MOOCs - a Revolution in Education?

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HKU Expert Address - October 11, 2013

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Agenda

- An analytical view of the MOOC phenomenon
- The evolution of MOOCs - “a MOOC is not a MOOC is not a MOOC”
- Thoughts about the future of MOOCs (esp. in higher education)
- Let’s make this an interactive discussion!

Massive Open Online Course (this slide may not be necessary)

- A course that is open, participatory, distributed, and connects students to a digital world interested in the same topic
- Provides a massive network of tools and people for students and educators to build their technology skills and professional networks for life-long learning
- Have attracted media interest due to huge enrollments and the involvement of "elite" institutions

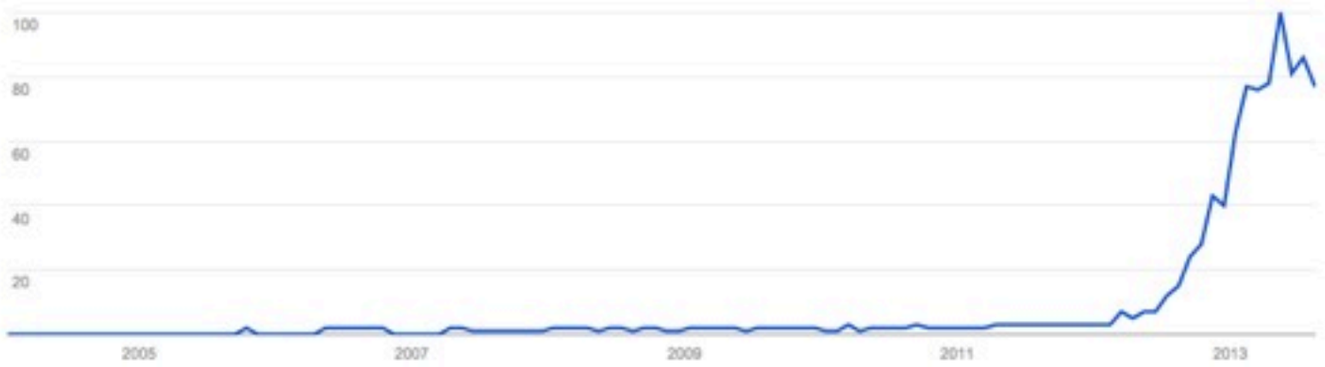
MOOC

Web Search interest: **mooc**. Worldwide, 2004 - present.

Interest over time

The number 100 represents the peak search interest

News headlines Forecast



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Regional interest

Vietnam	100
United States	67
Spain	66
Canada	57
Australia	56
Finland	52
India	37
Netherlands	36
United Kingdom	32
France	29

Region | City

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Related terms

Top Rising

mooc mooc	100
mooc courses	10
coursera	5
mooc online	5
mooc coursera	5
edx	5
mooc edx	5
mooc course	5
udacity	5
open mooc	5

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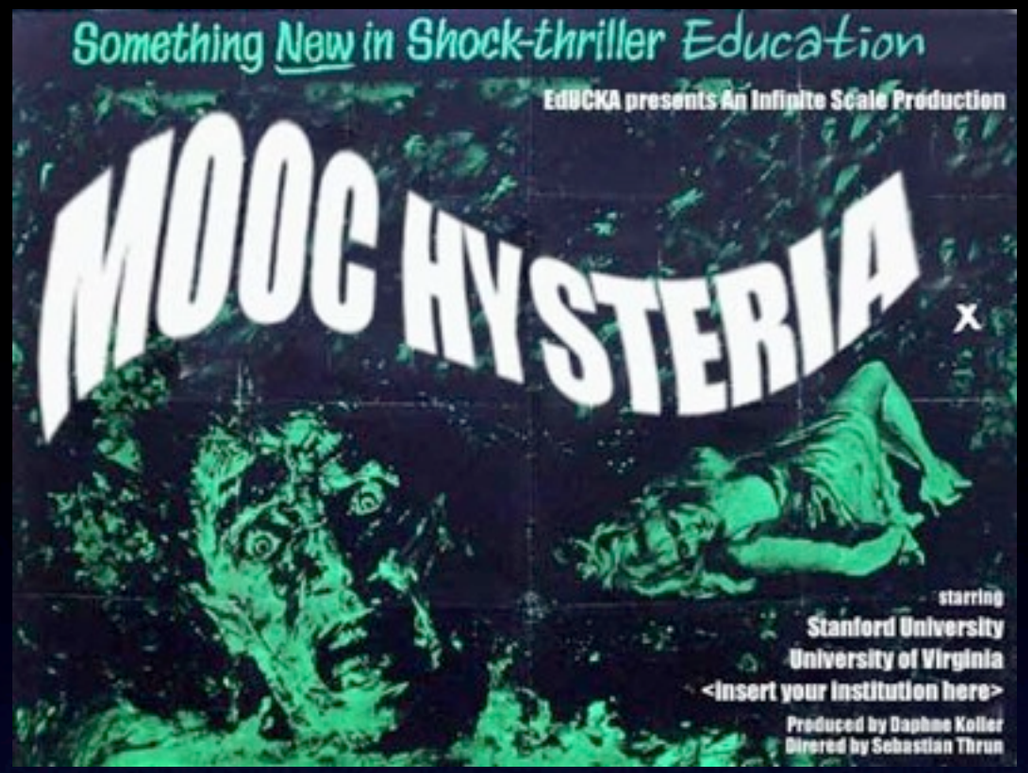

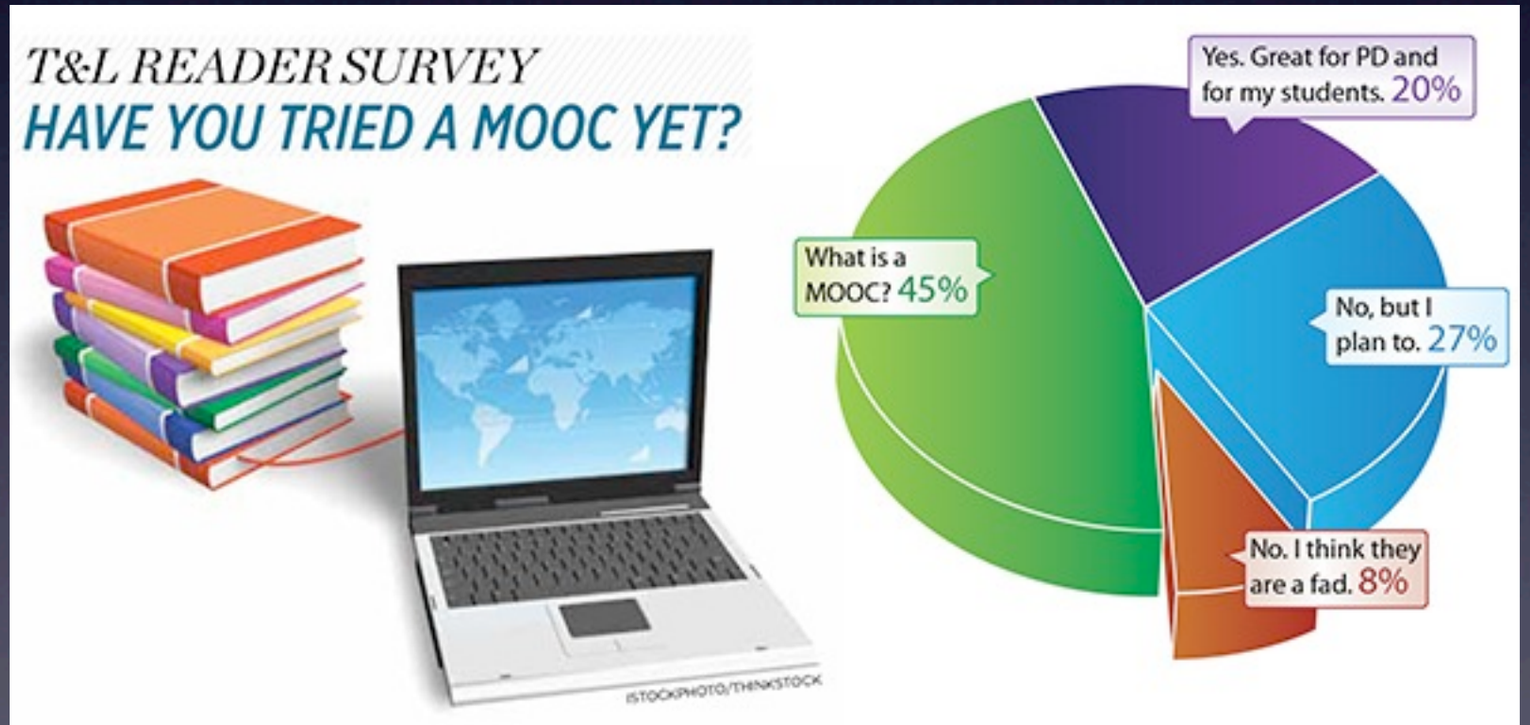

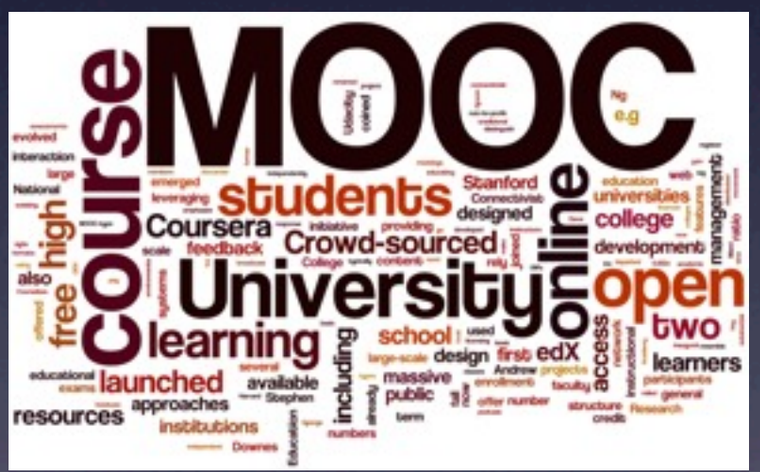

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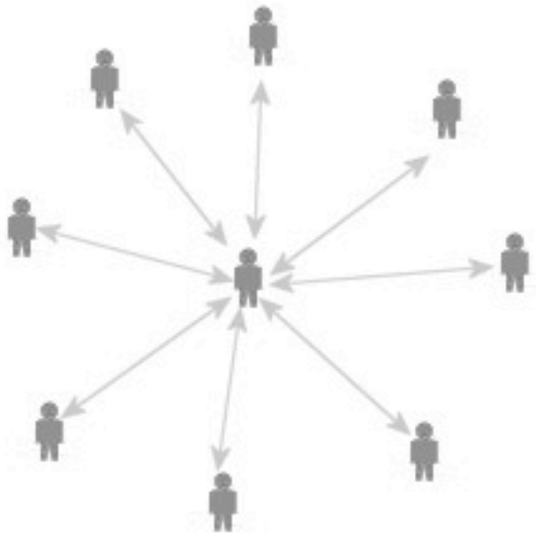
A brief history of MOOCs (1)

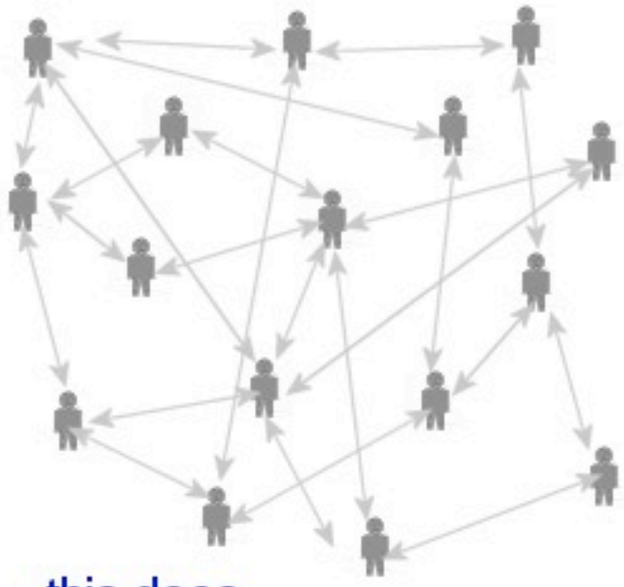
- 2004: George Siemens & Stephen Downes develop theory of Connectivism, "the thesis that knowledge is distributed across a network of connections, and therefore learning consists of the ability to construct and traverse those networks (Downes, 2012)

Why we designed MOOCs the way we did...

In Education...



this does not scale



this does

Stephen Downes 2012 cc by-nc-sa

"The interesting question now is not 'How can we use technology to do online what we cannot do in-class?' The compelling principle now is: 'Technology shouldn't merely simulate traditional functionality; it should extend and transcend those functionalities'"

(Sanders, Stanford)

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Downes' MOOC Model

- Four essential elements for a successful MOOC:
  - *Autonomy* - students decide how much to participate
  - *Diversity* - students come from all backgrounds, different countries, different experiences
  - *Openness* - MOOCs should be free or of such low cost that nearly anyone can participate
  - *Interactivity* - Chats, social networking, video meetings, collaboration

A brief history of MOOCs (2)

- 2002: MIT OpenCourseWare project formed
- 2008: First MOOC presented at University of Manitoba with ~2200 registrants
- 2008: Khan Academy starts up (actually in 2006)
- 2010: Dave Cormier videos about MOOCs added to YouTube (Cormier, 2010)
- 2011: MOOC for college prep skills helps freshmen prepare for college requirements (Cormier, 2011)

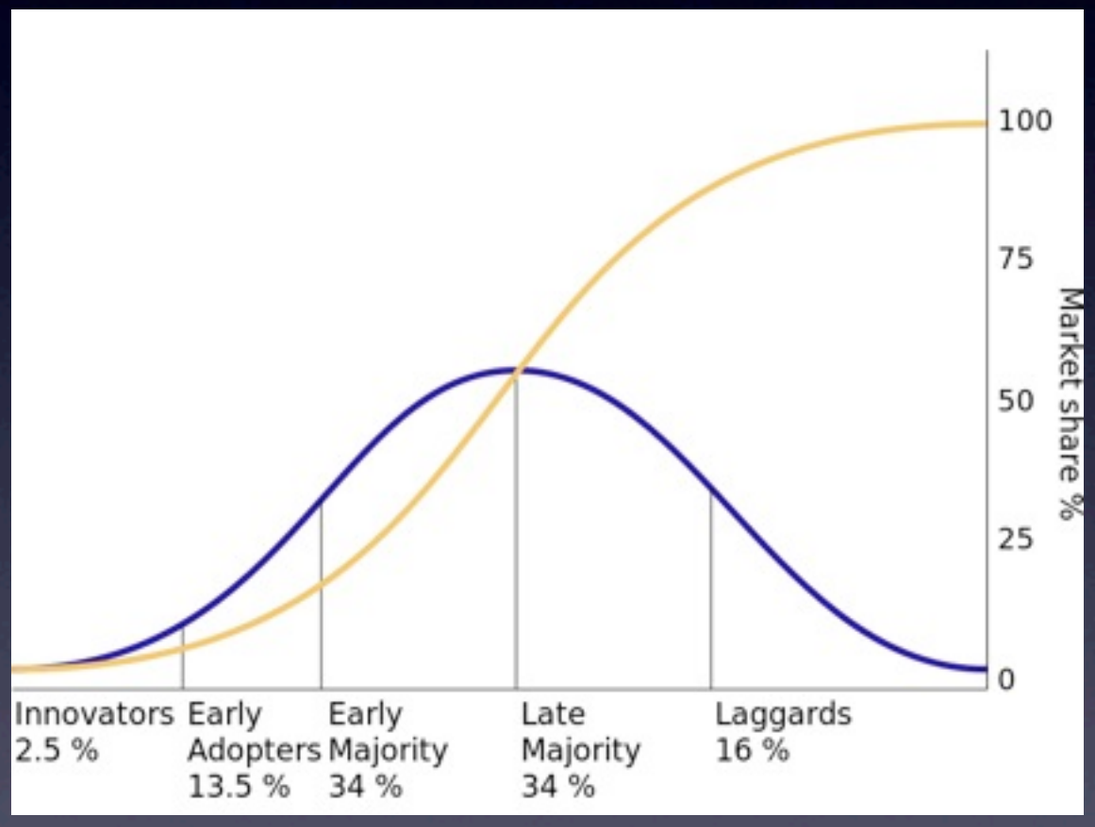
A brief history of MOOCs (3)

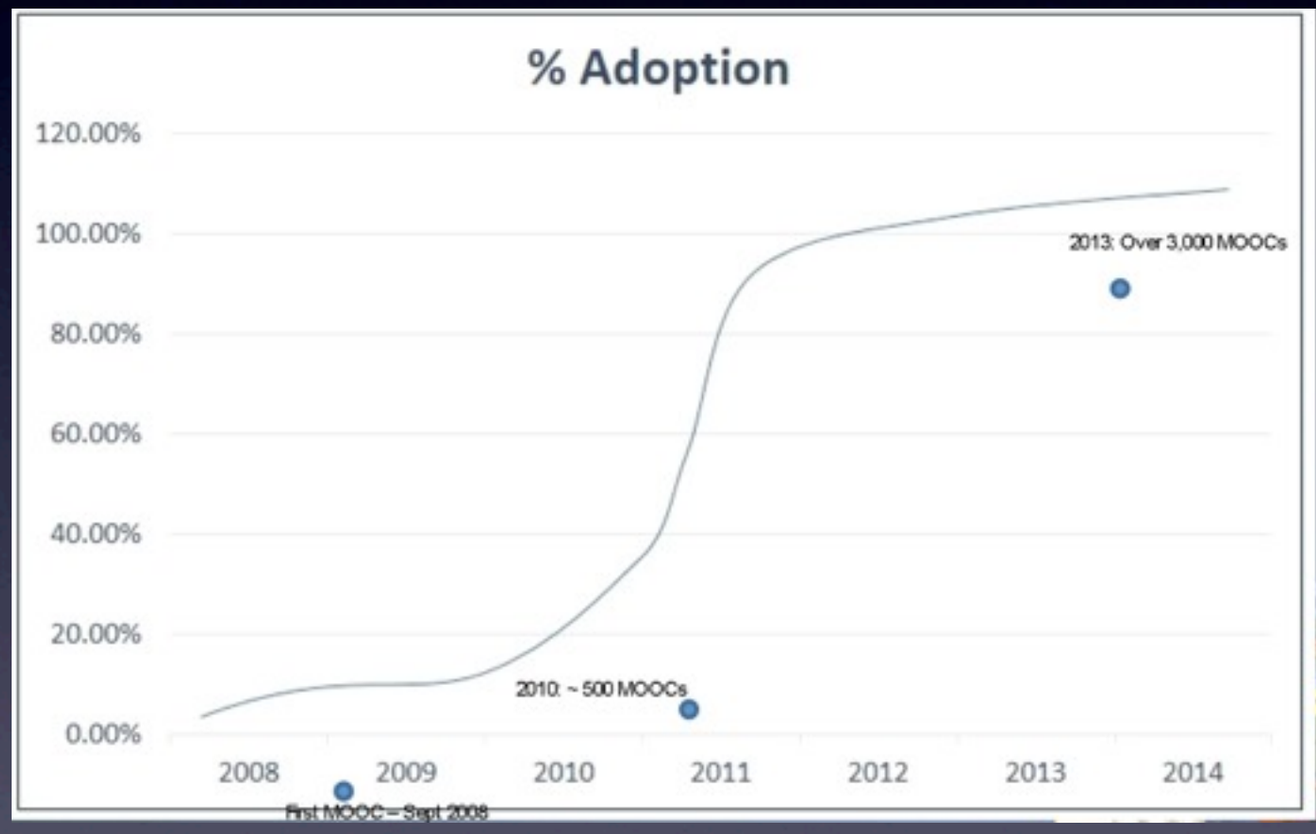
- 2011 Thrun's AI course at Stanford has 160k registrants
- 2012: Harvard's first MOOC has 370k registrants
- 2012: Coursera, Udacity, & edX formed; offers first xMOOCs
- 2012: New York Times calls 2012 "The Year of the MOOC"
- 2013: cMOOCs and xMOOCs too numerous to accurately count
- More on history later

Are MOOCs a "fad" or be taken seriously?

- Diffusion models have been traditionally used in the context of sales forecasting
- An analytical approach to describe the spread of a diffusion phenomenon
- Attempts to measure the interest and adoption of a phenomenon
- Diffusion metaphors are often more persuasive than numerical data, analytical models, and formal reasoning (Eccles & Nohria, 1993)

Rogers' S-curve





Illustrates *diffusion rates* over *time*

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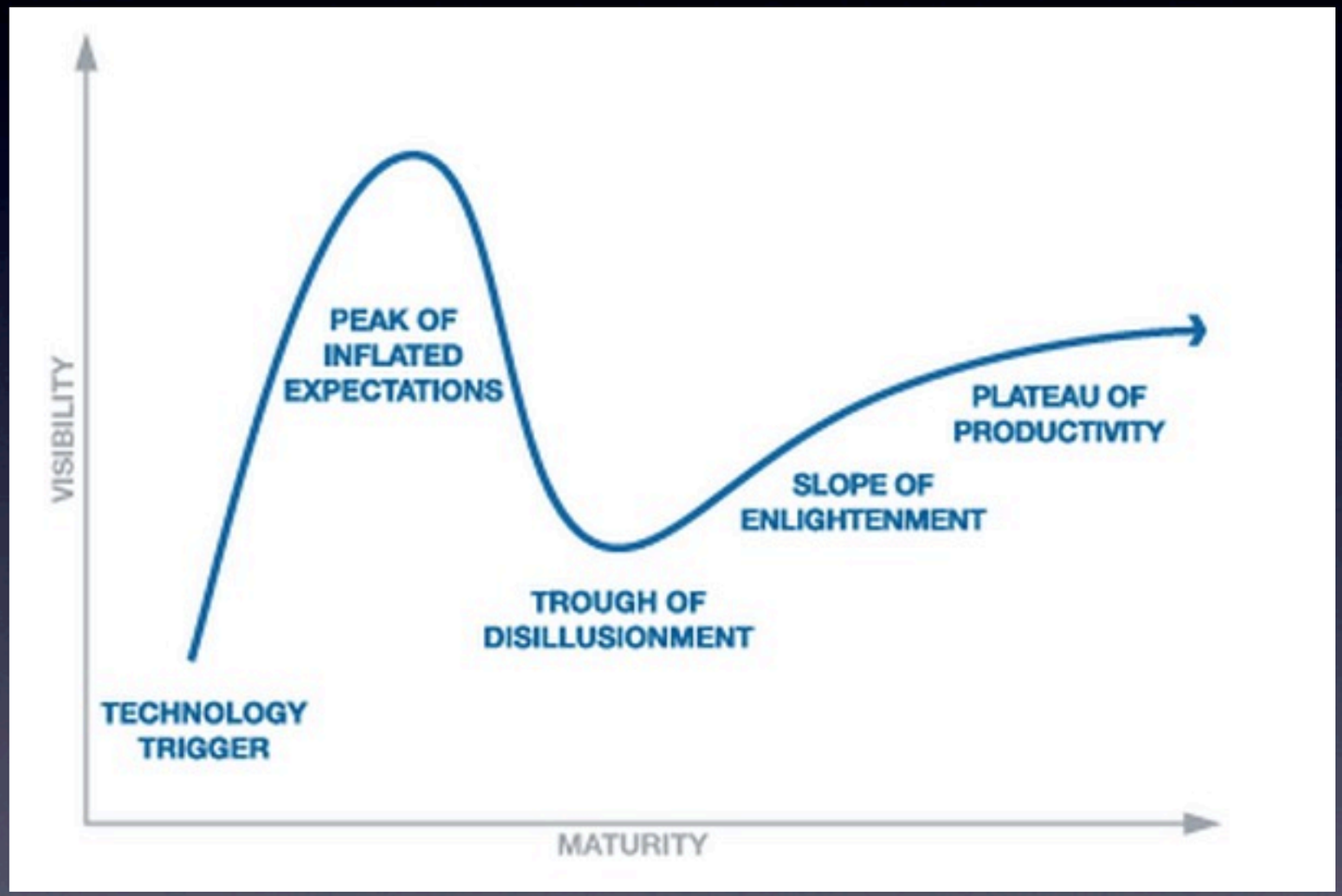
Gartner Group "Hype Cycle"



Illustrates *visibility* over *time*

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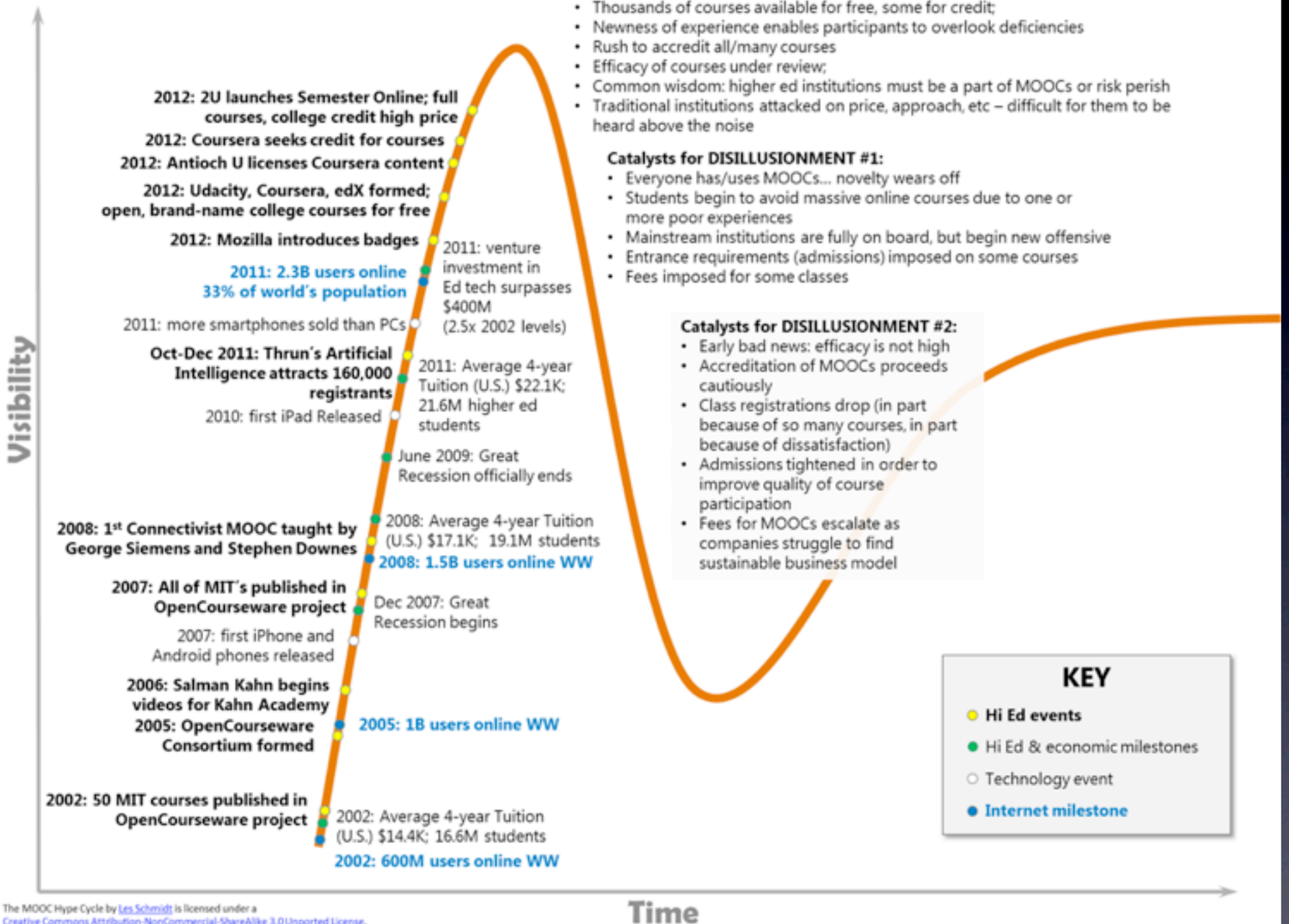
THE MOOC HYPE CYCLE – Nov 2012



Characteristics of PEAK of INFLATED EXPECTATIONS:

- Thousands of courses available for free, some for credit;
- Newness of experience enables participants to overlook deficiencies
- Rush to accredit all/many courses
- Efficacy of courses under review;
- Common wisdom: higher ed institutions must be a part of MOOCs or risk perish
- Traditional institutions attacked on price, approach, etc – difficult for them to be heard above the noise

Catalysts for DISILLUSIONMENT #1:

- Everyone has/uses MOOCs… novelty wears off
- Students begin to avoid massive online courses due to one or more poor experiences
- Mainstream institutions are fully on board, but begin new offensive
- Entrance requirements (admissions) imposed on some courses
- Fees imposed for some classes

Catalysts for DISILLUSIONMENT #2:

- Early bad news: efficacy is not high
- Accreditation of MOOCs proceeds cautiously
- Class registrations drop (in part because of so many courses, in part because of dissatisfaction)
- Admissions tightened in order to improve quality of course participation
- Fees for MOOCs escalate as companies struggle to find sustainable business model

KEY

- Hi Ed events
- Hi Ed & economic milestones
- Technology event
- Internet milestone

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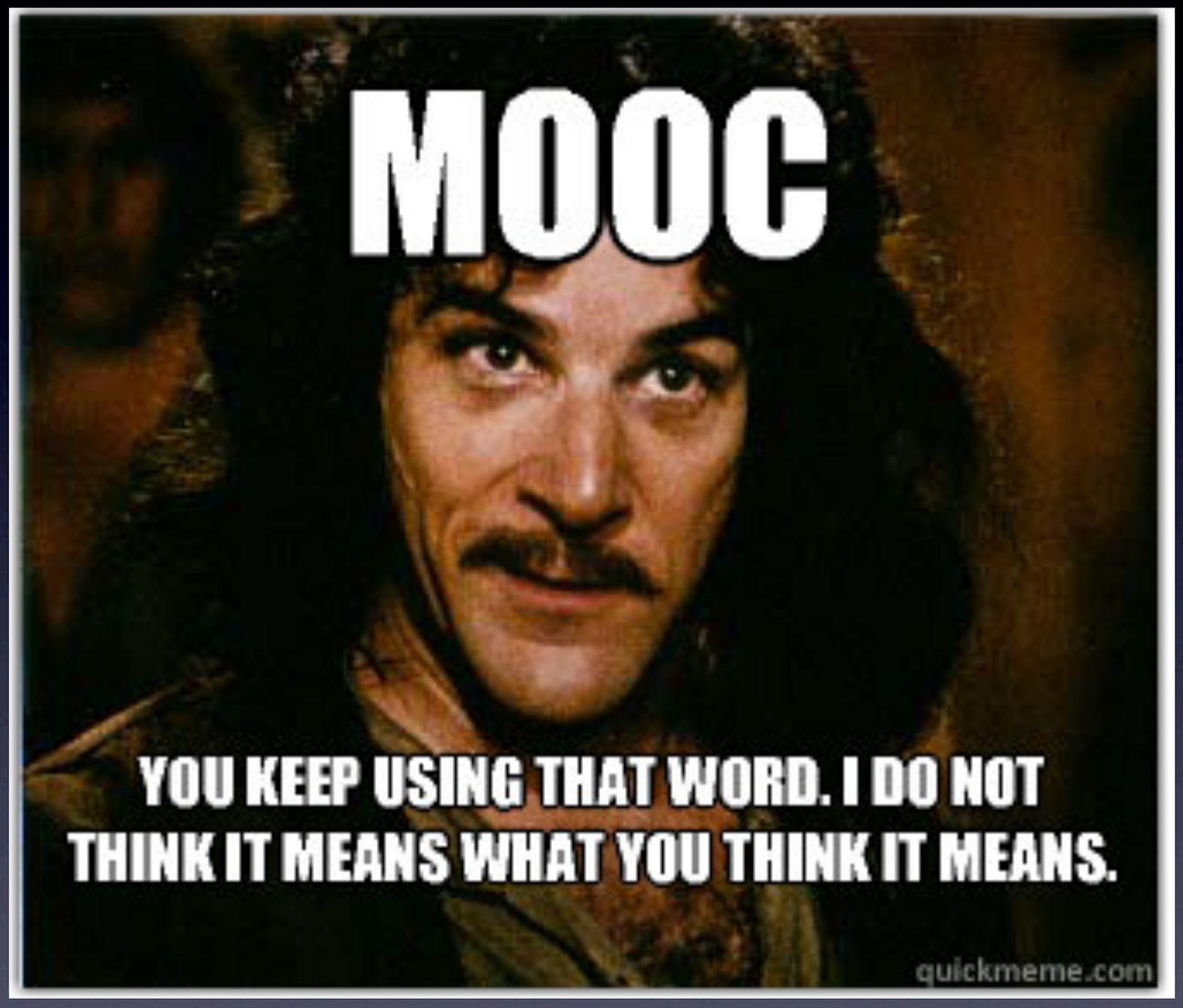

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Back to a definition

MOOC is not a "Massive Open Online Course," it is not a course. It is *"massive open digitally-mediated course-compatible resources (MODMCCRs)*
(Marc Sanders, Stanford)

MOOCs are a symptom of the LIL (learner-initiated learning) movement; BYOD reflects a move towards LIL (Trent Batson)

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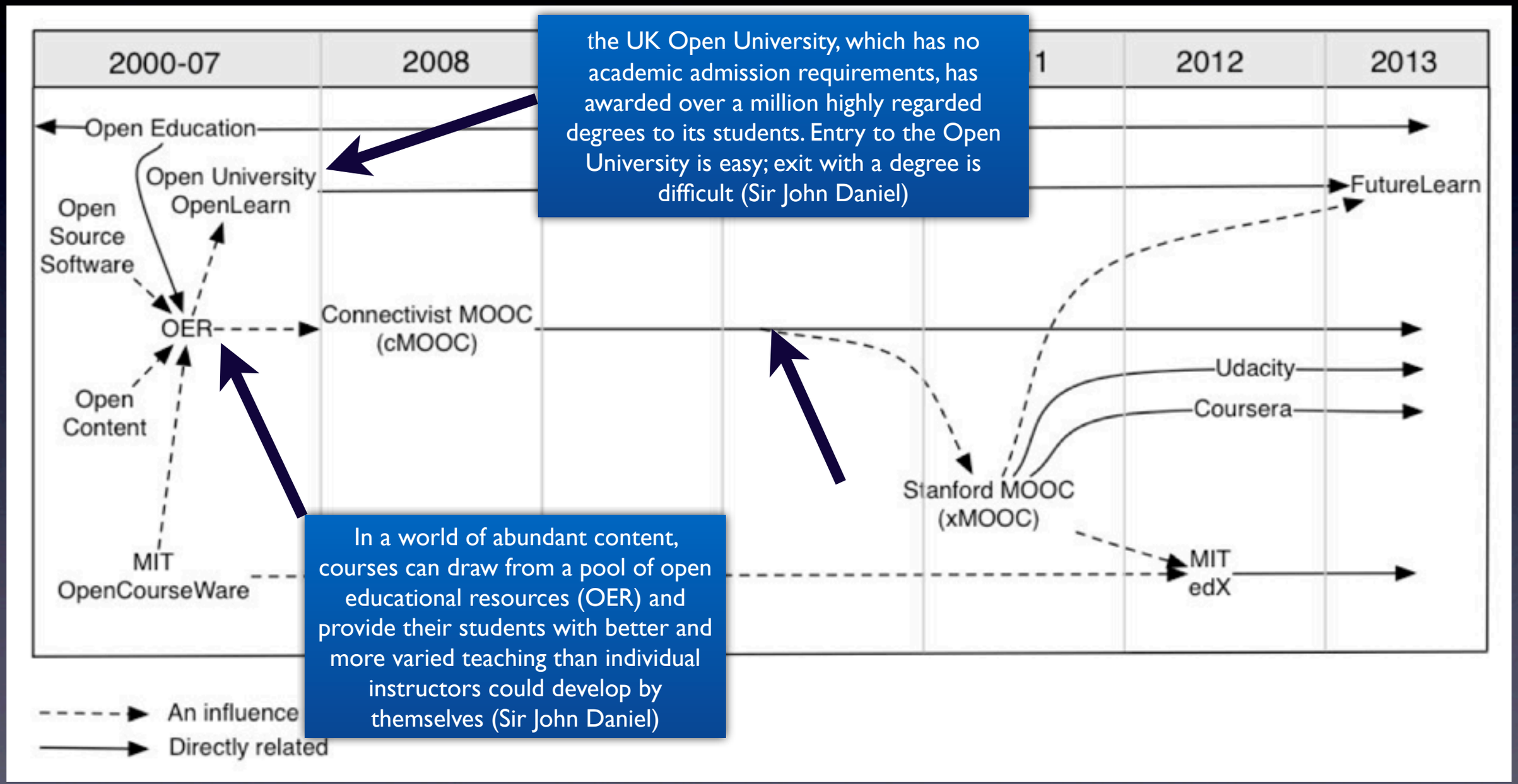
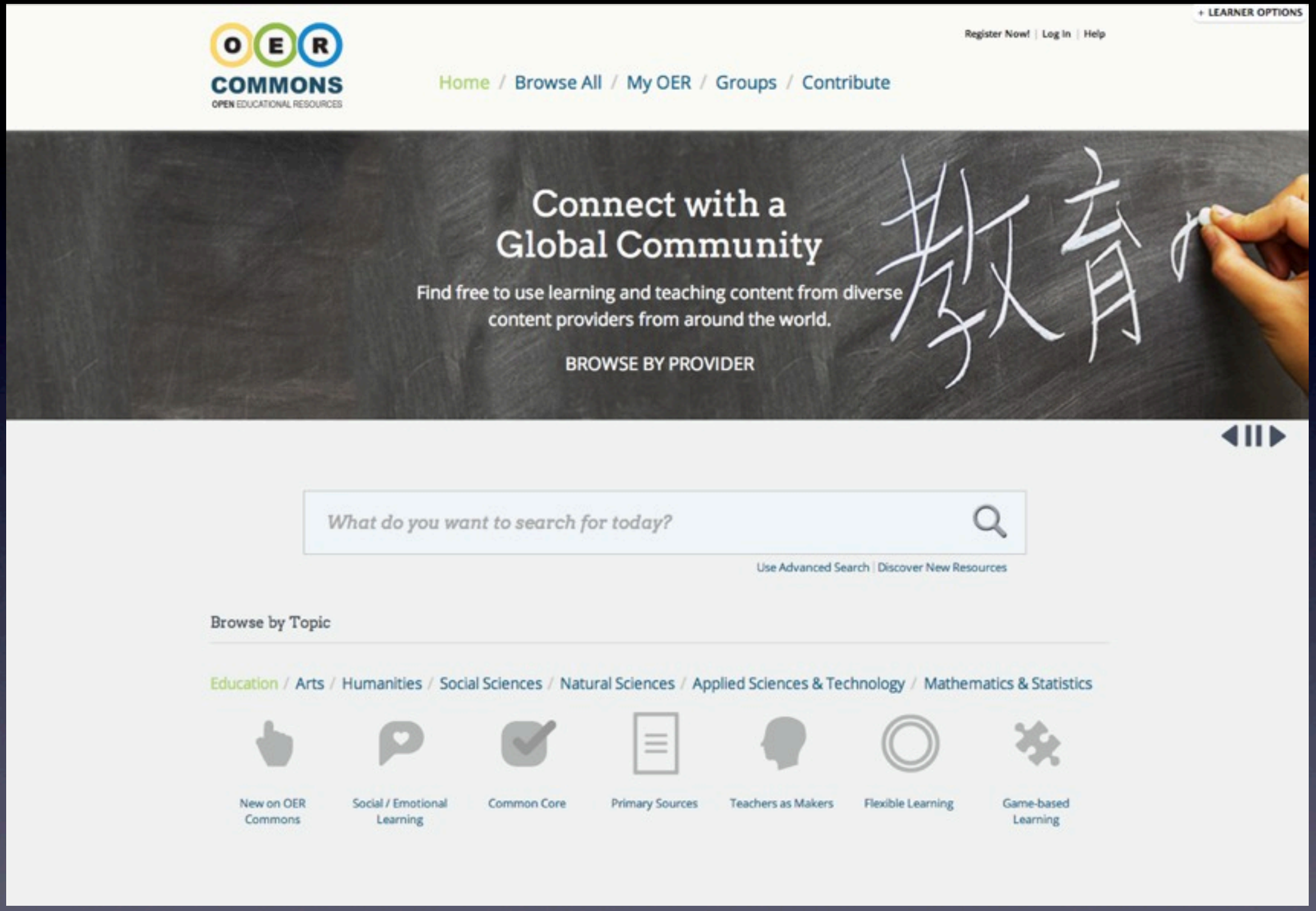
A little more history



the UK Open University, which has no academic admission requirements, has awarded over a million highly regarded degrees to its students. Entry to the Open University is easy; exit with a degree is difficult (Sir John Daniel)

In a world of abundant content, courses can draw from a pool of open educational resources (OER) and provide their students with better and more varied teaching than individual instructors could develop by themselves (Sir John Daniel)



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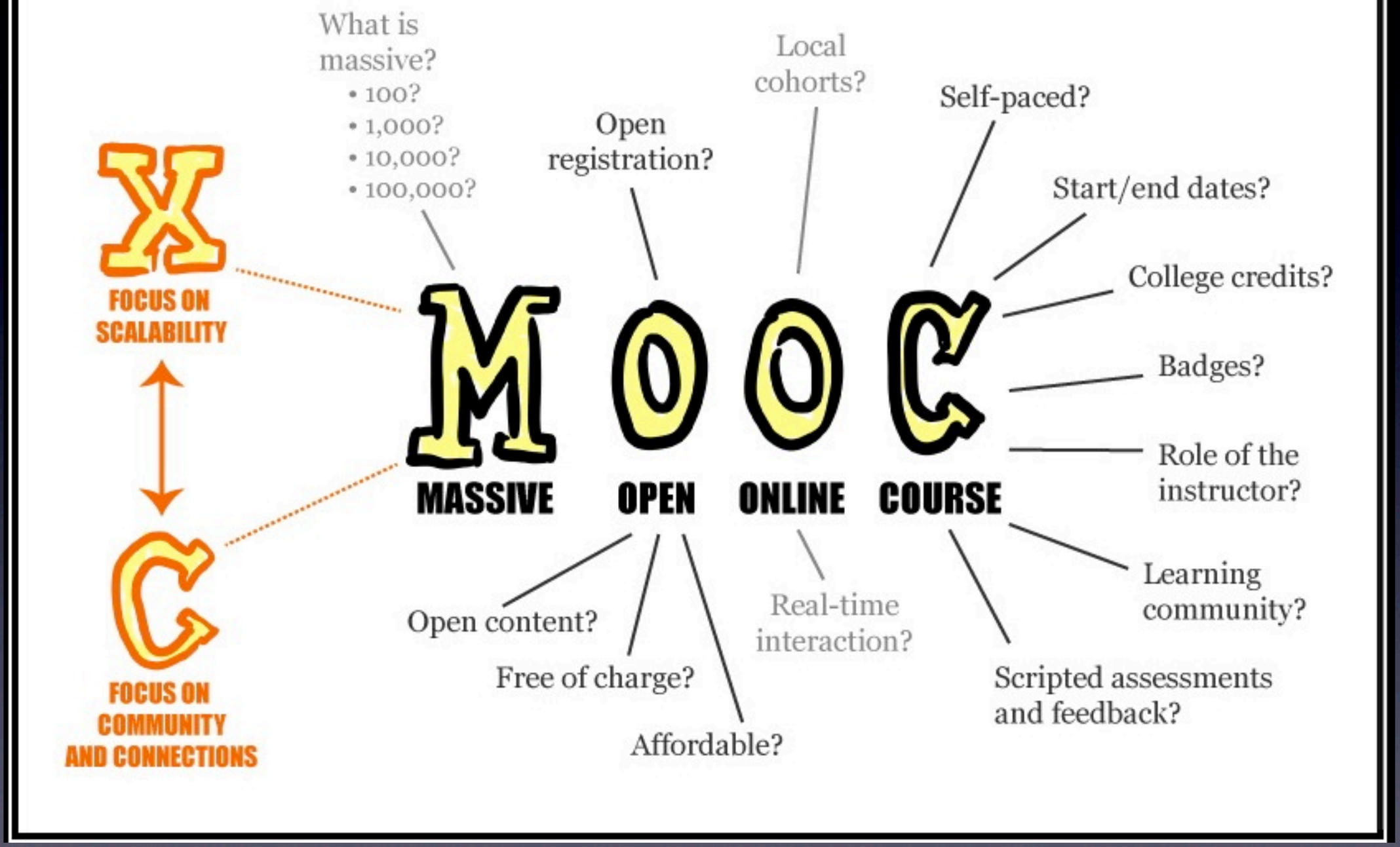

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an educational system should 'provide all who want to learn with access to available resources at any times in their lives; empower all who want to share what they know to find those who want to learn it from them; and finally furnish all who want to present an issue to the public with the opportunity to make their challenge known (Illich, 1971)

cMOOCs

the MOOCs attracting media attention today are "at the intersection of Wall Street and Silicon Valley" (Caulfield, 2012)

xMOOCs

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	xMOOC	cMOOC
What is the ultimate goal?	Efficiently deliver content to larger audiences; award learners with certificates/certifications; reach new audiences; experiment with new courses outside the university structure; increase access to Ivy League content or provide free access to education.	Foster connections and collaborations among learners; kindle future collaborations rather than provide a contained experience with a defined end date; spawn smaller niche communities.
What learning or instructional theories are informing the instructor's decisions?	Instructionism (teacher-centered): The learning process focuses on moving knowledge from the instructor to the student.	Connectivism and/or connected learning: The learning process focuses on the connections and collaborations between learners.
What is the role of the instructor?	The creator of content, assessments, activities, goals, and learning path.	A colearner, working collaboratively with other learners to create content, shape goals, generate new knowledge, etc.
What role does the learner play?	The learner receives knowledge (usually in video format), participates in small group work, and responds to quizzes and assessments.	The learner is a cocreator of the MOOC.
How are learners building new knowledge?	Learners view content developed by the instructor and apply that content to problem sets or projects defined by the instructor.	Learners create production-centered projects that relate to course themes; share knowledge they developed during the production process; give feedback and support to peers; share resources; etc.
How is learning assessed?	Learners complete assessments (quizzes or peer-reviewed assignments) that evaluate their comprehension of a topic as it is understood from the instructor's view.	Learners share their insights as they go through the knowledge-building process (e.g., via status updates or blog posts) and self-assess their learning paths.
Who is creating the content?	The content is created by the instructor.	The weekly activities are created by a core group of motivated learners and additional content is created by participants.
What types of interactions are taking place?	Learners view content created by the instructor and work in small groups to solve problems/work on projects.	Interactions take place between learners as they go through the knowledge-building process. The course content is shaped by these interactions as the learner contributes new material to the MOOC.
How flexible are the course path and the course goals?	The syllabus, activities, and assessments are determined by the instructor before the course launches. Prerecorded video content works well for xMOOCs since the learning path is set.	The general themes/topics are collaboratively determined by a small group of learners and shaped throughout the course by the whole group. Course goals are determined in response to the community, on a week-by-week basis.

(Source: *Campus Technology*)

But wait, there's more - "blended MOOCs"

- Attempts to implement the "flipped classroom" pedagogical model
  - Outside class: students participate in a MOOC (either a cMOOC or xMOOC)
  - Inside class: students discuss content, problem solve, do projects and lab work
- Changes the role of the instructor
- Simplifies (?) assessment
- "can be integrated deeply into a traditional campus-based education, providing the economic and pedagogical benefits of networked learning while preserving the desirable attributes of traditional face-to-face, place-based education" (Caulfield & Collier)

Again, are MOOCs a fad?

- Who do they benefit - the students or the sponsoring institution?
- Can they remain free?
- cMOOCs or xMOOCs ?

Common Pros & Cons (1)

- Advantages
  - Free unless college credit is available
  - Learning is informal & at student's own pace
  - Computer & Internet access are only resources required
  - Students can share work, assess others, & receive feedback from others
  - World-class instructors without high tuition of elite institutions

Common Pros & Cons (2)

- Disadvantages
  - xMOOCs involve costs, sometimes significant
  - No real-time engagement (face-to-face)
  - Technical difficulties
  - Academic dishonesty possible
  - Students must learn to be responsible for their own learning

Remember
"empower all who want to share what they know to find those who want to learn it from them"
(Illich, 1971)

Do MOOCs really make this possible?

Is it possible to experiment with "the MOOC world?"

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Google Course Builder

- Open source project based on the Google App Engine
- Grew out of "Power Searching with Google" course (155k registrants) run by Google Research

- Requires competence in HTML, JavaScript, & App Engine; template-based
- Strong support, user forum, Google+ hangouts, etc.
- Free up to a limit, then as a paid app (e.g., "Power Searching with Google" cost ~$20/day)

Community Tools Comparison

Technology	Best for...	Pros	Cons
Email announcement group	Sending one-way information (like course announcements) to course participants.	Easy, quick way to send out announcement emails. Students can opt out of receiving email. Most students are comfortable with email technology.	No way to enroll all students at once; they must individually register. Emails may be perceived as spam.
Web forum using Google groups	Post course announcements. Post optional material (background and advanced) for students to access and discuss. Students apply and display their understanding; debate with each other. Students share feedback about the course.	Students can answer each others' questions. Students can initiate their own discussions. Course staff can monitor discussions.	Many people are not comfortable with posting information publicly. Some students find Google Groups UI difficult to navigate.
Google+ page	Sending one-way information (like announcements) publicly.	Public. Reaches students when they are on Google+. Students can reshare posts. Posts can be edited after the fact.	Google+ does not have a high adoption rate. Public.
Blog	Post one-way course announcements.	People can choose to follow via email. Public. Can edit posts.	Public.
Email help alias	Students ask private questions of course staff. Students share feedback about the course.	Some students are hesitant to use forums; likely more comfortable with email technology.	Requires course staff to answer emails. Can end up answering same questions multiple times.
Hangouts	Live collaboration between students. Office hours with course staff.	Live video collaboration.	New technology that not all students will be comfortable with. Requires participants to have a Google+ account. Limit of 10 people in a hangout at a given time.
Hangouts On Air	Live office hours to address student questions.	Can broadcast to the world. Can collect engagement data easily.	Limited live interaction between students and instructors. New technology.
Google Moderator	Students ask questions of course staff.	Most popular questions can be addressed. Students vote for top questions.	Not well integrated with Hangouts on Air.
YouTube Channel	Host all videos; encourage reuse and video responses.	All of your course videos are accessible at one site.	

xMOOC Initiatives

Comparison of MOOCs and MOOC-like initiatives

June 2012

MOOC and MOOC-like initiatives	Launch	Credential	Taught by	$	Pace	Known for	Early critiques	Backing	Experience
Open Learning Initiative	2001		Carnegie Mellon Univ and others	$ for academic version	Asynch	Instructional design, research on results	Lack of instructor interaction	Hewlett and Gates Foundations, CMU	Custom web
iTunes U	2007	Varies by contributing school	Degree-granting institutions	0	Asynch	iTunes integration, Apps	Limited interactivity/ social tools, podcast focus	Apple	iTunes, Apple, Piazza
Khan Academy	2008	Badges	Khan and others	0	Asynch	Video chunk library, analytics	Not interactive, lacks learner support	Grants including Google and Gates Foundation	Screencasts, video, forums
Udemy	2010		Professors and professionals	Mix	Asynch	Giving instructors monetization option	Affiliate marketing	Venture funds + 30% of paid course sales	Various digital assets
P2PU (Peer to Peer University)	2010	Badges	Anyone, facilitators not instructors	0	Asynch	Peer learning	Guide on the side isn't expert	Mix of university and foundations	Web forums
Udacity	2011	Certificate	Stanford profs	0-$ for certified exam	Synch but self-paced	Stanford experiment turned startup, connect talent with companies	Robot graders, lack of active learning	Venture funds	Short videos, quiz, feedback
Bonk CourseSites for Blackboard	2011		Curtis J. Bonk, Indiana University	0	Synch	The World is Open author	Blackboard interface	Blackboard	Blackboard, Elluminate
TED-Ed	2012		TED presenters and other authors	0	Asynch, but can be assigned	TED quality, turning videos into lessons	Lack of interactivity	TED, Kohls, YouTube	Video plus lesson plans, quizzes
Coursera	2012	Certificate	Profs from big name schools	$ for cert	Synch but self-paced	Andrew Ng's spinoff from MOOC test at Stanford; peer eval voting	Lack of active learning, instructor interaction; long boring videos	Silicon Valley venture funds	Videos, question ranking
edX (Harvardx and MITx)	2012	Certificate	Harvard and MIT profs	$ for cert	Synch but self-paced	edX open source delivery platform, research outcomes	Essay grading software	$60M from MIT and Harvard	edX open source, videos

Pros & Cons		
Coursera	**Udacity**	**edX**
Pros: - Great range of courses covering many subject areas - Lots of information provided on individual courses - All courses feature a video introduction to the course - Many of the video lecture have an option to display subtitles in languages other than English - Almost all courses offer certification - Offer a career matching service - Central forum, following a gamification rewards system	**Pros:** - Able to sign in with Facebook or Twitter - All advertised courses are available to enroll onto straight away (apart from 4 courses which are coming soon) - All courses feature a video overview of the course - Courses do not follow a traditional textbook format - Highly interactive tutorials - Able to learn at your own pace with no deadlines - All courses offer certificates - Community forum where user are rewarded for participation - Some courses offer a proctored exam (fee payable)	**Pros:** - Good range of courses covering different subject areas - Lots of information available on individual courses - Most courses have a video introduction - Some courses have foreign language options, either in text transcription or whole course format - Certificates of mastery available for all courses - Proctored certificates also available if exam is taken under proctored conditions (there is a fee for this) - Course forums available to interact with peers of that course
Cons: - Not all advertised courses are currently available to enroll onto - Operate peer grading for some exercises which can be off putting - To achieve certification you must meet all course deadlines - Estimated weekly hours and deadlines can be difficult to meet for some people	**Cons:** - Limited range of courses - Not much written information on individual course contents - Does not currently offer any form of translation into foreign languages	**Cons:** - Not all advertised courses are currently available to enroll onto - Some courses that require prior knowledge offer a self-assessment but this is not available until the course has actually started - Estimated weekly hours and deadlines can be difficult to for some people to meet

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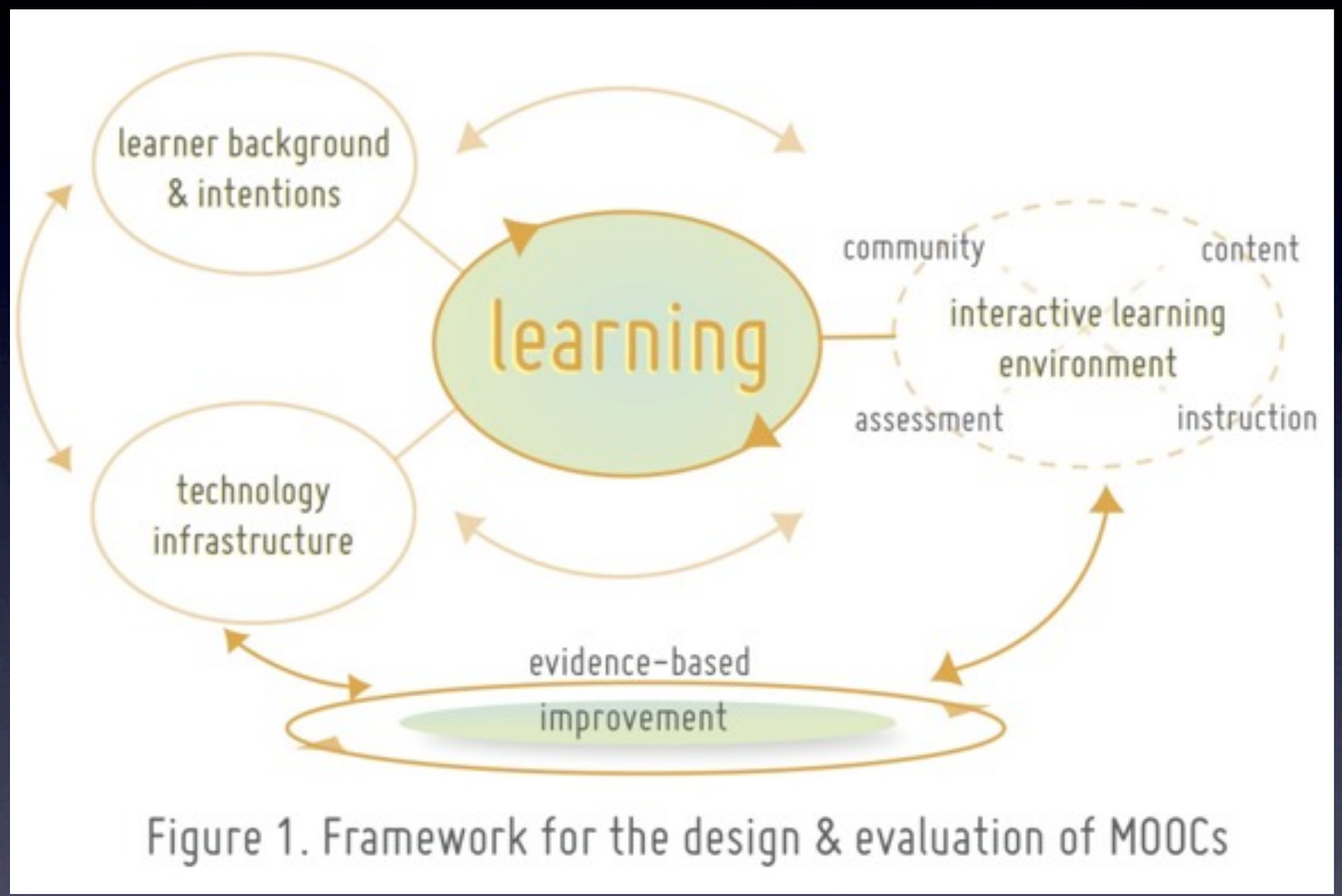

Figure 1. Framework for the design & evaluation of MOOCs

learner background & intentions:

- variety of student purposes for course engagement
- student experience
- byproduct of course topic, instructor, institution, and novelty of medium

(ref: Pea et.al.)

Four prototypical learner trajectories in MOOCs

- *Completing learners*: attempt the majority of the assessments offered in the class
- *Auditing learners*: attempt assessments infrequently, if at all, but watch lectures throughout the course
- *Disengaging learners*: attempt assessments at the beginning of the course but then move to sparsely watching lectures or disappear course entirely
- *Sampling learners*: briefly explore the course by watching a few videos, either at the beginning of the course or while it is underway
- ----*No-shows*: enroll but never actively engage with any of the course materials (study indicated 30%-43%)

(ref: Schneider, Stanford, 2013)

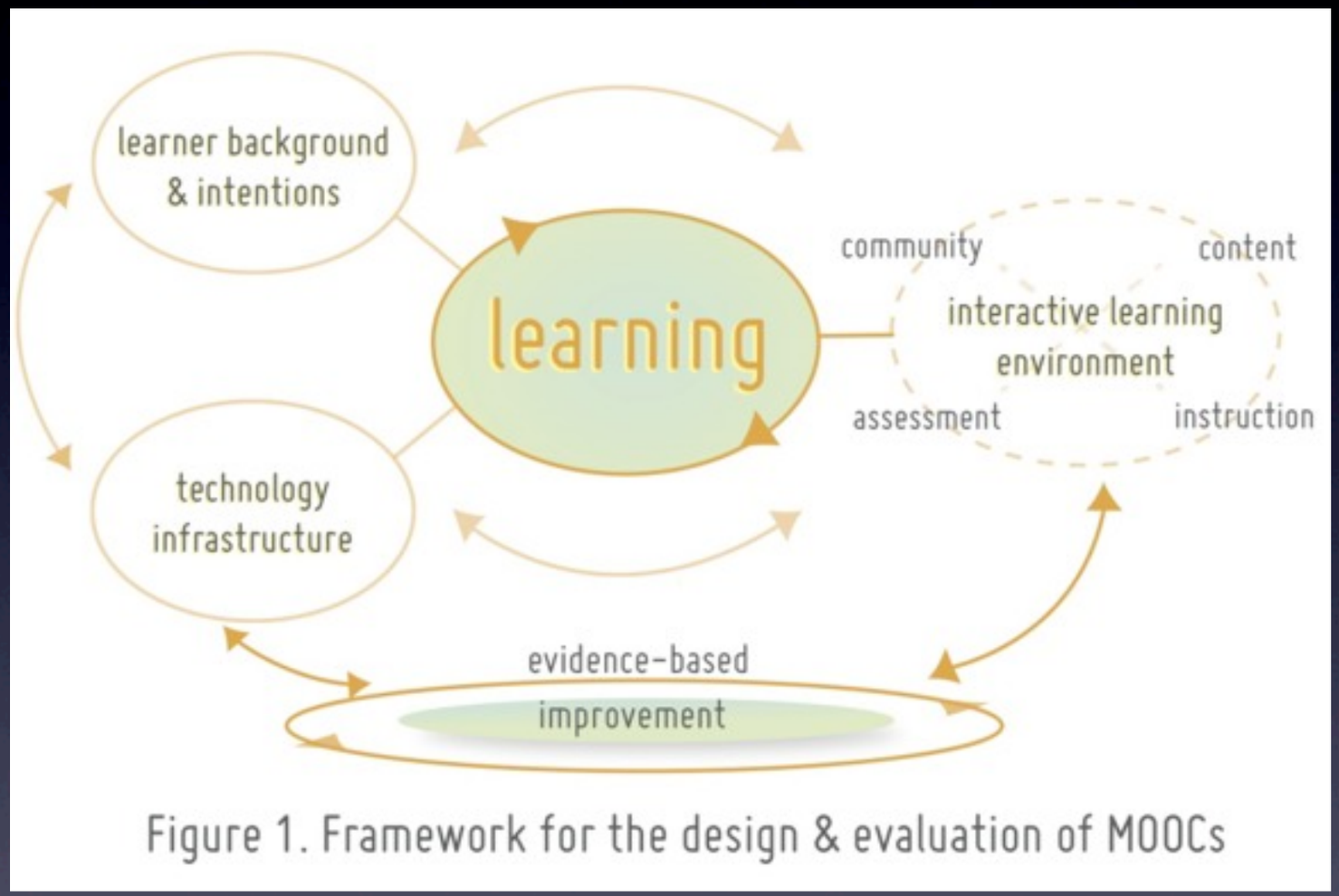

Figure 1. Framework for the design & evaluation of MOOCs

(ref: Pea et.al.)

technology infrastructure:

- social media & technology tools
- interactivity
- data collection & analytics

MOOC Tools & Pedagogy

the correlation between online learning tools used in MOOCs and Bloom's Taxonomy (Morrison, 2012)

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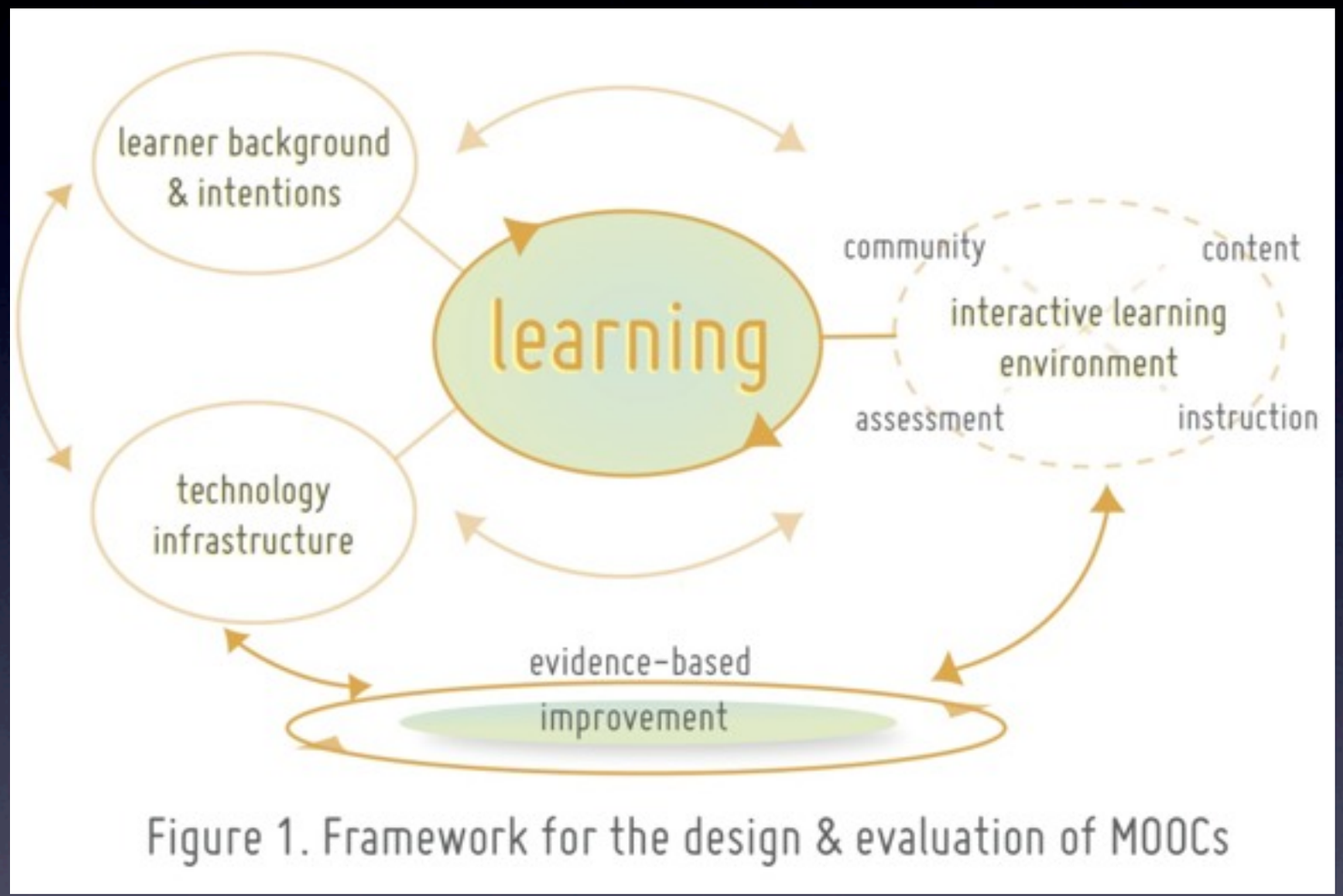

Figure 1. Framework for the design & evaluation of MOOCs

evidence-based improvement:

- evaluating design decisions around ILE and technology infrastructure
- measurement of desired learning outcomes

(ref: Pea et.al.)

San Francisco Chronicle

Online ed experiment's dismal outcome

9:21 PM

Massive Open Online Courses are supposed to be the next great thing in higher education. These are online courses that enroll, often for free, students who listen to lectures, complete assignments, and participate in discussion forums and question-and-answer sessions with instructors.

There were also problems with course design and deadlines in the university's experiment - once again, problems that other institutions will have to face. So many people have fawned over online education, and online coursework in general, that it's easy to forget how new this technology is, and how many kinks still need to be worked out before they have large-scale success.

The key is making sure that this doesn't happen at the expense of students' education. That's why San Jose State was right to pull the plug on this experiment for now - and why other institutions need to look before they leap into these courses.

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MOOCs & PD

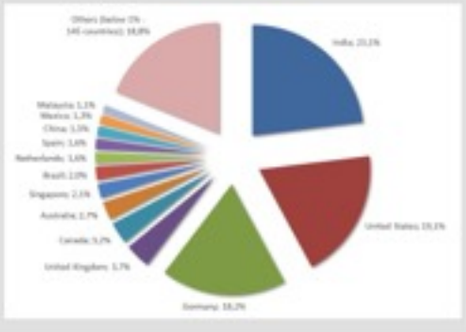
openSAP Blog

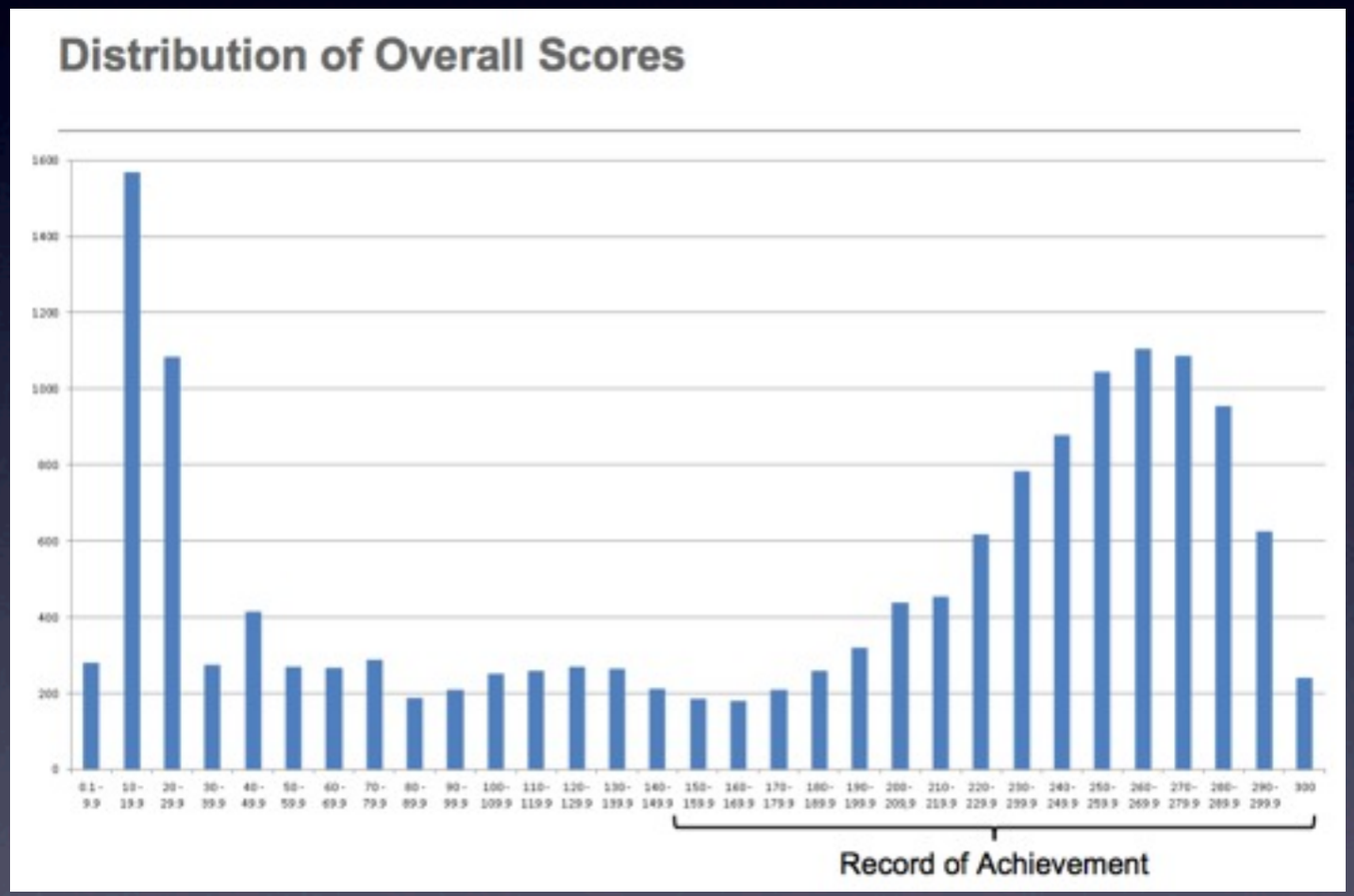
Introduction to Software Development on SAP HANA – Key Metrics (Geography, Age, Overall Scores)

Even when our first openSAP course *Introduction to Software Development on SAP HANA* was still in progress, many of you asked us to share some metrics on how the course was performing. On course completion, we provided some numbers in our final announcement. Building on this information, I would like to share and discuss the following data with you:

- The course was held from May 27 through July 15, 2013.
- 18,033 learners were enrolled on day 1 of the course.
- When the final exam ended, this number had increased to 40,386.
- 15,748 learners actively participated in the course.
- 10,795 learners took the final exam.
- We issued 9,383 graded records of achievement.
- 500,000 video lectures were watched.
- 500,000 self-tests were conducted.
- 70,000 assignments were submitted.
- 5,500 posts were created in the discussion forum.
- 9,879 cloud-based SAP HANA instances were deployed by the course participants.
- 160 private discussion groups were created by participants on openSAP.
- 3 local meet-up sessions were organized by course participants in Walldorf, Bangalore, and Sofia.
- 16 % of the course participants came from SAP.
- The female to male ratio of course participants was 1:5.

Let's take a quick look at the geographical distribution of course participants:





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Conclusions & thoughts on the future of MOOCs (1)

- "The MOOC Hype Cycle" may be overly pessimistic
- The MOOC phenomenon has successfully initiated new discussions on
  - The value of open education resources
  - Alternative strategies to address the rising costs of higher education
  - Learning "at the speed of need"
  - Resources for distant/continuing education (i.e., "the digital divide")
  - "Crowdsourcing education" (e.g., group learning/instruction, peer assessment)

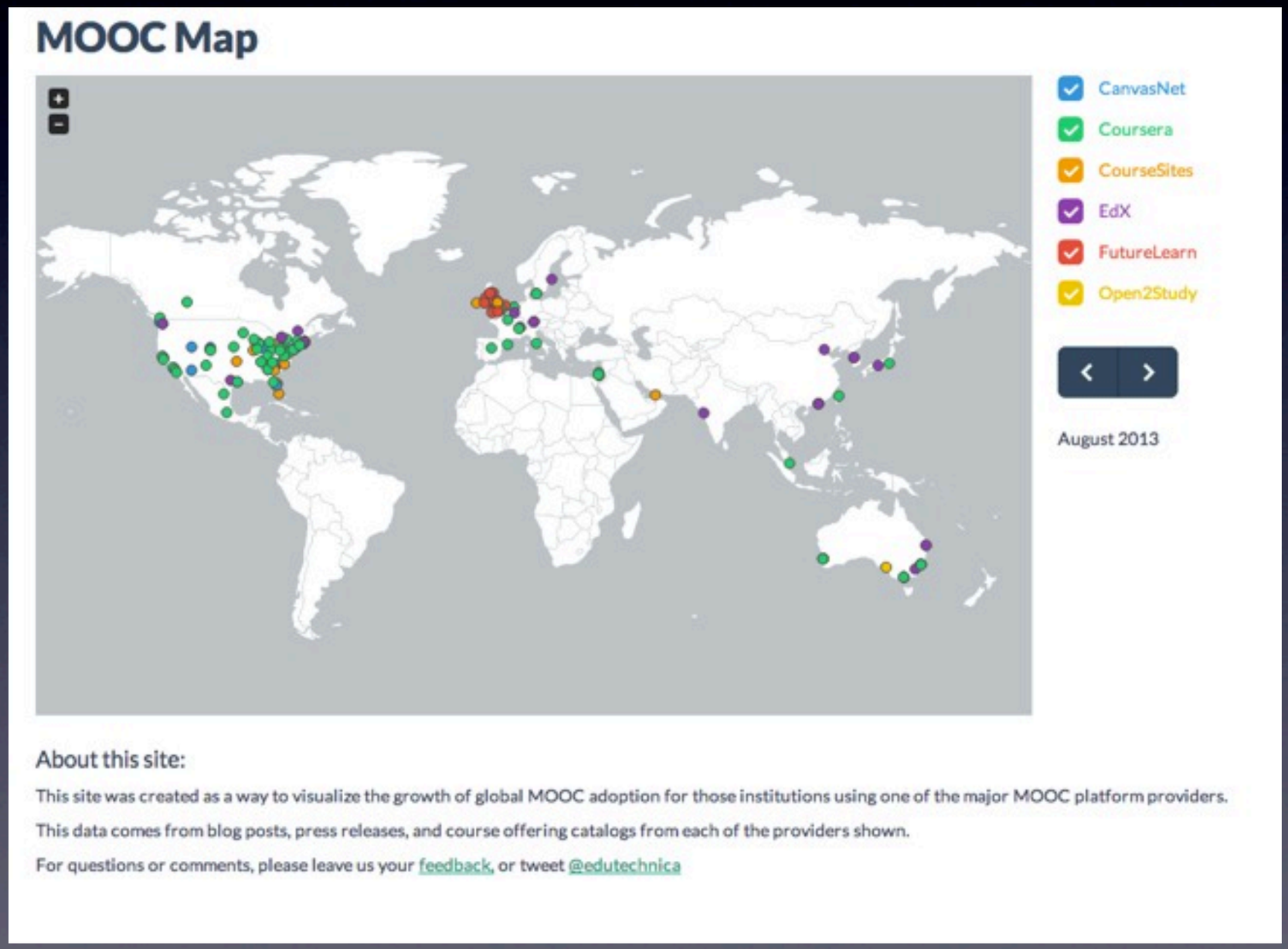
Conclusions & thoughts on the future of MOOCs (2)

- Experimentation will continue with the various "flavors" of MOOCs - not just xMOOCs and cMOOCs
- New business models around MOOCs will attract new participants
- More educational institutions will "jump on the MOOC bandwagon" either with local MOOCs (e.g., joining alliances like edX) or adopting flipped curricula using external MOOCs
- What about "MOOCs for the masses?" Should it be as easy for an individual to teach a MOOC as it is to author a Web page or a blog? Tools? (e.g., WordPress, GoogleDocs)

Conclusions & thoughts on the future of MOOCs (3)

- Greater use of MOOCs for professional development and business training will occur (replacing the old Webinar concept)
- Numerous issues must continue to be addressed
  - Impact on role of faculty
  - Institutional investment in free MOOCs
  - Registration fee models
  - Academic credit
  - Robustness of assessment techniques
  - Copyright & licensing issues
  - Archiving & searching
  - Security & privacy
  - Technology requirements

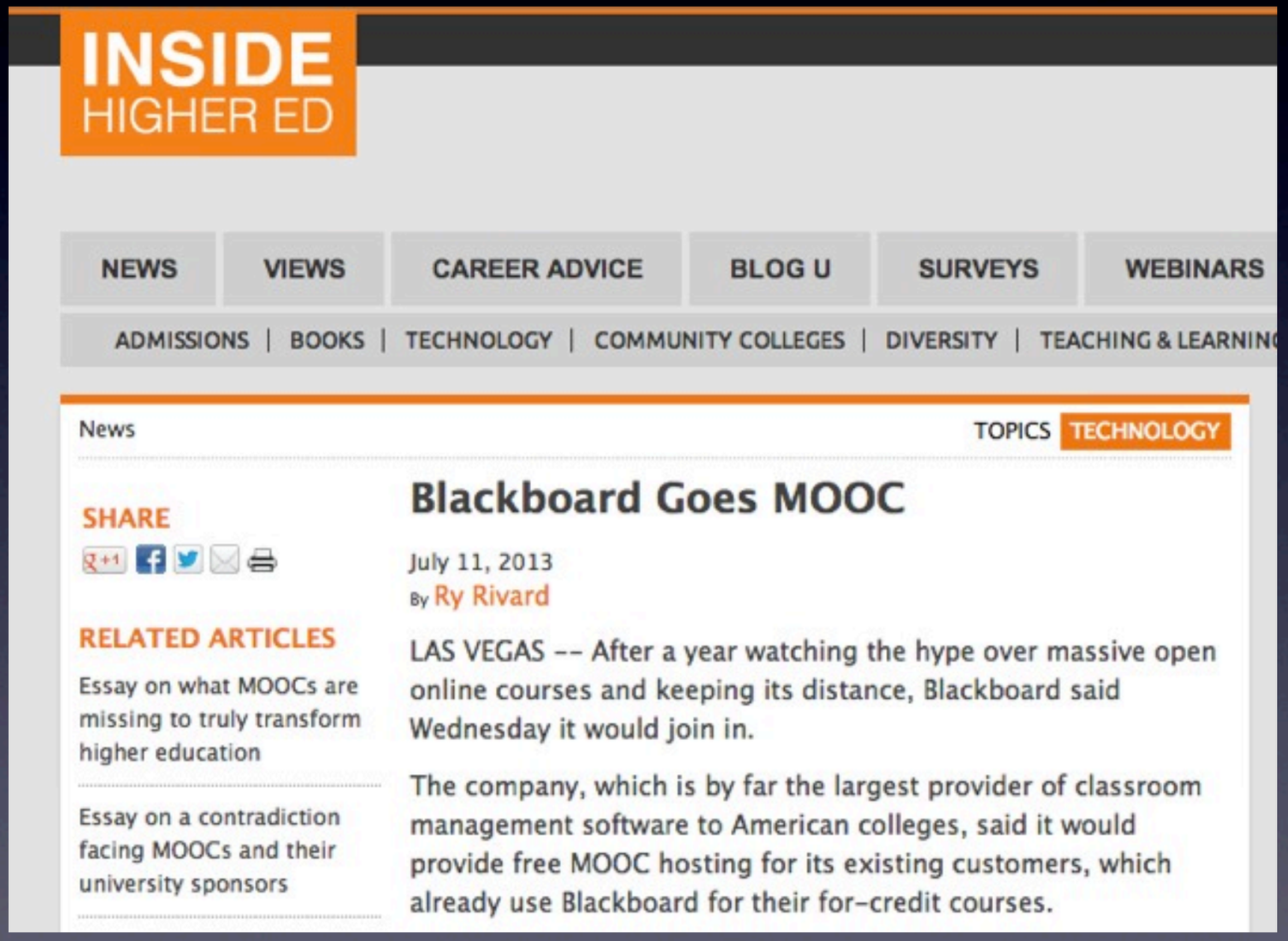
Meanwhile, the number of MOOCs continues to grow



But with obvious geographical gaps!

HKU Expert Address, 11 October 2013

Stay tuned: MOOCs remain in the news



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EDSURGE NEWS BRIEF

Aug 4, 2013

California's "MOOC Bill" on Hold

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HOLD UP: Ry Rivard at InsideHigherEd reported that a California bill introduced this March, **SB 520**, which would require the state's public universities to offer credit for online courses provided by third party providers is **"dead for now," or "until at least August 2014."** According to Rivard, the bill's chief backer is waiting to see results from online programs before pushing the bill further. It's likely that recent events like **Udacity's disappointing results with San Jose State University** may have played a role. Over at WCET, edtech analyst Phil Hill recapped **some of the contentious issues behind the bill**, especially when it comes to funding.

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Journalism in the Americas

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Knight Center's MOOC program, an innovative way to teach journalism skills in a massive, world-wide scale

By Knight Center

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More than 2,300 people from over 120 countries will start this Monday, Aug. 12 a five-week online course to learn the basic skills of data-driven journalism thanks to the **Knight Center for Journalism in the Americas**' innovative Massive Open Online Courses (or MOOCs) program, which has already reached more than 15,000 people from five continents since the initiative was launched 10 months ago.

MOOCs are revolutionizing the world of online education and, since October 2012, the Knight Center has offered its own with a twist. While most massive online courses are college classes that have been recorded on video and adapted to be shared over the Internet, the Knight Center's MOOCs have been specifically designed for the new format, emphasizing student interactions and collaborations. Through the courses' online forums, instructors are constantly answering questions and making general comments about students' work, while students are encouraged to discuss their assignments and help each other.

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kaggle

Customer Sol

Welcome to Kaggle, the leading platform for predictive mod competitions. Here's how t into competing on Kaggle –

New to Data Science? Visit our Wiki »
Learn about hosting a competition »
in-Class & Research competitions »

What do all the people on the leaderboard have in common? It's not an Ivy League education or a PhD in Statistics. According to Howard, it's creativity--and Coursera.

What's the typical background of a competition winner?

The people who win competitions are generally not Stanford-educated or Ivy League American Mathematicians. The world's best data scientists based on their actual performance haven't gone to famous schools. Most of the winners

rning from Andrew Ng's course

ds are electrical engineering and

These are areas in which for

alyze data and do useful things

Is this a new model for higher education?

Active Competitions

All Competitions

on

er and traffic.

46 days
Coming soon
$250,000

belkin

Belkin Energy Disaggregation Competition

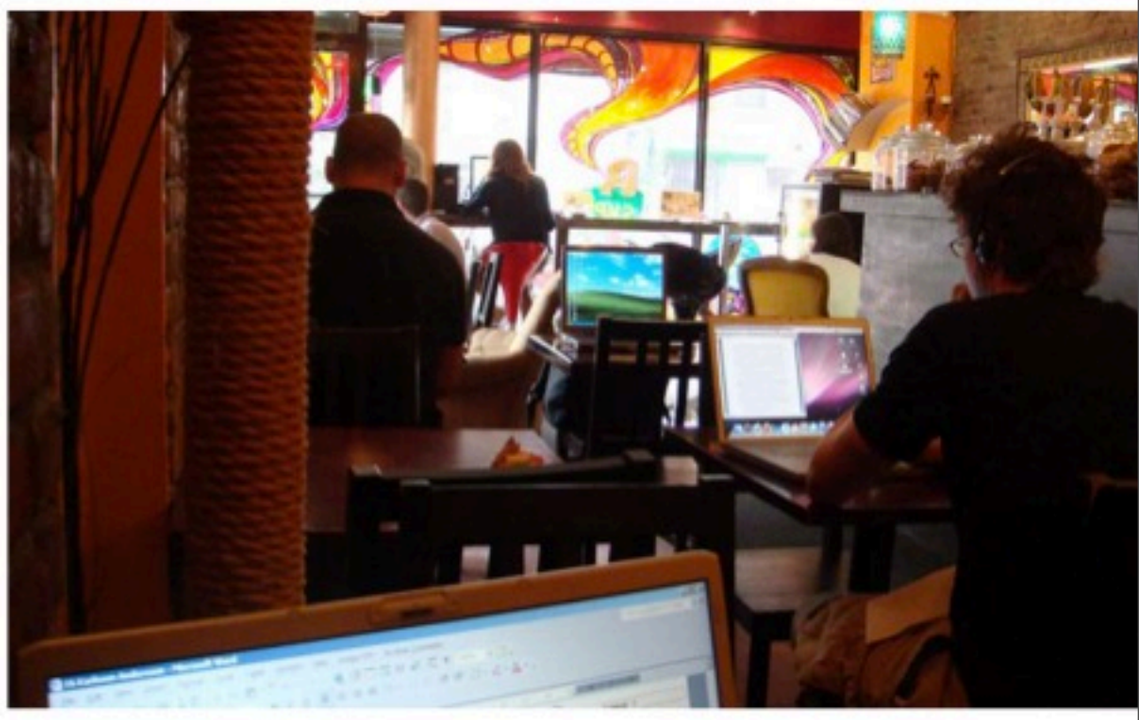
Disaggregate household energy consumption into individual appliances

2 months
61 teams
$25,000

The Potential of MOOCs? (1/2)

Traditional ← → **Modern**

VS.



Learning anywhere, anytime, as needed

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The Potential of MOOCs? (2/2)

From institutional-based credentialing → **To activity-based reputation**

Credentialing democratized

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Questions?
Comments?
Criticism?

bebo@slac.stanford.edu

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