What is the Future of Learning?:
Visions of Education 20/20 in Our Changing Learning World!

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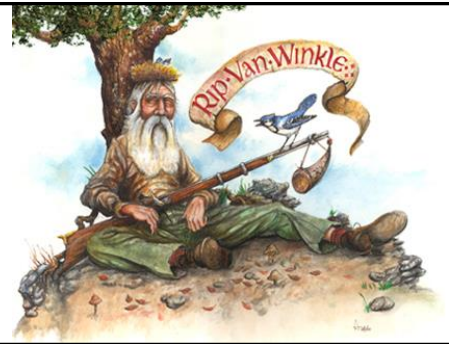http://mypage.iu.edu/~cjbonk/

Talk Overview

1. Education 20/20
2. New Roles of the Instructor
3. First and Last Principles of Instruction
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?
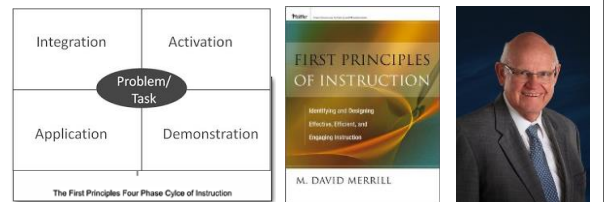

IF YOU DON'T STUDY

Education 20/20

20 New Roles of the Instructor

Captain
Course Ambassador
Consumer Advocate
Curator
Counselor
Cook
Change Catalyst
Conductor
Concierge
Comedian
Camping Trip Guide
Coach
Consultant
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

Integration	Activation
	Problem/Task
Application	Demonstration

The First Principles Four Phase Cylce of Instruction

FIRST PRINCIPLES OF INSTRUCTION

Identifying and Designing Effective, Efficient, and Engaging Instruction

M. DAVID MERRILL

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

20. ??? (what is missing)
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

Clearly...
Learning is Changing!

Poll #1: Remember Education 1.0?
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

Fast Forward 200 Years...
MOOC, Meet MORC (Massive Open Radio Course)
WHA, UW Madison, College of the Air, 1933,
Vocational Training dedicated to Agriculture,
and later Home Economics and Typing (On Wisconsin, Fall 2014)
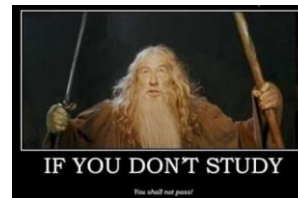

MOOC, Meet MORC   Mimeograph machine.

Poll #2: Fast Forward 50 more Years...
Do you remember education 2.0?

Poll #3: Do you really remember what was to be education 2.0?

IF YOU DON'T STUDY

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

Education 3.0...Education 20/20
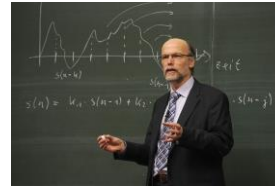
"In Education 3.0, classrooms would move away from lectures, such as this one, to having class time be spent on discussions and projects, using digital technology."
(Per Wikipedia: https://en.wikipedia.org/wiki/Education_3.0

Education 3.0
The Genesis and Emergence of Education 3.0 in Higher Education and its Potential for Africa
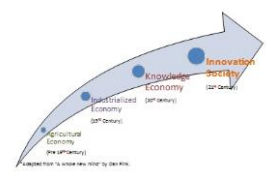First Monday, by Derek Keats and J. Philipp Schmidt, March 2007
http://firstmonday.org/ojs/index.php/fm/article/view/1625/1540

EDUCATION 3.0

Table 1: Educational generations in higher education

Characteristics	Education 1.0	Education 2.0	Education 3.0
Primary role of professor	Source of knowledge	Guide and source of knowledge	Orchestrator of collaborative knowledge creation
Content arrangements	Traditional copyright materials	Copyright and free/open educational resources for students within discipline, sometimes across institutions	Free/open educational resources created and reused by students across multiple institutions, disciplines, nations, supplemented by original materials created for them
Learning activities	Traditional, essays, assignments, tests, some groupwork within classroom	Traditional assignment approaches transferred to more open technologies; increasing collaboration in learning activities; still largely confined to institutional and classroom boundaries	Open, flexible learning activities that focus on creating room for student creativity; social networking outside traditional boundaries of discipline, institution, nation

---

Now What is Education 4.0?
"Innovation-producing education. Learn more in: Development of Individual Agency within a Collaborative, Creative Learning Community"
http://www.igi-global.com/dictionary/education-40/41755
https://thinc.in.th/engadmission/education4.html (Chula Engineering)

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-evolution-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

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-evolution-video-clip.php
http://www.tubechop.com/watch/8280981

August 21, 2016
ST Future Economy Roundtable:
Is Asia ready for the Fourth Industrial Revolution?
The Straits Times
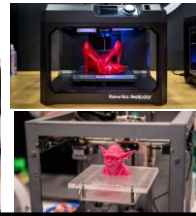http://www.straitstimes.com/asia/is-asia-ready-for-the-fourth-industrial-revolution

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

August 17, 2016
Research: 3D Printing Market to Double by 2020
Joshua Bolkan, Campus Technology
https://campustechnology.com/articles/2016/08/17/report-3d-printing-market-to-double-by-2020.aspx

Research: 3D Printing Market to Double by 2020
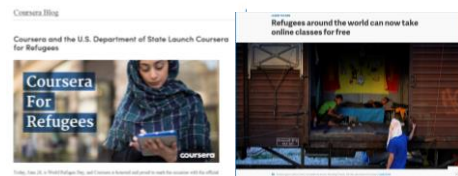By Joshua Bolkan | 08/17/16

June 7, 2016
Teaching refugees how to code
CNN Money
http://money.cnn.com/video/technology/2016/06/07/recoded-flatiron-refugees-code.cnnmoney/index.html

Teaching refugees how to code

Teaching refugees how to code

SCHOOL GIVES REFUGEES SKILLS TO CODE CNN

REFUGEES TRAINED TO BECOME SOFTWARE DEVELOPERS CNN
Adam Enbar | President, The Flatiron School

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

Coursera Blog

Coursera and the U.S. Department of State Launch Coursera for Refugees

Coursera For Refugees

Refugees around the world can now take online classes for free

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-reaches-black-latino-students/97671518/

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: Marcio Jose Sanchez, Associated Press)

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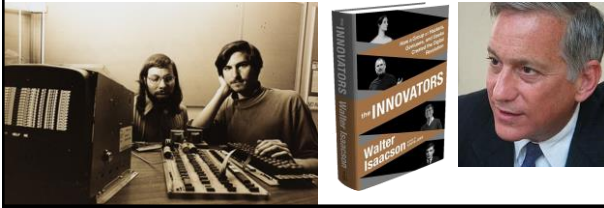**Read any good books lately detailing this shift?**

The Innovators:
How a group of hackers, geniuses, and geeks
created the digital revolution. New York: Simon
& Schuster.
Walter Isaacson (2014)
http://books.simonandschuster.com/The-Innovators/Walter-Isaacson/9781476708690

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/0062266683

Artificial Intelligence
John McCarthy, Stanford AI Lab
http://www.amazon.com/Machines-Loving-Grace-Common-Between/dp/0062266683

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/0062266683

Engelbart's prototype of a computer mouse, as designed by Bill English from Engelbart's sketches.
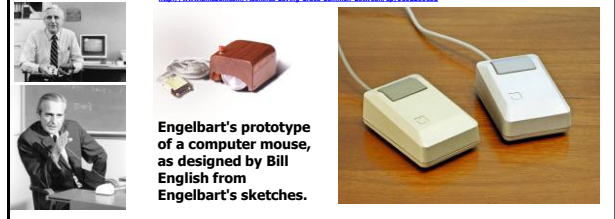
Knowledge Navigator (1987)
Apple Computer
http://www.youtube.com/watch?v=hb4AzF6wEoc
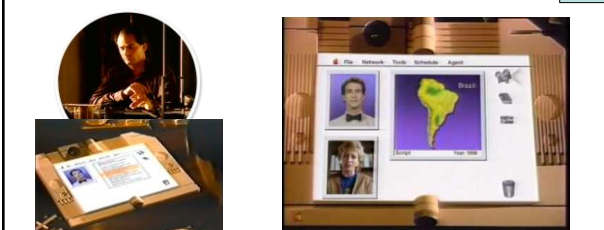
August 6, 2016
The Web is 25!
Happy (sort of) birthday, World Wide Web!,
Erica Fink and Jonathan Tortora, CNN Money (Tech)
http://info.cern.ch/ (First website)
http://info.cern.ch/hypertext/WWW/TheProject.html
http://money.cnn.com/2016/08/06/technology/world-wide-web-25-years-old/index.html?iid=hp-stack-dom

THE WORLD WIDE WEB
BEGINS ON MARCH 12, 1989

January 15, 2016
Wikipedia is 15!
Scott McLemee, Inside Higher Ed
https://www.insidehighered.com/views/2016/01/15/essay-wikipedias-fifteenth-anniversary?utm_source=Inside+Higher+Ed&utm_campaign=4a9a248980-DNU20160115&utm_medium=email&utm_term=0_1fcbc04421-4a9a248980-197362401

Wikipedia at 15

Celebrate or hate it as you will, writes Scott McLemee, 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 McLemee

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 Revolutioning Education

世界是开放的
网络技术如何变革教育
The World Is Open
How Web Technology Is Revolutioning Education
[美]柯蒂斯·J·邦克/著
焦建利/主译

「超越传统课堂、通见教育的未来、实现教育的变革」

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

CURTIS J. BONK
The World is Open
how Web Technology is Revolutionizing Education

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.onlinelearningsurvey.com/reports/openingthetextbook2016.pdf

AWARENESS OF OPEN TEXTBOOKS: 2015-16

- Very aware
- Aware
- Somewhat aware
- Not aware
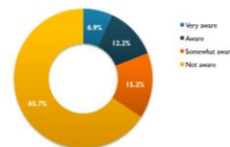
OER Use to Triple Over Next 5 Years

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).

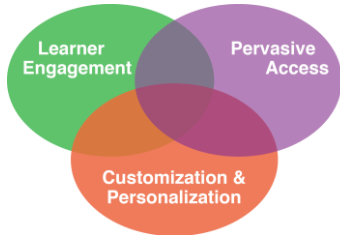**Phase IV, 2015**
THE AGE OF PERSONALIZATION.

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

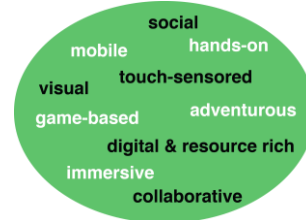
Thirty Ways
Learning is Changing...
(i.e., it's more informal, video-based, ubiquitous, collaborative, self-directed, global, mobile, open, massive, etc.)

30+ Ways Learning is Changing:
The Mega Trends

Learner Engagement

Pervasive Access

Customization & Personalization

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

social
mobile   hands-on
visual   touch-sensored
game-based   adventurous
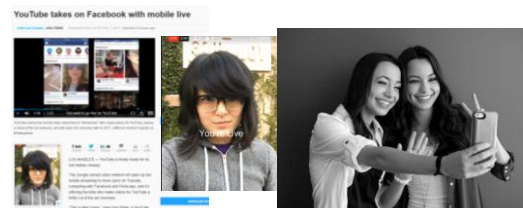digital & resource rich
immersive
collaborative

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/

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 $143.3 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/2015/07/25/meet-setavhout-and-its-2700-ar-glasses/30627861/
http://www.usatoday.com/story/tech/2015/06/09/tech-expo-spotlights-our-augmented-future/28754692/
Microsoft HoloLens: https://www.youtube.com/watch?v=aThCa9Rgvu4

Letsee is an AR app from a South Korea consumers to scan a product and see reviews instantly overlaid overtop.

8

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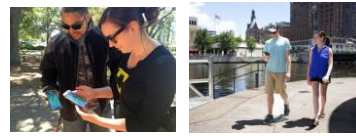
Pokémon Go players converged last week on the U. of Nebraska at Lincoln's Memorial Stadium, which officials had opened to the animated-monster hunters. The hit augmented-reality game has prompted many colleges to jump on the bandwagon.

August 23, 2016 (Engagement)
Learning is More Visual
e.g., reef videoconferencing
(Great Barrier Reef, Australia)
http://www.reefhq.com.au/education-at-reef-hq-aquarium/reef-videoconferencing

February 15, 2017 (Engagement)
Learning is More Synchronous
Shindig, Future Trends Forum, Bryan Alexander
https://bryanalexander.org/the-future-trends-forum/
http://www.shindig.com/
http://events.shindig.com/event/ftf-anniversary

February 17, 2016 (Engagement)
Learning is More Mobile
World's Cheapest Smartphone at $3.67
https://m.facebook.com/hashtag/launched?refid=52&__tn__=%2As
https://m.facebook.com/story.php?story_fbid=10153960012315798&id=102527030797
http://gadgets.ndtv.com/videos/freedom-251-launched-as-world-s-cheapest-smartphone-at-rs-251-404082

Samsung is hoping to have 10,000 apps by the time the Gear S3 launches this fall.

Want "FREE" engagement?
How about
"Adding Some TEC-VARIETY"?
http://tec-variety.com/

What motivates?
1. **Tone/Climate:** Psychological Safety, Comfort, Sense of Belonging
2. **Encouragement:** Feedback, Responsiveness, Praise, Supports
3. **Curiosity:** Surprise, Intrigue, Unknowns
4. **Variety:** Novelty, Fun, Fantasy
5. **Autonomy:** Choice, Control, Flexibility, Opportunities
6. **Relevance:** Meaningful, Authentic, Interesting
7. **Interactivity:** Collaborative, Team-Based, Community
8. **Engagement:** Effort, Involvement, Investment
9. **Tension:** Challenge, Dissonance, Controversy
10. **Yielding Products:** Goal Driven, Purposeful Vision, Ownership

How Learning is Changing:
Mega Trend #2. Pervasive Access

informal
free   global
video-based
open
synchronous   ubiquitous
direct from experts
online
immediate

July 21, 2016 (Access)
Learning is More Ubiquitous
Facebook's Aquila drone completes first test flight, Jessica Guynn, USA Today
http://www.usatoday.com/story/tech/news/2016/07/21/facebooks-aquila-completes-first-test-flight/87368910/

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.co.kr/wp/?page_id=244
http://363.co.kr/wp/?bw_gallery=study-cafe_11

May 7, 2014 (Access)
Learning is More Global
CNA - Speaking Exchange (video chats)
https://www.youtube.com/watch?v=-S-5EfwpFOk
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/?all
http://novemberlearning.com/blc-education-conference-2017/transformative-education-speakers/#olivia-van-ledtje
https://twitter.com/thelivbits?lang=en
https://www.youtube.com/watch?v=bXJwUE7eBuc

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/news/246551-shubham-jaglan-overwhelmed-by-dream-return-home-after-double-world-championship
http://www.ndtv.com/video/player/news/india-s-golf-prodigy-shubham-jaglan-returns-home-to-hero-s-welcome/377014

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

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

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/

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/blogs/digital-tweed/what-i-learned-asu-gsv-summit
http://www.enchovinews.com/asugsvsummit/
July 18, 2016 (Access)
Survey: Video Usage in Ed Continues Ramp-up,
Dian Schaffhauser, THE Journal

September 14, 2015 (Access)
Learning is More Video-Based
Credit for Watching a TED Talk? A new platform
aims to help employers track casual learning
Chronicle of Higher Education, Jeffrey R. Young
http://chronicle.com/article/Credit-for-Watching-a-TED/232973/?cid=at&utm_source=at&utm_medium=en
Degreed: https://degreed.com/
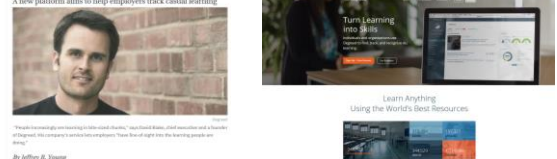
May 14, 2016 (Access)
Learning is More Immediate...
Mastodon bones offer clues of earliest humans in North America, Faith Karimi, CNN
Abstract: http://advances.sciencemag.org/content/2/5/e1600375
Full Article: http://advances.sciencemag.org/content/2/5/e1600375.full
Supplemental materials (PDF): http://advances.sciencemag.org/content/suppl/2016/05/10/2.5.e1600375.DC1
PDF: http://advances.sciencemag.org/content/advances/suppl/2016/05/10/2.5.e1600375.DC1/1600375_SM.pdf

November 19, 2015 (Access)
Learning is More Immediate...
New daddy longlegs named after 'Lord of the Rings' character Smeagol, Mary Bowerman, USA Today
http://www.usatoday.com/story/tech/nation-now/2015/11/19/new-daddy-longlegs-named-after-lord-rings-character-smeagol/76037286/
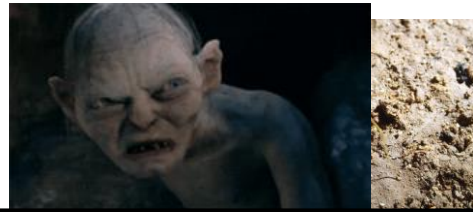
Learning is More Direct from Experts

June 20, 2016 (Access)
Learning is More Direct from Experts
(e.g., The Expert Café)
http://expertscafe.com/
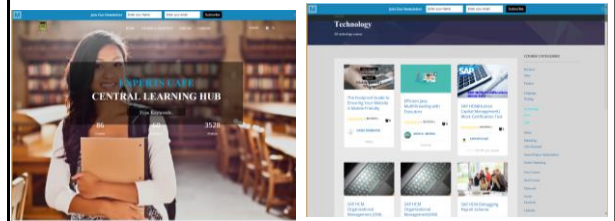
How Learning is Changing:
Mega Trend #3. Customization

massive
blended
self-directed
flipped
communal
personal
competency-based
on-demand
modifiable
modular
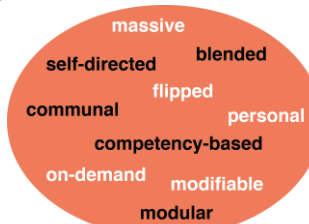
October 14, 2011
Learning is On Demand
Siri (co-founder Tom Gruber)
http://www.imore.com/siri

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

March 24, 2017
Learning is On Demand
Hey, Alexa: Siri's not so bad after all!
Jefferson Graham, USA Today
Samsung promises its Galaxy S8 Bixby assistant will be 'fundamentally different'
Edward Baig, USA Today, March 20, 2017

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

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

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

May 20, 2016 (Customization)
Learning is More Massive
agMOOCs (India)
http://www.agmoocs.in/

13
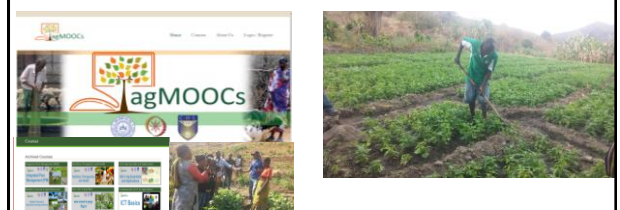
April 20, 2015 (Customization)
Learning is More Massive
250 MOOCs and Counting: One Man's Educational Journey, Chronicle of Higher Education
http://chronicle.com/article/250-MOOCsCounting-One/229397/?cid=at
If the MOOC movement has faded, nobody told Jima Ngei. Mr. Ngei, who lives in Port Harcourt, Nigeria, 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/

Growth of MOOCs

Source: CLASS CENTRAL
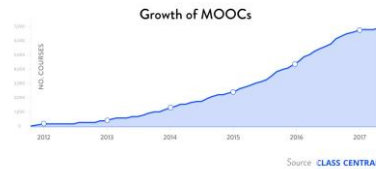
December 25, 2016
Class Central
https://www.class-central.com/report/mooc-stats-2016/

By The Numbers: MOOCS in 2016

58M Students   **700+** Universities   **6850** Courses

MOOCs in 2016. Analysis by Class Central

August 12, 2016 (Customization)
Class Central's Top 50 MOOCs of All Time, Dhawal Shah, Class Central Blog
"**Now there are close to 6,000 MOOCs from 600+ universities around the world.**"
https://www.class-central.com/report/top-moocs/

Never Stop Learning

BEST ONLINE COURSES OF ALL TIME
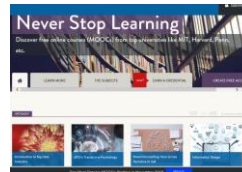
August 12, 2016 (Customization)
A Life of Happiness and Fulfillment
Indian School of Business, Rajagopal Raghanathan
https://www.class-central.com/mooc/2860/coursera-a-life-of-happiness-and-fulfillment

A Life of Happiness and Fulfillment

August 30, 2016
Thousands sign up for free online wine course, John Elmes, Wine News
http://www.decanter.com/wine-news/online-wine-course-adelaide-325646/

14

March 3, 2017 (Customization)
edX Expands MicroMasters Programs With Data Science ("nanodegrees")
Digital Leadership and More, Sri Ravipati, Campus Technology
https://campustechnology.com/articles/2017/03/01/edx-expands-micromasters-programs-with-data-science-digital-leadership-and-more.aspx

MOOCs and Open Education Around the World
http://routledge-ny.com/books/details/9781138807419/
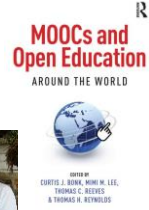
Type of MOOC	cMOOC	xMOOC	pMOOC
Learner Role	Active	Passive	Active
Instructor Role	Co-learner	Sage on video stage	Guide on the side
Learning Theory	Connectivism	Behaviorism	Constructivism
Primary Pedagogy	Knowledge integration	Knowledge duplication	Knowledge production
Metaphor	"We link movies"	"We watch 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	Seat 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.?). Boston, MA: Pearson Education. Available: http://www.publicationshare.com/3**

July 1, 2015 (Customization)
Chapter 14: Creating a Temporary Spontaneous Mini-Ecosystem through a MOOC
Paul Kim and Charlie Chung, Stanford University
Figure 2. Twitter thread announcing the MOOC

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://koreajoongangdaily.joins.com/news/article/article.aspx?aid=2989510
http://www.kmooc.kr/

30+ Ways Learning is Changing:
Recapping the Three Mega Trends:
Engagement, Access, and Customization
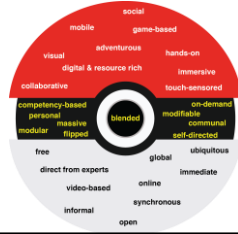
January 30, 2017
1. Professor Einstein PDA's
http://www.usatoday.com/story/tech/2017/01/30/robotic-barista-now-serving-really-fast/95888780/

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/43ancients/02files/Library_Alexandria.html
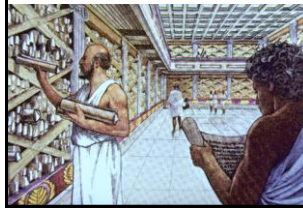
February 27, 2017
3. Robot Collaborators/Partners
http://www.thelivingmoon.com/43ancients/02files/Library_Alexandria.html

May 19, 2016
Pepper the robot needs U.S. programmers, Marco della Carva, USA Today
http://www.usatoday.com/story/tech/news/2016/05/18/google-calling-all-android-robot-programmers/84461778/
Usual internal link: http://trainingshare.com/usa2.html
New download link: https://www.dropbox.com/s/hxcuwqgvaj20oiv/pepper-the-robot2.mp4?dl=0

16

March 14, 2016
Artificial Intelligence and Robots
Paul Basken, The Chronicle of Higher Education

February 27, 2017
3. Three Part Resumes/CV's
http://www.thelivingmoon.com/43ancients/02files/Library_Alexandria.html

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/

February 27, 2017
3. Global Learning Partner or PBL Team Selection Walls
http://www.thelivingmoon.com/43ancients/02files/Library_Alexandria.html

September 2, 2016
5. MOOC Graders and Tutors
Introduction to Philosophy: God, Knowledge and Consciousness
($300 USD for an identity-verified certificate)
Carl Straumsheim, Inside Higher Ed
https://www.insidehighered.com/news/2016/09/02/massachusetts-institute-technology-experiments-instructor-grading-massive-open
https://www.edx.org/course/introduction-philosophy-god-knowledge-mitx-24-00x-1#.VKagwWTF-0c

May 4, 2016
6. MOOCs Social Justice and Spirituality
MOOC 4.0: The Next Revolution in Learning
& Leadership, Otto Scharmer, Huffington Post
http://www.huffingtonpost.com/otto-scharmer/mooc-40-the-next-revoluti_b_7209606.html

September 15, 2015 (Customization)
GROOCs are MOOCs for Social Impact
Social Learning for Social Impact, edX
Join the world's first GROOC – a MOOC for groups – to collaborate with others globally and create social change.
https://www.edx.org/course/social-learning-social-impact-mcgillx-groocx
https://www.youtube.com/watch?t=36&v=WNg-5LFAMdI

7. Rise of Super E-Mentors

8. Café Classroom and Café Connectedness

9. Instructional Designer Morphs into Learning Environment Engineer
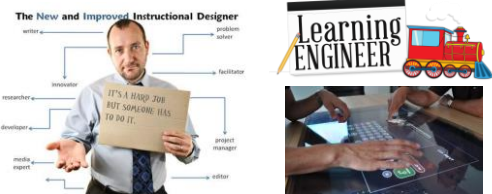
10. The Age of Personalization

The Future of Learning Plague
The new "Four Horsemen" of the Apocalypse:
Quality, Copyright, Plagiarism, and Assessment...

March 27, 2017
What will learning look like in 2025?
John Cavanaugh, eCampus News
http://www.ecampusnews.com/featured/featured-on-ecampus-news/learning-look-like-2025/?all

11. Orientation through VR
12. Scheduling through AI
13. Fully-Immersive Course Content
14. AI Analytics

June 3, 2016
Virtual Reality Lets Med Students Experience What It's Like To Be 74
Elyse Wanshel, Huffington Post
http://ht.ly/bSpe300XEPJ

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/2016/04/08/virtual-reality-tested-tool-confront-racism-sexism/82674406/
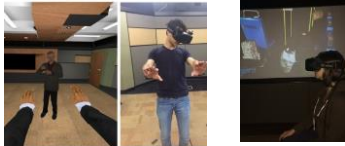
One VR diversity demo places the user in the body of an African-American woman as a white male avatar gets aggressive mere feet away. (In one Stanford VR demo, subjects are made to feel what is like to be homeless, as in this scene where the user is transported into the body of a woman riding the bus with a few possessions.)

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/arizona-state-u-launches-open-adaptive-lessons-on-space-exploration.aspx

March 2017 (Customization)
Coolest tech from SXSW
(Robotic AI conversationalist AI developed by Osaka University)
https://www.usatoday.com/tech/

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/talkingtech/2017/03/27/teslas-musk-may-now-want-plug-into-your-brain/99715510/
http://trainingshare.com/musk.html

Poll #5:
Who is now interested in Education 20/20…?
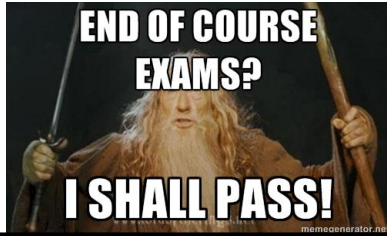
We are entering a jumping off point…
(South University of Science and Technology of China, Wednesday June 10, 2015)
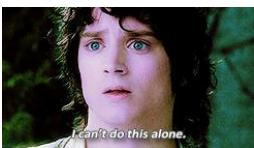

Things are heating up for PBL!

Education 20/20 is coming within reach!

Remember for Education 20/20 to impact PBL:
"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