

Taking Leadership in Mystery of MOOCs and the Mass Movement toward Open Education

Curtis J. Bonk,
Professor, Indiana University
 cjbonk@indiana.edu
<http://mypage.iu.edu/~cjbonk/>



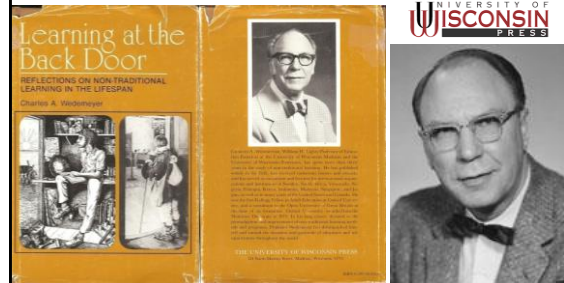
Part #1:
Learning is Changing... Through Open Ed, OCW, & MOOCs



Audience Poll #1:
Has learning technology ever transformed your life.



Took Correspondence & TV Courses
 (thanks to Bob Clasen and Charles Wedemeyer, the University of Wisconsin)



1728: 1st correspondence course advertised Boston
 (learn shorthand from Caleb Phillips thru weekly mailed lessons)
The First University Correspondence Course
 (University of London, External Program, 1858)
 1728-1990s – Generally postal system based
 1930s – phonograph and radio
 1950s and 1960s – television
 1970s and 1980s – VHS tapes
 1980s and 1990s – DVD



May 10, 2013
10 ed-tech tools of the 70s, 80s, and 90s
 eSchool News, Meris Stansbury
<http://www.eschoolnews.com/2013/05/10/10-ed-tech-tools-of-the-70s-80s-and-90s/print/>



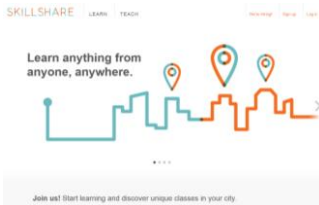
Looking to the Past...



Life as an accountant/CPA in a high tech company in the 1980s...



Fast Forward 25+ Years... "Anyone can now learn anything from anyone at any time."



August 5, 2013

Free Online Higher Education: 5 Best MOOCs

By **Kannan Sankaran, Epoch Times**

<http://www.theepochtimes.com/n3/229540-5-best-moocs-for-free-online-higher-education/>

MOOC at UPenn; Recession Fuels Explosion of Online Learning

<http://on.aol.com/video/recession-fuels-explosion-of-online-learning-517885097>

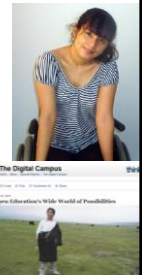


Learning is Changing New Technologies = New Delivery Methods...



I. Learning is More Open (80-Year-Old WGU Texas Grad Keeps His Promise, November 30, 2012, Reeve Hamilton, Texas Tribune)

THE TEXAS TRIBUNE
An 80-Year-Old Graduate With an Online Marketing Degree Kept His Promise



October 31, 2013

The launch of OERu: Towards free learning opportunities for all students worldwide, BC Campus (Canada)

<http://bccampus.ca/2013/10/31/the-launch-of-oeru-towards-free-learning-opportunities-for-all-students-worldwide/>

The launch of OERu: Towards free learning opportunities for all students worldwide

October 31, 2013

Imagine anyone in the world having credentials for it. With the launch that's exactly what is now possible and marks a transition from an elite program of accessible OERu studies.

The World is very open!
(In Chulalongkorn University Monday, March 10th)

The World is very open!
(in Ho Chi Minh City, Vietnam, Wednesday March 12th)

The World is very open!
(in Hoi An, Vietnam, Thursday March 13th)

The World is very open!
(in Hue, Vietnam, Friday March 14th)

January 29, 2014
Maybe it is not so open!
(e.g., MOOCs and the Promise of Internationalization, The Chronicle of Higher Education, Christina C. Davidson)



http://chronicle.com/ blogs/future/2014/01/29/moocs-and-the-promise-of-internationalization/?id=cpm&utm_source=ps&utm_medium=em

IV. Learning is More Mobile
New Coursera App for iOS!
Coursera Blog, December 8, 2013

<http://blog.coursera.org/post/6951833384/this-holiday-season-learn-on-the-go-with-the-new>

	Beijing 2008	London 2012
Smartphones	139.3 million	657 million
Facebook	90 million	901 million
Twitter	<1 million	300 million
Tweets / day	1.1 million	140 million
Tablets	0	54.8 million
App store downloads	300+ million	25+ billion

Sources: Nielsen, eMarketer, Corridor, Apple

V. Learning is More Global
UC Irvine (2013 report)

Example 3: Fundamentals of Japanese

Dr. Hideaki Riggs, Fall 2012 & Winter 2013, Tech-enhanced: [EEE Advanced Webbase \(Zoom/webex\)](#), [Skype](#) video conferencing tool, [Active Learning](#), Format: 5 - 1A lectures (24 students maximum); 3 - 2A lectures (24 students maximum); 2 - 3A lectures (24 students maximum)






Japanese end

VI. Learning is More Flipped
One Man, One Computer, 10 Million Students:
How Khan Academy Is Reinventing Education,
Forbes, November 19, 2013, Michael Noer
<http://www.forbes.com/sites/michaelnoer/2013/11/19/one-man-one-computer-10-million-students-how-khan-academy-is-reinventing-education/>
The One World Schoolhouse (Twelve, Oct. 2, 2012)



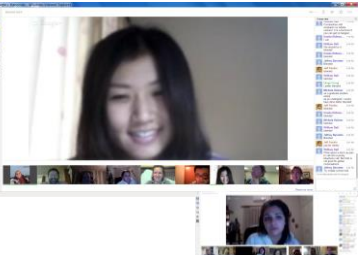



VII. Learning is More Video-Based
Adora Svitak, WFP Youth Representative - 2013
ECOSOC Youth Forum, March 27, 2013

"Shaping Tomorrow's Innovators: Leveraging science, technology, innovation and culture for today's youth" - Statement by the World Food Programme Youth Representative, Ms. Adora Svitak at the 2013 ECOSOC Youth Forum.
<http://webtv.un.org/meetings-events/ecosoc-and-its-kind/council-other-meetings/for-2013-ecosoc-youth-forum-youth-representative-2013-ecosoc-youth-forum-2013-ecosoc-innovators-leveraging-science-technology-innovation-and-culture-for-today-youth/1257875055001>




VIII. Learning also is More Collaborative
Collaboration and Discussion in Google Hangouts or with iPad,
Jan. 28, 2013
(Carrie Gong from Beijing Normal University)

IX. Learning is More Social
Facebook reaches one billion users, CNN Money,
Aaron Smith, October 4, 2012




X. Learning is More Personal
iPotty Aims To Entertain Toddlers During Toilet Training, Mashable, Kate Freeman
(January 10, 2013)
<http://mashable.com/2013/01/10/ipotty/>






Let's Review: Learning is Changing...
(i.e., it's more informal, video-based, ubiquitous, collaborative, self-directed, global, mobile, open, massive, etc.)



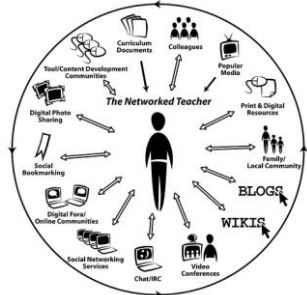



Frank Basile, an aircraft technician, took an MTX course on circuits and electronics to increase his knowledge.

Joe Alfonso, a financial adviser from Oregon, is taking the online finance course as a "refresher."

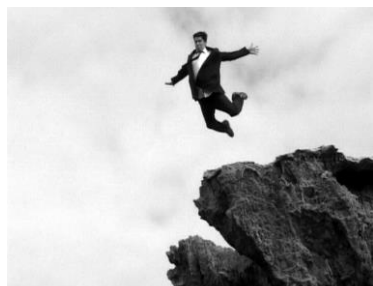
Poll #2: Is this a revolution in education today?
A. Yes...
B. No...

The Web of Learning

We are entering a jumping off point...



We are entering a jumping off point...




**We are entering a jumping
off point...**



**We are entering a jumping
off point...**



**Jumping off or tilting
sideways...?**



Or tilting sideways...?



Audience Polls #2:

- I. Who remembers what they were doing on 911?**
- II. Who remembers what they were doing on 441?**



Charles Vest (April 4, 2001)

"This is about something bigger than MIT. I hope other universities will see us as educational leaders in this arena, and we very much hope that OpenCourseWare will draw other universities to do the same. We would be delighted if -- over time -- we have a world wide web of knowledge that raises the quality of learning -- and ultimately, the quality of life -- around the globe."



October 31, 2013

The launch of OERu: Towards free learning opportunities for all students worldwide, BC Campus (Canada)

<http://bccampus.ca/2013/10/31/the-launch-of-oeru-towards-free-learning-opportunities-for-all-students-worldwide/>

The launch of OERu: Towards free learning opportunities for all students worldwide

October 31, 2013

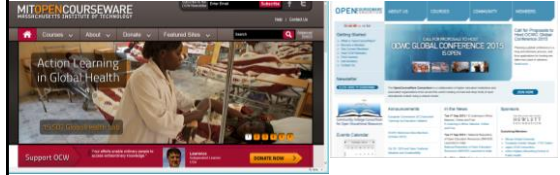
Imagine anyone in the world having access to a world-class education online for free, and getting credentials for it. With the launch of Open Educational Resources University (OERu) on November 1, that's exactly what is now possible. The launch is a significant milestone in higher education globally, and marks a transition from an international collaboration prototype to a sustainable, scalable program of accessible OERu study.



The official launch takes place at Thompson Rivers University in Kamloops, B.C. for [free-to-join participants](#), and streamed live for registered [virtual participants](#). The launch comes at the end of a two-day meeting of OERu anchor partners and will be hosted by Dr. Alan Shear, President, Thompson Rivers University. Sir John Daniel, Chair of United World Colleges (UWC) will give the keynote address and officially "push the button" to launch the OERu website.

"The OERu launch is an important milestone in the long campaign to make quality higher education more flexible and less expensive," said Sir John Daniel. "Getting it established will be a slow process because the concept is so radical. However, coming at a moment when higher education is in crisis because of rising costs and high youth unemployment, the OERu resources will form a kind of lifeline. In the next few days we'll reveal, but won't it be a bit."

Fast Forward to February 2014 MIT OCW and the OpenCourseWare Consortium



Instructor as Concierge



MIT OpenCourseWare (OCW)

<http://ocw.mit.edu/index.htm>

OCW is accessed by a broadly international population of educators and learners. MIT OpenCourseWare averages 1 million hits each month. Translations make a \$60,000 investment from all over the world for OpenCourseWare.

World Impact
Available in 100+ languages (PDF + HTML)

Our audience is diverse among students, educators, and self-learners.

Category	Percentage
Students	42%
Self Learners	43%
Educators	15%

MIT OpenCourseWare is being successfully used for a wide range of purposes.

October 28, 2013 Announcing MERLOT II: Multimedia Educational Resource for Learning and Online Teaching

<http://www.merlot.org/merlot/index.htm?action=find>

<http://www.youtube.com/watch?v=7Y1HNA6z0&feature=youtu.be>



September 16, 2013

Rwandan Degree Program Aims for a 'University in a Box', Chronicle of Higher Education, Megan O'Neil

<http://chronicle.com/article/Rwandan-Degree-Program-Aims/141631/>



Students attend an orientation session at Kepler, a new hybrid program in Kigali, Rwanda, which will use MOOCs and classroom time to help students earn competency-based associate degrees.

February 5, 2013

Bioelectricity: A Quantitative Approach, Duke University's First MOOC

http://dukespace.lib.duke.edu/ospace/bkstream/handle/10161/6216/Duke_Bioelectricity_MOOC_Fall2012.pdf

Figure 3. Bioelectricity Video Views
First and last dates for each week

Figure 5. Student motivations for enrolling

Other, please specify: 10%

Geographically isolated from educational institutions: 7%

Cannot afford to pursue a formal education: 10%

Interested in how these courses are taught: 34%

Professional Development: 64%

Decide if I want to take college/university classes: 13%

Supplement other college/university classes: 26%

Extending current knowledge of the topic: 53%

General interest in the topic: 87%

May 2013

MOOCs @ Edinburgh 2013- Report #1

Weekly course site activity - video content engagement

MOOC learner aspirations

Figure 9. Combined with survey responses to Q8 'What did you hope to get out of the course and did it meet your expectations?' - calculated as a sum of expected, not expected, and did better expectations - with percentage shown of total and survey responses.

January 21, 2014

MITx Working Papers (research on MOOCs)

<http://odl.mit.edu/mitx-working-papers/>

October 31, 2013

U.S. Teams Up With Operator of Online Courses to Plan a Global Network, Tamar Lewin, NY Times

http://www.nytimes.com/2013/10/31/us/politics/us-teams-up-with-coursera-to-plan-global-network.html?_r=1&hp

From Seoul, South Korea, to La Paz, Mexico, Coursera is partnering with local institutions to create "Global Learning Hubs," the company announced Oct. 31.

November 4, 2012

Udemy (professors create own courses) (e.g., "Planning Your Online Course")

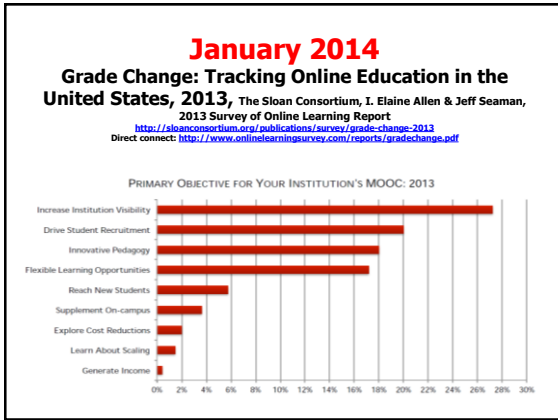
<https://www.udemy.com/courses/>

November 2, 2012

The Year of the MOOC, New York Times, Laura Pappano,

http://www.nytimes.com/2012/11/04/education/edtech/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?_r=1&hp

Clockwise, from top left: an online course in circuits and electronics with an M.I.T. professor (edX); statistics, Stanford (Udacity); machine learning, Stanford (Coursera); organic chemistry, University of Illinois, Urbana (Coursera).



July 16, 2013

"Golden Era of Learning"

Bill Gates Discusses MOOCs at Microsoft Research's Faculty Summit

<http://chronicle.com/article/A-Conversation-With-Bill-Gates/132591764>

On the Meaning of MOOC's
 Bill Gates says that this is the "golden era" of learning, thanks to massive open online courses and easy access to information. The chairman of Microsoft gave the keynote address on Monday at Microsoft Research's Faculty Summit, an annual event that brings together Microsoft researchers and academics from more than 700 institutions for a two-day conference on current issues facing computing.

May 6, 2013

Faculty Backlash Grows Against Online Partnerships

Chronicle of Higher Education, Steve Kolowich
<http://chronicle.com/article/Faculty-Backlash-Grows-Against/139049/>

May 6, 2013
 Faculty Backlash Grows Against Online Partnerships
 Michael Seneff, a Harvard professor, taught an online course that San Jose State U. asked its philosophy professors to use in place of their own instruction. They said no.

June 19, 2013

2013 is "The Year of the Anti-MOOC"

George Siemens, UW-Madison Summit

<http://globalthighered.wordpress.com/european-moocs-in-global-context/>

European MOOCs in Global Context
 Workshop
 21-22 June 2013 - UW-MADISON - EDUCATION BUILDING
 This workshop will explore the challenges and opportunities of MOOCs in global contexts. It will focus on the role of MOOCs in higher education and the impact of MOOCs on the global education landscape.

January 29, 2014

MOOCs and the Promise of Internationalization


The Chronicle of Higher Education, Christina C. Davidson
<http://chronicle.com/Chronicle/2014/01/29/moocs-and-the-promise-of-internationalization/>

THE CHRONICLE OF HIGHER EDU
 January 29, 2014
 #FutureEd
 MOOCs and the Promise of Internationalization
 A MOOC at Duke University, "Theory and Practice of Online Learning," opened its Monday morning. A list of its gathered in the university's South Westwood, participating students of technical questions about the online course. Near noon.

Mystery of MOOCs:


Part II. Five "5" MOOC Leadership Principles

MOOC Leadership Principle #1: Be First!
June 21, 2011 and August 2, 2011
Stanford U. Offers Free Online Course in Artificial Intelligence (over 160,000 enroll, 23,000 complete, and 238 perfect scores; <http://www.ai-class.com/>)



The image shows a screenshot of a news article from Stanford University. On the left is a photo of Professor Andrew Ng holding a tablet. On the right is a graphic for the 'Artificial Intelligence' course, featuring a person wearing a futuristic visor. Below the main headline is a smaller sub-headline: 'U. of Illinois at Springfield Offers New Massive Open Online Course'.

MOOC Leadership Principle #2: Take Risks
January 23, 2012, Udacity- Sebastian Thrun
<http://www.udacity.com/>




The image is a screenshot of the Udacity website. At the top, it says 'UDACITY' and 'We believe university-level education can be both high quality and low cost. Using the resources of the Internet, we've recruited some of the greatest teachers to hundreds of thousands of students all over the world.' Below this are two course cards: 'CS 101: BUILDING A SEARCH ENGINE' and 'CS 373: PROGRAMMING A ROBOTIC CAR'. On the right, there is a video player showing a hand drawing a diagram on a whiteboard with the word 'SEPARATION' written on it.

August 18, 2013
Virtual U: Master's Degree Is New Frontier of Study Online
Tamar Lewin, The New York Times
http://www.nytimes.com/2013/08/18/education/masters-degree-is-new-frontier-of-study-online.html?_r=0



The image is a screenshot of a New York Times article. The main headline is 'Virtual U: Master's Degree Is New Frontier of Study Online'. Below the headline is a photo of a man in a suit standing in front of a modern building. The article text is partially visible, starting with 'To mark the 50th anniversary of the College of Computing at the Georgia Institute of Technology, the school plans to offer students...

MOOC Leadership Principle #3: Rethink Delivery, Assessment, Certification, Students, etc.
MIT Will Offer MOOC Curricula, Not Just Single Courses, on edX
Steve Kolowich, Chronicle of HE
(September 18, 2013)
<http://chronicle.com/blogs/wiredcampus/mit-will-offer-mooc-curricula-not-just-single-courses-on-edx/46715>



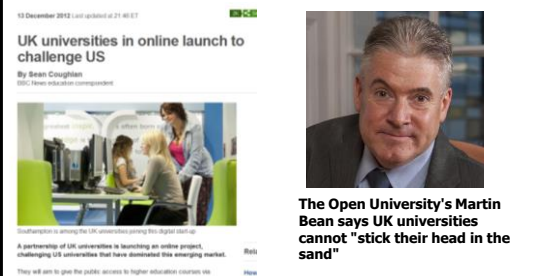
The image is a screenshot of a Chronicle of Higher Education article. The main headline is 'MIT Will Offer MOOC Curricula, Not Just Single Courses, on edX'. Below the headline is a photo of Steve Kolowich speaking at a podium. To the right is a video player showing a woman and a man in a classroom setting. The video title is 'MITX: MIT's new online learning initiative'.

Coursera List of Courses National Taiwan University
<https://www.coursera.org/taiwan>



The image is a screenshot of the Coursera website showing a list of courses from National Taiwan University. The list includes courses like 'University of Washington: Introduction to Business Management in Taiwan', 'National Taiwan University: Introduction to Computer-Aided Design and Computer Graphics', and 'National Taiwan University: Introduction to Business Management in Taiwan'. Each course entry includes a thumbnail image, the course title, and the start date.

December 13, 2012
UK universities in online launch to challenge US
BBC News, Sean Coughlan
<http://www.bbc.co.uk/news/education-20697392>



The image is a screenshot of a BBC News article. The main headline is 'UK universities in online launch to challenge US'. Below the headline is a photo of Sean Coughlan, a BBC news education correspondent. To the right is a video player showing a group of people in a classroom setting. The video title is 'The Open University's Martin Bean says UK universities cannot "stick their head in the sand"'. The article text is partially visible, starting with '13 December 2012 1:01 pm GMT+0 21 46:57'.

MOOC Leadership Principle #4: Collect Testimonials

June 11, 2012

<http://chronicle.com/article/S-Professors-Discuss-Teaching/132125/>



Krissa Swain, of Knoxville, Tenn., is taking "Operations Management" online to help develop her management skills.



Rajeev Bajpai, an airline pilot based in Mumbai, took an online computer-science course to gain programming skills.

MOOC Leadership Principle #5: Build on Strengths and Niche Areas Coursera course on Internet History, Technology, and Security, Chuck Severance 42,000+ sign up...

<http://www.youtube.com/watch?v=JzNHvmSv8TI>



September 9, 2013

Creativity MOOC Draw 120,000 Students (Penn State), Campus Technology, Leila Meyer
3 Student Profiles: Adventurers (committed); Tourists (pick and choose); and Explorers (in between)

<http://campustechnology.com/articles/2013/09/09/creativity-mooc-draws-120000-students.aspx?i=CTNU>

Dr. Jack V. Matson, Dr. Darrell Velegol and Dr. Kathryn W. Jablowski, Penn State University, Coursera



April 27, 2012

Introduction to Blackboard/CourseSites MOOC, With Dr. Curt Bonk: "Instructional Ideas and Technology Tools for Online Success" (4,039 now enrolled)

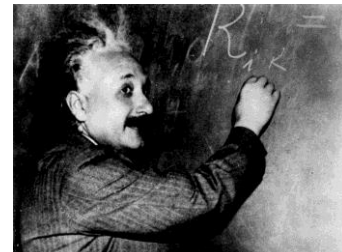
<http://www.youtube.com/watch?v=rBNe8CuePTQ&feature=youtu.be>



Mystery of MOOCs: Part III. 4 Types of MOOCs



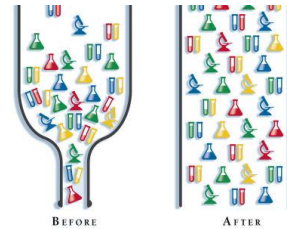
MOOC Type #1. Theory- or Trend-Driven MOOC



MOOC Type #2. Remedial Course MOOC



MOOC Type #3. Degree or Program Qualifier or System Bottleneck MOOC



MOOC Type #4. Professional Development (PD) (practical) MOOC



Mystery of MOOCs: Part IV. Five "5" MOOC Business Plans and Models



MOOC Business Model #1. Advertisers Underwrite Courses and Degrees



MOOC Business Model #2. Small and Flexible Application or Enrollment Fee



MOOC Business Model #3. Course Assessment Fee



MOOC Business Model #4. Certificate Fee (with sticker)

<https://twitter.com/drchuck/status/262423228717355009/photo/1>



MOOC Business Model #5. Free Entryway Course



Mystery of MOOCs: Part V. Seven "7" MOOC Instructor Guidelines

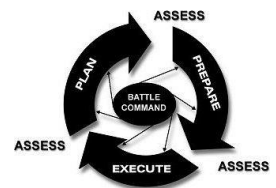


Audience Poll #3:
 Have you taught a MOOC before?
 Have you ever taken a MOOC as a student?
 Have you ever browsed a MOOC?

- A. Yes
- B. No




MOOC Instructor Guide #1. Plan and Prepare



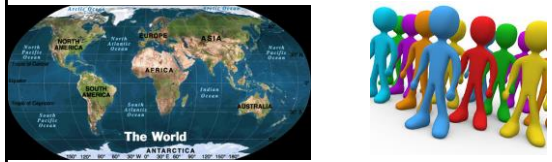
MOOC Guide #2.

Use Peer, Machine, Volunteer, and Self-Assessment (designate feedback providers)





MOOC Guide #3.

Personalize Where Possible!



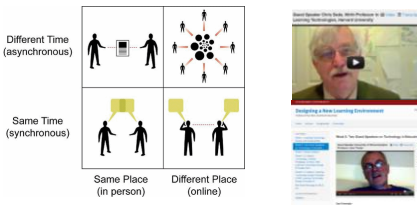
MOOC Guide #4.

Form Groups and Social Supports

MOOC Guide #5.

Combine Sync and Async Instruction



MOOC Guide #6.

Offer Weekly Recaps and Share Resources

Let's Recap




MOOC Guide #7.

Involve the Participants (e.g., use Polling Questions)

Poll #1:
What is your biggest gain from this course?

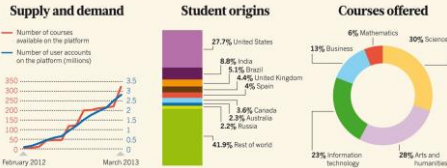
- A. Online teaching strategies
- B. Online teaching models
- C. Useful resources and tools
- D. New friends and connections
- E. Self-confidence



Mystery of MOOCs: Part VI. Research on MOOCs and OER

MOOCs rising

Over the last more than a year, Coursera in Mountain View, California — the largest of three companies developing and hosting massive open online courses (MOOCs) — has introduced 238 different courses from 62 universities in 17 countries (left). The platform's 2.9 million registered users come from more than 200 countries (center). And courses span subjects as diverse as pre-calculus, equine nutrition and introductory jazz improvisation (right).



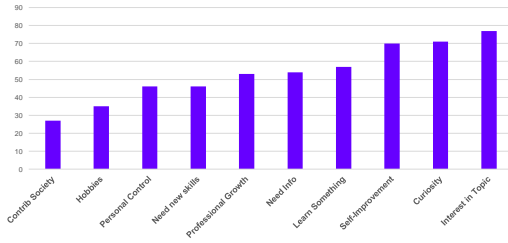
Study #1. MIT OpenCourseWare (OCW) Study

■ E-newsletter subscription 156,000 people

- 1,429 completed surveys
 - ◆ 613 completed open ended items
- 50% over age 40
- 76% males
- North America (44 percent); Asia (23 percent); Europe (14 percent); South America (10 percent); Middle East (3 percent); Oz (2 percent).
 - ◆ Top countries in the MIT OCW subscriber list were the United States, India, China, Brazil, Nigeria, Pakistan, Iran, Canada, the UK, Taiwan, Indonesia, Mexico, and Egypt.

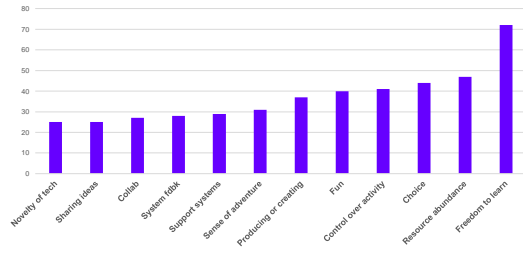
Reasons to explore?

Main Reason Explore the Web Informally to Learn
(MIT OCW Group; Note: Check all that apply)



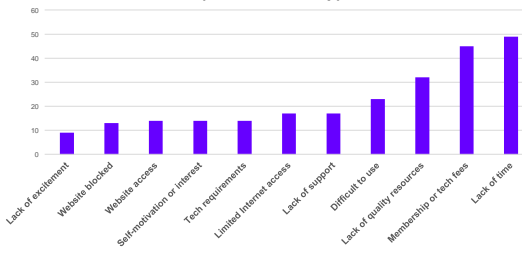
Factors leading to success or personal change?

Factors Leading to Success or Personal Change When Exploring Online
(MIT OCW Group; Note: Check all that apply)



What obstacles faced?

What Obstacles Faced When Learning Informally Online
(MIT OCW Group)



MIT Data: Self-Taught on Social Media

(21-30 year old unemployed female, North America)

At first my purpose was to fulfill boredom ...**After graduating with a MS, I was faced with unemployment. I took the opportunity to read blogs, watch Youtube videos, and more to learn about blogging and social media. Since then I have become well versed in social media and other business topics and started a business... I decided not to pursue a PHD because I am learning a more rapid pace. Instead of spending 5 years in school, I can be flexible and work on what I am learning.**



**MIT Data:
Prepares to Reenter University
(41-50 year old male, Middle East)**

Most interesting experience of my own was my use of MIT OCW to refresh on Calculus. I purchased the textbook and followed one of several calculus options on the site. **This was quite successful in re-introducing Calculus, as a prep to re-entering college 28 years after graduation - this time to study for a Master's.**



**MIT Data:
Retiree Develops New Hobby
(70+ year old female, North America)**

I'm an avid photographer and have developed skills for developing my own website for display of my photography and books I have written that include my photographs...I've had multiple careers, from science, to public administration, and information technology. The development of my art is a new and exciting experience.

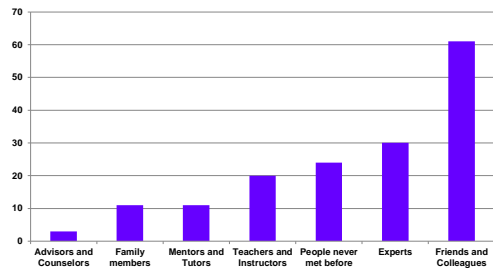


**Study #2.
Blackboard (CourseSites) MOOC
<http://events.blackboard.com/open>**



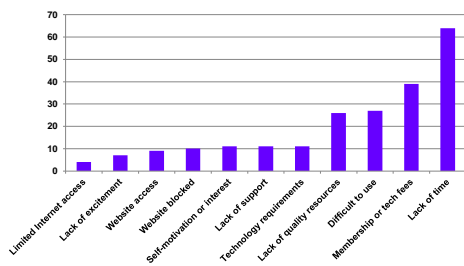
Blackboard Data

Who typically supports your informal learning experiences?



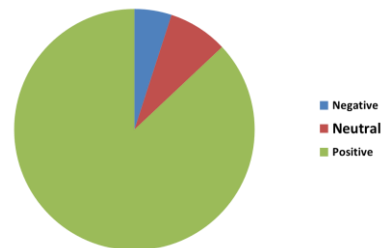
Blackboard Data

Figure 7. Obstacles and challenges faced when learning informally online.



Experience life change?

(0 = not at all; 5 = moderately; 10 = significantly)
Has your life changed from informal learning on the Web?



Life Changing Example #1

Yes. I plan to focus my Ph.D. research on alternative forms of learning (informal DIY) and credit (like open badges) and the changes higher ed and employers will have to make to accept these forms of credit.



Life Changing Example #2

It has made my job much easier and it's been easier for me to execute certain tasks, making me more willing to take on bigger challenges. It was also shown me how enjoyable it is to learn a computer language. It opened my mind to considering possibilities in this area. It also made my husband respect my ability around computers a bit more.



Life Changing Example #3

My life has changed in a big way. I used these new skills to create a small business that supplements my income. I couldn't use this income solely to support myself, but it does pay some bills.



Life Changing Example #4

It has changed because I have learned new things and got more creative in my own field...The key moment was when I felt that the world is now becoming open as Dr. bonk describes it. I don't need to travel to different countries and spend my time and money trying to get a new idea or learn a new skill. I can have the access to quality materials, novel ideas and experts anywhere and any time.



December 13, 2013

Former MIT president Charles M. Vest dies at 72 As the Institute's leader from 1990 to 2004, he sparked a period of dynamism.

Steve Bradt, MIT News Office

<http://web.mit.edu/newsoffice/2013/former-mit-president-charles-m-vest-dies-at-72-1213.html>

MITnews

Former MIT president Charles M. Vest dies at 72

As the Institute's leader from 1990 to 2004, he sparked a period of dynamism.

By Steve Bradt

December 13, 2013

Charles M. Vest, former MIT president, died at 72 on December 13, 2013. He served as president of MIT from 1990 to 2004.

Vest was a leader in the development of MIT's new initiatives in nanotechnology, robotics, and artificial intelligence.

He was also a strong advocate for the Institute's role in addressing global challenges.

Vest was born in 1941 in New York City and graduated from MIT in 1963.

He received his Ph.D. from MIT in 1966 and worked for several years at IBM.

He returned to MIT in 1971 and worked in various capacities until becoming president in 1990.

Under his leadership, MIT's research and educational programs expanded significantly.

Vest was a member of the National Academy of Sciences and the American Academy of Arts and Sciences.

He is survived by his wife, Joan, and two children.

Funeral services will be held at MIT on December 17, 2013.

Interment will be in the MIT Chapel.

For more information, please contact Steve Bradt at (617) 253-2345.

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