CONTINUOUS EXAMINATION IN THE AGE OF AI: COMPARING "EXPLAINER VIDEOS" AND TWO-STAGE EXAMS

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Take-home assignments play a central role in many physics and engineering courses. Well-constructed assignments give students the opportunity to hone their problem-solving skills and may help them develop higher-order skills, e.g., by synthesising or analysing the material. Moreover, take-home assignments serve as an example of continuous assessment, encouraging deep study throughout the course and providing opportunities to demonstrate skills before the final examination. For these reasons, many instructors cherish take-home assignments as a pedagogical instrument.

However, the rapidly expanding problem-solving capabilities of readily available AI tools risk making take-home assignments less effective as pedagogical instruments and raise issues of authenticity. Moreover, while traditional take-home assignments can expose students to the appropriate level of challenge, individual feedback is often delayed by a time-consuming grading process, thereby reducing the assignments' pedagogical effectiveness.

In this project, we have explored alternative forms of continuous assessment through an intervention conducted in a second-year *Electromagnetism & Waves* course in the Physics program at Stockholm University in the Spring term of 2026. The goal is to evaluate and compare two forms of continuous assessment that may be less severely affected by AI tools, and in which peer interactions provide timely feedback.

The continuous assessment in this course was based on six problem sets. The first three of these were assessed through "*Explainer Videos*" with peer review; the last three were assessed through short, in-class *"Two-Stage Exams"*. Explainer Videos are self-recorded videos where the students explain their solution to an assigned problem, guided by a grading rubric. The submitted videos are subsequently peer reviewed within a week of submission. Explainer Videos have been used at Stockholm University since 2020, and in this particular course since 2025. In Two-Stage Exams, students first take an individual test, which is immediately followed by a collaborative, second test, typically with the same or very similar questions [1, 2]. Two-stage exams have been successfully used for mid-term exams and final exams [3, 4]. Here, we explore how a shortened, focused version can be used for weekly continuous assessment.

We present results of this intervention based on student survey data, teaching assistant interviews, and self-reflections. We compare the two formats along several dimensions, including perceived learning value, robustness to AI-generated solutions, feasibility of implementation, and self-efficacy [5]. We argue that both formats offer complementary advantages for continuous assessment in the age of generative AI, and we identify conditions under which each is most effective.

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