
MOOC Panel Discussion

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MOOCs - What are they?

- Massive, Open, Online, Courses
- Nearly unlimited participation.
- Uses online video, problem sets, *etc* to deliver content.
- Physics Labs are a mixture of video analysis, simulation, computation, and at-home activities.
- Social media, internet forums, used to build community.

A Disruptive Technology - Issues and Questions

- Participation - many start, but completion rates $\approx 10\%$.
- Assessment - claims of modest improvement online.¹
- Costs - MOOCs cheaper, but price far from zero.
- How do you do physics labs?
 - Hands-on and online difficult to combine.
 - Rely on computation, video, at-home labs, ...
- Grading - has to be automated.
- Cheating.
- How do you make money?
 - Core content is usually free.
 - Fee for 'premium' services.

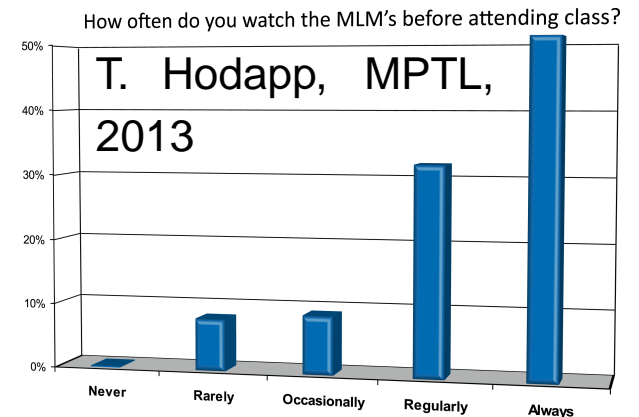
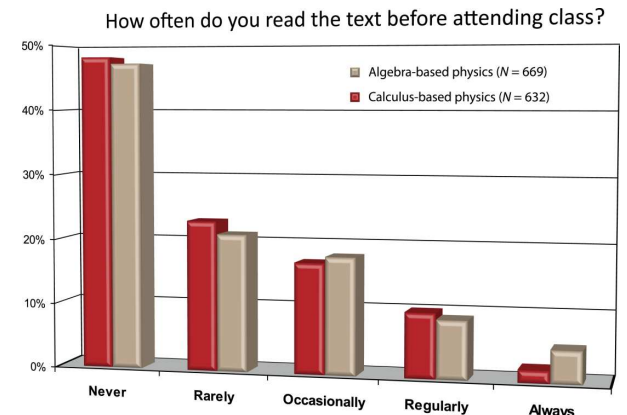
¹ *Evaluation of Evidence-Based Practices in Online Learning*, US Dept. of Ed., 2010.

Who Takes Them?

- Still early so the demographics likely to change.
- Many (often a majority) are working.
- Many (often a majority) already hold a degree.
- They are older - average age in the 30's.
- Many (sometimes a majority) are international.
- Gender balance varies, averages $\approx 60\%$ male.
- Graduate students.
- Undergrads.
- Intellectual curiosity.

My View From a National Liberal Arts Institution

- Focus on Student-Teacher interactions.
 - Small classes (≤ 24).
 - Intensive, hands-on, collaborative, lab experience.
 - Environment hard to create in MOOCs.
- Some changes
 - Flipped classrooms.
 - Video lectures done before class.
 - Class used for problem solving, ...
 - Students watch video; don't read.
 - T. Nordlund (UAB) talk earlier today.
 - Data collection on student work.
 - Based on my experience, discussions with Richmond deans and provost.



Thoughts

- Successful students better prepared and work harder!!!
- Potentially large impact on institutions with large lecture sections in introductory courses.
- Limited impact at liberal arts places - flipped classrooms.
- Possibly fewer faculty positions necessary at some institutions, but greater access to physics at others.
- Potential access for underrepresented groups to physics.
- Recruiting tool for elite institutions and students.

Places to Start

- Recent APS conference - Distance Education and Online Learning in Physics Workshop.

<http://www.aps.org/programs/education/conferences/chairs/2013/distance/index.cfm>

- Physics Today, *Issues and events*, vol 66, no. 3, March, 2013.

- Talk by Theodore Hodapp, APS Director of Education and Diversity at Multimedia in Physics Teaching and Learning Workshop (Madrid, 2013).

http://mptl18.dia.uned.es/mptl18/files/MPTL18_T_Hodapp.pdf

- *The Initial State of Students Taking an Introductory Physics MOOC*, J. M. Aiken et al. arXiv:1307.2533v2 [phys.ed-ph].

- MIT's Learning International Networks Consortium, <http://linc.mit.edu/>, last accessed Nov 18, 2013.
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