based exams provided one tool to combat test anxiety in mathematics and increase a student's ownership of her own learning. Active based learning strategies have been shown to increase student performance in STEM disciplines. We discuss our implementation of mastery-based testing in the calculus sequence with active based learning. In particular, the logistics of organizing a course for sufficient student feedback and meeting the needs of students with accommodations will be addressed. We will share the successes and pitfalls we encountered and propose solutions to some of these issues in addition to providing preliminary data to support the claim that the pairing of mastery based testing and active learning result in better student performance and persistence through the calculus sequence. (Received September 17, 2019)