Future Trends in Technology and Education
October 2013

A monthly futures report for higher education, compiled by Bryan Alexander.

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Editorial note: I'm getting ready for an end-of-year look back at leading trends. Which ones seem most powerful to you, based on your experience over 2013? Please email me your nominations and thoughts at bryan.alexander@gmail.com .
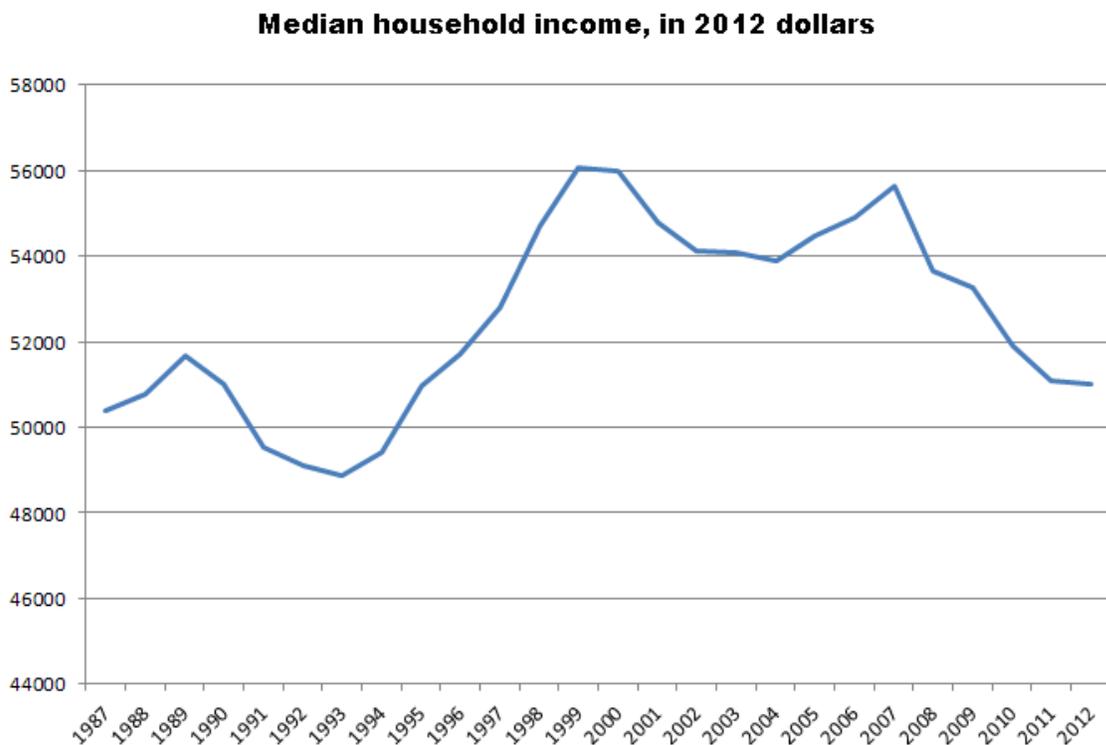
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I.   Education

Changes in international education. Transnational education is growing, according to a British Council report. Leading nations are Hong Kong, Qatar, Malaysia South Korea, Singapore, and the United Arab Emirates.[i]

Within the United States, foreign students have become the main driver for increased graduate school populations: "Between fall 2011 and fall 2012, total graduate enrollment increased 2.8% among temporary residents, but fell 3.2% among U.S. citizens and permanent residents."[ii]

Resistance to or friction on internationalized education continued, as Wellesley faculty recommending ending a partnership with a Chinese university if that nation prosecuted a faculty member for his political views. [iii] Another American campus, Bryant University, is pursuing closer Chinese ties without friction so far.[iv]

Economic trends. American median household economy remains depressed from its pre-financial-crash peak:

Median household income, in 2012 dollars

[v] Public K-12 funding remains lower than pre-financial-crash levels for 34 states.[vi]

Demographics.   Several northeastern colleges are considering collaboration unto merger, based on that region's declining student population.[vii] In contrast, America's Hispanic population continued to grow over the past decade, with new presences in southern and southeastern states.[viii]

Possible intergenerational tensions. Federal cuts to research budgets fall especially hard on younger faculty and grad students, possibly driving some out of academia.[ix]

Adjunctification. Another study claimed that students learned better with adjunct faculty than those on the tenure track. Adjuncts were especially good as serving less well prepared students.[x]

Research like this may strengthen institutional resolve to expand the proportion of term instructors.

Tufts adjuncts voted to unionize in a movement aimed at other Boston-area schools as well.[xi]

II.   Technology

Social media. To catch the Navy Yard shooter some users launched a "subReddit" (discussion forum) on popular social news site Reddit. Reddit admins then banned the site, fearing privacy problems.[xii]

Twitter is preparing for an initial public stock offering (IPO).[xiii]

eBooks continue to grow and develop. The Oyster ebook rental service (Netflix for books), which we noted in November 2012, expanded its library and plans new platforms.[xiv]
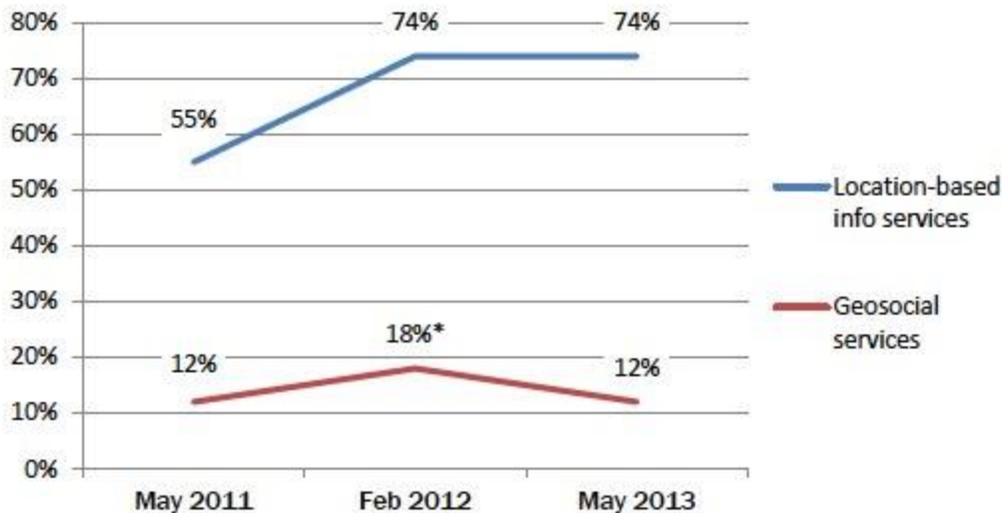
Device ecosystem keeps growing.

- Smartphones: more people than ever use mobile phones to get online, according to new research. "For many, such as younger adults or lower-income Americans, cell phones are often a primary device for accessing online content".[xv]
- Smartphone platform wars: Blackberry continues to suffer massive losses in both sales and market share, with one major research firm urging businesses to switch away from that platform immediately.[xvi]
- Wearable computing: Samsung's smart watch hit markets.[xvii]
- Gesture-based computing: Elon Musk has begun prototyping gesture-based 3d image manipulation tools resembling those in the *Iron Man* movies.[xviii] Google purchased Flutter, a gesture-based computing company, eliciting suspicions that they will include this interface in their Web-based products.[xix]
- Users increasingly connect their smartphones to geolocated data services:

Use of location-based information and geosocial services among smartphone owners, 2011-2013

For location services: % of smartphone owners who use their phone to get directions, recommendations, or other information related to a location where they happen to be.

For geosocial services: % of smartphone owners who use a service such as Foursquare or Gowalla to "check in" to certain locations or share their location with friends.

* Slight wording change since previous survey

Source: Pew Research Center's Internet & American Life Project tracking surveys. For 2011 data, n=2,277 adults ages 18 and older. For 2012, n=2,253 adults. For 2013, n=2,252 adults. All surveys were conducted via landline and cell phone, in English and Spanish.

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3d printing continues to innovate and grow. One 3d printer added a 3d scanner, so it can copy objects.[xxi] Artists printed a full-scale room, weighing 11 tons and including 260 million separately detailed surfaces.[xxii]
A portable 3d scanner designed to fit on one's smartphone raised money on Kickstarter.[xxiii]

Augmented reality's steady march. German surgeons used augmented reality displays to prepare for an operation.[xxiv]

Automation's promise. Many aspects of high-speed financial trading are rapidly growing beyond human control, according to new research. We may be witnessing the rise of "a new all-machine phase characterized by large numbers of subsecond extreme events…"[xxv]

Large-scale, bid budget artificial intelligence projects are experiencing a renaissance.[xxvi]

Chinese industry is starting to deploy robots, with potentially immense implications for that nation's economy and society.[xxvii] Moreover, Oxford researchers claim that "about 45 percent of total US employment is at risk" of "computerization."[xxviii]

III.   Education and Technology

More MOOCs and online learning.   MOOC provider Udacity launched Open Education Alliance, an online learning partnership with businesses, aimed at technology education.[xxix]

edX, Harvard and MIT's MOOC enterprise, partnered with Google to build an open source MOOC platform, which edX's president liked to "YouTube for MOOCs."[xxx] MIT also announced sequences of MOOCs within edX, akin to academic minors.[xxxi]

Sustainability: Coursera announced earning $1 million from its paid certification option.[xxxii]

British MOOC provider FutureLearn opened up 20 courses.[xxxiii] They emphasized a new layer of social interaction between students.[xxxiv] A rising number of European universities are starting to produce MOOCs.[xxxv] The Wharton Business School published contents of its first-year classes for free.[xxxvi]

Open access possibilities. California's community college system now requires funded projects to be published under a Creative Commons license.[xxxvii] (See also MOOCs, above) The European Union launched a continental open education portal.[xxxviii]

Big data and data analytics develop. Purdue University reports increased graduation rates for students using a locally-developed analytics tool.[xxxix]

Social media in education. Penn State faculty and staff used a Web-based petition service to protest their institution's new health care plan.[xl] The University of Kansas president placed a tenured professor on leave because of a controversial Twitter update.[xli] (See also "MOOCs", above, the case of FutureLearn)

Academia.edu, a social network aimed directly at educators and researchers, raised more venture capital funding while claiming 4.3 million users - nearly 1/4th of American higher ed. [xlii]

Maker movement. NASA representatives attended the World Maker Faire to solicit ideas about their forthcoming asteroid capture mission.[xliii]

Flipped classroom. A graduate program reported significant student learning gains as a result of switching in- and out-of-class activities.[xliv]

IV. The higher education bubble, continued.

[M]any, even most, highly educated young people are having a very rough time. They have their degrees, often acquired at the cost of heavy debts, but many remain unemployed or underemployed, while many more find that they are employed in jobs that make no use of their expensive educations. The college graduate serving lattes at Starbucks is a cliché, but he reflects a very real situation.[xlv]

-Paul Krugman,

Princeton University economist and Nobel laureate

This concept, which we began to track in early 2012, continues to build across multiple fronts. It holds that colleges are overpriced, that student demand is questionable, and both could drop together:

- The number of students enrolled in American higher education dropped by more than 400,000 from 2011 to 2012, according to Census data.[xlvi] The number of graduate students also dropped over the same period, falling 2.3% after a decade of growth.[xlvii] Graduate student applications in fall 2013 seem to be stagnating as well, apparently.[xlviii]
- Admissions officers report increasing difficulties in meeting enrollment targets.[xlix]
- Universities continue to cut research budgets in the wake of federal sequestration.[l] The next few months may see more of this, given the federal shutdown, approaching debt ceiling, and Congressional politics.[li] This seems to represent the latest datapoint in a longer trend, as federal funding for research seems to have dropped 9% since 2009.[lii] Meanwhile, Canadian scientists participated in rallies protesting cuts to their institutions.[liii]
- Several small institutions made well-publicized reductions to their pre-discount tuition. Converse College announced a *43% cut* to its published tuition.[liv] Ashland University "cut its advertised tuition price by 37 percent in fall 2014 to $18,908 from $30,064."[lv]
- Several institutions are considering mergers (see "Demographics", above). One recently-established northeastern university is suffering financially.[lvi]
- Midway College laid off faculty and staff after failing to meet admissions targets.[lvii]
- The proportion of students defaulting on their debt repayments rose to the highest level since 1995.[lviii]
- After other banks announced they would no longer expand student loans, one major bank decided to buck the trend, but as a public gesture, not a profit-taking.[lix]
- Rising medical costs are driving campus disputes. Penn State put in place new measures to control those costs, resulting in faculty protests.[lx] Labor negotiations broken down for several Vermont colleges over plans to have staff pay a larger share of health care premiums.[lxi]
- Grad school woes: middle-tier law schools are struggling with low enrollment.[lxii]

- Nearly one-half of American college grads told Gallup that their current jobs do not require a college degree.[lxiii]
- Politics, bipartisan: president Obama's education secretary, Arne Duncan, firmly indicated that last month's higher education proposal was progressing. He deemed academic criticism to be "premature and more than a little silly," and "urg[ed] higher education leaders to stop 'propping up the status quo.'".[lxiv]

Countervailing trends:

- Peter Thiel's scheme for getting bright teens to not attend college isn't panning out.[lxv]

Other trends. We have been tracking the following additional trends since early 2012, but found no new developments during this month. Possible explanations: one or more are fading as future trends; some may be building slowly over time; some stories were underreported.

Those trends include: athletic budgets doing well; shared academic services; executive compensation rising amid controversy; challenges to internships; badges progressing; alternative certification; crowdfunding growing; copyright battles continuing; cloud computing; the durability of Moore's Law; the limits of the Web; continuing development of Digital Humanities; LMSs; onshoring hardware production; digital video for teaching; crowdsourcing funding; rise of the net.generation; gaming in education; campus digital security threats growing; educational entrepreneurship; faculty criticizing deployment of technology.

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About Future Trends in Technology and Education

Future Trends in Technology and Education (FTTE) is a monthly report. It surveys recent developments in how education is changing, primarily under the impact of digital technologies. Its purpose is to help educators, policy-makers, and the public think about the future of teaching, learning, research, and institutions.

Every month FTTE aggregates recent developments, checking them against previously-identified trend lines. As certain trends build in support and significance, the report recommends watching them for future impact. FTTE also notes trends which appear to be declining in significance. Every single item is backed up by footnoted research, often accessible through the open Web. Trends are also aired for feedback and development via the author's Twitter (https://twitter.com/bryanalexander) and blog (http://bryanalexander.org/).

Subscriptions are free, and open to any interested person or institution.

For more information, see http://bryanalexander.org/future-trends-in-technology-and-education/ or http://bryanalexanderconsulting.com/ftte-report/.

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