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Using dynamic software to address common college calculus stumbling blocks.

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Summary: There are specific topics in college calculus that can be major stumbling blocks for students. Having taught college calculus for four years to over a thousand students, we observed that even the students who have already taken pre-calculus or calculus during their high school careers had common misunderstandings. Students may remember a technique without retaining the understanding of why it can be applied or what it is accomplishing, essentially only having knowledge of a rote procedure. Educators can address these areas of difficulty by regularly utilizing dynamic technologies such as Geometer's Sketchpad and Desmos in the classroom to fully illustrate calculus concepts. With these tools, teachers can help their students better understand how to reason mathematically in calculus.

Classification: I45 U75 R25 D75
Keywords: AP calculus; concepts; teaching; computer as educational medium; geometry software; college; university teaching; learning problems; misconceptions; student errors; graphing software; visualization; graphical representations; definition of a derivative; utilizing theorems; intermediate value theorem; mean value theorem; L'Hopital's rule; differentiation; curve sketching
http://journals.tc-library.org/index.php/matheducation/article/view/1042/646