Education 20/20 Meets Education 4.0: Visions of 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


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
Video: 1:45 http://curtbonk.com/futureandroids.html
Video: .49 - 1:12: http://curtbonk.com/futureandroids2.html
Video.01 - .25: http://curtbonk.com/futureandroids4.html

April 30, 2017
Education 1.0
‘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-NLh58bIK

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 constrain. 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.
"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

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**September 18, 2017**

**Education 1.0 to 3.0**

Gilly Salmon, University of Liverpool, UK

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**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/

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**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)

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**Question Answering:**

**Level 1 – Level 5**

(Paul Kim, Taiwan, November 2018)
▪ When did Elon successfully launch the SpaceX program?
▪ Who admitted that launching the car into space was "kind of silly and fun"?
▪ What are the things Tesla designed?
▪ What were the things Tesla couldn’t determine the cause of?
▪ How do you compare Elon Musk and Nicolas Tesla?
▪ How is Mars different from Jupiter?
▪ 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"?
▪ 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?
▪ What are the things Tesla designed?
▪ What were the things Tesla couldn’t determine the cause of?
▪ 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"?
▪ How do you compare Elon Musk and Nicolas Tesla?
▪ How is Mars different from Jupiter?
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▪ How do you compare Elon Musk and Nicolas Tesla?
▪ How is Mars different from Jupiter?

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/

Navigating the next industrial revolution

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
https://www.ecampusnews.com/campus-administration/education-gen-z-phigital-student/

3 must know’s about the rising “phigital” student—and why their impact is enormous, Meris Stansbury, eCamous News
https://www.ecampusnews.com/campus-administration/education-gen-z-phigital-student/

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

Clearly…
Learning is Changing!

Education 20/20

20 New Roles of the Instructor

Merrill’s First Principles of Teaching/Instruction

Bonk’s Last Principles of Teaching/Instruction (Education 4.0?)

Bonk’s Last Principles of Teaching/Instruction
(Education 4.0?)
1. The Principle of Flexibility
   [Link](http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html)

2. The Principle of Convenience
   [Link](http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html)

3. The Principle of Collegiality
   [Link](http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html)

4. The Principle of Cheerfulness and Optimism
   [Link](http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html)

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

6. The Principle of Choice and Options
   [Link](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

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 Evolution of E-Learning (All 7 year cycles)

Phase I, 1994:
THE AGE OF PORTALS AND PAGES (Netscape goes public).

Phase II, 2001:

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

Phase IV, 2015:
THE AGE OF PERSONALIZATION.

Other prior significant e-learning dates:
1985: first online course, Linda Harasim, U of Toronto
1987: Hypercard first shipped.
The World is Open: How Web Technology Is Revolutionizing Education

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
Bonk’s 20 “Last” Principles of Instruction (LAST = Learning Activation System Template)

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

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

- 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

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.

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.huffingtonpost.com/entry/scientist-pens-270-wikipedia-pages-in-a-year-so-female-scientists-get-noticed_us_5b574e4b4b0b15aba92c0d5
August 4, 2017
Learning is More Mobile
When our smartphones leave us out of touch
Brett Molina, USA Today

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

April 22, 2018
Learning is More Visual
Microsoft AI Commercial ft. Common
Video 1:00: Microsoft AI Commercial ft: https://www.youtube.com/watch?v=9tucY7Jhhs4 (Feb 11, 2018)
Video 1:00: Microsoft AI: Empowering Innovators ft. Common: https://www.youtube.com/watch?v=Z5OWdqfAYfw (April 22, 2018)
Video 0:44: Microsoft AI + The Yield: Taking the guesswork out of farming ft. Common: https://www.youtube.com/watch?v=7rzufxlGH4o (April 22, 2018)

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

Learning is More Immersive
3 ways districts can use AR and AI
Justin Anglio, eSchool News
https://www.eschoolnews.com/2018/05/01/3-amazing-ways-our-district-is-using-ar-and-vr/

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.

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

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.

Learning is More Ubiquitous
363 by Idea Group; Study Café Meeting Place; Idea Space (Seoul, Korea)
https://363.co.kr/wp/?page_id=244

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)

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


**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

Shindig, Future Trends Forum, Bryan Alexander

Anant Agarwal, CEO and founder of edX

https://bryanalexander.org/the-future-trends-forum/

https://shindig.com/

http://events.shindig.com/event/ftf-anniversary

https://shindig.com/client/client/?event=ftf-agarwal

**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

http://babson.qualtrics.com/jfe/form/SV_djbTFMIjZGYDNVb

http://www.onlinelearningsurvey.com/highered.html

**November 1, 2017**

Learning is More Online (Access)

Indiana University, Office of Online Education

http://onlinelearningsurvey.com/reports/gradeincrease.pdf

http://babson.qualtrics.com/jfe/form/SV_djbTFMIjZGYDNVb

http://www.onlinelearningsurvey.com/highered.html
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

July 29, 2018
Learning is More Online
Can a Huge Online College Solve California’s Work-Force Problems?
Karin Fischer, The Chronicle of Higher Education
http://curtbonk.com/link

March 21, 2018 (Engagement)
Learning is More Global
Chatterbox
The overall winner in the competition was Chatterbox, an online language school powered by refugees
http://wearechatterbox.org/

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

August 2, 2018
Learning is More Free and Open
OpenStax Infographic

March 19, 2018
Learning is More Free and Open
Open Textbook Network
Center for Open Education, University of Minnesota
http://research.cehd.umn.edu/
December 19, 2017 and April 24, 2018
Learning is More Free and Open
eTexts 101: A Practical Guide
https://iu.pb.unizin.org/iuetexts101/front-matter/introduction/

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)

May 3, 2017
Learning is More Free and Open
4 out of 5 Companies Have Hired a Coding Bootcamp Graduate
Sri Ravipati, Campus Technology
https://campustechnology.com/articles/2017/05/03/4-out-of-5-companies-have-hired-a-coding-bootcamp-graduate.aspx

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

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. Its technology enables asynchronous, pay-per-view live virtual sessions that can connect on any device.数十 thousands of teachers in over 200 countries are teaching using TeachMeNow. With over eleven million $10,000 paying users, in addition, TeachMeNow has created thousands of jobs for teachers and mentors. Some of the biggest corporate clients have created branded online learning communities.
https://teachmenow.com/
How Learning is Changing: Mega Trend #3. Customization

- massive
- self-directed
- communal
- competency-based
- on-demand
- modifiable
- modular

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

October 14, 2017
Learning is More Personalized
China wants to bring artificial intelligence to its classrooms to boost its education system

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

Students can now practice on actual SATs at www.TutorIT.org. They also will get individualized help on items they miss, as long as they wish or until they get them all right.
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/244003

A new grading tool called Gradescope — powered by AI and now being used for more than 175,000 students at 550 colleges — offers one window on the possibilities. The tool enables automate the grading process without requiring instructors to type or upload their grade book, allowing 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.

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/reviews/2017/05/09/amazon-echo-touchscreen-video-alexa/101448844/

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

January 9, 2017
Learning is More On Demand
Jill Watson, Round Three, Georgia Tech course prepares for third semester with virtual teaching assistants, Jason Maderer, Georgia Tech News Center
http://www.news.gatech.edu/2017/01/09/jill-watson-round-three

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

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 tú, le cobrará hasta por respirar.

Google Translate’s English translation: If I were you, I’ll even charge you for breathing.

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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• Original Spanish: Si yo fuera tú, le cobrará 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.
May 9, 2018
Learning is More On Demand
Google Duplex Demo from Google IO 2018
Video (4:12): https://www.youtube.com/watch?v=ch4MsQEmF3g
Donald Clark Plan B
http://donaldclarkplanb.blogspot.ca/2018/05/google-just-announced-ai-bot-that-could.html?m=1

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/

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
October 30, 2017
Learning is More Massive
Report: 59% of employed data scientists learned skills on their own or via a MOOC
Alison DeNisco Rayome

March 6, 2018
Learning is More Competency-Based
Degreed gets $42M to help build a tool to help employees learn the right skills
Matthew Lynley, TechCrunch
https://techcrunch.com/2018/03/06/degreed-gets-42m-to-help-build-a-tool-to-help-employees-learn-the-right-skills/

October 12, 2018 (Customization)
Learning is More on Modular
edX Expands MicroMasters Programs With Data Science (“nanodegrees”) Digital Leadership and More
Sri Ravipati, Campus Technology

Email inbox: June 11, 2018
Coursera
https://www.coursera.org/

MOOCs are Like Library Books…

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