Rethinking Learning:
Course Consumption & 21st Century Learning

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Outline

- Introduction
- Learning in the 21st Century

  "The world is changed."
- A preferred future?

  From monolithic and centralized to distributed.
- What might this mean?

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3 Introduction

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About Me

- B.S. & M.S. in Mechanical Engineering
- Taught multimedia design and open education
- ~10 years in educational digital libraries
  - Collections, nationwide collaborations, quality and peer review
- 9+ years in Open Education
  - Open Educational Resources and OpenCourseWare

- "Been There, Done That"
  - Multimedia courseware design and course support, Software design, Digital Libraries, Metadata, Learning Objects, Open Educational Resources/OpenCourseWare

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Outcomes

- An understanding of how we might think about the world of learning that is changing around us…
  - Changes from monolithic and centralized to distributed
  - Design of learning materials and interaction with them
  - Implications for design of systems and tools

- **A healthy discussion!**

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Disclaimers

- This is very much a *work in progress*…
- We are working with a number of faculty on these issues, but by no means are these approaches universally accepted, and thus you should take what's about to follow as *personal opinion*…
- Much of what we're doing *is not new or novel*; we might be at a point where technology and the environment may make it easier to do these things.

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Learning in the 21st Century

"The world is changed."

— Galadriel, Lord of the Rings

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Confluence of Events

- Global financial crisis…
  - Dramatic reduction in education budgets, continuing rise in costs, and rise in student loan debt
- Changing perceptions of the value of a degree

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Confluence of Events (cont.)

- Competency-based education/prior learning assessment
- Recognition of the half-life of learning in many disciplines
  - Transition to continual learning in many career paths
- Rise of openly accessible information, learning materials and opportunities, at scale
  - Wikipedia, Open Educational Resources/ OpenCourseWare, Creative Commons licensing
  - Khan Academy, Codecademy
- And…

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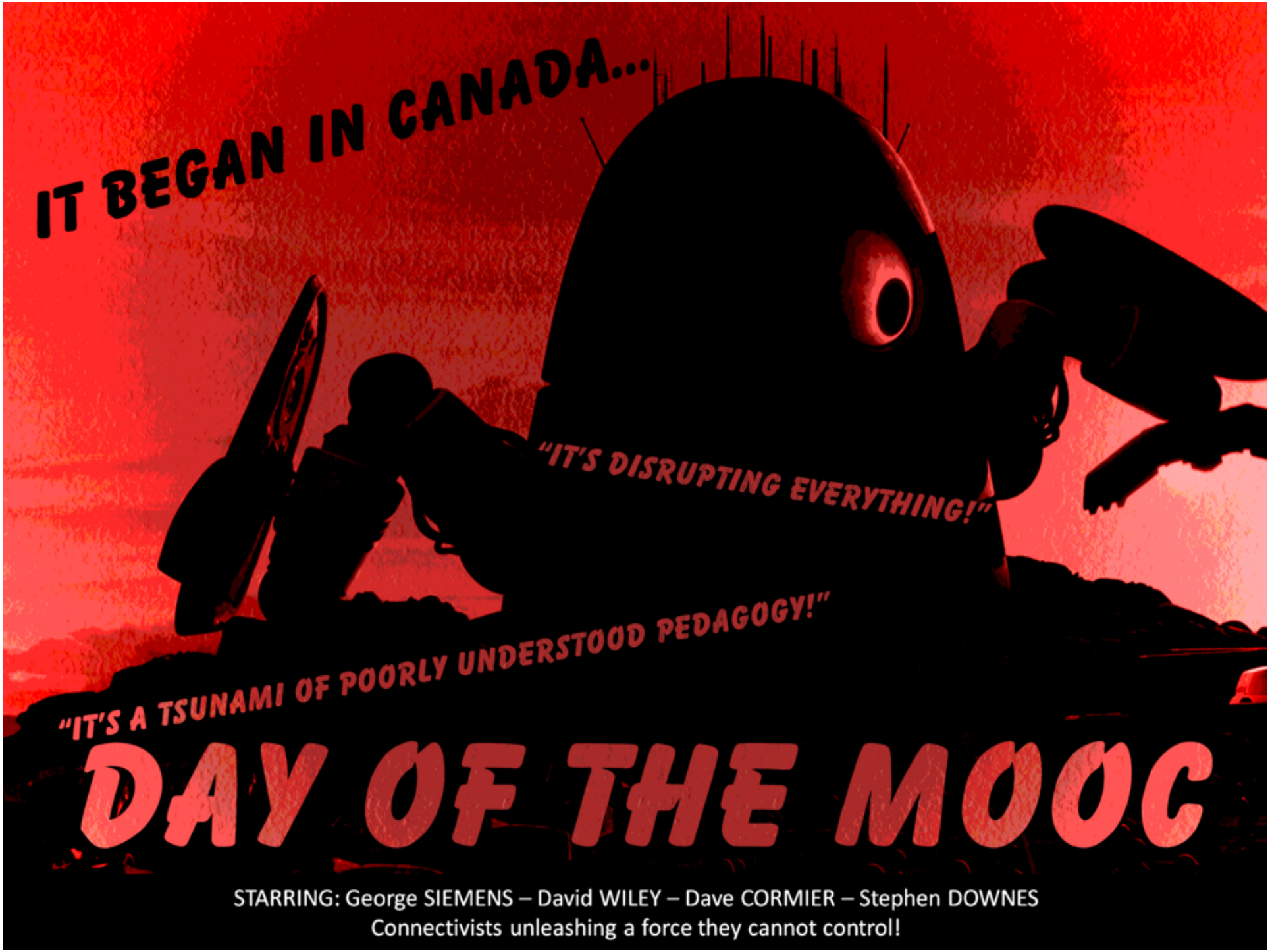
IT BEGAN IN CANADA...
"IT'S DISRUPTING EVERYTHING!"
"IT'S A TSUNAMI OF POORLY UNDERSTOOD PEDAGOGY!"
DAY OF THE MOOC
STARRING: George SIEMENS – David WILEY – Dave CORMIER – Stephen DOWNES
Connectivists unleashing a force they cannot control!

AVC musings of a VC in NYC

Apr 21
2013

Online Learni

Clayton Christensen's views on
week. For a different take on this t
learning in todays' NY Times.

I laid out my thoughts on this topic a few months ago. There is no q ion that putting all of these lectures and knowledge online is going to change things. But I am also a big fan of what happens wh of students get together in a class

k up
e is

It's hard to predict this stuff will be on higher ed, and we do know that real in person interaction is a huge part the learning equation. But these new tools will bring important changes. So if you are in the higher education business, you had better be getting your hands dirty with this stuff. The only way to really learn something is to do it yourself.

But I am also a big fan of what happens when a teacher and a small group of students get together in a classroom and real personal interaction happens.

So if you are in the higher education business, you had better be getting your hands dirty with this stuff. The only way to really learn something is to do it yourself.

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12 A Preferred Future?

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A Similarity of Goals

What Learners Want	How Learning Experiences Should be Designed
▫ I need to learn/ understand how to… (aka some "goal")	▫ Well defined, measurable and transparent learning objectives
▫ How do I know if I've learned something?	▫ Assessments that demonstrate mastery of the learning objective(s)

These apply to "traditional" instruction, as well as any of the new-fangled approaches like edX/Coursera/Udacity, Khan Academy, Codecademy, etc.

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A Difference in Control

This is how we learn as professionals!

Today: Easy to Administer

- Instructor-driven
- Monolithic terms: 10, 12, 14, 15 weeks
- Whole courses for full-time, college enrolled
- Assessment (learning) and certification (grade/credit/ degree) bundled together
- Monolithic systems (LMS), textbooks

Preferred Future: Focus on Learner

- Learner-requested
- Shorter: Days and weeks, not months
- Modules on demand, formal or informal settings
- Assessment and certification separated
- Distributed functionality where it's most effective

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Course Consumption & 21st Century Learning

- 2 examples as proxies, a bit of caricature
  - A typical course in a university's learning management system, as well as course materials on the web through OpenCourseWare sites
  - Modular materials with integrated assessments

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Resource Center

- Readings
- Assessments
- Web Media
- Final Exam
- Activities
- Syllabus

Precalculus II

Purpose of Course

SHOW

Learning Outcomes

CLOSE

Upon successful completion of this course, the student will be able to:

- measure angles in degrees and radians, and relate them to arc length;
- solve problems involving right triangles and unit circles using the definitions of the trigonometric functions;
- solve problems involving non-right triangles;
- relate the equation of a trigonometric function to its graph;
- solve trigonometric equations using inverse trig functions;
- prove trigonometric identities;
- solve trig equations involving identities;
- relate coordinates and equations in Polar form to coordinates and equations in Cartesian form;
- perform operations with vectors and use them to solve problems;

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Legend

Course Question & Answer

Viewing Saylor.org on an iPad? Click here for tips on optimizing your browsing experience! *Our courseware is best viewed using Microsoft Internet Explorer, Mozilla Firefox or Google Chrome browsers (please update to the latest versions.)*

Discuss MA003 with other Saylor Students here!

- Precalculus I ?

EXPAND ALL RESOURCES

Unit 1: Trigonometric Functions of Angles

Imagine standing some distance from a building and trying to guess at its height. With some simple measurements and the tools you learn in this unit, you will be able to find the height of the building precisely. This is one of the many application problems you will be able to solve after your study of trigonometry.

In this unit, you will explore the properties of circles and use those properties to investigate angles within the circle. In particular, you will begin with a new definition of angle measure related to arc length in a circle. A review of the equation for a circle with radius r leads to a definition of the sine and cosine functions, and you will use these to define the remaining trigonometric functions and explore their basic properties and identities. These definitions will be used to derive similar definitions for right triangle trigonometry, which is precisely the tool needed to solve problems like the one mentioned above.

Unit 1 Time Advisory show

Unit 1 Learning Outcomes show

1.1 Circles

Reading: Lippman and Rasmussen's *Precalculus: An Investigation of Functions*: "Chapter 5: Trigonometric Angles of Functions"

Link: Lippman and Rasmussen's *Precalculus: An Investigation of Functions*: "Chapter 5: Trigonometric Angles of Functions" (PDF)

Instructions: Please read pages 297-301 of Chapter 5 to learn about circles in trigonometry. Please note that this reading covers the material in subunits 1.1.1 through 1.1.4.

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Resource Center

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EXPAND ALL

Assessments

- 1.1.4 Assessment: Washington State Board for Community and Technical Colleges' MyOpenMath: "Section 5.1: Circles Graded Homework"
- 1.2.5 Assessment: Washington State Board for Community and Technical Colleges' MyOpenMath: "Section 5.2: Angles Graded Homework"
- 1.2.5 Assessment: Washington State Board for Community and Technical Colleges' "Chapter 5 Quiz 1"

  Link: Washington State Board for Community and Technical Colleges' "Chapter 5 Quiz 1" (PDF)

  Instructions: This assessment covers subunits 1.1.and 1.2. Complete this quiz after you have worked through the readings, web media, and assignments for subunits 1.1 and 1.2.

  See a broken link? Please let us know!
- 1.3.4 Assessment: Washington State Board for Community and Technical Colleges' MyOpenMath: "Section 5.3: Points on Circles using Sine and Cosine Graded Homework"
- 1.3.4 Assessment: Washington State Board for Community and Technical Colleges' "Chapter 5 Quiz 2"

Credit: Saylor Foundation, CC BY

Quiz #1a **NAME**_____

5.1, 5.2 Lippman/Rasmussen

Answers without proper justification may not receive full credit. Show your work algebraically.

1) Write an equation for a circle with diameter 20 centered at the point (-2, 4)

2) Find the point in the first quadrant where the line $y = 2x$ intersects a circle of radius 3 centered at the origin.

3) Convert 160 degrees to radians. Give an exact answer.

Credit: Washington SBCTC, CC BY

Analysis

- **What's good?**
  - Learning objectives clearly stated
  - Organized to match current models of college courses
- **What could be improved?**
  - Interleave assessments with readings, don't separate by type
  - Self-scoring assessments within the course; don't break the experience by linking elsewhere
  - Course modularity and descriptive labels, while supporting monolithic course
    - Do I find what I want in Unit 1 or Unit 2?
  - Transparency would be improved by linking assessments directly with learning objectives, mastery isn't clearly defined

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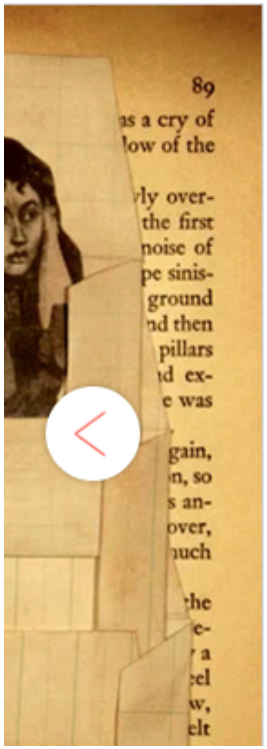

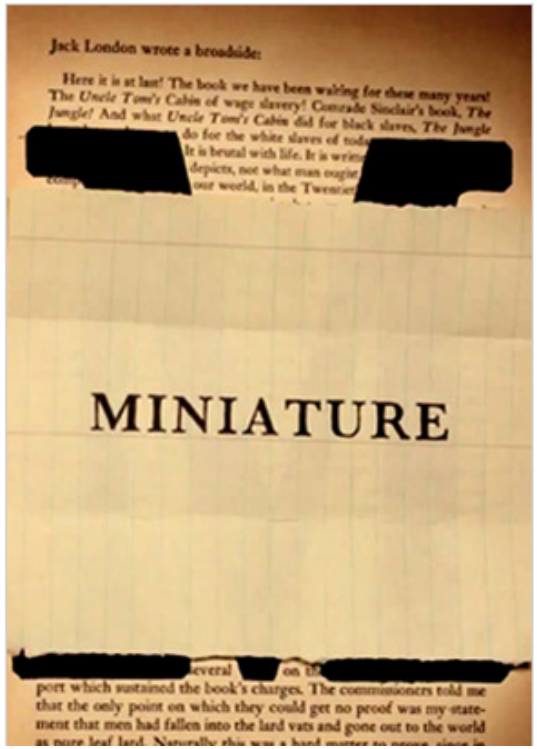

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How stats fool juries - Peter Donnelly

10163 Lesson Views

55 Flips

Watch

Think

Dig Deeper

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1 2 3 4 5 6 7 8

Donnelly's coin toss experiment demonstrates which of the following?

A On average, it takes more coin tosses to see the HTH (head-tail-head) pattern than it does to see HTT

B The HTT pattern, on average, requires more coin tosses than HTH

C The average number of tosses to get HTT is the same as the number to get HTH

D There are people out there with a lot of coins and a lot of time

Watch

Think

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How stats fool juries - Peter Donnelly

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41 Characters Available

Let's Begin…

B I U

interpreting statistics, along with the devastating impact these errors can have on the outcome of criminal trials. Peter Donnelly is an expert in probability theory who applies statistical methods to genetic data, spurring advances in disease treatment and insight on our evolution. He's also an expert on DNA an

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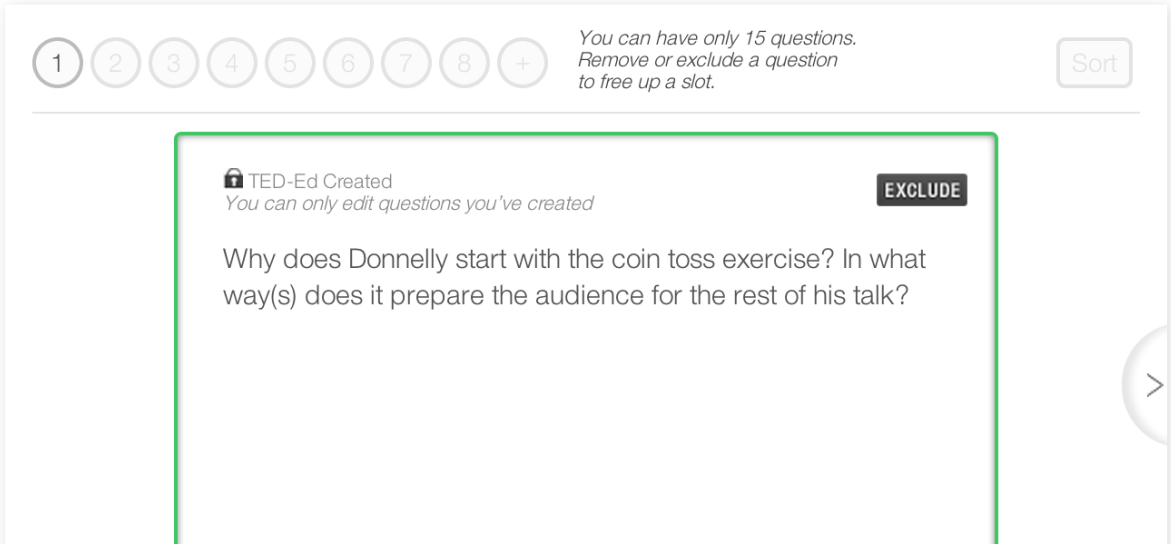

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How stats fool juries - Peter Donnelly

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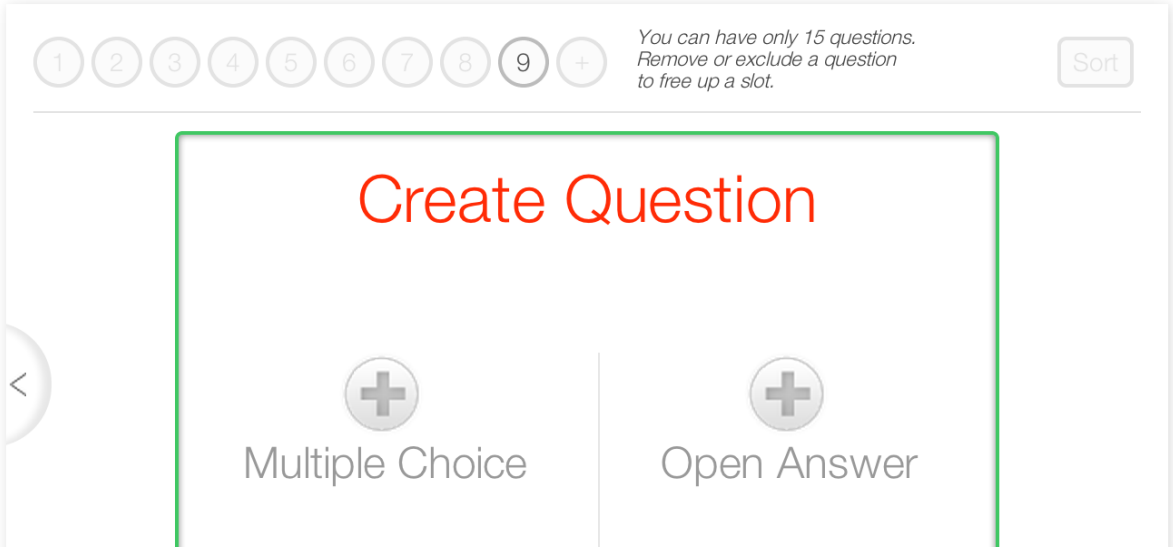

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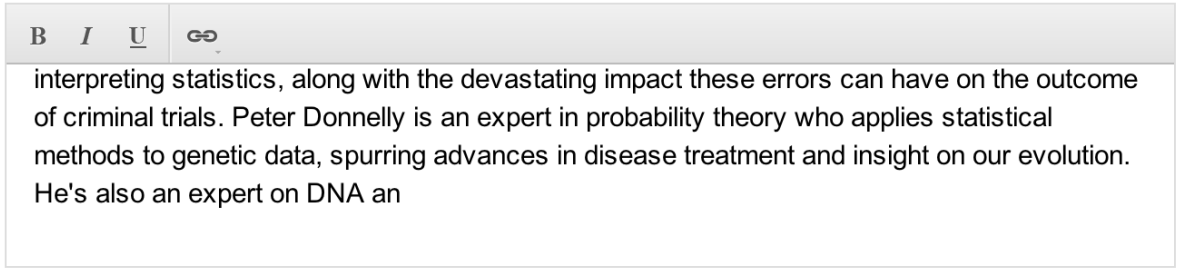

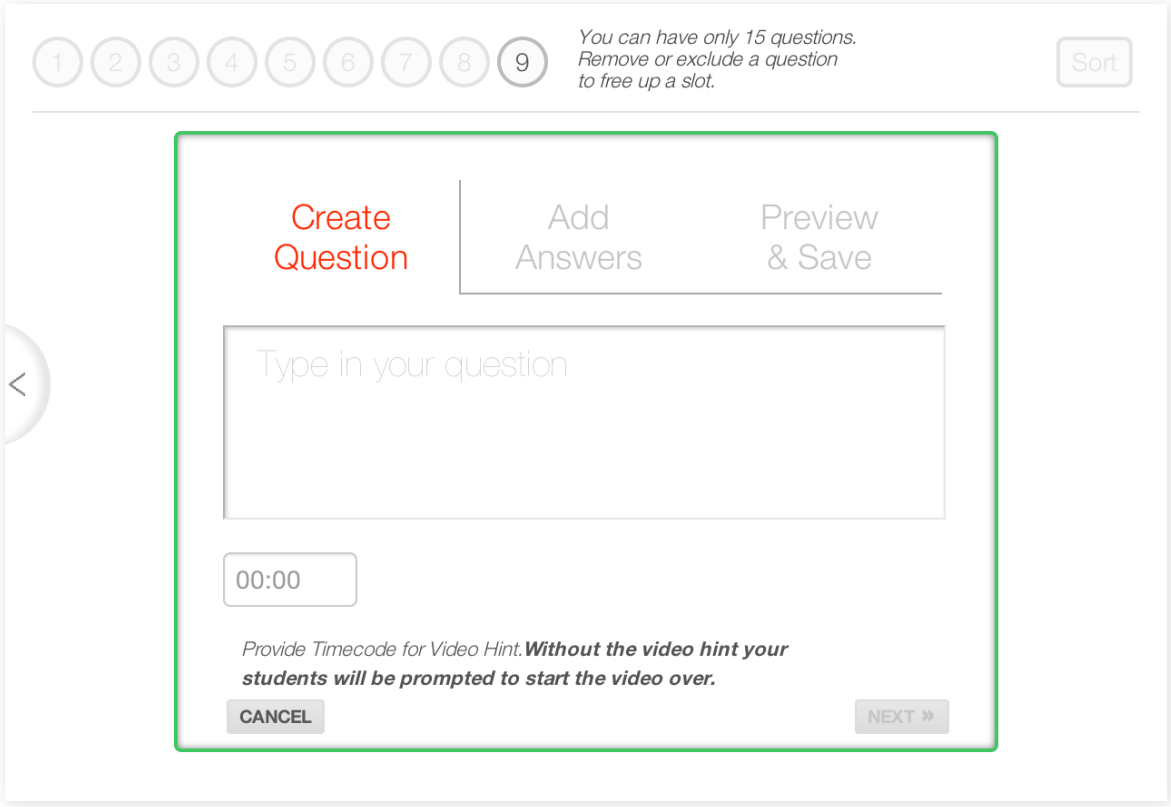

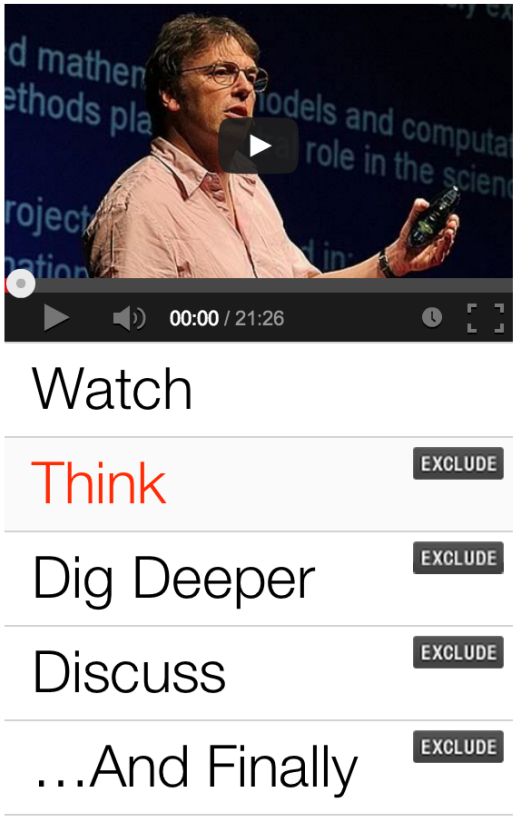

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Analysis

- **What could be improved?**

Is the ability to embed the Flip in my content!

The approach is good to drive traffic to TEDEd, but less so for the learning experience I want to provide/take part in

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What might this mean?

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Here's what we're thinking…

- Transition to modular (granular) learning experiences from full term-long courses
- Embed assessments (formative) directly in locally controlled content, and feedback results to learners and instructors
  - Give more practice problems
  - Wide range of sophistication, including psychometrics, IRT

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Here's what we're thinking… (cont.)

- Use MOOCs to scale aspects of learning that they're good at, combine with hands-on, small group experiences

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What might this mean for you?

- What are your unique contributions?
- What does a move from monolithic and centralized to distributed experiences mean?
  - What infrastructure, tools and services do you need to enable this?
  - Does the brand override the learning experience?

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Contact Me

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