8.MReVX: Mechanics ReView

8.MReVs is organized into weekly modules each containing a short e-text with supplemental videos, simulations, and embedded questions. Each module features homework problems at three levels (including challenging MIT exam-like problems) and a weekly quiz. Discussion forums follow each module and problem, enabling participants to learn from each other and from our cadre of alumni staff members.

Pedagogy by MIT RELATE

Our pedagogical approach, Modeling Applied to Problem Solving, presents a unified conceptual framework for the standard mechanics syllabus that closely ties into solving problems. It improves students’ overall expertise and general problem-solving skill, and leads to enhanced performance in students’ subsequent physics course in Electricity and Magnetism. The course imparts more conceptual learning than traditionally taught on-campus courses.

Special section targeted at teachers

Teachers in Massachusetts can receive Professional Development Points (PDPs) at no charge to teachers for completing the course, while teachers in a different state receive Continuing Education Units through the American Association of Physics Teachers at ½ their usual cost. Course resources are available to teachers for their own classes, and ultimately through a course-building application that will allow deploying them to students through edX.org. 542 teachers signed up this summer.

Vision

A common resource
Contains everything needed for a course
Created once
Free for all instructions
Integrated with best practices from PER
Easy to find, use, and deploy
Develops problem solving skills
Enjoyable and student-centered
Multi-pronged approach
A community-owned commons

Summary

We attempted two approaches for teaching in-service teachers.

The 8.MReV xMOOC is a course in mechanics, covering the same material as the MIT freshman physics course. It is a mature, developed course, based on PER pedagogy. Over it’s past iterations, over 25% of the “students” have been teachers. The course is being continuously expanded and improved.

Second, a recent pilot of a hybrid cMOOC/xMOOC, called Maker Physics, was created to introduce participants to specific areas of ed-tech and PER pedagogy, develop their comfort level with the edX platform and encourage the creation of physics content. Two working groups showed community style interactions during the creation of over 50 educational resources, although the pilot did not develop a course-wide community. We are currently working to develop a second iteration of this course.

If successful, a crowd of participants could have the potential to develop richer content than any single entity. In addition, getting teachers involved in resource creation provides a means for teachers to learn both from PER literature and from each other, by reading research papers, collaborating, critiquing each others’ work, and reading critiques of their own work. Usage data can help drive both selection of the best resources, and provide feedback to the community on what does and does not work.

Next Steps

Developing full course (maker-physics.org)
Good venue to publicize/apply your PER
Want to play? Let us know: pmitros@edx.org