

Technology Today, Technology Tomorrow: Might Learning Evolutions lead to Learning Revolutions?

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Talk Overview

1. Technology Yesterday
2. Technology Today

30 ways learning is changing...

Megatrends of Learning:

- a. Engagement
- b. Access, and
- c. Customization

3. Technology Tomorrow and Future Trends



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.

Part 1: Technology Yesterday



Poll: 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



Fall 2014, On Wisconsin 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



MOOC, Meet MORC



Mimeograph machine.

Winky Dink and ... Bill Gates?, Bob Greene, March 31, 2013, CNN



A girls uses her "Winky Dink" drawing kit to draw on a TV screen as they watch the 1950s kids program.

June 3, 2017 How PLATO changed the World...in 1960 Cait Etherington, ElearningInside News

<https://news.elearninginside.com/how-plato-changed-the-world-in-1960/>
PLATO was the first generalized computer-assisted instruction system. Starting in 1960, it ran on the University of Illinois' ILLIAC I computer. By the late 1970s, it supported several thousand graphics terminals distributed worldwide, running on nearly a dozen different networked mainframe computers. Many modern concepts in multi-user computing were originally developed on PLATO, including forums, message boards, online testing, e-mail, chat rooms, picture languages, instant messaging, remote screen sharing, and multiplayer games.



Artificial Intelligence John McCarthy, Stanford AI Lab

<http://www.amman.com/News/Local-Stock-Common-Believe/46/508226683>

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.amman.com/News/Local-Stock-Common-Believe/46/508226683>



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



The World of Open Education



Poll: Anyone remember these technologies?



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/>



September 19, 2014

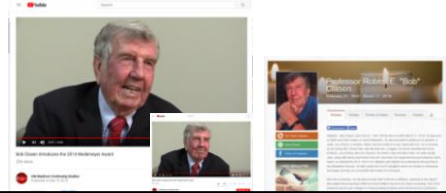
A Distance Learning Story

Bob Clasen, University of Wisconsin

https://www.youtube.com/watch?v=kCm1_MGaqe&feature=youtu.be

February 27, 1934-March 17, 2018

<https://www.lead4ward.com/2018/03/17/bob-clasen/>



September 26, 2018

Remember Education 2.0?

The rise and fall of the company behind 'Reader Rabbit' and all your favorite educational games

Abigail Cain, The Outline

<https://theoutline.com/post/302/remember-education-20-the-rise-and-fall-of-the-company-behind-reader-rabbit-and-all-your-favorite-educational-games>

Rocky's Boots: <https://www.youtube.com/watch?v=a-MJ58b1ik>

Project YES (Curt Bonk): <https://youtu.be/bZ5mQH4Ujs>



Knowledge Navigator (1987)

Apple Computer

<http://www.youtube.com/watch?v=bAAf5wEoc>



How Might Video Games Be Good for Us?

Jane McGonigal, October 15, 2012, BQO

<https://www.bqo.com/2012/10/15/how-might-video-games-be-good-for-us/>



August 6, 2016

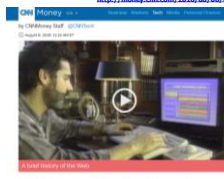
The Web is 25!

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>



THE WORLD WIDE WEB BEGINS ON MARCH 12, 1989

Twenty-five years ago, the first public website went live

January 15, 2016 Wikipedia is 15!

Scott McLeod, Inside Higher Ed

<https://www.insidehighered.com/digital-learning/article/2016/01/15/wikipedia-15-years-old>



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 1,000 pages, with an expected base of expansion.



April 4, 2016 MIT OpenCourseWare is 15!

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



The Creation of Effective Learning Environments

<http://study.com/academy/lesson/learning-environment-in-the-classroom-definition-importance.html>



July 29, 2016 Reimagine Your Learning Space: Starbucks Your Classroom!

Oskar Cymerman, Teaching Channel

<https://www.teachingchannel.org/blog/2016/07/29/starbucks-your-classroom/>



Sterile, industrial-era rows aren't very attractive or motivating. Even more, I've become convinced that traditional educational settings dull the senses...I believe the "Starbucks" environment will promote that freedom and movement. Freedom is the key ingredient to social-emotional well-being and deeper learning. Rows and columns constrict. They hold and stifle. That is the truth. That is the reality in many U.S. classrooms today. But no longer in mine. Never again.

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)

Now What is Education 4.0?

"Innovation-producing education. Learn more in: Development of Individual Agency within a Collaborative, Creative Learning Community"

<http://www.isi-global.com/dictionary/education-40/41755>

<https://thinc.in.th/engadmission/education4.html> (Chula Engineering)



April 25, 2018

Deliberate Innovation, Lifetime Education Commission on Creative the Next in Education Georgia Tech University, Office of the Provost <http://www.provost.gatech.edu/cne-home>

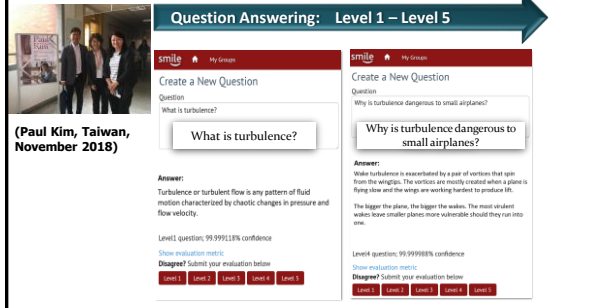
**November 8, 2018**

Learning is More Personalized AI Question Asking

(Paul Kim keynote in Taiwan; Education 4.0 Conference)
<https://www.facebook.com/digitalschema>
<https://www.facebook.com/digitalschema/videos/10217854957270186/>



Question Answering: Level 1 – Level 5



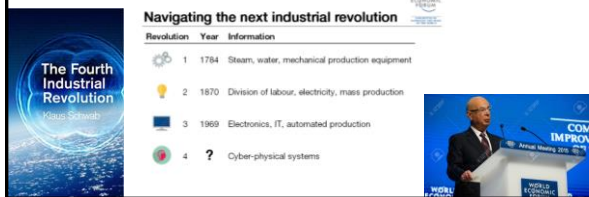
- Level 1**
 - When did Elon successfully launch the SpaceX program?
 - Who admitted that launching the car into space was "kind of silly and fun"?
- Level 2**
 - What are the things Tesla designed?
 - What were the things Tesla couldn't determine the cause of?
- Level 3**
 - How do you compare Elon Musk and Nicolas Tesla?
 - How is Mars different from Jupiter?
- Level 4**
 - Why did Tesla build a plant in Colorado, not in New York?
 - Why did Tesla at first consider whether they were "electrical disturbances as are produced by the sun"?
- Level 5**
 - If he did not devise ever-more sensitive receivers to detect these waves, what could have been the consequence?
 - If he did not introduce the AC motor in the late 1880, what would have been the consequence?

(Paul Kim, Taiwan, November 2018)

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, ever-connected, artificially intelligent robots, self-driving cars, smart technological brain enhancements, genetic editing, etc.)
<http://www.trainingshare.com/fourth-industrial-revolution-video-clip-ahot.php>

**April 13, 2016**

The Fourth Industrial Revolution: What it means, how to respond

Klaus Schwab, Founder and Executive Chairman, World Economic Forum
<http://trainingshare.com/fourth-industrial-revolution-video-clip.php>
<http://www.tubechop.com/watch/92869981>



August 21, 2016

**ST Future Economy Roundtable:
Is Asia ready for the Fourth Industrial Revolution?**
The Straits Times

<http://www.straitstimes.com/special/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."

July 11, 2017

The Rise of the Phigital Learner

Going 'phigital'? 4 things schools need to know about Generation Z, Todd Kominia, TrustEd

<http://trusteds12.com/phigital-digital-learning/>

May 15, 2017

3 must know's about the rising "phigital" student-and why their impact is enormous, Maris Stanbury, eCampus News

<https://www.ecampusnews.com/campus-administration/education-gen-z-what-students/>



**Clearly...
Learning is Changing!**



How Online Learning is Changing Classroom Design



Education 20/20

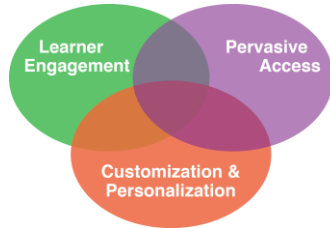


20 New Roles of the Instructor

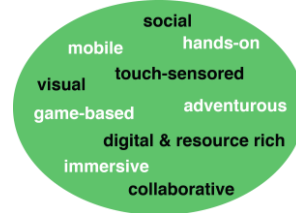
Captain **Course Ambassador** **Consumer Advocate**
Counselor **Curator** **Change Catalyst**
Conductor **Concierge** **Comedian**
Consultant **Camping Trip Guide** **Coach**
Community Organizer **Course Expedition Leader** **Collaborator**
Cultivator **Chemist** **Care Giver**
Colleague



30+ Ways Learning is Changing: The Mega Trends



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



January 3, 2018 Learning is More Mobile CES 2018: Your guide to the biggest consumer electronics show USA Today

<https://www.usatoday.com/story/tech/news/2018/01/03/ces-2018-what-to-expect-consumer-electronics-show/1088778602/>



The Octopus watch from Joy, an icon-based watch for kids to have good habits is on display during CES.



August 4, 2017 Learning is More Mobile When our smartphones leave us out of touch Brett Molina, USA Today

<https://www.usatoday.com/story/tech/news/2017/08/04/when-our-smartphones-leave-us-out-of-touch/104032062/>



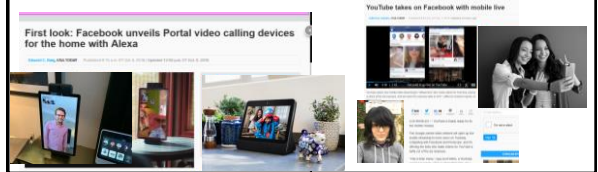
July 24, 2018 Learning is More Digital and Resource Rich This Physicist Wants Female Scientists To Get Noticed. So She Wrote 270 Wikipedia Profiles. Jenna Amatulli, Huffington Post

https://www.huffpost.com/entry/scientist-paula-270-wikipedia-profiles-in-a-year-so-female-scientists-get-noticed_us_30578ee4b01b1a192c0d5



October 8, 2018 Learning is More Social First look: Facebook unveils Portal video calling devices for the home with Alexa Edward C. Baig, The USA Today

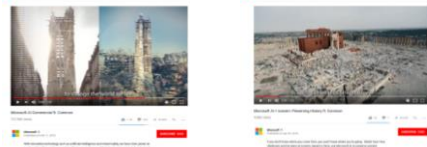
<https://www.theverge.com/2018/10/8/facebook-portal-video-calling-devices-for-the-home-with-alexa/127333/>
<http://www.usatoday.com/story/tech/2017/10/17/youtube-takes-facebook-mobile-tv/37566592/>



April 22, 2018
Learning is More Visual

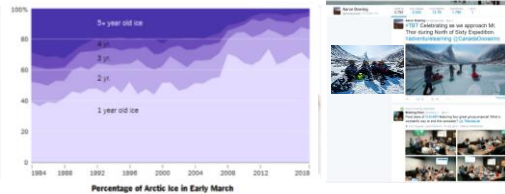
Microsoft AI Commercial ft. Common

Video 1:00: Microsoft AI Commercial ft. Common: <https://www.youtube.com/watch?v=9tucY77hhe4> / (Feb 11, 2018)
 Video 1:48: Microsoft AI: Amplifying Human Ingenuity: <https://www.youtube.com/watch?v=N0mu725NP3o>
 Video 1:00: Microsoft AI: Empowering Innovators ft. Common: <https://www.youtube.com/watch?v=2520e6u6f7w> (April 22, 2018)
 Video: 1:00 Microsoft AI + Icones: Preserving History ft. Common: <https://www.youtube.com/watch?v=2D2GauHt5H4> (April 22, 2018)
 Video: 0:44: Microsoft AI + The Yield: Taking the guesswork out of farming ft. Common: <https://www.youtube.com/watch?v=7zmfxf6H4> (April 22, 2018)



May 14, 2018 (Engagement)
Learning is More Adventurous
Aaron Doering, Chasing Seals, TEDx

<https://chasingseals.com/>
<https://twitter.com/chasingseals>
<https://www.nytimes.com/interactive/2018/05/14/climate/arctic-sea-ice.html>



August 8, 2017
Learning is More Game-like
ShortSims

<http://www.shortsims.com/>
 Clark Aldrich clark@clarkaldrichdesigns.com



July 29, 2018
Learning is More Collaborative
Why Silicon Valley is teaming up with San Quentin to train young people to code
Jessica Guynn and Megan Diskin, USA TODAY

<https://www.usatoday.com/story/tech/2018/07/25/callifornia-youth-learning-code-prison-help-san-quentin-inmates/81812002/>
 Video (1:46): <http://courtsim.com/san-quentin.html>

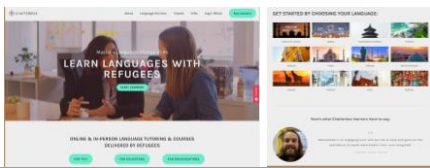


March 21, 2018 (Engagement)
Learning is More Collaborative

Chatterbox

The overall winner in the competition was **Chatterbox**, an online language school powered by refugees

<https://www.chatterbox.org/>



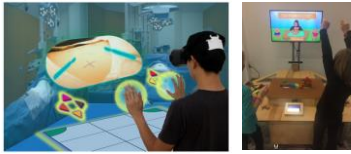
September 4, 2017
Virtual Reality and AR Explodes
VR Lets Med Students Experience What It's Like To Be 74
Elyse Wanshel, Huffington Post

<https://www.huffpost.com/entry/vr-lets-med-students-experience-what-its-like-to-be-74>
<https://bit.ly/18Se300EP>



Facebook Spaces is a new social VR hang out area that allows owners of Oculus Rift and Touch to interact in virtual reality. (Photo: Facebook)

May 1, 2018
Learning is More Hands-on
3 ways districts can use AR and AI
Justin Anglio, eSchool News



EarthShake, the first educational game for the NoRILLA system, teaches early physics principles through hands-on learning.

May 1, 2018
Learning is More Immersive
3 ways districts can use AR and AI
Justin Anglio, eSchool News



When a teacher glances around her classroom, Lumilo allows her to see real-time analytics (in the form of icons) floating directly above each student's head. The teacher can glance directly at a student or "click" on a student's icon to see more detailed information about where and how that student might be struggling.

September 5, 2017
Learning is More Immersive
Get ready for thousands of augmented reality
Apple apps

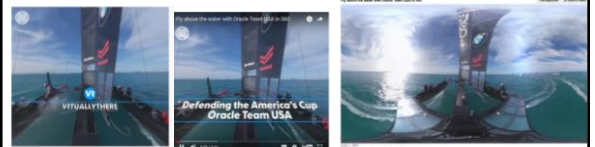
Jefferson Graham, The USA Today
 AI Pets (.34): <http://curtbonk.com/arkit.html>
 Meal (30 seconds): <http://curtbonk.com/arkit2.html>



The Food Network's app will be updated for AR in the new version of iOS11. (Photo: Food Network)

May 30, 2017
Learning is More Immersive
Fly above the water with Oracle Team USA in 360

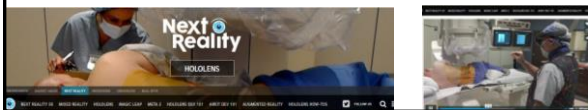
The first 17 seconds: <http://curtbonk.com/sailing-17.html>
 1:24 to 1:54: <http://curtbonk.com/sailing-46.html>
 Whole video: <http://curtbonk.com/sailing.html>
 1:01: <http://curtbonk.com/sailing-101.html>



July 19, 2017
Learning is More Immersive
HoloLens Assists in Live Surgery

Tommy Palladino, Next Reality
 Video #1: 1:09: <http://curtbonk.com/hololens.html>
 Video #2: 1:37: <http://curtbonk.com/hololens2.html>

07/19/2017
 HoloLens Assists in Live Surgery
 Numerous examples exist of doctors and surgeons using HoloLens to plan surgeries. The device has even been used to view reference images during a procedure and stream it to a remote audience. Until recently, it has not been used to augment the surgeon's view of the patient during a live surgery.
 Original Video: <https://hololens.reality.news/news/hololens-assists-live-surgery-5178867/>



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=DYlaMWTvg>
 27 seconds <http://curtbonk.com/thejournal27.html>
 38 Seconds <http://curtbonk.com/thejournal38.html>
 1:10: <http://curtbonk.com/thejournal.html>



April 8, 2018**Pros and Cons of Virtual Reality in the Classroom**

Adam Evans, The Chronicle of Higher Education

<https://www.chronicle.com/article/ProsCons-of-Virtual/243016?cid=cp197>**Pros and Cons of Virtual Reality in the Classroom****Pro:**

An art professor might virtually guide students in his rural-Kentucky classroom through an exhibit happening in Paris, allowing them not only to explore works of art but also to virtually hold and examine them up close. A biology class might virtually travel down DNA strands previously visible only through a microscope.

Con:

We need to be having conversations about the ethics of using virtual reality in the classroom. Just because we have the ability to virtually transport a student to a war-torn country or a historical moment in time does not mean we should do so without thinking of possible consequences. What ethical obligations might faculty members owe our students during these experiences?

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



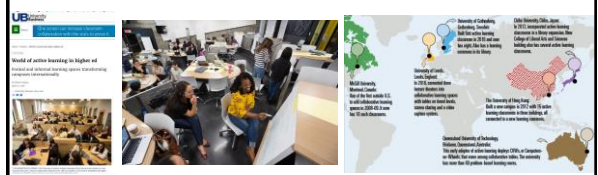
August 1, 2016 (Access) Learning is More Ubiquitous 363 by Idea Group; Study Café Meeting Place; Idea Space (Seoul, Korea)

http://363.co.kr/wp/?wp_sitemap=study-cafe_11

April 16, 2018 Learning is More Informal

World of active learning in higher ed
Formal and informal learning spaces transforming campuses internationally

Sherrie Negrea, University Business, May 2018

<https://www.universitybusiness.com/article/world-active-learning-higher-ed>

May 7, 2014 (Access) Learning is More Global

CNA - Speaking Exchange (video chats)

<https://www.youtube.com/watch?v=8-SEVv9FOk>

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.



July 11, 2018 Learning is More Immediate... Fossil of first giant dinosaur, dubbed Ingentia prima, found in Argentina Brett Molina, USA Today

<https://www.usatoday.com/story/news/science/2018/07/11/first-giant-dinosaur-fossil-found-argentina/27483002/>
<https://www.usatoday.com/story/news/science/2017/05/05/new-argentina-dinosaur-fossil-discovery/401475466/>
 15 second: <http://curibronk.com/ghostbusters15.html>

Fossil of first giant dinosaur, dubbed Ingentia prima, found in Argentina



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.oels.ca/events/open-education-ontario-summit>



There is a direct relationship between textbook costs and student success



August 2, 2018
Learning is More Free and Open
OpenStax Infographic
https://oeb-us-els-openstax.com/www.network/oweb/06/c2/06a/2018/01/17/infographic_2018_Final_2134km.pdf



48% of degree-granting institutions using OpenStax textbooks
 1,170+ non-U.S. schools using OpenStax textbooks
 3,990+ U.S. schools using OpenStax textbooks
 100+ countries using OpenStax textbooks
 4.2 million students

March 19, 2018
Learning is More Free and Open
Open Textbook Network
 Center for Open Education, University of Minnesota
<http://research.cehd.umn.edu/otn/>





Open Textbook Network
 WE ARE A COMMUNITY DEDICATED TO RESKITS
 600+ Campuses represented
 \$8.5 Million Student savings by OTN members
 45% of faculty who attend an OTN workshop adopt an open textbook

December 19, 2017 and April 24, 2018
Learning is More Free and Open
eTexts 101: A Practical Guide
<https://lib.unt.edu/eTexts101/Student-Workshop/Introduction/>
<https://lib.unt.edu/eTexts101/>




OpenStax Saved 1 Million Students \$70 Million
 by Heidi Colburn | 21 August 2017

Real cost savings for students participating in TU's eTexts Program

Year	2012	2013	2014	2015	2016	2017
Surveys	\$49,124	\$108,238	\$253,031	\$335,257	\$475,332	\$514,905
Fair	\$49,124	\$108,238	\$253,031	\$335,257	\$475,332	\$514,905
OpenStax	\$500,000	\$625,000	\$1,450,257	\$1,475,257	\$2,200,485	\$1,075,035

May 3, 2017
Learning is More Free and Open
 4 out of 5 Companies Have Hired a Coding Bootcamp Graduate
 Sri Ravipati, Campus Technology
<http://www.campus-technology.com>




Resumes with "coding bootcamp" education experience
 (for 1,000,000 resumes on Indeed)


August 9, 2017
Learning is More Free and Open
Modern State Education Alliance
<https://modernstates.org/>




Freshman Year For Free
 Take freshman, first-semester courses online for free. Earn credit for college credit.

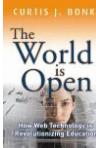
New Venture Will Offer Free Courses That Students Can Take for College Credit
 By Gail Berman | 8/9/2017

The World is Open: How Web Technology Is Revolutionizing Education



TEN OPENERS: (WE-ALL-LEARN)


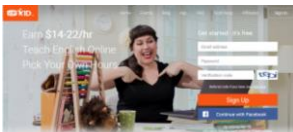
1. Web Searching in the World of E-Books
2. E-Learning and Blended Learning
3. Availability of Open Source and Free Software
4. Leveraged Resources and OpenCourseWare
5. Learning Object Repositories and Portals
6. Learner Participation in Open Information Communities
7. Electronic Collaboration
8. Alternate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




March 6, 2018 Learning is More Direct from Experts

By connecting Chinese pupils with North American teachers, Beijing-based platform is building cultural bridges, one online English class at a time.

Most Innovative Companies, Fast Company
Interview with VIPKid CEO Cindy Mi
<https://www.fastcompany.com/company/vipkid>

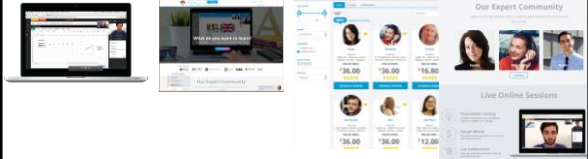



March 21, 2018 Learning is More Direct from Experts

TeachMeNow

TeachMeNow is a gig-economy platform for teachers. This marketplace connects teachers, experts, and mentors to students. The technology combines scheduling, payments and live virtual sessions that can connect on any device allows tens of thousands of teachers to create their own online businesses, with some earning over \$100,000 last year. In addition, schools and companies including Microsoft use TeachMeNow software to create their own-branded online learning communities.

<https://teachmenow.com/>



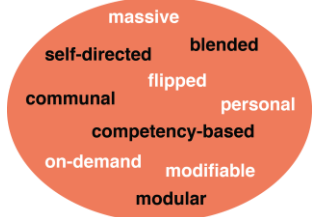
September 25, 2017 Learning is More Direct from Experts

Professors Have Taken Over the MOOCs: How open online learning is changing

Joshua Kim, Inside Higher Ed
<https://www.insidehighered.com/blogs/technology-and-learning/professors-have-taken-over-moocs>



How Learning is Changing: Mega Trend #3. Customization



The diagram is a large orange circle containing the following terms arranged in a circular pattern:

- massive
- self-directed
- blended
- communal
- flipped
- personal
- competency-based
- on-demand
- modifiable
- modular

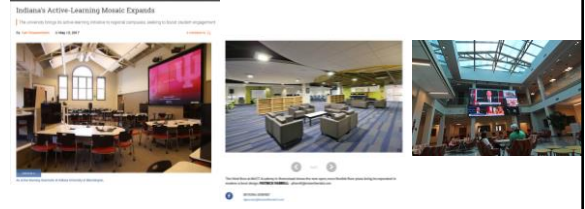
January 14, 2018
Learning is More Communal
Facebook invites you to live in a bubble
where you're always right
 Callum Borchers, The Washington Post

<https://www.washingtonpost.com/news/technology/wp/2018/01/14/facebook-lets-you-live-in-a-bubble-where-youre-always-right-but-youre-not-alone/2018/01/14/>



May 12, 2017 (Customization)
Learning is More Modifiable

The Future of Collaboration Spaces Encompasses Video
 Interactive, Mobile, Julie Johnston, IU, Campus Technology



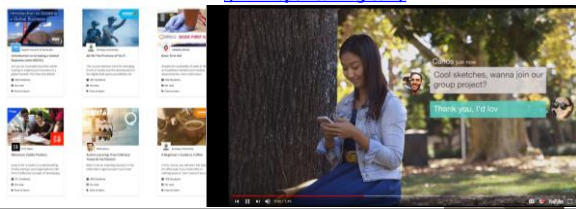
March 2, 2018
Learning is More Modifiable
The Architecture of Ideal Learning
Environments
 Emelina Minero, Edutopia
<https://www.edutopia.org/article/architecture-ideal-learning-environments>



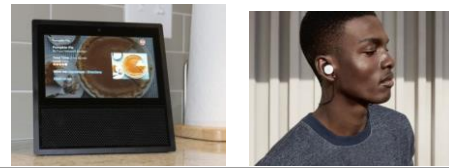
January 20, 2016
Learning is More Blended
Universities tap growth of craft beer,
offer classes, Chicago Tribune
<http://www.chicagotribune.com/news/education/CT-01-20-16-universities-tap-growth-of-craft-beer-offer-classes-2016-01-20%3A.html>



February 27, 2017
Learning is More Self-Directed
The LMS Market is Quickly Losing Ground
 Carol Leaman, CLO
<https://www.openlearning.com/>
<https://www.openlearning.com/>



January 2, 2018
Learning is More Personal
5G to AR: Here are 7 technologies to
watch in 2018, Edward C. Baig, USA Today
<https://www.usatoday.com/story/tech/2018/01/02/7-technologies-to-watch-in-2018/4511110002/>
 (e.g., Augmented hearing)



March 14, 2016
Learning is More Personal
Artificial Intelligence and Robots
Paul Basken, The Chronicle of Higher Education
<https://www.chronicle.com/article/Behind-a-Computer-s-Surprise/235687>
<https://www.audible.com/story/audiobook/2016/03/12/behind-a-computer-s-surprise-audio/18725992>

Behind a Computer's Surprise Victory, Hints of Global Economic Upheaval
 By Paul Basken (and the author)




October 14, 2017
Learning is More Personalized
China wants to bring artificial intelligence to its classrooms to boost its education system
Meng Jing, South China Morning Post
<https://www.scmp.com/tech/innovation/article/2151212/china-wants-bring-artificial-intelligence-its-classrooms-boost>
 Video 1:33: <http://curtbonk.com/chinese-ai.html>

Size of internet-enabled education market (billion yuan)

2013	92.4
2014	122
2015	161
2016	212.5
2017*	280.5



*2017 data based on 1H 2017 data, South China Morning Post



The system can also analyse the learning pattern of a whole class — and point out the weak problems


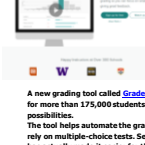
November 15, 2018
Learning is More Personalized
TutorIT SAT Prep
Joseph M. Scandura; scandura@gmail.com
<https://www.audible.com/story/audiobook/2018/11/15/tutorit-sat-prep-audio/18725992>

Students can now practice on actual SATs at tutorit.com. They also will get individualized help on items they miss, as long as they reach or used them get them all right. SATs personally cover very similar material from one year to the next. Students can continue with additional SATs until they reach their goal.

April 8, 2018
Learning is More Personal
Can Artificial Intelligence Make Teaching More Personal?
Goldie Blumenstyk, The Chronicle of Higher Education
<https://www.chronicle.com/article/Can-Artificial-Intelligence/243023>

Can Artificial Intelligence Make Teaching More Personal?



A new grading tool called [gradescope](https://www.gradescope.com) — powered by AI and now being used for more than 175,000 students at 550 colleges — offers one window on the possibilities. The tool helps automate the grading process without requiring instructors to rely on multiple-choice tests. Several professors who use it say the automation has actually made it easier for them to personalize their teaching. At the University of Michigan at Ann Arbor, students in a statistics class last fall had their writing assignments evaluated by an [automated text-analysis tool](https://www.gradescope.com).

May 9, 2017 (Customization)
Learning is More On Demand (PDAs)
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-touchscreen-video-alexa/10146884/>
 24 seconds: <http://curtbonk.com/jetsons24.html>
 44 seconds: <http://curtbonk.com/jetsons44.html>





August 2, 2018
Hey, Alexa, Should We Bring Virtual Assistants to Campus? These Colleges Gave Them a Shot
Lindsey Ellis, The Chronicle of Higher Education
<https://www.chronicle.com/article/Hey-Alexa-Should-We-Bring/244129>

Alexa goes to college: Echo Dots move into dorms on campus

Hey, Alexa, Should We Bring Virtual Assistants to Campus? These Colleges Gave Them a Shot



January 9, 2017

Learning is More On Demand

Jill Watson, Round Three, Georgia Tech course prepares for third semester with virtual teaching assistants, Jason Haderer, Georgia Tech News Center

The Terribly Thin Conception of Ethics in Digital Technology, David Golumbia, Uncomputing
<http://www.uncomputing.org/>

Bot teacher that impressed and fooled everyone, Donald Clark, Plan B
<http://donaldclarkplanb.blogspot.co.uk/2016/11/bot-teacher-that-impressed-and-fooled.html>



April 8, 2018

Learning is More On Demand

What I Learned When My Students Used Google Translate

Diane Loyet, The Chronicle of Higher Education
<https://www.chronicle.com/article/What-I-Learned-When-My/243017>

- I was very surprised by the results. They sent me examples of translations into English from Albanian, Chinese, Kazakh, Russian, and Spanish. **The translations from Albanian, Kazakh, Russian, and Spanish were good.** They were not perfect, but the mistakes were such that, had I encountered the sentences in a student paper, I would have attributed them to grammatical errors on the part of the non-native speaker of English. Here is one of the Spanish examples:
- Original Spanish:** *Si yo fuera tú, le cobrara hasta por respirar.*
- Google Translate's English translation:** *If I were you, I'll even charge you for breathing.*
- Accurate translation:** *If I were you, I would even charge him for breathing*



April 8, 2018

Learning is More On Demand

What I Learned When My Students Used Google Translate

Diane Loyet, The Chronicle of Higher Education
<https://www.chronicle.com/article/What-I-Learned-When-My/243017>

- In contrast, Google Translate's English version of a Chinese passage was unintelligible:**
- But the second language acquisition is a steady process, if you take a cure to do, that is, chronic diseases and even health care, unlike acute disease, once the recipe to treatment, the consequences will soon be reflected.*



May 9, 2018

Learning is More On Demand

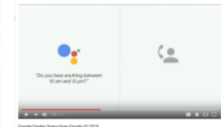
Google Duplex Demo from Google IO 2018

Video (4:11): <https://www.youtube.com/watch?v=bd1mEm2Fv08>

Video (2:05): <http://courtsbook.com/googleio-245.html>

Extra video (4:21): <http://courtsbook.com/googleio2018.html>

<http://donaldclarkplanb.blogspot.co.uk/2018/05/people-just-announced-ai-bot-that-could.html?m=1>



Some Weird Things Are Going On...

Weirdness #1: Never Stop Learning!



I'M WEIRD!

But I know you love me!

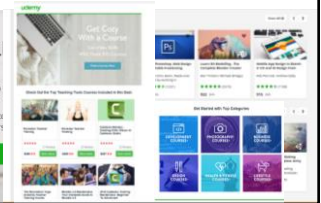


July 28, 2016

Learning is More Massive

Udemy: "Get cozy with a class"

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



MOOC Trends and Recent Data



Weirdness #2: MOOCs are not dead August 19, 2018

Cumulative Growth in Number of MOOCs, 2011-18

Almanac 2018, Chronicle of Higher Education

<https://www.chronicle.com/article/Top-5-MOOC-Providers-by-Number/244697?id=cp216>



Cumulative Growth in Number of MOOCs

2011-18

Source: MOOCs

Source: MOOCs

Source: MOOCs

Source: MOOCs

Source: MOOCs

Source: MOOCs

Source: MOOCs

Source: MOOCs

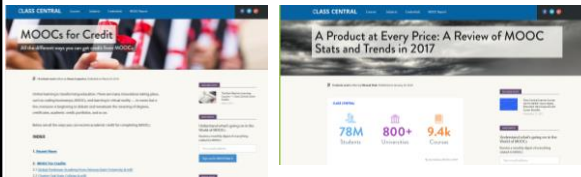
Source: MOOCs



INDIANA UNIVERSITY BLOOMINGTON

January 22, 2018 Learning is More Massive MOOCs for Credit Class Central

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



Weirdness #3: Your Friends are doing MOOCs June 15, 2017

Massive List of MOOC Providers Around The World, Class Central

JMOOC, K-MOOC, and T-MOOC?

<https://www.class-central.com/report/mooc-providers-list/>



INDIANA UNIVERSITY BLOOMINGTON

Weirdness #4: Summer MOOC Discounts Email inbox: June 10, 2018 edX (Summer discounts)

<https://www.edx.org/course>



Weirdness #5: Master's of Accountancy MOOCs? Email inbox: June 11, 2018

Coursera

<https://www.coursera.org/>



Weirdness #6: MOOC Info in Engagement Announcements September 26, 2018

The Future of Professional Credentialing ... in an Engagement Announcement Joshua Kim, Inside Higher Ed

<https://www.insidehighered.com/digital-learning/mooc/technology-and-learning/future-professional-credentialing-engagement>

The future bride graduated from the University of Vermont with a bachelor's degree in anthropology and is currently pursuing a master's degree in public health. She is employed as a care navigator with Apple.

The future groom graduated from Worcester Polytechnic Institute with a bachelor's degree in mechanical engineering and is currently pursuing a master's degree in mechanical engineering. He has been accepted in the Harvard Business School program and plans to start in November. He is currently working as a technical program manager at Apple.

They are planning on a summer wedding in 2020.

INSIDE
HIGHER ED



May 19, 2016 Weirdness #7: 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>

THE CHRONICLE OF HIGHER EDUCATION

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



Weirdness #8: Hundred+ MOOC Clubs April 20, 2015

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."

Weirdness #9: We All Teach the World October, 2018

Teaching the World, Sarah Fister Gale, CLO Chapter 19: Harnessing the Power of Open Learning to Share Global Prosperity and Eradicate Poverty

Sheila Jagannathan, World Bank, Washington DC

<https://imagazine.chronicle.com/issue/October-2018/teaching-the-world/>



May 20, 2016 Chapter 18: Changing the Tune: MOOCs for Human Development? A Case Study (agMOOCs in India)

Balaji Venkataraman and Asha Kanwar (COL)

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




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/dc-chuck-graduate-ceremony-python-specialization/>




World First: University of Michigan's Dr. Chuck Holds a Graduation Ceremony for MOOC Students



Programming for Everybody - Spring Graduation - 2016

Weirdness #10: MOOC Wave #2 is here!
May 21, 2018
 The Second Wave of MOOC Hype Is Here, and It's Online Degrees
 Dhawal Shah, Class Central
<https://www.edupage.com/news/2018-05-21-the-second-wave-of-mooc-hype-is-here-and-its-online-degrees>



September 12, 2018
Coursera's CEO on the Evolving Meaning of 'MOOC'
 Dian Schaffhauser, Campus Technology
<https://campustechnology.com/article/2018/09/12/coursera-ceo-on-the-evolving-meaning-of-mooc.aspx>



Coursera's CEO on the Evolving Meaning of 'MOOC'

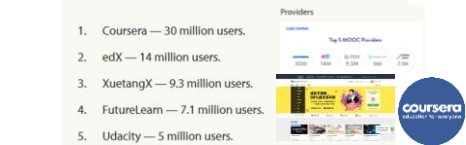


Jeff Maggioncalda, Coursera CEO

Weirdness #11: Mega Millions of MOOC Users
January 22, 2018
 A Review of MOOCs Stats and Trends in 2017, Dhawal Shah, Class Central
<https://www.class-central.com/report/mooc-stats-and-trends-2017/>

Here is a list of the top five MOOC providers by registered users:

1. Coursera — 30 million users.
2. edX — 14 million users.
3. XuetangX — 9.3 million users.
4. FutureLearn — 7.1 million users.
5. Udacity — 5 million users.



Weirdness #12: Discounted MOOC-based MBAs
August 7, 2017
 FutureLearn and Coventry University to Roll Out 50 Online Degrees (Last year Deakin University announced a similar partnership with FutureLearn)
 Class Central, Dhawal Shah
<https://www.class-central.com/report/futurelearn-coventry-university-roll-out-online-degrees/>

Degree	Provider	University	Cost
MS Computer Science	Udacity	Georgia Tech	\$6,600
MS Analytics	edX	Georgia Tech	\$10k
MBA	Coursera	University of Illinois	\$22k
MS CS Data Science	Coursera	University of Illinois	\$19.2k
MS Accounting	Coursera	University of Illinois	\$27.2k
Masters in Innovation and Entrepreneurship	Coursera	HEC Paris	€20k
Cyber Security (Masters)	FutureLearn/Deakin University		£24k
Development and Humanitarian Action (Masters)	FutureLearn/Deakin University		£24k
Professional Practice: Information Technology (Masters)	FutureLearn/Deakin University		£24k

October 12, 2018
Weirdness #13: Microcredentials and Nanodegrees
Learning is More on Modular
 edX Expands MicroMasters Programs With Data Science ("nanodegrees")
 Digital Leadership and More, Sri Ravipati, Campus Technology
<https://campustechnology.com/article/2018/10/12/edx-expands-micro-masters-programs-with-data-science-nanodegrees-and-digital-leadership-and-more.aspx>

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



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



WHAT'S NEXT



Part III. Technology Tomorrow

http://www.huffpost.com/author/marie-bourgeois/p/prepare-for-future-learning_b_16462735.html

TECHNOLOGY

How Human is Too Human for Robots?

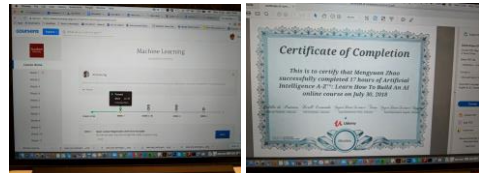


August 1, 2018

1. Independent Studies Via MOOCs MOOC: AI A-Z: Learning How to Build an AI Online Course and Machine Learning

Mengyuan Zhao

<https://www.udemy.com/artificial-intelligence-ai/>
<https://www.coursera.org/learn/machine-learning>



October 12, 2018

2. OER-Based Courses and Programs

The Chronicle of Higher Education

Launching OER Degree Pathways:

An Early Snapshot of Achieving the Dream's OER Degree Initiative and Emerging Lessons
https://www.achievethe dream.org/sites/default/files/initiatives/launching_oer_degree_pathways.pdf
Griffiths, R., Gardner, S., Lundh, P., Shear, L., Ball, A., Milevsky, J., Wang, S., Desrochers, D., Stalsloff, R. (2018). *Participant Experiences and Financial Impacts: Findings from Year 2 of Achieving the Dream's OER Degree Initiative*. Menlo Park, CA: SRI International.



Saving money with open-ed resources.

- A large-scale effort to encourage the use of open-education resources has helped students save money and bolstered their learning, according to a report, released today, on the findings from the second year of Achieving the Dream's OER Degree Initiative. The study found that:
 - Students saved between \$66 and \$121 per course.
 - Over 60 percent of students reported that the overall quality of their learning experience in an OER course was higher in comparison to a typical, non-OER course.
 - The number of OER courses at participating institutions jumped from 13 in 2016 to 385 in the spring of 2018; the number of students enrolled in OER courses went from 3,404 in 2016 to 37,398 in 2017.

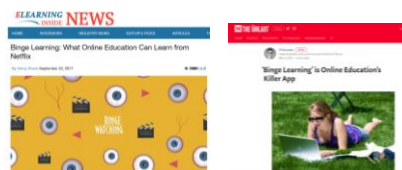
September 22, 2017

3. Binge Learning Experiences

What Online Education Can Learn from Netflix

Henry Kronk, E-learning Inside News

<https://thebulletin.com/binge-learning-is-online-education-s-killer-app-84da18f8ae76>



June 11, 2017 (New Learning Times)
4. Rise of Super E-Mentors and AI Coaches
 (Paul Kim, 2018)



February 27, 2017
5. Web Conferencing Walls

Global Learning Partner or PBL Team Selection Walls

http://www.thelivingmoss.com/43ancients/52files/Library_Alexandria.html



September 26, 2018
6. Interactive Agents and Tutors
 Pushing the Boundaries of Learning With AI

Lindsay McKenzie, Inside Higher Ed

<https://www.insidehighered.com/digital-learning/article/2018/09/26/interactive-swift-expand-use-ai-higher-ed-teaching-and-learning>
<https://www.ibm.com/blogs/ai/2018/09/mandarin-language-ai/>
<https://www.youtube.com/watch?v=7Eu5TuiR2A>
 1:17: <http://curtbonk.com/mandarin.html>



Mandarin Language Learners Get a Boost From AI



January 30, 2017
7. Professor Einstein PDA's

<http://www.usatoday.com/story/tech/2017/01/30/robotic-hatbox-now-serving-math-fan/988870/>

When the Teaching Assistant Is a Robot



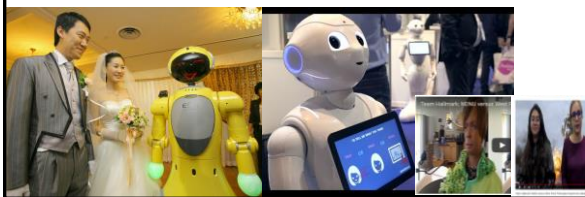
Twenty-Four Seven Tutoring



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)
<https://www.usatoday.com/story/tech/2017/01/30/robotic-hatbox-now-serving-math-fan/988870/>

February 27, 2017
8. Robot Collaborators/Partners

http://www.thelivingmoss.com/43ancients/52files/Library_Alexandria.html



January 16, 2018
Robots are better at reading than humans
 Brett Molina, The USA Today

<https://www.usatoday.com/story/tech/news/2018/01/16/robots-better-reading-than-humans/1036420001/>
 Video (57 seconds): <http://curtbonk.com/robots1.html>

Robots are better at reading than humans



March 29, 2017**Every industrial robot takes up to 6 jobs, study finds****Steve Goldstein, MarketWatch**<http://www.marketwatch.com/story/every-industrial-robot-takes-up-to-6-jobs-from-robotics-research-finds-2017-02-29>Video: 1:46 <http://curtbonk.com/futureandroids.html>Video: :49-1:12: <http://curtbonk.com/futureandroids2.html>Video: :01 to :49: <http://curtbonk.com/futureandroids3.html>Video: 01:-25: <http://curtbonk.com/futureandroids4.html>**March 24, 2017****Artificial Intelligence Market in the US Education Sector 2017-2021**<http://www.researchandmarkets.com/research/51shz/artificial>**AI Market to Grow 47.5% Over Next Four Years****Richard Chang, Campus Technology**<https://campustechnology.com/articles/2017/03/23/ai-market-education-sectors-on-rapid-expansion.aspx>**9. Café Classroom and Café Connectedness****Starbucks Your Classroom!****Oskar Cymerman, Teaching Channel**<https://www.teachingchannel.org/blog/2016/07/25/starbucks-your-classroom/>

Sterile, industrial-era rows aren't very attractive or motivating...I believe the "Starbucks" environment will promote that freedom and movement...Freedom is the key ingredient to social-emotional well-being and deeper learning. Rows and columns constrict. They hold and stifle.

10. Instructional Designer Morphs into Learning Environment Engineer**The New and Improved Instructional Designer****February 27, 2017**
11. World Knowledge Refreshment Stations<http://www.theivivingschool.com/55-and-over/50th-Library-Alexandria.html>**March 28, 2017****12. Brain-based Learning****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/2017/03/23/elon-musk-neuralink-plug-your-brain/40471434002>

Elon Musk wants to link human brains with computers. The CEO of SpaceX and Tesla Motors is working on a brain-computer interface (BCI) called Neuralink. The company is currently in the early stages of research and development.



Poll:
Evolution or Revolution?



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

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



Things are heating up!

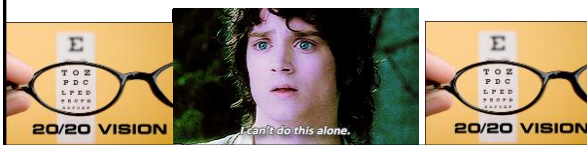


**The Learning Revolution is
coming within reach!**



Remember...
"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: cjbonk@indiana.edu

