Information and Society-E2
-Information Education 1-

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E-LEARNING & MOOC

Problems of Traditional Offline Learning

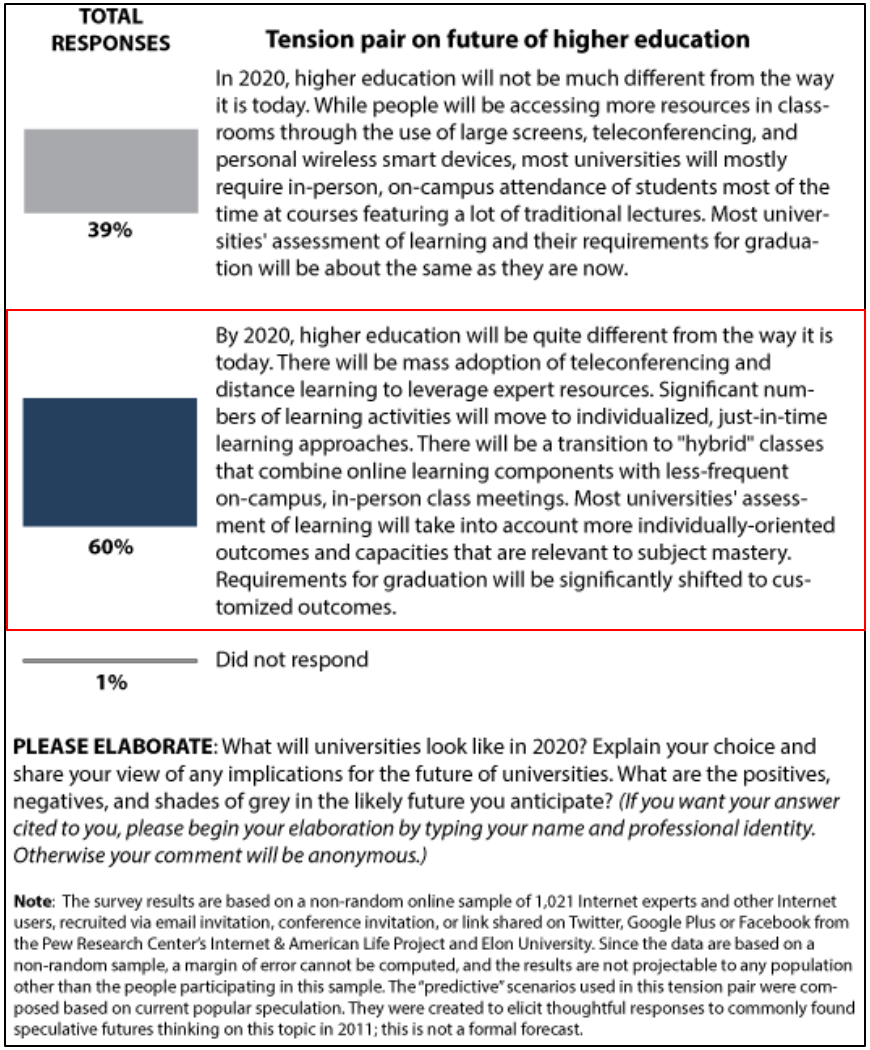
"…Although higher education is widely seen as a positive experience, the immense and growing cost of attending a university has combined with questions about the relevance of a degree, producing scepticism around the current method employed by schools…"

"…In particular, it is increasingly considered wasteful for students to live on campus, and for professors to deliver the same lectures in person, semester after semester…"

Sevil Omer and Devin Coldewey. *As K-12 classrooms get more high tech, colleges get more virtual*. 2012

http://www.nbcnews.com/id/48358371/ns/technology_and_science-back_to_school/%20-%20.UE5SVJhSbao#.U7HuxPmSySo

Higher Education's Destination by 2020 (Survey of 1,021 Internet Experts in 2012)



"*It's still hard to get a well-paying job without a college degree, and that probably won't change by 2020…*"
"*But there may be many more paths to that degree than there are today.*"

http://www.pewinternet.org/2012/07/27/main-findings-higher-educations-destination-by-2020/

Open Learning

- Approach to education that seeks to **remove all unnecessary barriers to learning**
- Open Learning Principles (UNESCO):
  1. Learning opportunity should be lifelong and should encompass both education and training
  2. Learning provision should be flexible so that learners can increasingly choose, where, when, what and how they learn, as well as the pace at which they will learn
  3. …

A Basic Guide to Open Educational Resources (OER), UNESCO, http://unesdoc.unesco.org/images/0021/002158/215804e.pdf

e-Learning

What is e-Learning?

- e（electronic） Learning
- Learning using information technology
- Type of distance learning

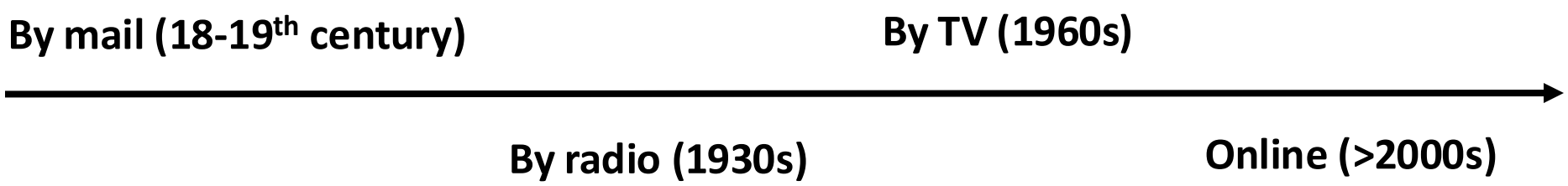
Learning using the Internet

Definitions:

“Educational processes that utilize information and communications technology to mediate asynchronous as well as synchronous learning and teaching activities.” “Learning conducted via electronic media, typically on the Internet” (Oxford Dictionaries)

Distance Learning History

- Distance learning is not a completely new idea
  - E.g., correspondence courses



e-Learning Characteristics

Advantages

- Taking advantage of ICT and the Internet
- Providing learning activities rather than just providing information
- No space and time constraints
- Flexibility: learners determine their own pace of learning
- It is cost-effective

Problems

- Can be effective in the transmission of knowledge, but less effective in training various qualities and abilities of students like creativity, working in teams, presentation skills, interpersonal skills, etc.
- Difficult to control and monitor persistency and motivation of students
- Low completion rates
- Learners may feel a sense of isolation
- Possible health related issues (eyestrain, bad posture or other physical problems)

e-Learning Characteristics

Synchronous Learning

- Using any learning tool in real-time that allows students and teachers to ask and answer questions immediately, e.g., online chat or videoconferencing
- Students who participate in synchronous learning courses are able to interact with other students and teachers during the lesson
- No feeling of isolation but not very flexible style

Asynchronous Learning

- Carried out even when the student or teacher is offline, e.g., coursework delivered via web, email and messages posted on community forums
- High flexibility as students follow the curriculum at their own pace
- Difficult for students who lack the motivation to do the coursework on their own
- Can lead to feelings of isolation

OCW

What is OCW?

- OpenCourseWare
- *"…free and open digital publication of university-level educational materials. These materials are organized as courses, and often include course planning materials and evaluation tools as well as thematic content…"*
- Synonymous with OER (Open Educational Resources)

Open content

- Syllabus
- Lecture and video lecture
- Quizzes, assignments

MIT OpenCourseWare

http://ocw.mit.edu/

MIT OpenCourseWare

http://ocw.mit.edu/

Summary

- Opened in 2001
- Over 2,400 courses available, 300 million visitors
- "*The idea is simple: to publish all of our course materials online and make them widely available to everyone*."
  Dick K.P. Yue, Professor, MIT School of Engineering
- **Unlocking Knowledge**
  - MIT OpenCourseWare (OCW) is a web-based publication of virtually all MIT course content. OCW is open and available to the world and is a permanent MIT activity.
  - Not a part of official education of MIT

MIT OpenCourseWare

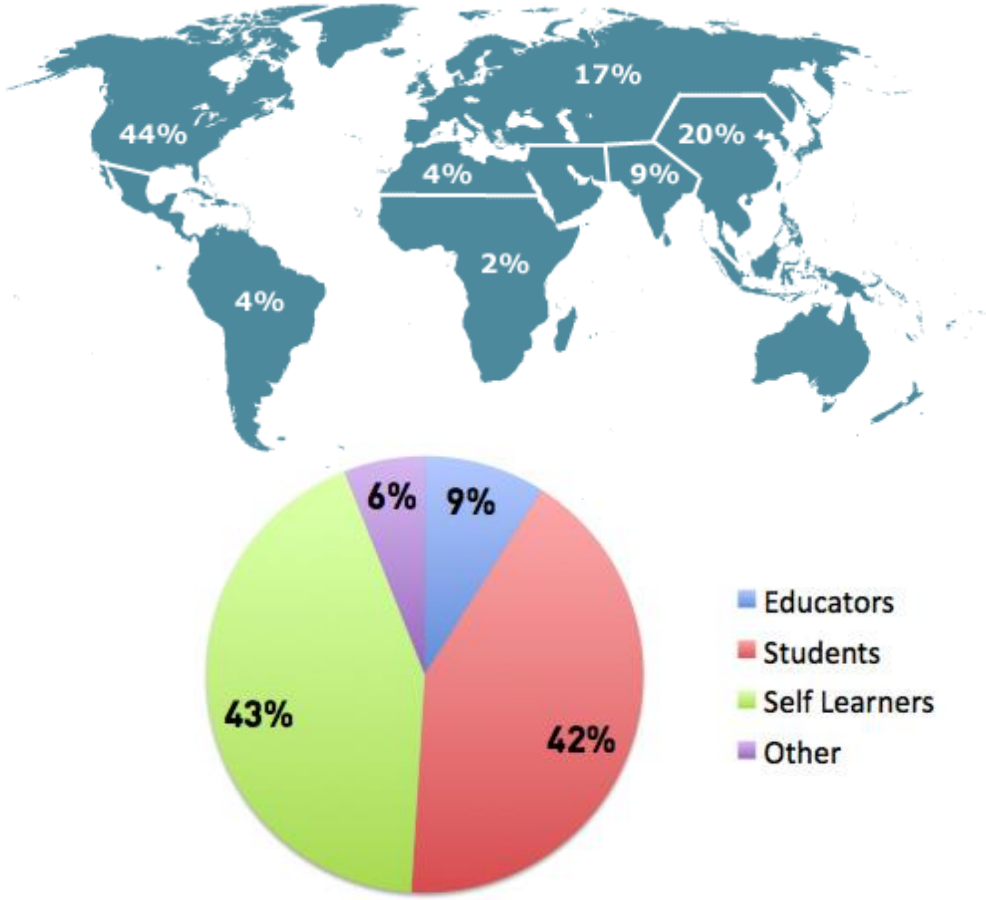
http://ocw.mit.edu/

Geography

- Students coming from different parts of the world
- N. America: 44%

Student Types

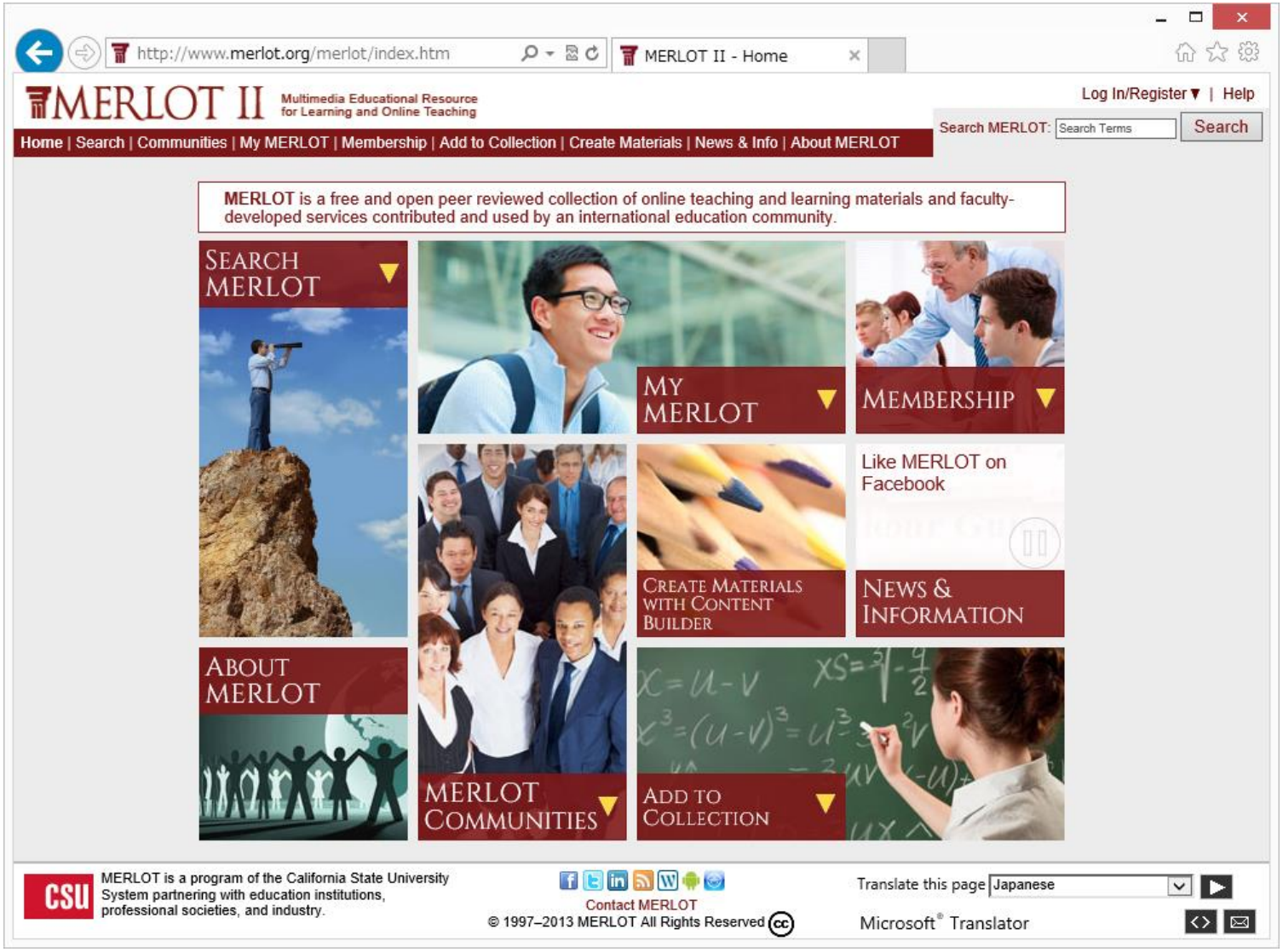
- independent students 43%
- students 42%
- teachers 9%



MIT OpenCourseWare Web
http://ocw.mit.edu/about/site-statistics/

MERLOT

http://www.merlot.org/



MERLOT

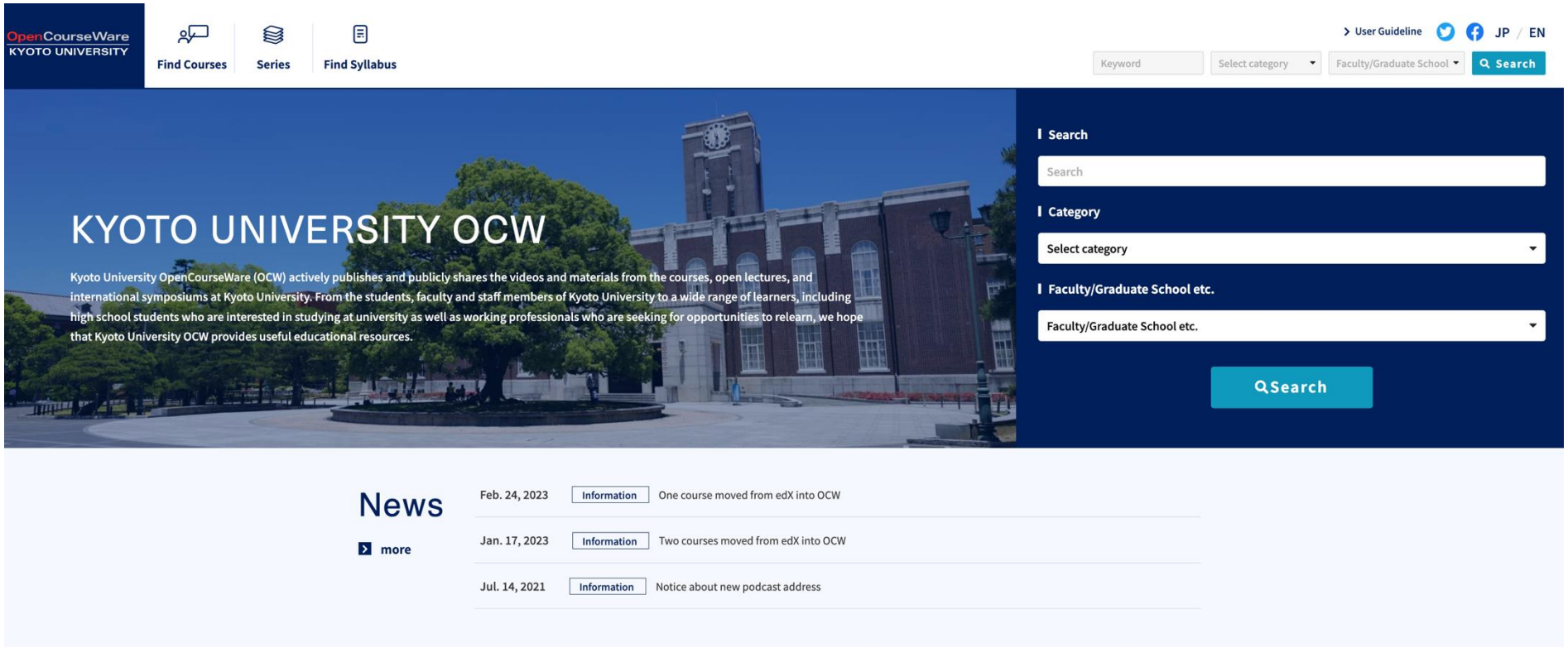
http://www.merlot.org/

Summary

- MERLOT is a free and open peer reviewed collection of online teaching and learning materials and faculty-developed services contributed and used by an international education community
- Established by the University of California in 1997 as a spin-off from its Education Center
- Provides a link to Web teaching materials offered by various institutions as well as the evaluation of these teaching materials

Kyoto University OCW

http://ocw.kyoto-u.ac.jp/en



MOOC

- Massive Open Online Course (MOOC): courses created using web technologies that allow teachers and educators to construct virtual classrooms
- Typical MOOCs: a series of lessons for thousands of students
  - In addition to quizzes, weekly auto-graded assignments, and discussion forums

OCWs	MOOCs
Static character	Dynamic character
Always can be accessed	Can be accessed when course is open
No student assessment	Have student assessment
No accreditation	Have accreditation
Individual	Often collaborative
Usually provided by higher education institutions	Provided by companies or by higher education institutions

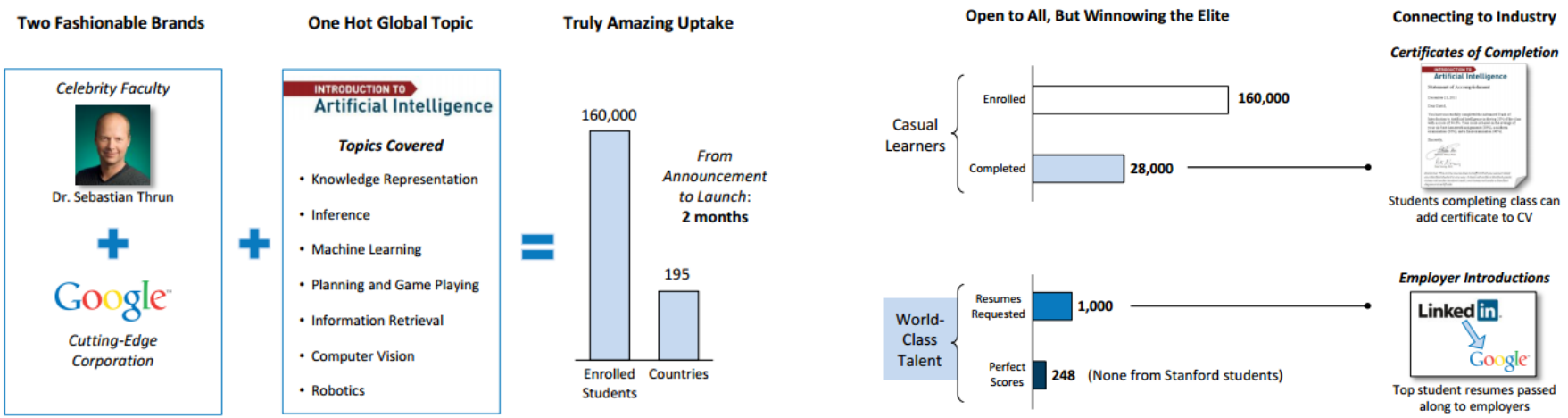
Differences of OCWs and MOOCs

Typical MOOC Course

- Time period: 4 to 10 weeks
- Most time spent for learning
- Students on average dedicate 2 to 6 hours a week to the course
  - A small group of highly engaged learners may be more committed
- Materials are consumed less and less throughout the MOOC as many learners' drop or become less engaged
  - Tens of thousands applicants
  - Hundreds of students who complete and obtain certificates
- MOOC resources remain accessible after the course closes

Beginning of MOOC

- AI Lecture by S. Thrun in 2011 (Thurn is leading the development of the world's first driverless car), joined by Google Director of Research, Peter Norvig
- Registered by 160k students after limited advertising,
- from which 28k students completed the course
  - More than Thrun could have ever expected from a standard classroom throughout his entire career.
- Success reasons
  - High-quality, interactive content for free
  - "Celebrity" faculty and involvement of highly innovative company
  - Assessment, certification (certificate of completion signed by the instructors without any official credit awarded), and a link to employers (potential for new headhunting model)



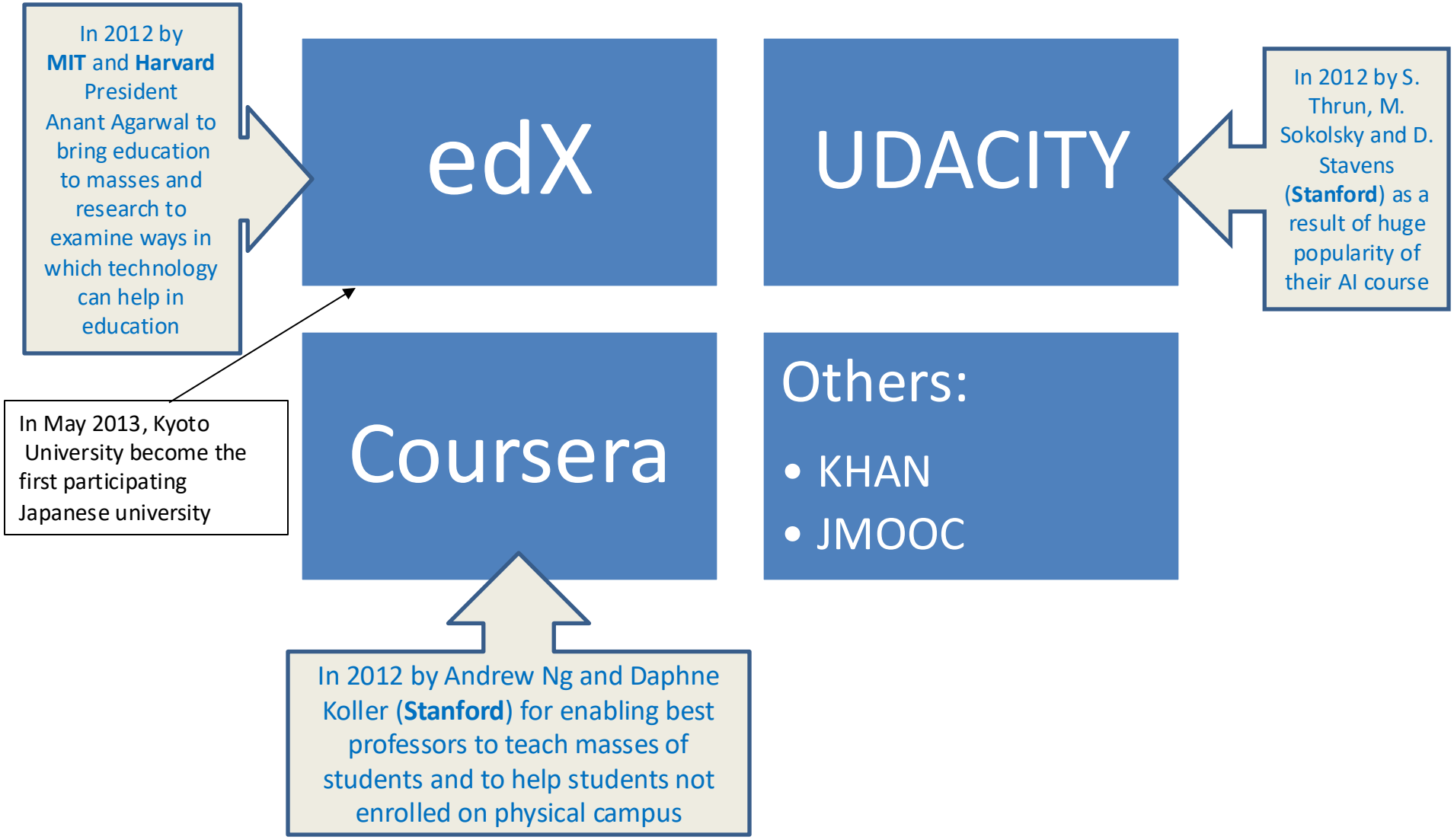
Understanding the MOOC Trend: The Adoption and Impact of Massive Open Online Courses. Education Advisory Board, 2012
http://blogs.oregonstate.edu/engage/files/2012/12/Understanding-the-MOOC-Trend.pdf

MOOC Rise

- In 2011-2012 there was rapid launch of MOOCs
- Faculty at elite universities worked through several organizations or start-ups to make complete courses available online
  - Usually free and open for anyone willing to enrol
- Some courses attracted over hundred thousand students from nearly every country in the world

Understanding the MOOC Trend: The Adoption and Impact of Massive Open Online Courses. Education Advisory Board, 2012
http://blogs.oregonstate.edu/engage/files/2012/12/Understanding-the-MOOC-Trend.pdf

MOOC Offering Organizations



edX

edX

- https://www.edx.org/
- Non-profit organization founded by Harvard University and Massachusetts Institute of Technology in the fall of 2012
- By developing an open source educational environment, lectures are published through the edX
- As of May 2018, 2136 are provided on edX
- In May 2013, Kyoto University become the first participating Japanese university

Back to schools and partners

KyotoUx

Free online courses from Kyoto University

Founded in 1897, Kyoto University is acknowledged as one of the most accomplished research-oriented universities in Asia. The validity of that reputation is testified by the accolades conferred on our alumni researchers, most notably eight Nobel Prize laureates who undertook vital research during their time at the university. In addition to those awards, several other Kyoto University faculty members have received respected accolades, including two Fields Medalists and one recipient of the Gauss Prize.

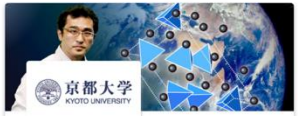
Visit the KyotoUx Facebook page for more information.

Kyoto University MOOCs
Browse free online courses in a variety of subjects. Kyoto University courses found below can be audited free or students can choose to receive a verified certificate for a small fee. Select a course to learn more.

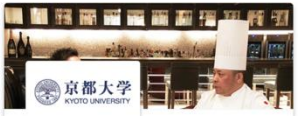
Courses

The Chemistry of Life
KyotoUx
Course

Stochastic Processes: Data Analysis and Computer Simulation
KyotoUx
Course



Introduction to Geochemistry
KyotoUx
Course



Culture of Services: Paradox of Customer Relations
KyotoUx
Course

Introduction to Statistical Methods for Gene Mapping
KyotoUx

Ethics in Life Sciences and Healthcare: Exploring Bioethics th…
KyotoUx

Introduction to Animal Ethics
KyotoUx

Evolution of the Human Sociality: A Quest for the Origin of Our Soci…
KyotoUx

UDACITY

UDACITY

- https://www.udacity.com
- Established by artificial intelligence researchers at Google
- As of 28 April 2014, Udacity has 1.6 million users in 12 full courses and 26 free courseware.
- Motto: “To bring accessible, affordable, engaging, and highly effective higher education to the world.”
- Cost of MOOC at Georgia Institute of Technology: $6,600
- Regular course tuition fee: $45,000

Coursera

Coursera

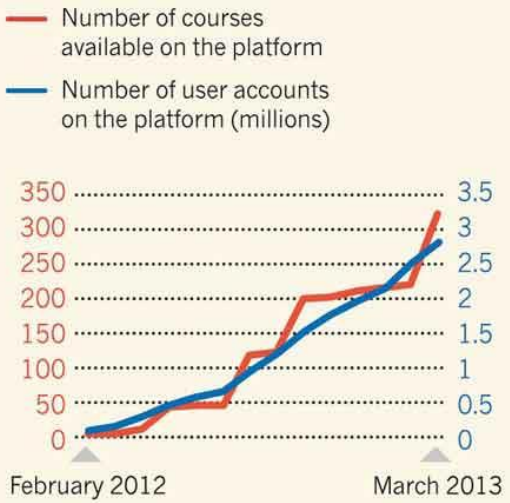
- https://www.coursera.org
- Profit organization for educational technology established by Stanford University
- Partners with many universities around the world to offer free online courses
- As of February 2017, Coursera had 24 million registered users signed up for its programs, and offered more than 2,000 online courses
  - Low percentage of completion at 7-9%
- The University of Tokyo joined in Autumn 2013 to offer free classes

MOOC Rise: Coursea

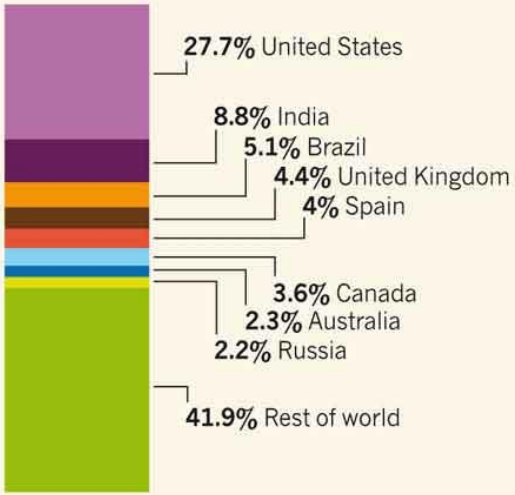
MOOCs rising

Over little more than a year, Coursera in Mountain View, California — the largest of three companies developing and hosting massive open online courses (MOOCs) — has introduced 328 different courses from 62 universities in 17 countries (left). The platform's 2.9 million registered users come from more than 220 countries (centre). And courses span subjects as diverse as pre-calculus, equine nutrition and introductory jazz improvisation (right).

Supply and demand



Student origins



Courses offered

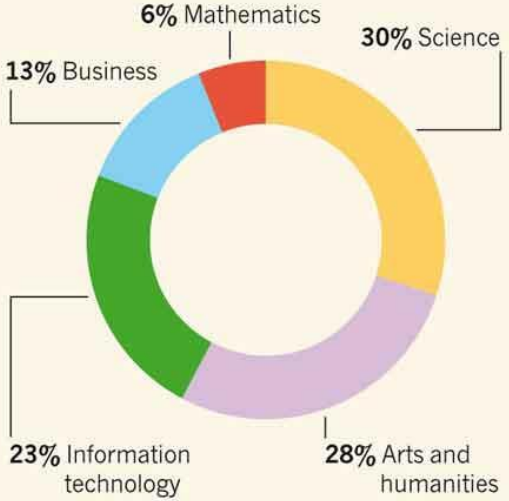


Image: Courtesy of Nature magazine

http://www.scientificamerican.com/article/massive-open-online-courses-transform-higher-education-and-science/

Costs and Benefits

- High-Quality MOOCs are expensive to produce
- Often they require millions of dollars to build new technology platforms, redesign popular courses, and develop new multimedia content
- Yet, they are infinitely scalable…
  - Once a virtual learning environment is in place, the marginal cost of adding students is almost zero

- So far, MOOCs have not significantly reduced the costs of running a university
  - Only the wealthiest institutions have been able to afford to develop them

- While private companies or start-ups naturally think about resources, elite universities and institutions supporting MOOCs are less interested in generating revenues
  - More interested in increasing access, generating good publicity and providing a platform for faculty who want to experiment with new technologies
  - MOOCs are seen as means to enhance their position, not a disruptive threat

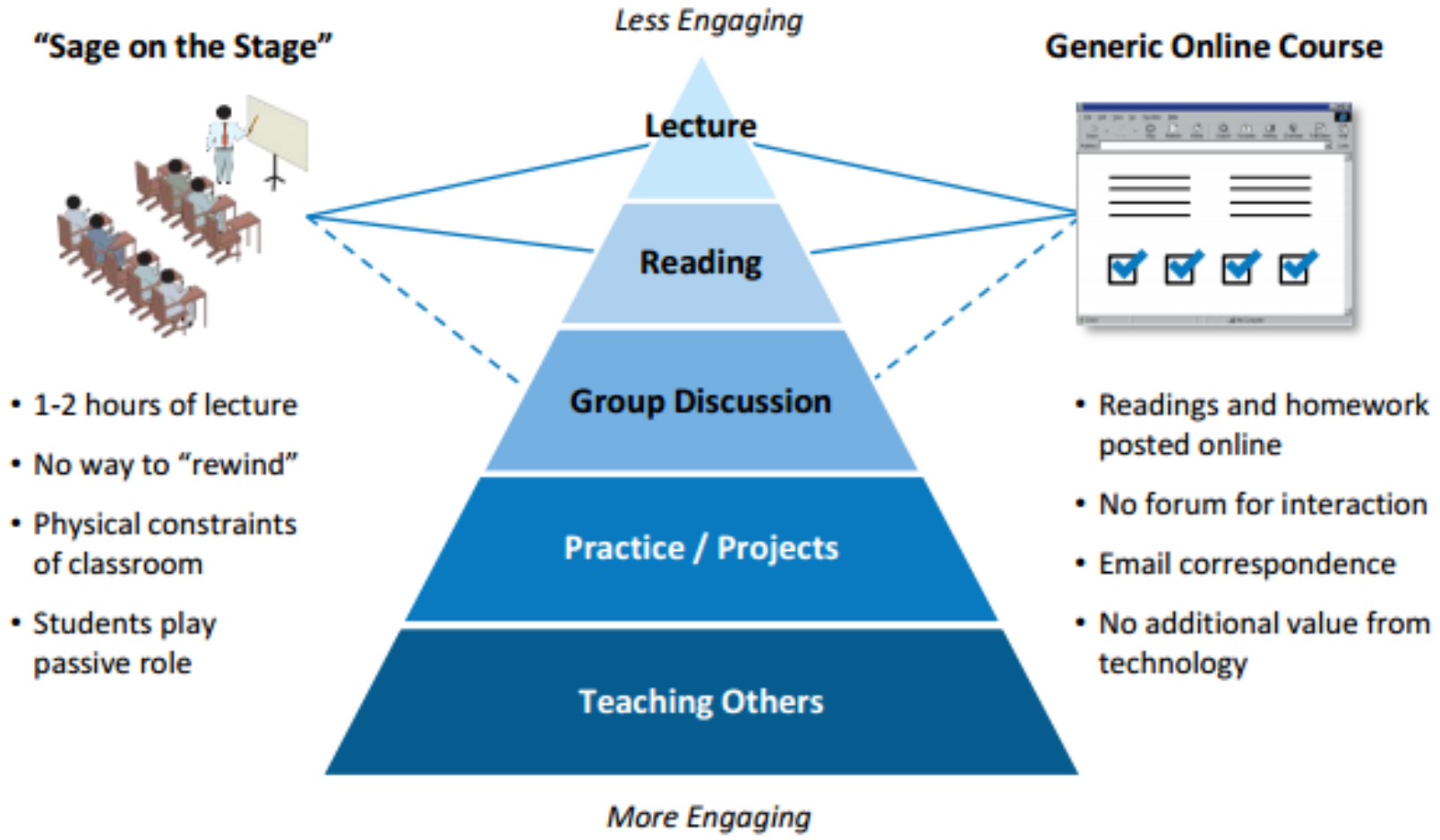
Educational Institutions: Key Goals of Introducing MOOCs

Major goals based on interviews with educators from 29 institutions that implement MOOCs (2014):

1. Extending the reach of the institution and access to education (65%)
2. Building and maintaining brand (41%)
3. Improving economics by lowering costs or increasing revenues (38%)
4. Improving educational outcomes for both MOOC participants and on-campus students (38%)
5. Driving innovation in teaching and learning (38%)
6. Conducting research on teaching and learning (28%)

Fiona M. Hollands and Devayani Tirthali, "MOOCs: Expectations and Reality Full Report", 2014, Columbia University
http://www.academicpartnerships.com/sites/default/files/MOOCs_Expectations_and_Reality.pdf

Still We Need More Efficient Technological Solutions…



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Science of Pedagogy

- Most of the initial MOOC lectures are just recordings of live, real lectures
- Lecturers are however trying to adapt courses to specific characteristics of online learning, through
  - Automatic assessment
  - Crowdsourcing
  - Personalization, adaptive platforms
  - Game based learning
  - Learning analytics
  - Etc.

MOOC: Business Model

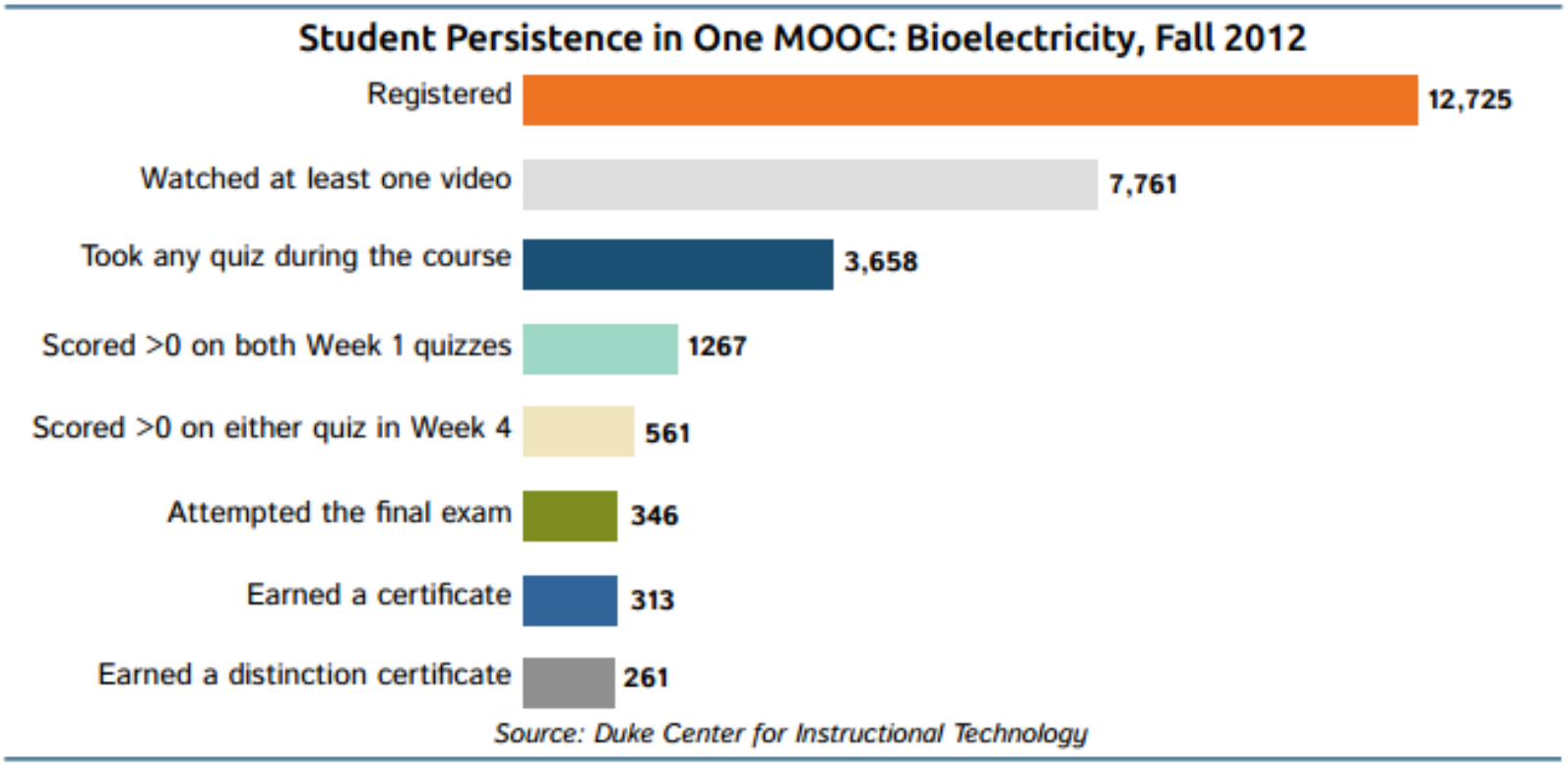
- No standard business model for how MOOCs will generate revenue
- Possibilities for revenue:
  - Advertising: courses have sponsors whose names are visible
  - Additional options: course materials including videos are free, but additional services like assignment grading, access to the social networks, and discussions, online tutoring, face-to-face instruction with a local instructor are fee-based
  - Tuition model: students pay for course credits
  - Student attraction: drawing MOOC participants into existing, full-tuition degree programs
  - Licensing model: selling the course, parts of the course, or its customized versions course to institutions or businesses for their internal use; license institutional use of the MOOC platform itself
  - Headhunting: matchmaking students and employers
  - Using student data: selling student information to potential employers or advertisers

MOOCs: Threats and Controversies

- Smaller or less prestigious institutions have not so far engaged strongly with MOOCs
  - Yet they fear being left behind, losing market share and recruits
- Many claim that MOOCs are unable to serve learners with more complex learning needs
- Although some courses have already been accredited and universities are beginning to accept transfer credit for completing MOOCs, this has led to many questions about how MOOCs may shape the future of higher education
  - As MOOCs become increasingly popular all over the world, the means by which learning is measured, evaluated, and credited is a topic of controversy in higher education

Student Persistence

- Drop out rate is quite high, around 90%

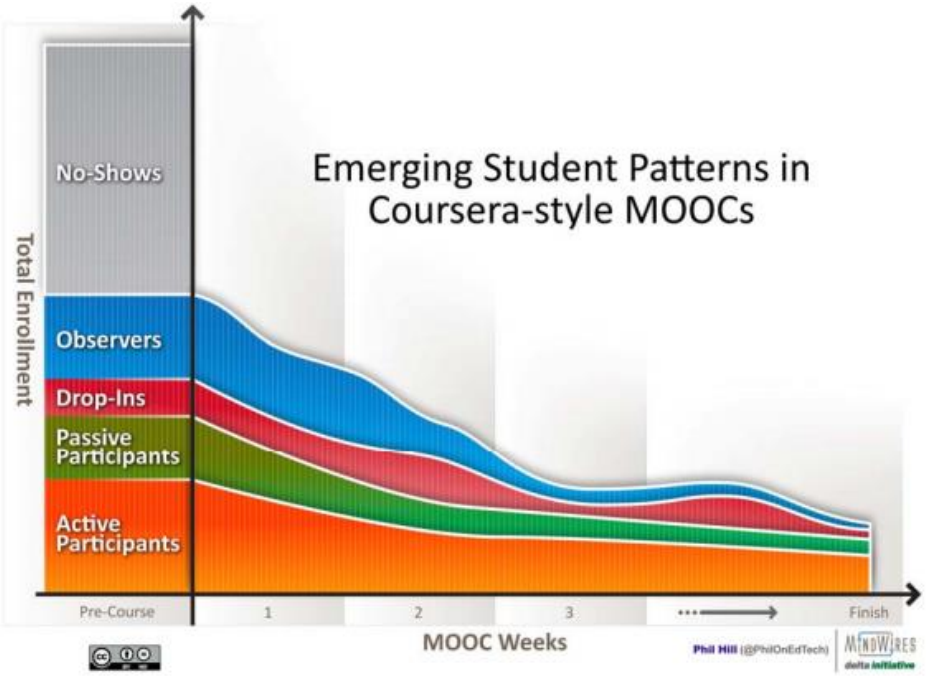


25% students dropped out even before the course started

Inside Higher Ed: A selection of Inside Higher Ed articles and essays on massive open online courses, Academic Partnerships, 2013
http://facultyecommons.org/wp-content/uploads/2013/05/IHE_MOOCs-Booklet_May-2013.pdf

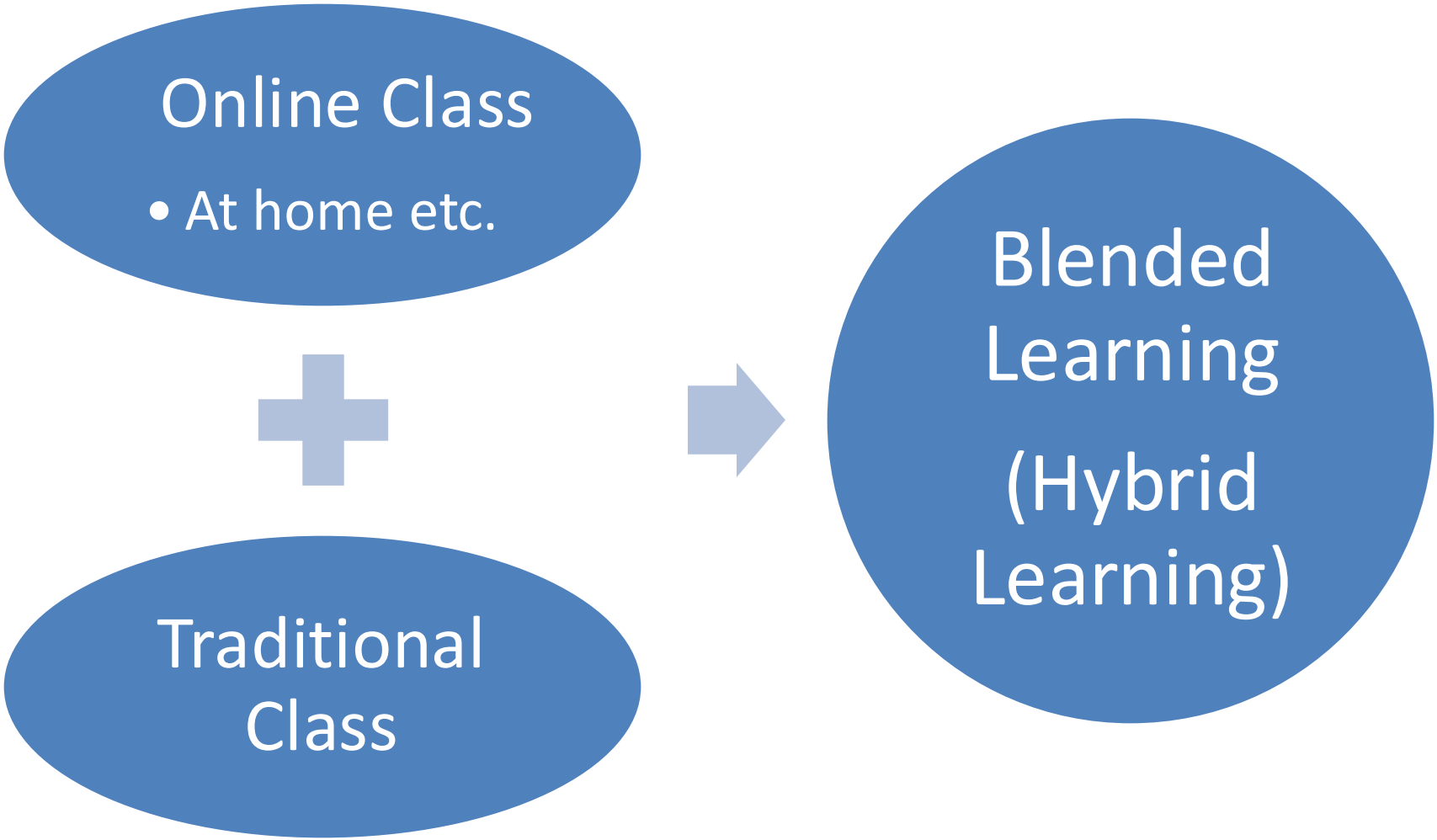
Student Types and their Persistence

- **Lurkers** – enrol to observe or sample a few items
- **Drop-Ins** – partially or fully active participants for a selected topic who do not attempt to complete the entire course
- **Passive Participants** – students who view a course as content to consume and expect to be taught (tend not to participate in activities or class discussions)
- **Active Participants** – fully participate in the MOOC, including consuming content, taking quizzes and exams, writing assignments, peer grading, participating in discussions using SNSs, blogs or other social media



http://mfeldstein.com/emerging_student_patterns_in_moocs_graphical_view/

Blended Learning (ブレンド型学習)

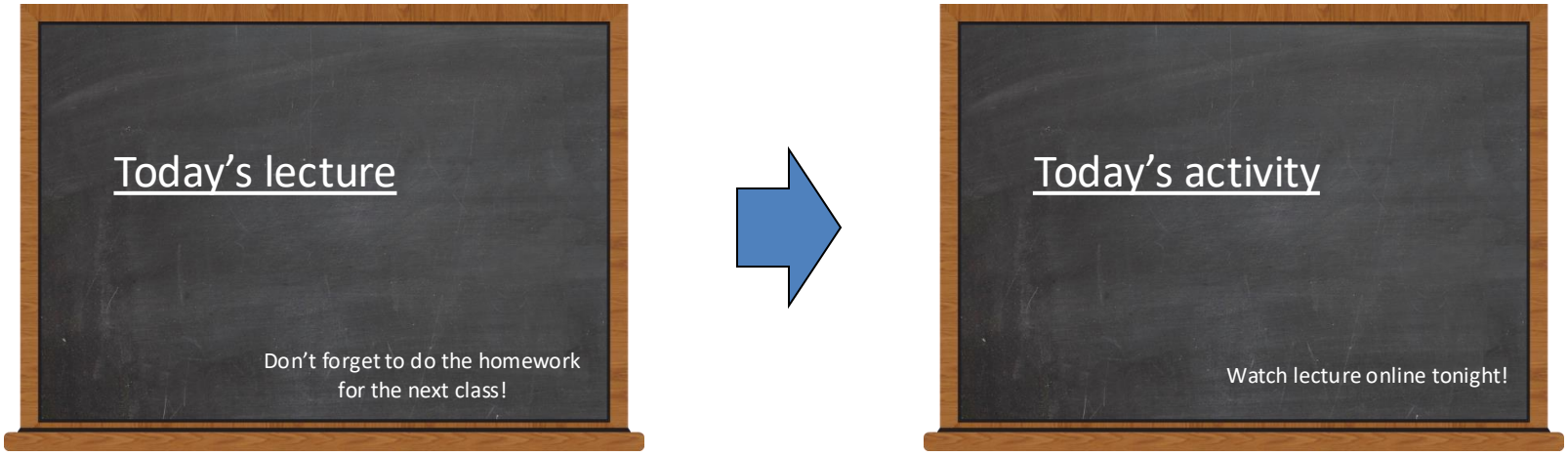


Blended Learning

- Combination of offline traditional learning and online learning in a way that the one complements the other
  - E.g., a student attends classes in a real-world classroom setting, and then supplements the lesson plan by completing online multimedia coursework

Flipped Classroom

- Type of blended learning
- Inverts traditional teaching methods
  - Delivering instruction online (outside of class)
  - “Moving” homework into the classroom



Flipped classroom

Flipped Classroom Characteristics

- Students first study the topic by themselves (e.g., using video lessons)
- They then apply the knowledge by solving problems and doing practical work in real class
- The teacher helps students anytime they have problems
- Merits
  - More class time for hands-on work and learning by doing and asking questions
  - Students can also help each other

Thank you

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