Education 20/20 meets Education 4.0: Visions of Our Changing Learning World!

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

Talk Overview
1. Education 20/20 and Education 4.0
2. Artificial Intelligence vs. Intelligence Augmentation
3. The Evolution of E-Learning
   (30 ways that learning is changing...)
5. Future Trends and Ideas

(Circa Confucius 551–479 BCE)

What happens to sleeping students?

Merrill’s First Principles of Teaching/Instruction
http://travelinedman.blogspot.com/2011/05/bonks-first-principles-of-instruction.html
1. The Principle of Flexibility
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

2. The Principle of Convenience
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html
3. The Principle of Collegiality

4. The Principle of Cheerfulness and Optimism

5. The Principle of High Expectations

6. The Principle of Choice and Options

7. The Principle of Empowerment and Autonomy

8. The Principle of Support and Feedback
9. The Principle of Spontaneity
http://travelinedman.blogspot.com/2011/05/bonks-last-principles.html

10. The Principle of Organization
http://travelinedman.blogspot.com/2011/05/bonks-last-principles.html

11. The Principle of Sharing
http://travelinedman.blogspot.com/2011/05/bonks-last-principles.html

12. The Principle of Nontraditional Learning
http://travelinedman.blogspot.com/2011/05/bonks-last-principles.html

13. The Principle of Passion and Inspiration
http://travelinedman.blogspot.com/2011/05/bonks-last-principles.html

14. The Principle of Relevance and Meaningfulness
http://travelinedman.blogspot.com/2011/05/bonks-last-principles.html
15. The Principle of Trial and Error (i.e., it is ok to fail)  
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

16. The Principle of Expanded Resources  
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

17. The Principle of Human Connectedness  
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

18. The Principle of Cognitive Apprenticeship  
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

19. The Principle of Purpose and Vision  
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

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

"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


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://www.tubechop.com/watch/8280981

“IT’s quite clear that the established models of education have to change and adapt to the new environment.”

January 14, 2016

The Fourth Industrial Revolution:

What it means, how to respond

Klaus Schwab, Founder and Executive Chairman, World Economic Forum


http://www.tubechop.com/watch/8280981

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


http://www.tubechop.com/watch/8280981

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

June 7, 2016
Teaching refugees how to code, CNN Money

June 20, 2016
Coursera on a Mission to Help Refugees
Lauren Camera, US News and World Report

September 21, 2016
Udacity Unveils Nanodegree Program for Self-Driving Car Engineers
Sri Ravipati, Campus Technology

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

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: Read any good books lately detailing this shift?

The Innovators:
Walter Isaacson (2014)
http://books.simonandschuster.com/The-Innovators/Walter-Isaacson/9781476708690

Machines of Loving Grace:
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

March 14, 2016
Artificial Intelligence and Robots
Paul Basken, The Chronicle of Higher Education
http://www.chronicle.com/article/Behind-a-Computer-s-Surprise-Victory-Hints-of-Global-Economic-Uph/235687?cid=at&utm_source=at&utm_medium=en&elqTrackId=b050021f79e64d299f78b827af837b4a&elq=9ab0ff65a0e940caa0943c7774346&elqaid=8231&elqat=1&elqCampaignId=2650
http://www.usatoday.com/story/tech/2016/03/13/robots-androids-geminoids-sxsw/81735092

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, time-sharing, hypertext, word processing, hypertext, electronic mail, and electronic conferencing. This invention is as revolutionary in its way as the invention of fire was in its way.”
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.
June 10, 2015
Augmented reality promises ‘superpowers’, and people are listening
The USA Today, Marco della Cava

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

Knowledge Navigator (1987)
Apple Computer
http://www.youtube.com/watch?v=hb4AzF6wEoc

October 14, 2011
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 “Chip”), Elizabeth Weise, USA Today
The World is Open:
How Web Technology Is Revolutioning Education

February 22, 2017
Digital citizenship lessons from a 9-year-old with 18,000 Twitter followers, Alan November, eSchool News
http://www.eschoolnews.com/2017/02/22/digital-citizenship-twitter/

August 5, 2015
Shubham Jaglan (10 years old) Overwhelmed by "Dream" Return Home After Double World Championship
Disha Chopra, NDTV Sports

April 20, 2015
250 MOOCs and Counting: One Man's Educational Journey, Chronicle of Higher Education
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."

July 2016
I. Elaine Allen and Jeff Seaman, Babson Survey Research Group

January 3, 2017
College is Over
Roger Schank, LinkedIn
January 15, 2016
Wikipedia is 15!
Scott McLemee, Inside Higher Ed
https://www.insidehighered.com/views/2016/01/15/essay-wikipedias-fifteenth-anniversary

April 4, 2016
MIT OpenCourseWare is 15!
http://ocw.mit.edu/about/15-years/

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

1971
Email is 35 years old!
Raymond Tomlinson, inventor of modern email, dies, USA Today (March 7, 2016)

Invented: May 24, 1844
150 Years since Lincoln needed the Telegraph (T-Mail)
Mr. Lincoln's T-Mails: How Abraham Lincoln Used the Telegraph to Win the Civil War, Tom Wheeler (2008).
http://www.amazon.com/Mr-Lincolns-T-Mails-Abraham/dp/0061129801
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

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

Learning is More Social
YouTube takes on Facebook with mobile live
Jefferson Graham, USA Today

Learning is More Visual
e.g., reef videoconferencing
(Great Barrier Reef, Australia)

Learning is More Adventurous
Aaron Doering, Chasing Seals, TEDx
http://chasingseals.com/
https://twitter.com/chasingseals

February 7, 2017 (Engagement)
Learning is More Social
YouTube takes on Facebook with mobile live
Jefferson Graham, USA Today

August 23, 2016 (Engagement)
Learning is More Visual
e.g., reef videoconferencing
(Great Barrier Reef, Australia)

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

Pokemon 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.

April 2, 2015 (Engagement)
Learning is More Immersive
The Quest to Put More Reality in Virtual Reality
Review: Samsung rises to challenge with Galaxy S6 and S6 Edge, Edward Baig, USA Today

NextVR crew members set up their virtual reality cameras at an NBA game, allowing viewers of the live event to see the game from a variety of positions in the arena.

February 15, 2017 (Engagement)
Learning is More Synchronous
Shindig, Future Trends Forum, Bryan Alexander

February 17, 2016 (Engagement)
Learning is More Mobile
World’s Cheapest Smartphone at $3.67

Samsung Pay on the Gear S3. (Photo: Eli Blumenthal, USA TODAY)

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

September 7, 2016 (Engagement)
Learning Apps - Personalized Interfaces for Performance
Elliott Masie’s Learning TRENDS; trends@masie.com

Personalized for an employee based on their development goals, competency gaps and changing skill/information matrix in the workplace. A Learning App could provide a just in time set of content, context, collaboration connections, coaching sets and real time feedback.

Want “FREE” engagement? How about ”Adding Some TEC-VARIETY“?
http://tec-variety.com/
How Learning is Changing: Mega Trend #2. Pervasive Access

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

July 21, 2016
Facebook’s Aquila drone completes first test flight
Jessica Guynn, USA Today

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 (Customization)
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

September 28, 2016 (Customization)
Learning is More Free
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

http://www.eschoolnews.com/asugsvsummit/

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/
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

Learning is More Direct from Experts (e.g., The Expert Café)
http://expertscafe.com/

Nine-Year-Old Anvitha Vijay is the Youngest Developer at WWDC (age 9)
(Angle Worldwide Developers Conference), Gadgets

This Mongolian Teenager Aced a MOOC Now He Wants to Widen Their Impact
(140,000 people took 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-MOOC-Now-He-Wants-to-Widen/236362

How Learning is Changing: Mega Trend #3. Customization
massive self-directed
blended flipped
communal competency-based
on-demand modifiable
personal modular
September 7, 2016 (Customization)
Learning is More Comfortable
The Future of Collaboration Spaces Encompasses Video Interactive, Mobil, Julie Johnston, IU, Campus Technology

In the Indiana University Media School lobby, a large display will showcase student work and provide interactive sessions. (photo by Allen Major/The Media School © Indiana University)

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

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

February 16, 2017
Zuckerberg: Bonds between strangers can help in divisive times
Jessica Guynn, USA Today

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

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

Growth of MOOCs

Source: Class Central

December 25, 2016
Class Central

58M
Students
700+
Universities
6850
Courses

December 23, 2016
HarvardX and MITx: Four Years of Open Online
Courses -- Fall 2012 - Summer 2016
Isaac Chung, MIT, and Andrew Dean Ho, Harvard

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/

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

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/
August 5, 2015 (Customization)
How Nanodegrees Are Disrupting Higher Education
John Waters, Campus Technology
http://campustechnology.com/articles/2015/08/05/how-nanodegrees-are-disrupting-higher-education.aspx

January 13, 2016 (Customization)
Degree gets you a tech job — or your money back
Marco della Cava, USA Today

July 28, 2016 (Customization)
Coursera Specializations email
Starting Monday August 1st: 9 Top Specializations
http://routledge-ny.com/books/details/9781138807419/

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)
World First: University of Michigan’s Dr. Chuck Holds a Graduation Ceremony for MOOC Students
Anuar Lequerica, Class Central
https://www.class-central.com/report/dr-chuck-graduate-ceremony-z806f0a4
<table>
<thead>
<tr>
<th>Type of MOOC</th>
<th>InMOOC</th>
<th>dMOOC</th>
<th>½MOOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learner Role</td>
<td>Active</td>
<td>Passive</td>
<td>Active</td>
</tr>
<tr>
<td>Instructor Role</td>
<td>Co-learner</td>
<td>Sage on video stage</td>
<td>Guide on the side</td>
</tr>
<tr>
<td>Learning Theory</td>
<td>Construction</td>
<td>Behaviorism</td>
<td>Constructivism</td>
</tr>
<tr>
<td>Primary Pedagogy</td>
<td>Knowledge integration</td>
<td>Knowledge application</td>
<td>Knowledge production</td>
</tr>
<tr>
<td>Metaphor</td>
<td>“We build movies”</td>
<td>“We watch movies”</td>
<td>“We make movies”</td>
</tr>
<tr>
<td>Development Approach</td>
<td>Learning design</td>
<td>Instructional design</td>
<td>Educational design research</td>
</tr>
<tr>
<td>Primary Type of Assessment</td>
<td>Self-Assessment</td>
<td>External and/or Peer-Assessment</td>
<td>Self-and/Client Assessment</td>
</tr>
<tr>
<td>Funding Source</td>
<td>Self-funded</td>
<td>Course or Client-funded</td>
<td>Ongoing or continuous funding</td>
</tr>
</tbody>
</table>

Figure 1. Differences among three types of MOOCs (Bonk & Holberg, 2016).


August 24, 2016
K-MOOCs (and ocMOOCs and hMOOCs)
Revolutionizing online education
Professor creates courses tailored to cultural differences
Kim Jongho Kang, Seoul-MOOCs
http://www.kmooc.kr/

May 4, 2016
MOOC 4.0: The Next Revolution in Learning & Leadership
Otto Scharmer, Huffington Post
http://www.huffingtonpost.com/otto-scharmer/mooc-4-0-the-next-revolution_b_7209606.html

September 2, 2016
Humans, the Latest MOOC Feature
Introduction to Philosophy: God, Knowledge and Consciousness
($300 USD for an identity-verified certificate)
Carl Straumsheim, Inside Higher Ed

WHAT’S NEXT

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

Humans, the Latest MOOC Feature
MIT experiments with instructor grading in massive open online courses as a way to expand teaching and learning opportunities for students and instructors.
January 30, 2017
Personal Professor Albert Einstein
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)

Things are heating up!

Education 4.0 is coming within reach!

Poll #10:
Who is now interested in Education 20/20...?

Remember for Education 20/20 to meet Education 4.0:
“"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