

# Technology and the Future of Higher Education\*

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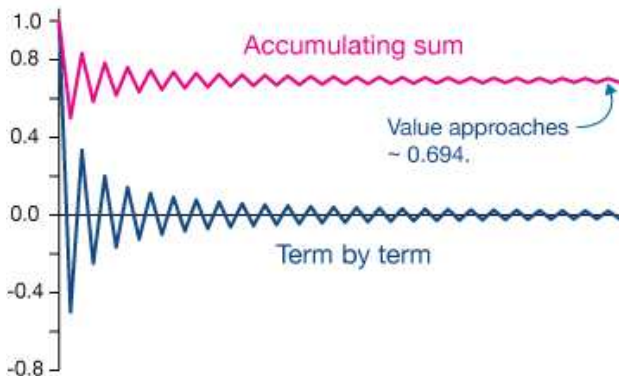
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\*or “Technology and the Future of Higher Education”

## Alternating Series

$$\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{n} = \frac{1}{1} - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \frac{1}{5} - \dots$$



# The End of the World, I



## The Inevitable Rise of the Machines

*You hear that Mr. Anderson? That is the sound of inevitability. It is the sound of your death.*

Agent Smith, *The Matrix*, 1999

*...as far ahead as any of us can see... there will be a demand for an education at both undergraduate and graduate levels that continues to emphasize the informal as well as the formal modes of learning that are possible in a collegiate setting.*

Bowen, 2000

*Far greater access to the Internet, improvements in Internet speed, reductions in storage costs, the proliferation of increasingly sophisticated mobile devices, and other advances have combined with changing mindsets to suggest that online learning, in many of its manifestations, can lead to at least comparable learning outcomes relative to face-to-face instruction at a lower cost.*

Bowen, 2012

*The digital revolution in higher education has already happened. No one noticed.* Shirky,

2015 [Compare: *The future is already here – it's just not very evenly distributed.* William Gibson]

## The Rise [and Fall?] of the MOOC

*[T]he standard model has become unsustainable. To avoid disruption, institutions of higher education must develop strategies that transcend imitation. They must also master the disruptive technology of online learning and make other innovations.*

Clayton Christensen and Henry Eyring, 2011

*In 50 years, there will be only 10 institutions in the world delivering higher education and Udacity has a shot at being one of them.*

Sebastian Thrun, 2012

*The Year of the MOOC*

The New York Times, 2012

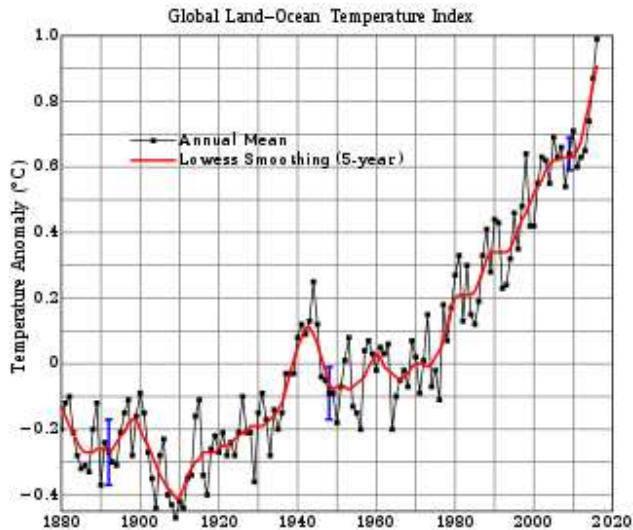
*The belief that education can be replaced by a computer program is a myth, driven in part by media eager to play upon people's fears in an otherwise important, constructive debate.*

Sebastian Thrun, 2013

*We were on the front pages of newspapers and magazines and at the same time, I was realizing, we don't educate people as others wished, or as I wished. We have a lousy product.*

Sebastian Thrun, 2013

## The End of the World, II; Science



## The End of the World, II; Awww



## Not Just MOOCs

Even should the MOOC moment fade, we are left with

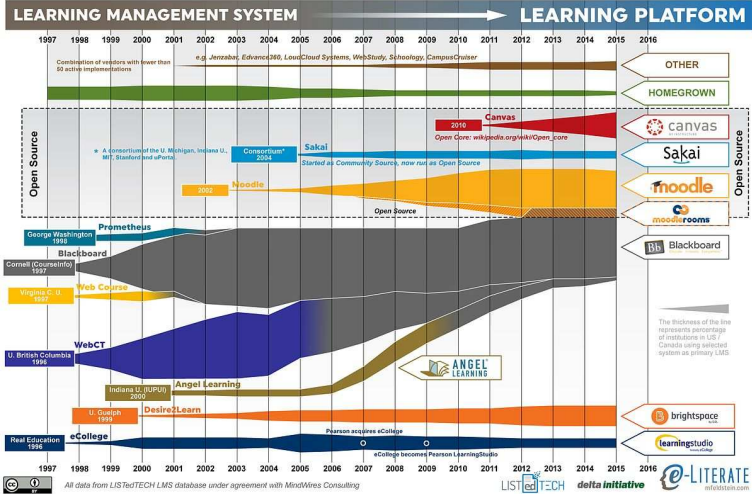
- **unbundled** courses,
- **Learning Management Systems [LMSs]**,
- **video capture**,
- ghastly intellectual property special cases for contingent faculty members' course materials,
- automated homework systems ... particularly in STEM, but also some essay grading in humanities and social sciences as well,
- *"personalized learning"* ... [little other than rebranded **"drill and kill"**]



# LMS Totalitarianism

## LMS Market Share For US & Canadian Higher Ed Institutions

SPRING 2016  
VERSION



## Electronic Taylorism

Frederick Winslow Taylor *Principles of Scientific Management*, 1914:

*The ingenuity and experience of each generation of each decade, even, have without doubt handed over better methods to the next. This mass of rule-of-thumb or traditional knowledge may be said to be the principal asset or possession of every tradesman.*

*The managers assume, for instance, the burden of gathering together all of the traditional knowledge which in the past has been possessed by the workmen and then of classifying, tabulating, and reducing this knowledge to rules, laws, and formulæ which are immensely helpful to the workmen in doing their daily work.*

This is, for the workers, **deskilling**.

Sounds like an LMS course shell, automated grading, adjunctification....

The very next year, the AAUP spoke clearly on **Academic Freedom**.

# The Neoliberal Dystopia that is the Internet

Some history:

The Internet was conceived during the MAD days of the Cold War and had its wild adolescence during the Reagan/Thatcher/Friedman rise of neoliberalism.

The MAD days explain why there is no security or privacy built into the foundations of the Internet, and why the DNS system seems weirdly tacked-on as an afterthought.

Some small pimples from the period of neoliberal adolescence have grown huge:

Imagine a business which delivers medical care, in the course of which it takes a pint of blood from each patient. Suppose it started to give away [some] health care, to build a customer base, and to sell all this blood. *[The American Red Cross is a for-profit corporation!]*

The name of this company in cyberspace is **Google**. Or **Facebook**.

*[The Atlantic noticed this recently, but it's in our Introduction!]*

Market caps as of close of business yesterday: Google, \$631.77B; Facebook, \$435.33B

## Making First-Mover Advantage Permanent

Apple's market cap is \$753.67B . But it is a different business model, based not on luring customers with some “free service” (search or networked [high school-level] social interaction, respectively) and then using them for marketing, but rather based on first-mover advantage locked-in by *copyright law* – in particular, the **Digital Millennium Copyright Act [DMCA]**.

There is no such thing as “streaming media” ... so *Digital Restrictions Management* is necessary. To make DRM work, you need *signed code* and *walled gardens*.

“There's an app for that!”

*[Side note: The word “app” drives me berserk. “Program” is a perfectly fine word. We should read “app” as “serf.” Every time someone talks about a “nice app,” they mean a program that has a nice side effect, but whose main purpose is to give profit or control to someone else.]*

Consequences, entirely in the IT world, include: increased prices [obviously: that's the point], reduced innovation [no unanticipated uses of devices] terrible security [putting security researchers in jail, etc.], weird ownership of data produced [e.g., medical, agricultural], etc.

## Back to Higher Ed

Restate this for [*i.e.*, how do the above features of neoliberal cyberspace translate into the deeply IT-infused] higher education:

- lock-in
- walled gardens
- DRM
- no unanticipated uses

Ugh.

Particularly the last one: isn't that exactly a failure of academic freedom waiting to happen?

But also the other ones:

- LMSs as walled gardens
- DRM (on electronic textbooks, other tools such as electronic homework systems, *etc.*)
- intellectual property issues! *e.g.*, do you own your Blackboard course [configuration]?

## The Scientific Method, the Project of Scholarship – in IT, FLOSS

Purely in IT, there is a solution: **free software**. Because of a weakness of the English language, this is confusing. The slogan is

“Free as in speech, not as in beer.” Richard M. Stallman

Since few are as pure as `rms`, it is probably best to use the term

### Free/Libre Open-Source Software [FLOSS].

Scientific ideas are common good. Algorithms [sometimes] are. Maybe software should be, too.

- GPL [Stallman]
- the Creative Commons [Lessig]
- GNU/Linux [Torvalds], Apache, Wordpress, Mediawiki [Wales], *etc.*

Most of the Internet runs on FLOSS!

Neoliberal hegemony makes it hard to believe this. [*E.g.*, disbelief about  $\text{T}_{\text{E}}\text{X}$ .]

## Action Items

The good news is that there is a thriving alternative to the neoliberal nightmare of the commercial Internet. Creeping IT in higher ed can go in the direction of Windoze/Apple/Facebook/Google or FLOSS. Academic freedom **requires** the latter.

We can do this by

- Demanding a voice in IT decisions, including:
  - who will be CIO on campus
  - what software will be installed on lab and even office computers around campus
  - how the campus website will be organized and run
  - what LMS will be used – indeed, if one will be used at all
- start using Open Education Resources – e.g., the Open Textbook Network
- post your articles on arXiv.org and SocArXiv.org
- release everything you can with Creative Commons licenses
- don't cultivate walled gardens
- always prefer FLOSS
- learn some IT technicalities ... it's not exactly rocket science.

Students are natural allies. FLOSS is usually *free* [as in beer], which helps in today's era of every-increasing student costs. Perhaps they also like control of their electronic lives.

# A FLOSSy Skyscraper: The Academic Project **with** Academic Freedom

