Reinventing Education

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edX.org

Courtesy Eric Klopfer
A Not For Profit Venture of Harvard & MIT

Open source Platform

Portal for learning edx.org

Harvard ➔ HarvardX
MIT ➔ MITx
Berkeley ➔ BerkeleyX
U ➔ Ux
X university consortium

Pedagogy research on learning using “big data”

Production support to ensure high quality

*Harvard and MIT have committed $60M to the venture
Flipping the Funnel

- 8,240 Took the Final
- 10,547 Made it the Mid-Term
- 7,157 Certified
- 9,318 Passed the Mid-Term
- 26,349 Tried the First Problem Set
- 154,763 Registered for 6.002x: Circuits and Electronics

Same staff resources as 150 person on-campus class

Anatomy of an edX Online Class

- 154,763 Registered for 6.002x: Circuits and Electronics
- Part 1: Today: Search in the presence of uncertainty

Worst-Case vs. Average Case

Uncertain outcomes controlled by chance, not an adversary.
Learning Sequences Promote Active Learning

Tell me and I forget.
Teach me and I remember.
Involve me and I learn.

— Benjamin Franklin

Learning and retention is related to depth of mental processing.
— Craik and Lockhart, 1972

Video Snippets

Why did this (temp insensitivity) happen? Our next Ahal Insight:

Insight:

Suppose I perturb the circuit
(e.g. force $V_0$ momentarily to 12V somehow).
Student Controlled Pacing Improves Learning

Students who were able to press a continue button to go on to the next segment performed better...

– Mayer 2003
J. educational computing research

Autograded Exercises Provide Instant Feedback
Instant Feedback Improves Learning

Rapid feedback has a significant and positive effect on student performance when compared to no rapid feedback.

— Chen, Whittinghill, Kadlowec 2010

Virtual Game-Like Laboratory
Oh god; have I missed you... :~}