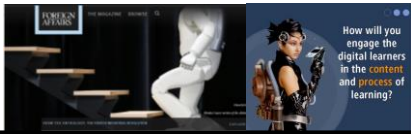


What is the Future of Learning?: The Fourth Industrial Revolution Meets the Fourth E-Learning Revolution

Curtis J. Bonk, Professor, Indiana University

cjbonk@indiana.edu

<http://mypage.iu.edu/~cjbonk/>

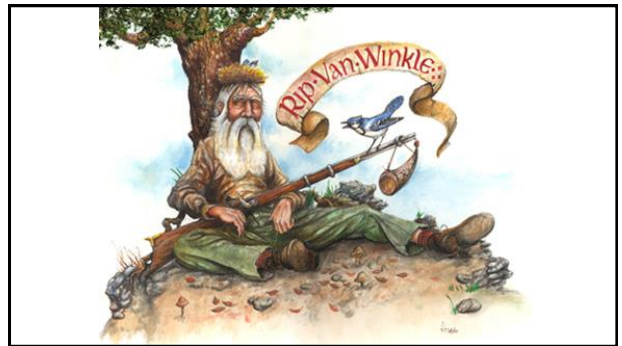


Talk Overview

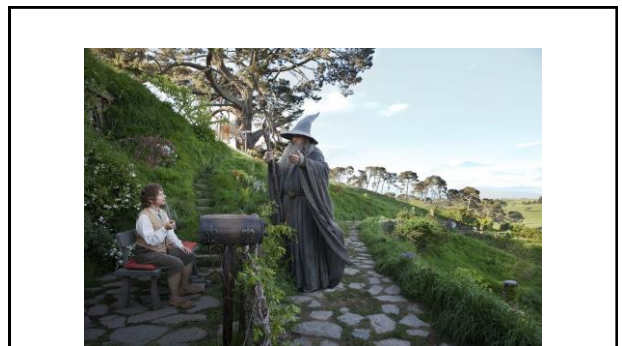
1. Education 20/20 and the Role of the Instructor
2. First and Last Principles of Instruction
3. 4 Industrial Ages; 4 E-Learning Ages
4. Artificial Intelligence vs. Intelligence Augmentation
5. Megatrends of Learning: Engagement, Access, and Customization (30 ways that learning is changing...)
6. Future Trends and Ideas



(Circa Confucius 551–479 BCE)



What happens to
sleeping students?



Education 20/20



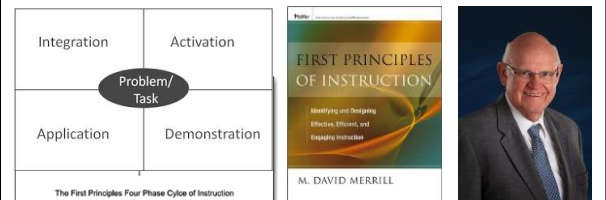
20 New Roles of the Instructor

Captain Course Ambassador Consumer Advocate
 Counselor Curator Cook Change Catalyst
 Conductor Concierge Comedian
 Consultant Camping Trip Guide Coach
 Course Expedition Leader Collaborator
 Community Organizer Chemist Care Giver
 Cultivator Colleague



Merrill's First Principles of Teaching/Instruction

<http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html>



Bonk's 20 "Last" Principles of Instruction (LAST = Learning Activation System Template)

<http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html>

Flexibility Support and Feedback Choice and Options
 Convenience Spontaneity Nontraditional Learning
 Collegiality Organization Passion and Inspiration
 Sharing Relevance and Meaningfulness
 Cheerfulness and Optimism Trial and Error (i.e., it is ok to fail)
 High Expectations Purpose and Vision Expanded Resources
 Empowerment and Autonomy Human Connectedness #20 ???
 Cognitive Apprenticeship

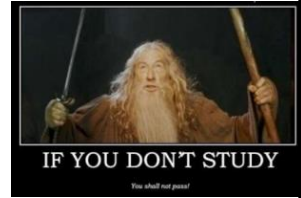


20. ??? (what is missing)

<http://travelinmedman.blogspot.com/2011/05/bonks-test-principles-of-instruction.html>



Clearly... Learning is Changing!



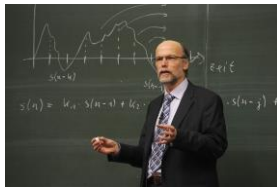
Poll #1: Do you remember the days before e-learning?



Fast Forward 30+ More Years... "Anyone can now learn anything from anyone at any time."



Education 3.0...Education 20/20

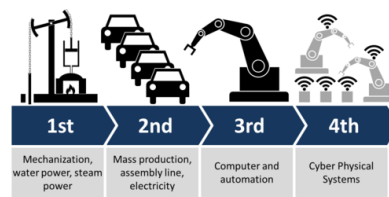


"In Education 3.0, classrooms would move away from lectures, such as this one, to having class time be spent on discussions and projects, using digital technology."
(Per Wikipedia: https://en.wikipedia.org/wiki/Education_3.0)

Just what is the Fourth Industrial Revolution?

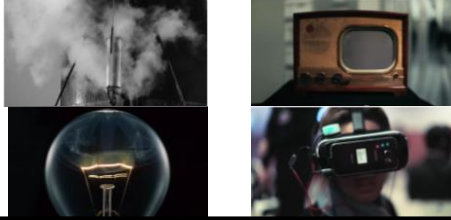
Industry 4.0 (per Wikipedia)

https://en.wikipedia.org/wiki/Industry_4.0




April 13, 2016**The Fourth Industrial Revolution**

Klaus Schwab, Founder and Executive Chairman, World Economic Forum
 (Ubiquitous, mobile supercomputing, artificially-intelligent robots, self-driving cars, neuro-technological brain enhancements, genetic editing, etc.)
<http://www.trainingshare.com/fourth-industrial-revolution-video-clip-short.php>


**January 14, 2016****The Fourth Industrial Revolution: What it means, how to respond**

Klaus Schwab, Founder and Executive Chairman, World Economic Forum
<https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>
 (Ubiquitous, mobile supercomputing, artificially-intelligent robots, self-driving cars, neuro-technological brain enhancements, genetic editing, etc.)
<http://www.trainingshare.com/fourth-industrial-revolution-video-clip-short.php>



Navigating the next industrial revolution

Revolution	Year	Information
1	1784	Steam, water, mechanical production equipment
2	1870	Division of labour, electricity, mass production
3	1969	Electronics, IT, automated production
4	?	Cyber-physical systems


January 14, 2016**The Fourth Industrial Revolution: What it means, how to respond**

Klaus Schwab, Founder and Executive Chairman, World Economic Forum
<https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>



The possibilities of billions of people connected by mobile devices, with unprecedented processing power, storage capacity, and access to knowledge, are unlimited. And these possibilities will be multiplied by emerging technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing.

January 14, 2016**The Fourth Industrial Revolution: What it means, how to respond**

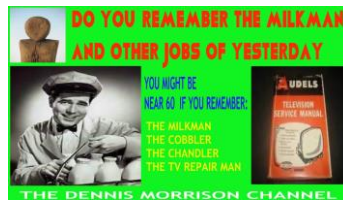
Klaus Schwab, Founder and Executive Chairman, World Economic Forum
<https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

**April 30, 2017****'Those Jobs Are Gone'**

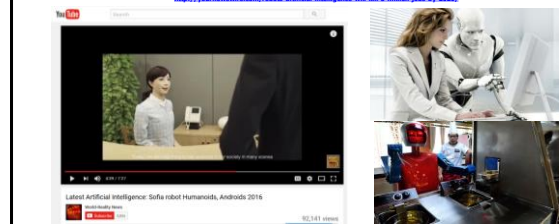
Steve Kolowich, The Chronicle of Higher Education
<http://www.chronicle.com/article/Whos-UpWhos-Down-in/239964>

'Those Jobs Are Gone'

A 19-hour documentary follows the author, Steve Kolowich, as he visits a group of workers in the textile industry who are struggling to find new jobs in a post-industrial world. The film is a powerful look at the challenges of the future of work.

**March 22, 2016****Robots & Artificial Intelligence Will Kill 5 Million Jobs By 2020**

Carol Adl, Artificially-intelligent robots
<https://www.youtube.com/watch?v=QUR8342W6Q>
<http://yournewswire.com/robots-artificial-intelligence-will-kill-5-million-jobs-by-2020/>



August 21, 2016

ST Future Economy Roundtable: Is Asia ready for the Fourth Industrial Revolution?

The Straits Times
<http://www.straitstimes.com/asia/Is-asia-ready-for-the-fourth-industrial-revolution>



"It's quite clear that the established models of education have to change and adapt to the new environment."

April 13, 2016

The Fourth Industrial Revolution:

What it means, how to respond

Klaus Schwab, Founder and Executive Chairman, World Economic Forum

<https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>
<http://trainingshare.com/fourth-industrial-revolution-video-clip.php>
<http://www.tubechop.com/watch/8280981>



The world is really open to learning.

August 17, 2016

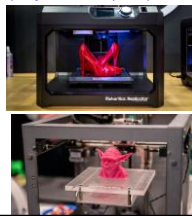
Research: 3D Printing Market to Double by 2020

Joshua Bolkan, Campus Technology

<https://campustechchannel.com/article/2016/08/17/research-3d-printing-market-to-double-by-2020.aspx>

Research: 3D Printing Market to Double by 2020

By Joshua Bolkan 08/17/16

**June 7, 2016**

Teaching refugees how to code CNN Money

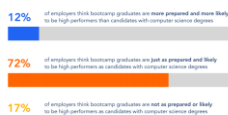
<http://money.cnn.com/video/technology/2016/06/07/recorded-refugees-code.cnnmoney/index.html>

**May 3, 2017**

4 out of 5 Companies Have Hired a Coding Bootcamp Graduate

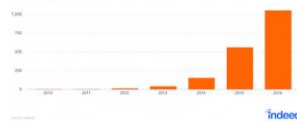
Sri Ravipati, Campus Technology

<http://campustechchannel.com/article/2017/05/03/4-out-of-5-companies-have-hired-a-coding-bootcamp-graduate.aspx>



Resumes with "coding bootcamp" education experience

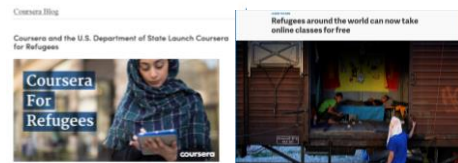
For 1,000,000 resumes on Indeed

**June 20, 2016**

Coursera on a Mission to Help Refugees

Lauren Camera, US News and World Report

<http://www.usnews.com/news/articles/2016-06-20/coursera-on-a-mission-to-help-refugees>



February 9, 2017
More black and Latino students learn to code as Code.org classes swell

Jessica Guynn, USA Today

<http://www.usatoday.com/story/tech/news/2017/02/09/codeorg-teaches-black-latino-students/97921518/>



Code.org said Thursday that it has enrolled more than 10,000 students in its CS Principles course. About half of the students are Latino or African American. Photo: Reuters and Reuters/Associated Press

September 21, 2016
Udacity Unveils Nanodegree Program for Self-Driving Car Engineers

Sri Ravipti, Campus Technology

<http://campustechology.com/articles/2016/09/21/udacity-unveils-nanodegree-program-for-self-driving-car-engineers.aspx>



Udacity Unveils Nanodegree Program for Self-Driving Car Engineers

By Sri Ravipti - 09/21/16



May 10, 2017
3 overlooked LinkedIn features to find a better paying job

Steven Petrow, USA Today

<http://www.usatoday.com/story/tech/news/2017/05/10/3-overlooked-linkedin-features/36102490/>

3 overlooked LinkedIn features to find a better paying job



July 28, 2016

Knod

(Per Dr. Michael Mayrath: work with employers to diagnose skills gaps, then provide a platform to deliver content to build those skills in a learn by doing experiences, real projects with employers)

<http://www.knod.net/>



Poll #4:
Read any good books lately detailing this shift?



The Innovators:
How a group of hackers, geniuses, and geeks created the digital revolution. New York: Simon & Schuster.

Walter Isaacson (2014)

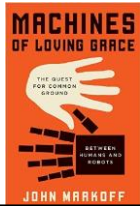
<https://books.google.com/books?id=The-Innovators-Walter-Isaacson/9781452908000>



Machines of Loving Grace:

The Quest for Common Ground Between Humans and Robots. HarperCollins.
John Markoff (2015)

<http://www.amazon.com/Machines-Loving-Grace-Common-Between/dp/0062266863>



Artificial Intelligence

John McCarthy, Stanford AI Lab

<http://www.amazon.com/Machines-Loving-Grace-Common-Between/dp/0062266863>

John McCarthy

- 1955: Develop the phrase "Artificial Intelligence"
- 1959: Programs with Common Sense
- 1960: First LISP implementation
- 1971: Turing Award Recipient



Intelligence Augmentation and Amplification

Douglas Engelbart's "The Mother of All Inventions" (1968)
Augmentation Research Center (ARC)

(The live demonstration featured the introduction of the computer mouse, video conferencing, teleconferencing, hypertext, word processing, hypermedia, object addressing and dynamic file linking, bootstrapping, and a collaborative real-time editor.)

<http://www.amazon.com/Machines-Loving-Grace-Common-Between/dp/0062266863>



Engelbart's prototype of a computer mouse, as designed by Bill English from Engelbart's sketches.



Knowledge Navigator (1987)

Apple Computer

<http://www.youtube.com/watch?v=h4kzFwEoc>



August 6, 2016

The Web is 25!

Happy (sort of) birthday, World Wide Web!
Erica Fink and Jonathan Tortora, CNN Money (Tech)

<http://info.cern.ch/> (First website)

<http://info.cern.ch/hypertext/WWW/TheProject.html>

<http://money.com.com/2016/08/06/technology/world-wide-web-25-years-old/index.htm?lid=hp-stack-dom>



January 15, 2016

Wikipedia is 15!

Scott McLeod, Inside Higher Ed

<https://www.insidehighered.com/news/2016/1/15/celebrate-wikipedia-15th-anniversary>



Wikipedia at 15

Celebrate or hate it as you will, writes Scott McLeod, Wikipedia has metamorphosed from its beginnings as a gangly cultural interloper into the de facto reference work of first resort.

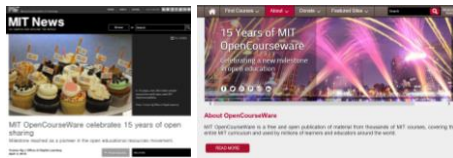
January 15, 2016

by Scott McLeod

Wikipedia came into the world 15 years ago today -- and, man, what an ugly baby. The first snapshot of it in the Internet Archive is from late March of 2001, when Wikipedia was already 10 weeks old. At that point, it claimed to have more than 3,000 pages, with an expressed hope of reaching

April 4, 2016 MIT OpenCourseWare is 15!

<http://ocw.mit.edu/about/15-years/>



The World is Open: How Web Technology Is Revolutionizing Education



TEN OPENERS: (WE-ALL-LEARN)

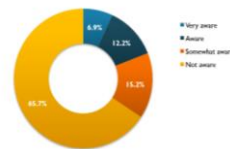
1. Web Searching in the World of E-Books
2. E-Learning and Blended Learning
3. Availability of Open Source and Free Software
4. Leveraged Resources and OpenCourseWare
5. Learning Object Repositories and Portals
6. Learner Participation in Open Information Communities
7. Electronic Collaboration
8. Alternate Reality Learning
9. Real-Time Mobility and Portability
10. Networks of Personalized Learning



July 2016 The Awareness Problem: Opening the Textbook: Educational Resources in U.S. Higher Education, 2015-2016

I. Elaine Allen and Jeff Seaman, Babson Survey Research Group
<http://www.asilinklearningresources.com/reports/openingthetextbook2016.pdf>

AWARENESS OF OPEN TEXTBOOKS: 2015-16



OER Use to Triple Over Next 5 Years



The Evolution of E-Learning (All 7 year cycles)



Phase I, 1994:
THE AGE OF
PORTALS AND
PAGES (NETSCAPE
GOES PUBLIC).



Phase II, 2001:
THE AGE OF
OPENNESS
(MIT OCW &
WIKIPEDIA BORN).



Phase III, 2008:
THE AGE OF
MOOCs (FIRST
MOOC OFFERED).



Phase IV, 2015
THE AGE OF
PERSONALIZATION.

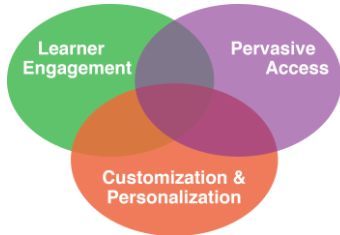
Other prior significant e-learning dates: 1985: FIRST ONLINE COURSE, LINDA HARASIM, UNIV. OF TORONTO
1987: HYPERCARD FIRST SHIPPED.

Thirty Ways Learning is Changing...

(i.e., it's more informal, video-based, ubiquitous, collaborative, self-directed, global, mobile, open, massive, etc.)



30+ Ways Learning is Changing: The Mega Trends



How Learning is Changing: Mega Trend #1. Learner Engagement



Learning is More Social

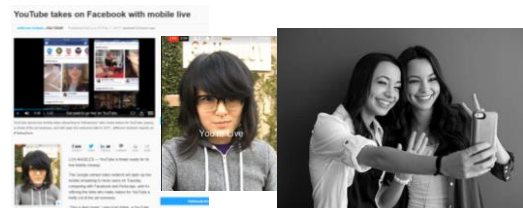


February 7, 2017 (Engagement) Learning is More Social

YouTube takes on Facebook with mobile live

Jefferson Graham, USA Today

<http://www.usatoday.com/story/tech/2017/02/07/youtube-takes-facebook-mobile-live/97566592/>



May 31, 2017 Learning is More Digital and Resource Rich Enticing Students to Read Again

Ellen McCracken, The Chronicle of Higher Education

Digital Dubliners—a guide to Joyce's stories written for students by students, will bring a new reading experience to today's classroom.



February 27, 2017 (Engagement) Learning is More Immersive Augmented and Virtual Reality Spending to Double in 2017, Sri Ravipati, THE Journal

<https://thejournal.com/articles/2017/02/27/augmented-and-virtual-reality-spending-to-double-in-2017.aspx>
Worldwide: "forecasts the AR/VR market to reach \$13.9 billion in 2017 -- up 130.5 percent from the \$6.1 billion spent in 2016. Furthermore, AR/VR spending is expected to accelerate over the next several years, achieving a compound annual growth rate (CAGR) of 198 percent over the 2015-2020 forecast period and reaching \$14.7 billion in 2020."

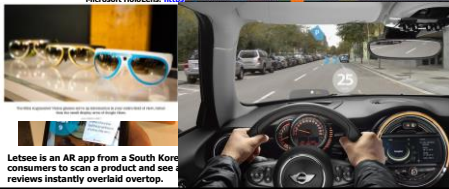


June 10, 2015 (Engagement) Learning is More Immersive

Augmented reality promises 'superpowers', and people are listening

The USA Today, Marco della Cava

<http://www.usatoday.com/story/tech/2015/06/10/letsee-app-review/2961266/>
<http://www.usatoday.com/story/tech/2015/06/10/letsee-app-review/2961266/>
 Microsoft HoloLens: <https://www.youtube.com/watch?v=3bCnDn8u8>



Letsee is an AR app from a South Korean consumer to scan a product and see reviews instantly overlaid on top.

May 18, 2017

Learning is More Immersive

Google Expeditions Adds Augmented Reality for Classrooms, Sri Ravipati, THE Journal
<https://thejournal.com/articles/2017/05/18/google-expeditions-adds-augmented-reality-for-classrooms.aspx>

<https://www.youtube.com/watch?v=D1d4WTVY>

27 seconds: <http://curtbonk.com/thejournal27.html>

38 Seconds: <http://curtbonk.com/thejournal38.html>

1:10: <http://curtbonk.com/thejournal.html>

Google Expeditions Adds Augmented Reality for Classrooms

By Sri Ravipati



June 1, 2017 Learning is More Immersive

Major League Baseball to live-stream games in virtual reality

Edward C. Baig, USA Today

<https://www.usatoday.com/story/tech/2017/06/01/mlb-vr-live-stream/20170601/>
 High-end 720p: Whole video: <http://curtbonk.com/video-of-sports-in-here.html>
 Super high-end 4K: Whole video: <http://curtbonk.com/video-of-sports-in-here-4k.html>
 1:09: <http://curtbonk.com/video-of-sports-in-here-108.html>



May 30, 2017

Learning is More Immersive

Fly above the water with Oracle Team USA in 360

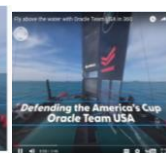
<https://www.usatoday.com/story/tech/2017/05/30/oracle-team-usa-360/20170530/>

The first 17 seconds: <http://curtbonk.com/sailing-17.html>

1:14 to 1:54: <http://curtbonk.com/sailing-40.html>

Whole video: <http://curtbonk.com/sailing.html>

1:01: <http://curtbonk.com/sailing-101.html>



May 7, 2015 (Engagement) Learning is More Adventurous

Aaron Doering, Chasing Seals, TEDx

<http://chasingseals.com/>

<https://twitter.com/chasingseals>



July 22, 2016 (Engagement) Learning is More Game-like

When Pokémon Goes to Campus: The Good, the Bad, and the Ugly

Gabriel Sandoval, Chronicle of Higher Education

<http://chronicle.com/article/When-Pok%C3%A9mon-Goes-to-Campus/237777>



Pokémon Go players converged last week on the U. of Nebraska at Lincoln's Memorial Stadium, which officials had opened to the animated-monster hunters. The hit augmented-reality game has prompted many colleges to jump on the bandwagon.

Learning is More Online (Access)

June 15, 2014

Starbucks offers workers 2 years of free college, CNN Money, Gregory Wallace (from Arizona State online programs)

http://money.com/2014/06/15/news/economy/starbucks-scholarship-education/index.html?h=hp_12
<http://www.cnn.com/2014/06/15/starbucks/index.html>



May 10, 2017

Learning is More Online (Access)

50-year-old Bible college in Colorado Springs to sell campus, switch to online-only instruction, Debbie Kelley, The Gazette

<http://www.thegazette.com/35-year-old-bible-college-to-sell-campus-switch-to-online-only-instruction/article1862879>

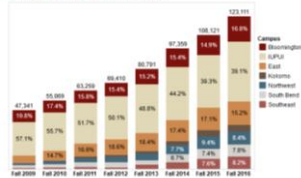
50-year-old Bible college in Colorado Springs to sell campus, switch to online-only instruction

By Debbie Kelley May 10, 2017 - Updated May 10, 2017 at 5:07 am



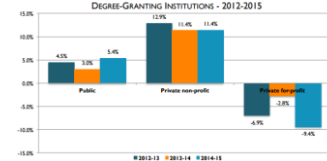
November 22, 2016 Learning is More Online (Access) Indiana University, Online Course Enrollments <https://cbl.bi.iu.edu/>

Trends for Total Hours Taken in Online Classes



May 2, 2017 Learning is More Online (Access) 'Volatile' but Growing Online Ed Market, Carl Straumsheim, Inside Higher Ed <http://www.insidehighered.com/digital-learning/article/2017/05/02/online-ed-market>

YEAR-TO-YEAR PERCENTAGE CHANGE IN DISTANCE ENROLLMENTS - DEGREE-GRANTING INSTITUTIONS - 2012-2015



April 27, 2017 Learning is More Online (Access) Purdue Buys For-Profit Kaplan University for \$1 to Create New Kind of Public University, Jeffrey R. Young, EdSurge <https://www.edsurge.com/news/2017-04-27/purdue-buys-the-profit-kaplan-university-the-1-to-create-new-kind-of-public-university>



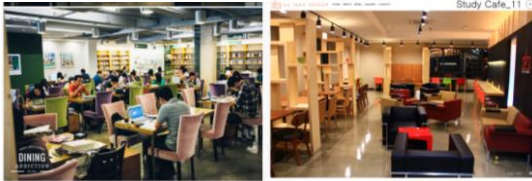
July 21, 2016 (Access) Learning is More Ubiquitous Facebook's Aquila drone completes first test flight, Jessica Gwynn, USA Today <http://www.usatoday.com/story/tech/news/2016/07/21/facebook-aquila-completes-first-test-flight/87248110/>



An aerial view of Aquila, a autonomous aircraft Facebook is designing to deliver mobile broadband networks to isolated people (mission to fly 60,000 above Earth for up to 3 months at a time; current record for solar-powered unmanned flight is 2 weeks). (Photo: Facebook)

August 1, 2016 (Access)
Learning is More Ubiquitous
 363 by Idea Group; Study Café
 Meeting Place; Idea Space (Seoul, Korea)

<http://363.ck.kr/en/2016/08/01/idea-space-seoul>
<http://363.ck.kr/en/2016/08/01/idea-space-seoul>



May 7, 2014 (Access)
Learning is More Global

CNA - Speaking Exchange (video chats)
<https://www.youtube.com/watch?v=S-5EfwF0k>
 FCB Brazil and the CNA language school network are launching the Speaking Exchange project, which connects CNA students in Brazil with Americans living in retirement homes.



February 22, 2017 (Access)
Learning is More Informal

Digital citizenship lessons from a 9-year-old with 18,000 Twitter followers, Alan November, eSchool News

<http://www.eschoolnews.com/2017/02/22/av-digital-citizenship-twitter/>
<http://www.eschoolnews.com/2017/02/22/av-digital-citizenship-twitter/>
<http://www.eschoolnews.com/2017/02/22/av-digital-citizenship-twitter/>
<http://www.eschoolnews.com/2017/02/22/av-digital-citizenship-twitter/>



August 5, 2015 (Access)
Learning is More Informal

Shubham Jaglan (10 years old) Overwhelmed by "Dream" Return Home After Double World Championship
 Disha Chopra, NDTV Sports

<http://sports.ndtv.com/golf/shubham-jaglan-overwhelmed-by-dream-return-home-after-double-world-championship>
<http://sports.ndtv.com/golf/shubham-jaglan-overwhelmed-by-dream-return-home-after-double-world-championship>



June 13, 2016 (Access)
Learning is More Free and Open
 Nine-Year-Old Anvitha Vijay is the Youngest Developer at WWDC (age 9)
 (Apple Worldwide Developers Conference), Gadgets

<http://developer.apple.com/news/2016-06-13/27b>



May 4, 2016 (Access)
Learning is More Free and Open
This Mongolian Teenager Aced a MOOC
 (140,000 people take the MIT MOOC on Circuits and Electronics, 1 of 300 to get a perfect score)
 The Chronicle of Higher Education, Jeffrey R. Young
<http://chronicle.com/article/This-Mongolian-Teenager-Aced-a/236362>

THE CHRONICLE OF HIGHER EDUCATION

This Mongolian Teenager Aced a MOOC. Now He Wants to Widen Their Impact.

By Jeffrey R. Young | MAY 4, 2016

This is the latest episode of our new podcast series on the future of higher education. You can subscribe to it on iTunes and Google Play.

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May 19, 2016 (Access)
Learning is More Free and Open
From MOOC to bootcamp to MIT
MIT News, Office of Digital Learning
 (Jin Wu—from MITx to MIT Global Entrepreneurship Bootcamp to master's student)
<http://news.mit.edu/2016/mooc-bootcamp-mit-0519>



September 28, 2016 (Access)
Learning is More Free and Open
Bookshare, An accessibility online
library for people with disabilities
<https://www.bookshare.org/>



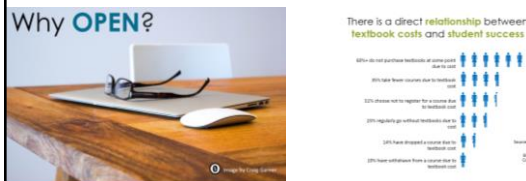
April 6, 2017 (Access)
Learning is More Free and Open
Indiana University's eText program saves students over
\$3.5 million (Program makes digital textbooks cost less
and do more, grows 56 percent),
Indiana University Newsroom
<https://ibnews.iu.edu/articles/2017/indiana-universitys-etext-program-saves-students-over-3-5-million.php>



March 27, 2017 (Access)
Learning is More Free and Open
Beyond Free: Harnessing the resonant value in open
and collaborative practices for the public good
David Porter, CEO, eCampus Ontario,
Open Education Ontario Summit
<https://www.oecs.ca/events/open-education-ontario-summit>

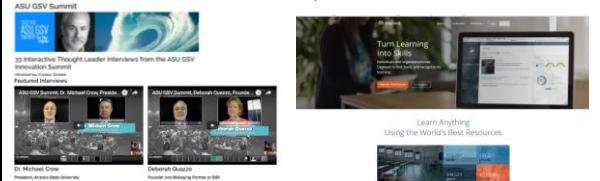


March 27, 2017 (Access)
Learning is More Free and Open
Beyond Free: Harnessing the resonant value in open
and collaborative practices for the public good
David Porter, CEO, eCampus Ontario,
Open Education Ontario Summit
https://www.slideshare.net/David_Porter
<https://www.oecs.ca/events/open-education-ontario-summit>



May 4, 2016 (Access)
Learning is More Video-Based
What I Learned at the ASU GSV Summit
Kenneth Green, Inside Higher Ed
<https://www.insidehighered.com/digital-learning/article/2016/05/04/what-i-learned-at-the-asu-gsv-summit>

July 18, 2016 (Access)
 Survey: Video Usage in Ed Continues Ramp-up,
 Dian Schaffhauser, THE Journal



May 14, 2016 (Access)

Learning is More Immediate...

Mastodon bones offer clues of earliest humans in North America, Faith Karimi, CNN

Abstract: <http://advances.sciencemag.org/content/2/5/e1600375>
Full Article: <http://advances.sciencemag.org/content/2/5/e1600375.full>
Supplemental materials (PDF): <http://advances.sciencemag.org/content/suppl/2016/05/10/2.5.e1600375.DC1>
PDF: http://advances.sciencemag.org/content/suppl/2016/05/10/2.5.e1600375.DC1/1600375_S4.pdf

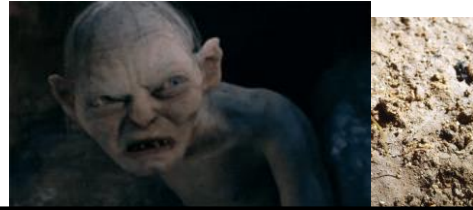
Mastodon bones offer clues of earliest humans in North America



November 19, 2015 (Access)

Learning is More Immediate...

New daddy longlegs named after 'Lord of the Rings' character Smeagol, Mary Bowerman, USA Today



May 9, 2017 (Access)

Learning is More Immediate...

Meet Zuul, the new dinosaur species named after 'Ghostbusters' demon
Traci Watson, USA Today

<https://www.usatoday.com/story/news/2017/05/09/new-species-dinosaur-named-ghostbusters/40475468/>
15 second: <http://curtbonk.com/ghostbusters15.html>
27 second: <http://curtbonk.com/ghostbusters27.html>

Meet Zuul, the new dinosaur species named after 'Ghostbusters' demon



June 7, 2017

Learning is More Immediate...

Oldest Fossils of Homo Sapiens Found in Morocco, Altering History of Our Species, Carl Zimmer, The New York Times



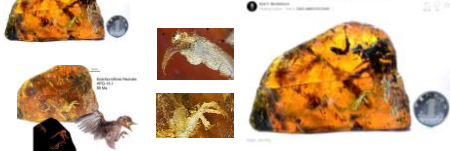
June 7, 2017

Learning is More Immediate...

Scientists Find 100 Million-Year-Old, Nearly Complete Baby Bird Trapped in Amber, Ryan F. Mandelbaum, Gizmodo

<http://gizmodo.com/scientists-find-100-million-year-old-mostly-complete-b-1795904335>

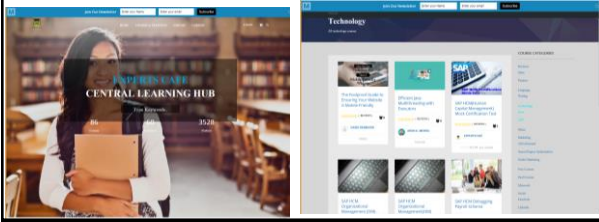
Scientists Find 100 Million-Year-Old, Nearly Complete Baby Bird Trapped in Amber



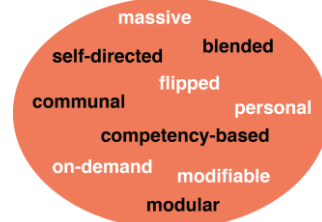
Learning is More Direct from Experts



June 20, 2016 (Access)
Learning is More Direct from Experts
 (e.g., The Expert Café)
<http://expertscafe.com/>

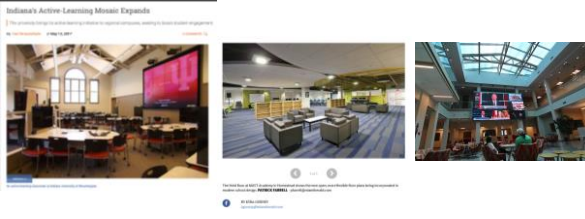


How Learning is Changing:
Mega Trend #3. Customization



May 12, 2017 (Customization)
Learning is More Modifiable

The Future of Collaboration Spaces Encompasses Video
 Interactive, Mobile, Julie Johnston, IU, Campus Technology
<https://www.campus-technology.com/2017/05/12/future-of-collaboration-spaces-encompasses-video-interactive-mobile/>



October 14, 2011
Learning is On Demand
Siri (co-founder Tom Gruber)
<http://www.imore.com/siri>



May 20, 2017
Why type when you can say it? Google Assistant shows up Siri and Alexa on the iPhone, Jefferson Graham, USA Today
<https://soundcloud.com/jefferson-graham/icym-your-fingers-are-set-to-get-a-rest>
<https://soundcloud.com/jefferson-graham/google-assistant-outshines-siri>

ICYMI - your fingers are set for a rest, Talking Tech
 Google Assistant outshines Siri, Talking Tech
 .30 seconds to 1.21: <http://curtbonk.com/googleaudio51.html>
 .10 seconds to 1.21: <http://curtbonk.com/googleaudio71.html>
 .55 to 1.21: <http://curtbonk.com/googleaudio26.html>



May 9, 2016
Personal Digital Assistants (PDA)
Personal digital assistants are on the rise (and they want to talk) USA Today, Edward Baig
 (i.e., Google codename of "Chirp"), Elizabeth Weise, USA Today
<http://www.usatoday.com/story/tech/news/2016/05/09/what-is-google-chirp-what-is-google-chirp/8412445>



June 7, 2017
Learning is On Demand
 'Alexa, are you turning my kid into a jerk?',
 Josh Hafner, USA Today

<https://www.usatoday.com/story/tech/nation/2017/06/07/alexa-you-turning-my-kid-into-jerk/375949001/>



May 9, 2017 (Customization)
Amazon Echo Show brings chatty Alexa to a two-way, video touchscreen
 Edward C. Baig and Elizabeth Weise, USA Today

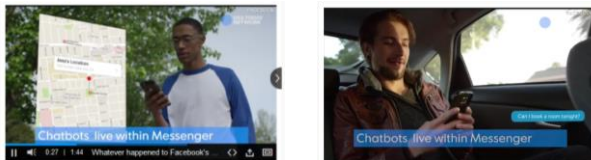
<https://www.usatoday.com/story/tech/2017/05/09/amazon-echo-show-two-way-video-touchscreen/4048864/>

24 seconds: <http://curtbonk.com/jetsons24.html>
 44 Seconds: <http://curtbonk.com/jetsons44.html>



April 17, 2017
Facebook's future will blend physical and digital worlds
 Jessica Guynn, USA Today

<https://www.usatoday.com/story/tech/2017/04/17/facebook-ai-launches-open-adaptive-lessons-on-space-exploration/4004864/>



January 20, 2016 (Customization)
Learning is More Blended
 Universities tap growth of craft beer, offer classes, Chicago Tribune

<http://www.chicagotribune.com/business/ct-college-craft-beer-offer-classes-20160120-story.html>



March 23, 2017 (Customization)
Learning is More Personal
 Arizona State U Launches Open, Adaptive Lessons on Space Exploration
 Rhea Kelly, Campus Technology

<https://campustechnology.com/articles/2017/03/23/arizona-state-u-launches-open-adaptive-lessons-on-space-exploration.aspx>



February 16, 2017 (Customization)
Learning is More Communal
 Building Global Community, Marc Zuckerberg, Facebook

<https://www.facebook.com/marc.zuckerberg/building-global-community/10103596321158471/>



May 20, 2016 (Customization) Learning is More Massive agMOOCs (India)

<http://www.agmoocs.in/>



April 20, 2015 (Customization) Learning is More Massive

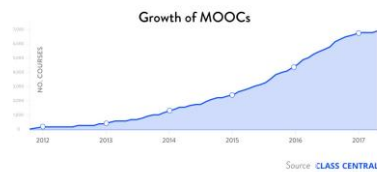
250 MOOCs and Counting: One Man's Educational Journey, Chronicle of Higher Education
<http://chronicle.com/article/250-MOOCsCounting-One/229397?cid=at>
If the MOOC movement has faded, nobody told Jima Ngei. Mr. Ngei, who lives in Port Harcourt, Nigeria, has completed and passed 250.



Jima Ngei: "I had this unrelenting fear that this miracle of free access might evaporate soon."

December 25, 2016 By The Numbers: MOOCs in 2016 Dhawa Shah, Class Central

<https://www.class-central.com/report/mooc-stats-2016/>



December 25, 2016 Class Central

<https://www.class-central.com/report/mooc-stats-2016/>



58M
Students

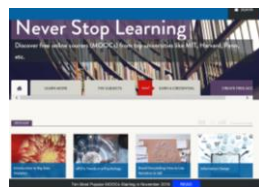
700+
Universities

6850
Courses

MOOCs in 2016: Analysis by Class Central

June 15, 2017 MOOCs for Credit Class Central

<https://www.class-central.com/report/moocs-for-credit/>



August 12, 2016 (Customization) A Life of Happiness and Fulfillment Indian School of Business, Rajagopal Raghunathan

<https://www.class-central.com/mooc/2860/courses-a-life-of-happiness-and-fulfillment>



A Life of Happiness and Fulfillment
Indian School of Business, Rajagopal Raghunathan
This course, based on the award-winning class offered both at the Indian School of Business and at the Indian School of Business at the University of Texas at Austin, is designed to help students develop the skills to shape their lives into a series of joyful, meaningful, and fulfilling experiences, and to learn how to live a life of happiness and fulfillment.

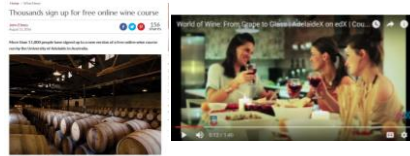


A Life of Happiness and Fulfillment
Indian School of Business, Rajagopal Raghunathan

August 30, 2016

Thousands sign up for free online wine course, John Elmes, Wine News

<http://www.deccanter.com/wine-news/online-wine-course-adelaide-32566/>

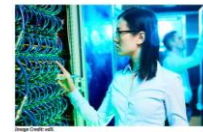


March 3, 2017 (Customization)

edX Expands MicroMasters Programs With Data Science ("nanodegrees")

Digital Leadership and More, Sri Ravipati, Campus Technology

edX Expands MicroMasters Programs With Data Science, Digital Leadership and More



MOOCs and Open Education Around the World

<http://routledge-ny.com/books/details/9781138807419/>



Type of MOOC	cMOOC	xMOOC	pMOOC
Learner Role	Active	Passive	Active
Instructor Role	Co-learner	Sage on video stage	Guide on the side
Learning Theory	Connectivism	Behaviorism	Constructivism
Primary Pedagogy	Knowledge integration	Knowledge production	Knowledge production
Metaphor	"We link movies"	"We watch movies"	"We make movies"
Development Approach	Learning design	Instructional design	Educational design research
Primary Type of Assessment	Self Assessment	External and/or Peer Assessment	Self and/or Client Assessment
Funding Source	Suit of the pants funding	Large external funding	Moderate client provided funding

Figure 1. Differences among three types of MOOCs (Reeves & Hedberg, 2014).

Bonk, C. J., Lee, M. M., Reeves, T. C., & Reynolds, T. H. (in press). The emergence and design of massive open online courses (MOOCs). In R. A. Reiser, & J. V. Demsey (Eds.), *Trends and Issues in Instructional Design and Technology* (4th Ed.), (pp.7). Boston, MA: Pearson Education. Available: <http://www.publications.pearson.com/3>

July 1, 2015 (Customization)

Chapter 14: Creating a Temporary Spontaneous Mini-Ecosystem through a MOOC

Paul Kim and Charlie Chung, Stanford University



June 14, 2016 (Customization)

Chapter 15: Learning About MOOCs by Talking to Students

Charles Severance, Univ. of Michigan

Anuar Lequerica, Class Central

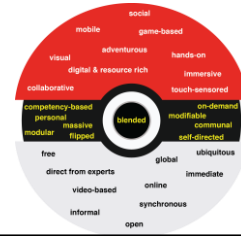
<https://www.class-central.com/report/dr-chuck-graduate-ceremony-python-specialization/>



August 24, 2016
K-MOOCs (and ocMOOCs and hMOOCs)
 Revolutionizing online education
 Professor creates courses tailored to cultural differences
 Korea JoongAng Daily, Bong-Moon Kim
<http://www.kmooc.kr/>



30+ Ways Learning is Changing:
 Recapping the Three Mega Trends:
 Engagement, Access, and Customization



WHAT'S NEXT

May 4, 2017
Prepare For Future Learning
 Dr. Marie Bountroglanni, Dean, The Chang School, Ryerson U,
 Huffington Post
http://www.huffingtonpost.ca/dr-marie-bountroglanni/prepare-for-future-learning_b_16407756.html



January 30, 2017
1. Professor Einstein PDA's
<http://www.usatoday.com/story/tech/2017/01/30/robotic-barista-now-serving-really-fast/95888780/>



Professor Einstein, an educational Wi-Fi connected robot is on display at the Hanson Robot display during the opening day of Consumer Electronics Show 2017. (Photo: Robert Hanashiro, USA TODAY)
<http://www.usatoday.com/story/tech/2017/01/30/robotic-barista-now-serving-really-fast/95888780/>

February 27, 2017
2. World Knowledge Refreshment Stations
http://www.thelivingmoon.com/43ae0c1e20f1e5/Library_Alexandria.html



February 27, 2017**3. Robot Collaborators/Partners**http://www.thelivingmoon.com/43ancients/02ffea/Library_Alexandria.html**June 15, 2017****A New Class Of Robots Could Actually Help Identify Training And Employment Opportunities****Gordon Freedman, Forbes**<https://www.forbes.com/sites/gordonfreedman/2017/06/15/a-new-class-of-robots-could-actually-help-identify-training-and-employment-opportunities/#56a09951489>Usual internal link: <http://trainingshare.com/usa2.html>New download link: <https://www.dropbox.com/s/hacnagvq3b0h1/pepper-the-robot2.mp4?dl=0>**March 14, 2016****Artificial Intelligence and Robots****Paul Basken, The Chronicle of Higher Education**<http://www.chronicle.com/article/Artificial-Intelligence-and-Robots/238888>**Behind a Computer's Surprise Victory, Hints of Global Economic Upheaval**

By Paul Basken | March 12, 2016

**Forget the robots — here come the geniuses!****June 14, 2017****Element AI, a platform for companies to build AI solutions, raises \$102M, Ingrid Lunden, TechCrunch**<https://techcrunch.com/2017/06/14/element-ai-a-platform-for-companies-to-build-ai-solutions-raises-102m/>**Brace yourselves: AI is set to explode in higher ed in the next 4 years**

BY LARINA KUCHEV, ASSOCIATE DEAN, CENTER FOR AI, MIT, 6/14/17

April 2016, 2017

As AI grows in the education sector, its impact could be felt in student learning programs, websites and admissions programs.

March 24, 2017**Artificial Intelligence Market in the US Education Sector 2017-2021**<http://www.researchandmarkets.com/research/5lshzz/artificial>**AI Market to Grow 47.5% Over Next Four Years****Richard Chang, Campus Technology**<https://campustechnology.com/articles/2017/03/23/artificial-ai-market-to-grow-47-5-over-next-four-years.aspx>**AI Market to Grow 47.5% Over Next Four Years**

By Richard Chang | 03/24/17

**March 28, 2017****Elon Musk's Neuralink wants to plug into your brain, Marco della Cava, USA Today (includes 34 second video)**<https://www.usatoday.com/story/tech/2017/03/27/elon-musk-neuralink-brain-computer-interface-video/101111100/><https://www.usatoday.com/story/tech/2017/03/27/elon-musk-neuralink-brain-computer-interface-video/101111100/>

Elon Musk wants to link human brains with computers. The CEO of SpaceX and Tesla Motors is working on a way to connect through another company he has launched: Neuralink. USA Today



June 3, 2016

4. Explosion of Virtual Reality VR Lets Med Students Experience What It's Like To Be 74

Elyse Wanshel, Huffington Post
<http://ht.ly/hSpe300XEPJ>

Virtual Reality Lets Med Students Experience What It's
Like To Be 74

One could be exactly 74 for the average med student, who is 24

by Elyse Wanshel

**April 10, 2016**

Virtual reality tested by NFL as tool to confront racism, sexism

Marco della Cava, USA Today

<http://www.usatoday.com/story/tech/news/2016/04/10/virtual-reality-tested-tool-confront-racism-sexism/8262466/>



One VR diversity demo places the user in the body of an African-American woman as a white male avatar gets aggressive mere feet away. (In one Stanford VR demo, subjects are made to feel what it's like to be homeless, as in this scene where the user is transported into the body of a woman riding the bus with a few possessions.)

October 25, 2016

Osso VR Mixed Reality Promo

<http://ossovvr.com/>
https://www.youtube.com/watch?v=yes_GET1a6o

**February 27, 2017**

5. Web Conferencing

Global Learning Partner or PBL Team Selection Walls

http://www.thelivingmoon.com/43ancienta/520files/Library_Alexandria.html

**May 4, 2016**

6. MOOCs Social Impact and Spirituality MOOC 4.0: The Next Revolution in Learning & Leadership, Otto Scharmer, Huffington Post

http://www.huffpost.com/otto-scharmer/mooc-40-the-next-revolution_in_7209606.html

**June 11, 2017 (New Learning Times)**

7. Rise of Super E-Mentors



Twenty-Four Seven Tutoring
 by Cathy Dancy



8. Café Classroom and Café Connectedness



9. Instructional Designer Morphs into Learning Environment Engineer

The New and Improved Instructional Designer



10. The Age of Personalization



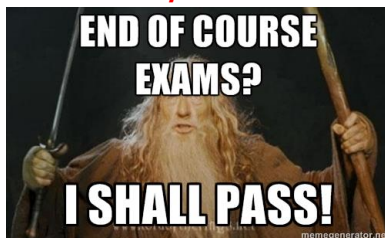
The Future of Learning Plague

The new "Four Horsemen" of the Apocalypse:

Quality, Copyright, Plagiarism, and Assessment...



Poll #5:
Who is now interested in Education
20/20...?



We are entering a jumping off point...

(South University of Science and Technology of China, Wednesday June 10, 2015)



Things are heating up for PBL!



Education 20/20 is coming within reach!



Remember for Education 20/20
to make an impact:
"I cannot do this alone."

"I cannot do this alone."
"I cannot do this alone."
"I cannot do this alone."



Any Questions or Comments?

Slides at: TrainingShare.com
Papers: PublicationShare.com
Free book: <http://tec-variety.com/>
Email: curt@worldisopen.com

