Apr 12th, 8:05 AM - 8:17 AM

Technology Solutions for Better Teaching

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Being a professor is a dream job. However, there is more to be done than time to do it, and quality teaching takes time. Intuitively, we know that multiple choice exams are a second-best evaluation tool and research shows that students actively engaged will have better outcomes. Creating engaging content and avoiding multiple choice exams takes time. Thankfully, there are some tools available to help.

I will present three technology tools that can help faculty do a better job with a binding time constraint. *Gradescope* is a website that can speed scoring student work and improve grading objectivity. *Top Hat* is a student engagement tool that overcomes several common classroom problems. *YouTube* videos can provide outside help for students.

Gradescope can speed grading by using machine learning and sound design principles. Student work with a fixed format is scanned (or submitted electronically) and matched to a student roster with the help of machine learning. Multiple choice and short answer questions are then grouped for grading. Essay questions are presented one at a time, for each student, without identification of the student. The grader compares each student's work to a rubric. The rubric has the advantage of being able to be re-weighted and updated as trends are discovered in the grading process.

Top Hat is an online ecosystem consisting of web-tools and phone applications. In- structors can take *location specific* attendance, poll the class, ask reinforcing questions, and encourage discussion. The environment helps break the ice as students are less afraid to ask questions and make comments as they see that they are not alone. The interface also puts the instructor's slides on their device in sync with the lecture and makes them available outside of class.

YouTube videos can help reinforce student learning. A recent mini-grant has provided resources to create videos that will strengthen specific skills that students may miss in lecture. I will present a video and a summary of how it was made.

Taken together, or individually, these tools are an investment. There is a learning curve, and none of them are free. I hope to show that, for some faculty, the trade-off is advantageous.