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

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Talk Overview
1. Jobs are changing
2. Education 20/20 and the Role of the Instructor
3. First and Last Principles of Instruction
4. Megatrends of Learning: Engagement, Access, and Customization (30 ways that learning is changing...)
5. Future Trends and Ideas

(Circa Confucius 551–479 BCE)

November 28, 2017
Automation could kill 73 million U.S. jobs by 2030
Paul Davidson, USA Today

Video (1:30): http://curtbonk.com/automation2.html

September 18, 2018
Machines will create 58 million more jobs than they displace by 2022, World Economic Forum says (133 million jobs will emerge and 75 million may be lost)
Hamza Shaban, The Washington Post
March 29, 2017
Every industrial robot takes up to 6 jobs, study finds
Steve Goldstein, MarketWatch

Intelligence Augmentation and Amplification
Douglas Engelbart’s “The Mother of All Inventions” (1968)
Augmentation Research Center (ARC)
(‘The live demonstration included the introduction of the computer mouse, online conferencing, hypertext, word processing, hypertext, and the concept of sharing ideas on-screen.”)
http://www.amazon.com/Machines-Loving-Grace-Common/dp/0062266683
Engelbart’s prototype of a computer mouse, as designed by Bill English from Engelbart’s sketches.

April 30, 2017
‘Those Jobs Are Gone’
Steve Kolowich, The Chronicle of Higher Education

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://www.youtube.com/watch?v=a-NLh58bI

Fast Forward 30+ Years…
“Anyone can now learn anything from anyone at any time.”

The Creation of Effective Learning Environments
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

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

September 18, 2017
Education 1.0 to 3.0
Gilly Salmon, University of Liverpool, UK
http://www.gillysalmon.com/learningfutures.html

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-40/41795
https://thinc.in.th/engadmission/education4.html (Chula Engineering)

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/10217854977276184/
Question Answering: Level 1 – Level 5

Level 1
Create a New Question
What is turbulence?

Level 2
Create a New Question
Why is turbulence dangerous to small airplanes?

Level 3
Why did Elon successfully launch the SpaceX program?

Level 4
Who admitted that launching the car into space was "kind of silly and fun?"

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)
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.”

July 11, 2017
The Rise of the Phigital Learner
Going ‘phigital!’ 4 things schools need to know about Generation Z, Todd Kominiak, TrustEd
May 15, 2017
3 must know’s about the rising “phigital” student—and why their impact is enormous,
Meris Stansbury, eCampus News
https://www.ecampusnews.com/campus-administration/education-gen-z-phigital-student/

Clearly…
Learning is Changing!

Education 20/20

20 New Roles of the Instructor
Captain, Counselor, Conductor, Consultant, Course Ambassador, Curator, Course Expedition Leader, Consumer Advocate, Change Catalyst, Cook, Comedian, Coach, Collaborator, Chemist, Care Giver, Colleague, Community Organizer, Cultivator.
April, 2016
Instructional Design in Higher Education, Gates Foundation and Intentional Futures

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

Bonk’s Last Principles of Teaching/Instruction (Education 4.0?)
http://travelinedman.blogspot.com/2011/05/bonks-last-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
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html
4. The Principle of Cheerfulness and Optimism
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

5. The Principle of High Expectations
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

6. The Principle of Choice and Options
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

7. The Principle of Empowerment and Autonomy
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

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

August 6, 2018
Why I'm Easy: On Giving Lots of A’s
Gary Laderman, The Chronicle of Higher Education

August 8, 2017
Professor's plan to let students grade themselves gets an F,
Paul LeBlanc, CNN
9. The Principle of Spontaneity
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html

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

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

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

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

14. The Principle of Relevance and Meaningfulness
http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.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

The World of Open Education

September 19, 2014
Story #1...I am a product of distance learning...
Bob Clasen, University of Wisconsin
https://www.youtube.com/watch?v=kCm1_MGaqec&feature=youtu.be
February 27, 1934 - March 17, 2018

The World is Open: How Web Technology Is Revolutionizing Education

The Evolution of E-Learning (All 7 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 MOODS (FIRST MOOD OFFERED).

Phase IV, 2015:
THE AGE OF PERSONALIZATION.

Other prior significant e-learning dates:
1985: FIRST ONLINE COURSE, LINDA MARAED, UNIV OF TORONTO
1987: HYPERCARD FIRST SHIPPED.
17. The Principle of Human Connectedness

18. The Principle of Cognitive Apprenticeship

19. The Principle of Purpose and Vision

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

ARKit lets you create immersive augmented reality experiences on iOS devices. (Photo: Wearable)

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

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

This Physicist Wants Female Scientists To Get Noticed. So She Wrote 270 Wikipedia Profiles.
Jenna Amatulli, Huffington Post

July 24, 2018
Learning is More Digital and Resource Rich
This Physicist Wants Female Scientists To Get Noticed. So She Wrote 270 Wikipedia Profiles.
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
Video (1 minute): http://curtbonk.com/facebook-portal.html

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=9tucY7Jhhs4
Video 1:48: Microsoft AI: Amplifying Human Ingenuity:
https://www.youtube.com/watch?v=NDmu7Z5NPXo
Video 1:00: Microsoft AI: Empowering Innovators ft. Common:
https://www.youtube.com/watch?v=Z5OWdqfAYfw
Video: 1:00: Microsoft AI + Iconem: Preserving History ft. Common:
https://www.youtube.com/watch?v=ZDZjaIhzMSM
Video: 0:44: Microsoft AI + The Yield: Taking the guesswork out of farming ft. Common:
https://www.youtube.com/watch?v=7rzufxlGH4o

May 14, 2018 (Engagement)
Learning is More Adventurous
Aaron Doering, Chasing Seals, TEDx
http://chasingseals.com/
https://twitter.com/chasingseals

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

March 21, 2018 (Engagement)
Learning is More Collaborative
Chatterbox
The overall winner in the competition was Chatterbox, an online language school powered by refugees
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 NoLLA 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, Lumino 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.

July 19, 2017
Learning is More Immersive
HoloLens Assists in Live Surgery
Tommy Palladino, Next Reality

Numerous examples exist of doctors and surgeons using the HoloLens during their procedures. Until recently, however, it has not been used to augment the surgeon’s view of the patient during a live surgery.

May 18, 2017
Learning is More Immersive
Google Expeditions Adds Augmented Reality for Classrooms
Sri Ravipati, THE Journal

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)
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

May 7, 2014 (Access)
Learning is More Global
CNA - Speaking Exchange (video chats)
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

September 21 and November 12, 2017
Learning is More Immediate...
Scientists just discovered the first brainless animal that sleeps
Sara Kaplan, Washington Post

November 19, 2015 (Access)
Learning is More Immediate...
New daddy longlegs named after 'Lord of the Rings' character Smeagol
Mary Bowerman, USA Today

October 4, 2018 (Engagement)
Learning is More Synchronous
Anant Agarwal, CEO and founder of edX
February 19, 2018
Learning is More Online (Access)
Grade Increase:
Tracking Distance Education in the United States
Joshua Kim, Inside Higher Ed
http://onlinelearningsurvey.com/reports/gradeincrease.pdf

November 1, 2017
Learning is More Online (Access)
Indiana University, Office of Online Education

November 11, 2018
Meet the New Mega-University:
Can the fast-growing Southern New Hampshire U. transform higher education?
Goldie Blumenstyk, The Chronicle of Higher Education
https://www.chronicle.com/article/Meet-the-New-Mega-University/245049

October 31, 2018
Can a Huge Online College Solve California’s Work-Force Problems?
Karin Fischer, The Chronicle of Higher Education
https://www.chronicle.com/article/Can-a-Huge-Online-College/244054

September 17, 2018
Talk to Books
https://books.google.com/talktobooks/

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
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.

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 occur on any device. Allowing 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.

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

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
The Architecture of Ideal Learning Environments
Emelina Minero, Edutopia
January 20, 2016
Learning is More Blended
Universities tap growth of craft beer, offer classes, Chicago Tribune

January 2, 2018
Learning is More Personal
5G to AR: Here are 7 technologies to watch in 2018, Edward C. Baig, USA Today

October 14, 2017
Learning is More Personalized
China wants to bring artificial intelligence to its classrooms to boost its education system
How the take off of AI-enabled education will affect the interaction between China’s 14 million teachers and 188 million pupils
Meng Jing, South China Morning Post

November 15, 2018
Learning is More Personalized
TutorIT SAT Prep
Joseph M. Scandura; scandura0@gmail.com

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

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
**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

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**January 9, 2017**

Learning is More On Demand

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

The Terribly Thin Conception of Ethics in Digital Technology, David Golumbia, Uncomputing

http://www.uncomputing.org

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**April 8, 2018**

Learning is More On Demand

What I Learned When My Students Used Google Translate

Diane Loyet, The Chronicle of Higher Education


- 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 tu, le cobraría 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.

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**April 8, 2018**

Learning is More On Demand

What I Learned When My Students Used Google Translate

Diane Loyet, The Chronicle of Higher Education


- 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.

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**May 9, 2018**

Learning is More On Demand

Google Duplex Demo from Google IO 2018

Video (4:11): https://www.youtube.com/watch?v=bd1mEm2Fy08

Video (2:05): http://curtbonk.com/google40-245.html


Donald Clark Plan B

http://donaldclarkplanb.blogspot.ca/2018/05/google-just-announced-ai-bot-that-could.html?m=1

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**January 22, 2018**

Learning is More Massive

MOOCs for Credit

Class Central

https://www.class-central.com/report/moocs-for-credit/
July 28, 2016 (Customization)
Learning is More Massive
Udemy: "Get cozy with a class"
https://www.udemy.com/

September 26, 2018
The Future of Professional Credentialing
... in an Engagement Announcement
Joshua Kim, Inside Higher Ed

April 20, 2015
250 MOOCs and Counting: One Man's Educational Journey,
Chronicle of Higher Education
http://chronicle.com/article/250-MOOCs-Counting/229397/?cid=at

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

MOOCs and Open Education
Around the World
http://routledge-np.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)
Chapter 15: Learning About MOOCs by Talking to Students
Charles Severance, Univ. of Michigan
Anuar Lequerica, Class Central
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

Email inbox: June 10, 2018
edX (Summer discounts)

Email inbox: June 11, 2018
Coursera

MOOCs are Like Library Books...

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

Prepare For Future Learning
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-
https://www.coursera.org/learn/machine-

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

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://theumlaut.com/binge-learning-is-online-
s-killer-app-84da18f8ae76

7. Rise of Super E-Mentors and Coaches
(Paul Kim, 2018)

February 27, 2017
5. Web Conferencing Walls
Global Learning Partner or PBL Team Selection Walls
http://www.thelivingmoon.com/43ancients/02files/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-

https://www.ibm.com/blogs/research/2018/08/mandarin-

https://www.youtube.com/watch?time_continue=4&v=7EuSTu1iR2A

http://curtbonk.com/mandarin.html

1:17 http://curtbonk.com/mandarin.html
January 30, 2017
7. 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)

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

February 27, 2017
9. Café Classroom and Café Connectedness
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. ... 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 shift.

February 27, 2017
10. Instructional Designer Morphs into Learning Environment Engineer

June 3, 2016
11. World Knowledge Refreshment Stations
http://www.thelivingmoon.com/43ancient/02files/Library_Alexandria.html

June 3, 2016
12. Explosion of Virtual Reality
VR Lets Med Students Experience What It’s Like To Be 74
Elyse Wanshel, Huffington Post
http://ht.ly/bSpe300XEPJ
Poll: Excited or does all this give you a headache?

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.”

Any Questions or Comments?

Slides at: TrainingShare.com
Papers: PublicationShare.com
Free book: http://tec-variety.com/
Email: cjbonk@indiana.edu