“Other” EdTech “Stuff” at MIT

Brandon Muramatsu, mura@mit.edu
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Modularity Experiments
Concept-based Approaches
Embedded Assessment
MIT Office of Educational Innovation and Technology

- *Partners* with *faculty* across MIT
- Leads *experiments* in *innovative* approaches to learning and teaching
- *Scales up* projects from individual faculty to departments and the university
- Partners with other campus entities to *sustain* innovations long-term
MIT Council on Educational Technology

- MITCET’s “mission...is to enhance the quality of MIT education by encouraging the appropriate application of technology, both on and off campus.”

- Representation from across campus
Modularity Experiments

- Experiments to explore:
  - Deeper learning experiences
  - Flexibility in time (not always organized into one-semester chunks) and geography (not always on campus)

- Call for participation
  - Aero/Astro, Chemistry, Mechanical Engineering
i2.002 in Mechanical Engineering

- The department is interested in experimenting with its curriculum, perfect candidate

- 2.002 Mechanics and Materials II is a typical MIT engineering class:
  - Traditional lectures, lots of equations using blackboards *gasp*
  - Problem sets, labs
  - “MIT Hard”

- Set of experiments beginning in Spring 2012
i2.002

Mechanics & Materials II

Department of Mechanical Engineering
Office of Educational Innovation and Technology
Teaching & Learning Laboratory
(with funds from MIT Council on Education Technology,
Class of 1960 and the Office of Digital Learning)
i2.002: Mechanics and Materials II

Pre-reqs. & 2.001

- Plasticity
- Viscoelasticity
- Fracture & Fatigue
- Rubber

3D Continuum Mech & Linear Elasticity
i2.002 Spring 2012 Experiment

- MIT students took i2.002 online and at a distance
  - Online and In-Person Students Performed the Same
    - Students in Spain, Puerto Rico and California
    - Same course, same lectures, same p-sets (homework), same labs and same exams
- Lecture videos
  - Traditional classroom videos
  - But... we had a TA divide the video into segments by concepts
  
  **Added about 10 minutes per lecture, that’s it!**
i2.002 Spring 2013 Experiment

- Linked “typical” online course content with concept-based tools
  - Video browsable by concepts
- Virtual TA’s
  - Help students get started with p-sets, similar to the help they’d get in office hours

On-going Experiments
Continuous Innovation
Flipped classroom with embedded assessment
- Students review materials ahead of time
- Including answering questions embedded in content
- Quick feedback loop allowing faculty to address items in class, with examples
Open Embedded Assessment

- edX presents content and embedded assessment tightly linked
  - Quick feedback loops
  - Lots of opportunity to practice/apply

- OEIT New Project: Embed formative assessment in any web-based content
  - Overcome limitations of current approaches
Open Embedded Assessment

Question 1

\[
\frac{5}{12} \quad ? \quad \frac{3}{5}
\]

- Greater than (>)
- Less than (<)
- Equivalent (=)

Check Answer

<iframe src="//openItems/1" frameborder='0' width='300' height='371' /></iframe>
\[
\frac{6}{35} \cdot \frac{21}{40}
\]
“More” EdTech Stuff in OEIT

- Collaborations in Online Teacher Education and Professional Development
  - MIT-Haiti Initiative & EDC-Pakistan
- Interactive software, visualizations
  - StarGenetics, StarBiochem
- Infrastructure software development
  - MIT Core Concept Catalog & Repositories
- Collaborations with Community Colleges
Contact Me

Brandon Muramatsu
mura@mit.edu
@bmuramatsu (Twitter, Slideshare)

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