Education/Training 20/20: En“visioning” Change and the LAST Principles You’ll Ever Need
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http://curtbonk.com/

Talk Overview
1. Jobs are changing. Learning environments 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. Final thoughts and predictions

The Evolution of E-Learning (All 7 year cycles)

Phase IV, 2015: THE AGE OF PERSONALIZATION.

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

October 24, 2019
Update Complete: U.S. Nuclear Weapons No Longer Need Floppy Disks
Liam Stack, The New York Times

Virtual Tactical Operations Center (VTOC)

Language Training (October 27, 2011)
Military Mobile Learning (See: the U.S. Army Learning Concept for 2015; 2011, January 15).
http://www.youtube.com/watch?v=KD9NGAV3k (4:26 minutes)

Increasing Demand for Digital Learning Experience and Instructional Design Expertise
EDUCAUSE Horizons Report, 2019 Higher Education Edition

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

July 24, 2018
The 100-Year Life: Living and Working in an Age of Longevity
Lynda Gratton and Andrew Scott
http://www.100yearlife.com/

March 13, 2019
The Career Curriculum Continuum
Andrew Hermalyn, Inside Higher Ed
January 14, 2016
The Fourth Industrial Revolution:
What it means, how to respond
Klaus Schwab, Founder and Executive Chairman, World Economic Forum
http://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

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

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

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

The Creation of Effective Learning Environments
http://www.maine.edu/administration/Registrar/RegistrarSections/RegistrarSections RG.Education3.0.html
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.

Now What is Education 4.0?

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

“IT'S QUITE CLEAR THAT THE ESTABLISHED MODELS OF EDUCATION HAVE TO CHANGE AND ADAPT TO THE NEW ENVIRONMENT.”

“The Fourth Industrial Revolution:
What it means, how to respond
Klaus Schwab, Founder and Executive Chairman, World Economic Forum

“3 must know's about the rising ‘phigital’ student and why their impact is enormous”

Undergraduate Gen Z students & information technology
Vickie Cook, University of Illinois Springfield

2/11/2020
Clearly... Learning is Changing!

Education 20/20

From Instructor as Credit Manager and Court Room Judge

1. Instructor as Counselor
2. Instructor as Consultant

3. Instructor as Conductor

4. Instructor as Course Ambassador

5. Instructor as Curator

6. Instructor as Concierge

7. Instructor as Camping Trip Guide
8. Instructor as Cultivator

20 New Roles of the Instructor
- Course Ambassador
- Captain
- Curator
- Consumer Advocate
- Change Catalyst
- Counselor
- Concieger
- Coach
- Comedian
- Conductor
- Care Giver
- Consultant
- Camping Trip Guide
- Collaborator
- Community Organizer
- Chemist
- Colleague
- Merrill’s First Principles of Teaching/Instruction
  - Integration
  - Activation
  - Problem/Task
  - Application
  - Demonstration

1. The Principle of Flexibility
  - (e.g., multiple due dates, grace period, flexible agenda, etc.)

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

M. David Merrill
2. The Principle of Convenience
(http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html)
(e.g., multiple ways to turn in, record the class, get student input on how to teach the class, etc.)

3. The Principle of Collegiality
(http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html)
(e.g., help turn papers into publications, introduce students to colleagues, ask them to share resources and papers with you, etc.)

4. The Principle of Cheerfulness and Optimism
(http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html)
(e.g., smile, celebrate accomplishments, positive feedback before any criticisms, etc.)

5. The Principle of High Expectations
(http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html)
(e.g., post high quality student work, challenge, offer job aids, mention students prior successes like conference presentations from final projects, etc.)

6. The Principle of Choice and Options
(http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html)
(e.g., sign up for weeks to present, have 10 midterm or final options and pick any 4, choose if want to work as a group/team or individually submit, etc.)

7. The Principle of Empowerment and Autonomy
(http://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html)
(e.g., build something for a wider audience, design, negotiate the syllabus in a wiki, students vote on agenda items, student presentations of final projects, etc.)
8. The Principle of Support and Feedback

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

(e.g., offer extensive feedback, assign virtual tutors for feedback, offer summary feedback for common questions, use job aids and scaffolds, etc.)

9. The Principle of Spontaneity

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

(e.g., try stuff out and debrief, teach agenda or syllabus, combine ideas, etc.)

10. The Principle of Organization

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

(e.g., create and share agenda in advance, contact guest speakers in advance and share their bios and pics, arrange order of student presentations, etc.)

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

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)

Bonk's 20 "Last" Principles of Instruction
(LAST = Learning Activation System Template)

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

The World of Open Education

The World is Open:
How Web Technology Is Revolutionizing Education

The World is very open!
(South University of Science and Technology of China, Wednesday June 10, 2015)
Fast Forward to 2020...

“Anyone can now learn anything from anyone at any time.”

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: Wareable)

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
touch-sensored
Visual
game-based
Adventure
Digital & resource rich
Immersive
Collaborative

Simulations in Virtually Inspired Learning is More Digital and Resource Rich

May 30, 2019
Center for Medical Simulation
Learning is More Digital and Resource Rich
https://virtuallyinspired.org
https://harvardmedsim.org/training/clinical-training/

May 30, 2019
Center for Medical Simulation
Learning is More Digital and Resource Rich
https://virtuallyinspired.org
https://harvardmedsim.org/training/clinical-training/
May 28, 2020

Virtual Reality Comes to the Classroom, Beth McMurtrie, The Chronicle of Higher Education

https://www.chronicle.com/interactives/20190528-ImmersiveTech

Video (17 seconds): A virtual-reality experience for students in a conducting class:

http://curtbonk.com/virtual-o.htm

Video (13 seconds): A group of students could gather around a virtual heart:

http://curtbonk.com/vrheart.html

Additional Video (17 seconds): Hamilton College literature students built virtual worlds based on novels and stories they read in class.

May 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:


July 17, 2017

Learning is More Immersive

Learning Chemistry in Virtual Reality,

Sarah Hardman, New Learning Times


1:38 video:

https://vialogues.com/vialogues/play/38337/

All:

http://curtbonk.com/chemistry-vr.html

January 29, 2020

Learning is More Immersive

Emergency Worker VR Training

No smoke, no water, no waste. VR could train the next generation of firefighters

Nell Lewis, CNN Business


Kirk Johannesen, IU News at IU Bloomington

Firefighter trainees from the Cosumnes Fire Department are taught how to handle specific scenarios while wearing VR headsets.

The FLAIM Systems simulator recreates the whole experience, from the visual scenario to the likely temperature. A grassfire scenario in virtual reality, created by FLAIM Systems.
May 28, 2019
Virtual Reality Comes to the Classroom
Beth McMurtrie, The Chronicle of Higher Education
https://www.chronicle.com/interactives/20190528-ImmersiveTech
A group of students could gather around a virtual heart: http://curtbonk.com/vrheart.html
Unlike VR headsets, augmented-reality glasses allow users to see the world around them, opening up possibilities for shared learning experiences. A group of students could gather around a virtual heart as their professor takes it apart to show them the components. (Microsoft)

September 5, 2017
Learning is More Immersive
Jefferson Graham, The USA Today
Get ready for thousands of augmented reality Apple apps
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)

June 12, 2019
Learning is More Game-Based
Your doctor may be playing medical video games at work. That could be good for your health
Edward Baig, USA Today
Your doctor may be playing medical video games at work. That could be good for your health

January 23, 2020
Learning is More Game-Based
Coronavirus Outbreak Causes Surge In Plague Inc Downloads
Lara Jackson, Gamebyte

May 30, 2019
Simulation Center, IUPUC
Learning is More Hands-On
The IUPUC Simulation Center is one of only 100 labs in the world to be fully accredited by the Society for Simulation in Healthcare
https://www.iupuc.edu/about/simulation-center/index.html

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.
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

June 5, 2018
Learning is More Collaborative
Chatterbox: Master a Language, Change a Life
Mursal Hedayat, London
https://www.youtube.com/watch?v=3K3VexuIpe0

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
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 1, 2018
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/

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
December 9, 2019
Learning is More Free
The Free-College Fantasy
Kevin Carey, The Chronicle of Higher Education
https://www.chronicle.com/interactives/20191209-FreeCollege

March 19, 2018
Learning is More Free and Open
Open Textbook Network
Center for Open Education, University of Minnesota
https://www.chronicle.com/interactives/20180319-FreeCollege

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

March 22, 2012
Learning is More Video-Based
Defense Health Agency (DHA)
https://deployedmedicine.com/market/11/content/30

January 23, 2020
Learning is More Video-Based
Coronavirus: UK-made ‘Plague’ game downloads soar in China amid virus outbreak
Sky News, UK
Whole video: http://curtbonk.com/corona.html
First 58 seconds: http://curtbonk.com/corona-58.html
May 7, 2019
Learning is More Online
Simulated Natural Disaster Field Training Exercise
Captains Career Course
https://www.dvidshub.net/image/5343668/captains-career-course

November 10, 2019
Learning is More Online
IU online enrollment on significant upswing
Michael Reschke, Herald Times

November 10, 2019
Learning is More Online
IU online enrollment on significant upswing
Michael Reschke, Herald Times

December 2019
Learning is More Online
EJ Online Newsletter
Fall 2019 shows continued online growth
https://teachingonline.iu.edu/about/newsletter/articles/191220-fallcensus.html
A word from the director
https://teachingonline.iu.edu/about/newsletter/articles/191220-foley.html

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

January 1, 2018
Learning is More Synchronous
Indiana doctor finds perfect fit with virtual assistant, Allen Laman, The Dubois County Herald (Jasper, Indiana)
http://curtbonk.com/link
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

August 2, 2018
Learning is More On Demand
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/

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/

January 29, 2020
Learning is More On Demand
Arizona State University students embrace and profess their love to a chatbot named Sunny
Rachel Leingang, Arizona Republic

June 19, 2019
Learning is More On-Demand
DeepZen will allow authors to turn ebooks into audiobooks
Michael Kozlowski, Good e-Reader
Deep Zen, IBM
http://www.deepzen.io/
1) http://www.deepzen.io/1
2) http://www.deepzen.io/2
September 17, 2018
Learning is More On Demand
Talk to Books
[Link to Google Books]

September 17, 2018
Learning is More On Demand
Talk to Books
[Link to Google Books]

May 12, 2017 (Customization)
Learning is More Modifiable
The Future of Collaboration Spaces Encompasses Video
Interactive, Mobile, Julie Johnston, IU, Campus Technology

April 8, 2018
Learning is More Personal
Can Artificial Intelligence Make Teaching More Personal?
Goldie Blumenstyk, The Chronicle of Higher Education

September 10, 2019
The Future of Learning, Transforming Access
Simon Nelson, CEO, FutureLearn, PCF9 Conference, Edinburgh, Scotland

September 10, 2019
The Future of Learning, Transforming Access
Simon Nelson, CEO, FutureLearn, PCF9 Conference, Edinburgh, Scotland

September 9, 2019
Asha Kanwar, President and CEO, Commonwealth of Learning (COL), PCF9 Conference, Edinburgh, Scotland

Inclusion
- 186 million disabled children have not completed primary school
- 94% disabled children are out of school in developing countries
- Access to tertiary education for people with disabilities is 0%
And the threat of AI and automation is very real. A 2017 report by McKinsey found that half of all current work activities could be automated, using technology that already exists, and that by 2030 anywhere from 75 million to 375 million workers worldwide will be displaced from their old jobs and require retraining.

The Future of Learning, Transforming Access
Simon Nelson, CEO, FutureLearn, PCF9 Conference, Edinburgh, Scotland

Learning is More Massive
Simon Nelson, CEO, FutureLearn, PCF9 Conference, Edinburgh, Scotland

Online Degrees Slowdown:
A Review of MOOC Stats and Trends in 2019
Dhawal Shah, Class Central
December 16, 2019
2020 Impact Report, edX

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

Lindsey McKenzie, Inside Higher Ed

October 3, 2019
Learning is More Modular
Google IT Professional Certificates
Coursera Blog
https://grow.google/programs/it-support/?cid=wc&source=ams&sourceId=61203
Video: Melinda Williams: Aspiring IT Support Specialist (2:57)
https://www.youtube.com/watch?time_continue=107&v=fvhPKZWbfms&feature=emb_logo
https://blog.coursera.org/looking-back-at-the-first-years-impact-of-the-google-it-support-professional-certificate/

MOOCs and Open Education
(book projects)
http://moocsbook.com/

30+ Ways Learning is Changing:
Recapping the Three Mega Trends: Engagement, Access, and Customization
1. Medical Robot Remote Doctor Visits
Sci-Fi gadgets that are now a reality
Edmund C. Baig, USA Today

2. 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-az/
https://www.coursera.org/learn/machine-learning

3. OER-Based Courses and Programs
The Chronicle of Higher Education
Launching OER Degree Pathways:
As Early Adopters of Achieving the Dream's OER Degree Initiative and Emerging Lessons

4. Brain Wave Trackers
How China Is Using Artificial Intelligence in Classrooms | WSJ
Video (5:43): https://www.youtube.com/watch?v=JMLsHI8aV0g&feature=emb_logo

5. Web Conferencing Walls
Global Learning Partner or PBL Team Selection Walls
http://www.thelivingmoon.com/43ancients/02files/Library_Alexandria.html

6. Interactive Agents and Tutors
Pushing the Boundaries of Learning With AI
Lindsay McKenzie, Inside Higher Ed
https://www.youtube.com/watch?time_continue=4&v=7EuSTu1iR2A
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

November 8, 2019
Hey, Alexa: Can a robot with AI or your voice assistant help you feel less lonely?
Edmund C. Baig, USA Today

January 7, 2020
9. Talking to Dead People
Old Musicians Never Die. They Just Become Holograms
Mark Binelli, The New York Times

August 29, 2019
‘Hey, Google! Let me talk to my departed father.’
Peter Holley, The Washington Post
https://www.washingtonpost.com/technology/2019/08/29/hey-google-let-me-talk-to-my-departed-father/
Poll:
Evolution or Revolution?

April 23, 2015
Are We Living In a Learning Revolution?
Beth Wisch eLearning Industry
https://elearningindustry.com/living-elearning-revolution

Not Me...I am happy!
and...
My minions are happy!

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