Paper-based homework has a much stronger correlation with exam scores than online homework.

**Motivation**

Online homework systems are almost ubiquitous among introductory physics classes for the feedback they provide students and the ease of grading for faculty. But how well do they support learning and exam preparation?

**Context & Analysis**

- N=31 paper-based
- N=23 online
- Introductory E&M courses
- 2 quarters of data from each modality
- Compared each student’s average exam score to the average homework score for the quarter

**Course Differences**

- Similar assignments in terms of questions
- Online hw weighted at 6% of course grade
- Paper-based hw weighted at 20% of course grade
- 1/2 graded on completion
- Paper-based hw graded using a problem solving rubric also used on exams
- Online hw graded on a correct/incorrect basis.

**Interpretation**

- Larger R² value for paper-based homework scores indicates that a student’s homework score more consistently predicts their exam score.
- More generally, these results indicate that paper-based homework better aligns students’ homework effort with their exam performance.
- Paper-based homework seems to engage students more authentically, and supports their learning better.

**What do these results mean to you?**

- Does this pattern hold more broadly, over many quarters, and in other classes besides E&M?
- What aspects of the two different homework modalities cause this difference?
- What might be the impact of ChatGPT?