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Mastery-Based Assignments for Large Enrolment Introductory Physics Courses

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In this talk, we will present a mastery-based approach to introductory physics assignments (i.e., homework), and the results of a study comparing this mastery-based method to a standard online (large publisher) assignment software. We then will discuss the implementation of this method to a large enrolment introductory physics course. In the past decades, introductory physics courses at Canadian universities have increasingly relied on online assignment systems to manage the delivery, submission and grading of students take home assignments. These standard online systems face common issues such as a lack of detailed feedback and solutions (leaving students frustrated not knowing the cause of their errors/ unable to learn from their mistakes) and an over-emphasis on final answers (with associated algebraic solutions available on the internet). The mastery-based method we present involves two parts to each assignment, an initial traditional written submission, and a re-submission after detailed solutions have been released to the students; this two-part process allowed for the elimination of intensive grading resources, while allowing students to focus on detailed process-based written solutions and proper corrections to all errors in their re-submission. Students who were part of the study completed an entire introductory physics course with each assignment method. Results strongly favored the mastery-based method in all significant categories assessed in the study, with students reporting increased understanding of how to approach and complete introductory physics problems, as well as decreased stress and frustration, as primary benefits.

Keyword-1

Introductory Physics

Keyword-2

Homework Assignments

Keyword-3

Mastery-Based Assignments

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