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# Implementing and assessing computational modeling in introductory mechanics

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Students taking introductory physics are rarely exposed to computational modeling. In a one-semester large lecture introductory calculus-based mechanics course at Georgia Tech, students learned to solve physics problems using the VPython programming environment. During the term 1357 students in this course solved a suite of fourteen computational modeling homework questions delivered using an online commercial course management system. Their proficiency with computational modeling was evaluated in a proctored environment using a novel central force problem. The majority of students (60.4%) successfully completed the evaluation. Analysis of erroneous student-submitted programs indicated that a small set of student errors explained why most programs failed. We discuss the design and implementation of the computational modeling homework and evaluation, the results from the evaluation and the implications for instruction in computational modeling in introductory STEM courses.

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