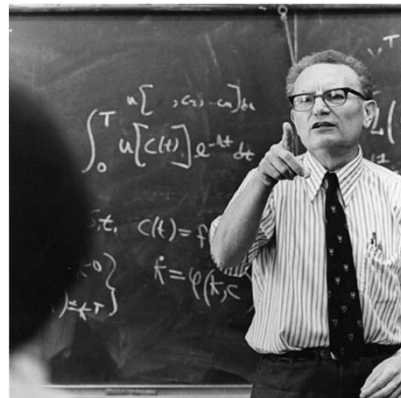
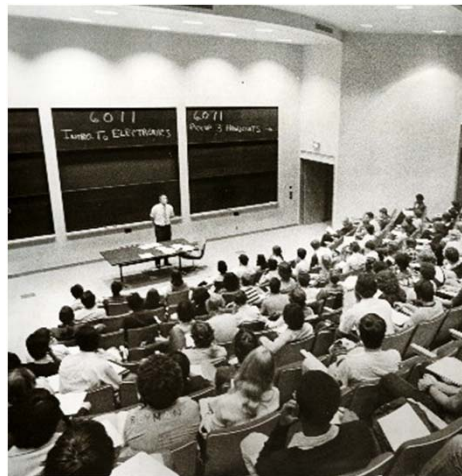


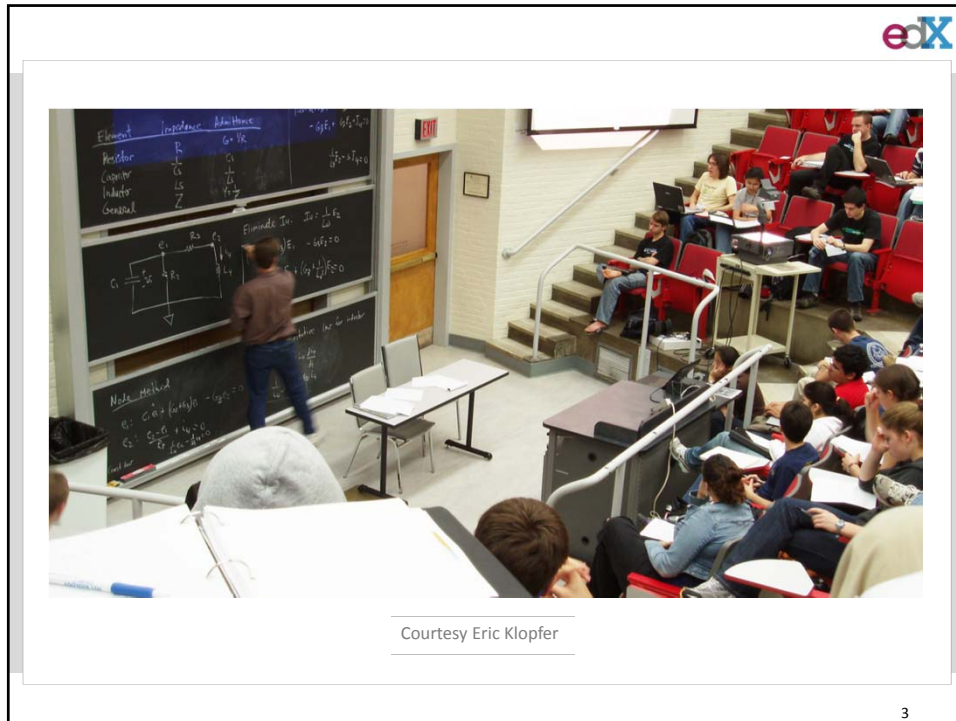


Reinventing Education


Anant Agarwal
edX.org



Courtesy Eric Klopfer



Courtesy Eric Klopfer



A Not For Profit Venture of Harvard & MIT

Open source **Platform**

Portal for learning edX.org

Harvard → *HarvardX*

MIT → *MITx*

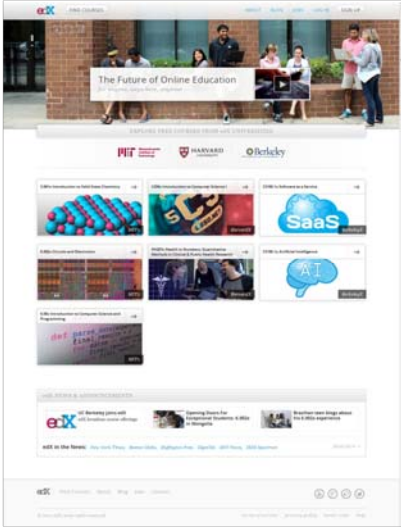
Berkeley → *BerkeleyX*

U → *Ux*

X university consortium

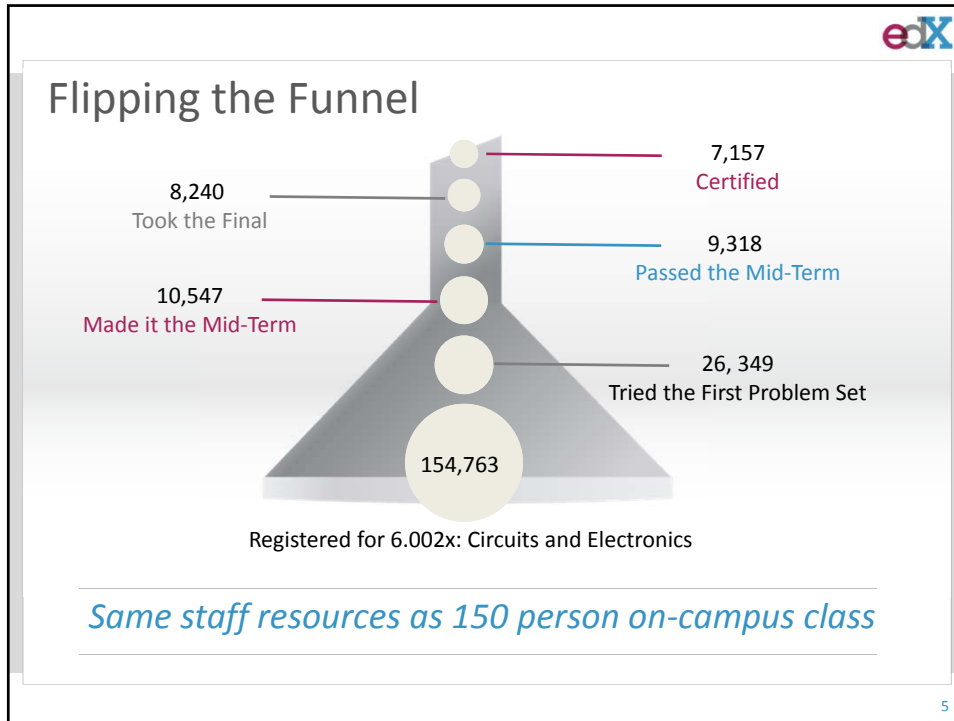
Pedagogy research on learning using “big data”

Production support to ensure high quality



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

4



Anatomy of an edX Online Class

Courseware | Updates & News | Syllabus | Course Info | Course Staff | Discussion | Wiki | Progress | Instructor

Week 1
Week 2
Week 3
Week 4

Lecture 6: Adversarial Search
Lecture 7: Uncertainty and Utilities
Homework 3: Games
Homework 3: Games (practice)
Project 2: Multi-Agent Search

PART 1: TODAY: SEARCH IN THE PRESENCE OF UNCERTAINTY

Worst-Case vs. Average Case

about our actions having unknown results, but rather than thinking that the results are worst case, we should be thinking about some kind of average case.

And we should be thinking that those aren't really min nodes, but they're some kind of chance node.

And the general idea for today is going to be to think about the case where all uncertainty is controlled by chance, and not by an adversary.

Idea: Uncertain outcomes controlled by chance, not an adversary!

1:54 / 2:11 | SPEED 1.0x | HD | CC



Learning Sequences Promote Active Learning

Tell me and I forget.

Teach me and I remember.

Involve me and I learn.

– Benjamin Franklin

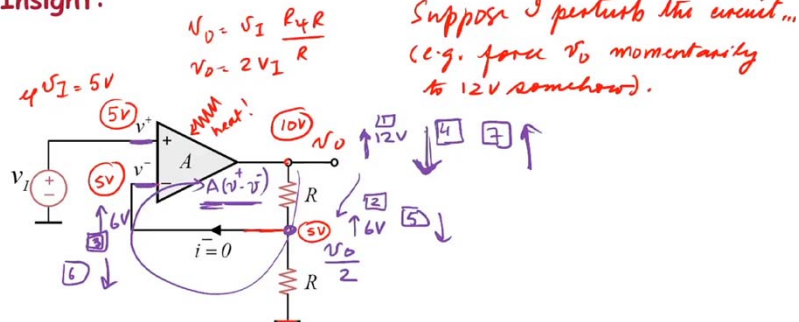
Learning and retention is related to depth of mental processing.

– Craik and Lockhart, 1972



Video Snippets

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





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

9



Autograded Exercises Provide Instant Feedback

This problem investigates how resistors combine. Consider the three resistor networks shown below:

Network A: A circuit with two resistors in series, each labeled R .

Network B: A circuit with two resistors in parallel, each labeled R .

Network C: A circuit with two resistors in parallel, each labeled R , and a third resistor labeled R in series with the parallel combination.

What is the equivalent resistance as an algebraic expression (in terms of R) of network A as viewed from its port?

What is the equivalent resistance as an algebraic expression (in terms of R) of network B as viewed from its port?

What is the equivalent resistance as an algebraic expression (in terms of R) of network as C viewed from its port?

10



Instant Feedback Improves Learning

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

— Chen, Whittinghill, Kadowec 2010

11



Virtual Game-Like Laboratory

The screenshot shows a web browser window displaying the edX courseware interface for MITx 6.002x Circuits and Electronics. The URL is https://www.edx.org/courses/MITx/6.002x/2012_Fall/courseware/Overview/Circuit_Sandbox/. The interface includes a navigation menu on the left with options like 'Overview', 'Welcome to 6.002x', 'Lecture Sequence', 'edX Tutorial', 'Lecture Sequence', 'Using the Tools', and 'Lab'. The main content area is titled 'CIRCUIT SANDBOX' and contains a grid-based workspace for building a circuit. The workspace is currently empty, showing a grid and a toolbar with various components and tools. The text in the sandbox area reads: 'Here's a sandbox where you can experiment with all the components we'll discuss in 6.002x. If you click on CHECK below, your diagram will be saved on the website and you can return at some later time.'

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Oh god; have I missed you... :~}