Meaningful Medical Instruction in the Digital Age: When Evolution Stumbles into Evolution

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http://curtbonk.com/

The Olympic Distance Running Controversy of 1984 Did Zola Budd Trip Mary Decker?


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


March 29, 2017

Every industrial robot takes up to 6 jobs, study finds

Steve Goldstein, MarketWatch


Video: .49 to 1:12: http://curtbonk.com/futureandroids2.html
Video: .01 to .49: http://curtbonk.com/futureandroids3.html
Video.01 to 1:25: http://curtbonk.com/futureandroids4.html
April 30, 2017
Education 1.0
‘Those Jobs Are Gone’
Steve Kolowich, The Chronicle of Higher Education

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

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

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)

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
The Creation of Effective Learning Environments


July 9, 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.

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.teachingchannel.org/blog/2016/07/29/starbucks-your-classroom/

3 must know’s about the rising “phigital” student and why their impact is enormous, Vickie Cook, Meris Stansbury, eCampus News
https://www.visioncritical.com/blog/generation-z-infographics

Undergraduate Gen Z students & information technology
Vickie Cook, University of Illinois Springfield
Matt Kleinschmit (2019)
https://www.ecampusnews.com/campus-administration/education-gen-z-phigital-student/

September 22, 2017
Binge Learning: What Online Education Can Learn from Netflix
Henry Kronk, E-learning Inside News
https://theumlaut.com/binge-learning-is-online-education-a-killer-app-elearnmag

Clearly... Learning is Changing!
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
20 New Roles of the Instructor

2. The Principle of Convenience

3. The Principle of Collegiality
4. The Principle of Cheerfulness and Optimism

[Image: https://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

[Image: https://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, final projects, etc.)

6. The Principle of Choice and Options

[Image: https://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

[Image: https://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

[Image: https://travelinedman.blogspot.com/2011/05/bonks-last-principles-of-instruction.html]

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

How Learning is Changing: Mega Trend #1. Learner Engagement
Simulations in Virtually Inspired
Learning is More Digital and Resource Rich
https://virtuallyinspired.org/portfolio/online-
engineering-lab-with-high-end-equipment/

May 30, 2019
Center for Medical Simulation
Learning is More Digital and Resource Rich
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
A virtual reality experience for students in a conducting class:
http://curtbonk.com/virtual-o.htm
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)

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

July 17, 2017
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
01.41:
http://curtbonk.com/chemistry-vr-1.html
01.41-1:16:
http://curtbonk.com/chemistry-vr-2.html
1:16-1:36:
July 28, 2017
Scenario-Based Learning and Challenges
Learning is More Immersive
Modern medicine breathes new life into virtual training

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
https://news.iu.edu/stories/2020/02/iub/inside/04-cu-cu

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.

September 5, 2017
Learning is More Immersive
Get ready for thousands of augmented reality Apple apps
Al Pach, CNET
https://cnet.com/aarkit.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

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.iupui.edu/about/simulation-center/index.html
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
http://research.cehd.umn.edu/otn/

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

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

July 22, 2019
Learning is More Audio-Based
Defense Health Agency (DHA)
https://deployedmedicine.com/market/11/content/306162
March 22, 2012
Learning is More Video-Based
Defense Health Agency (DHA)

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.divishub.net/image/5343668/captains-career-course

December 2019
Learning is More Online
IU 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

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

January 1, 2018
Learning is More Synchronous
Indiana doctor finds perfect fit with virtual assistant, Allen Laman, The Dubois County Herald (Jasper, Indiana)
**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](https://www.insidehighered.com/blogs/technology-and-learning/professors-have-taken-over-moocs)

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**How Learning is Changing: Mega Trend #3. Customization**

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

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**February 11, 2020**

**Learning is More Blended**

Healthcare Communication Skills

[Healthcare Communication](http://www.kynectiv.com)

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**May 12, 2017 (Customization)**

**Learning is More Modifiable**

The Future of Collaboration Spaces Encompasses Video

Interactive, Mobile, Julie Johnston, IU, Campus Technology


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**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](https://www.chronicle.com/article/Can-Artificial-Intelligence/243023)

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**January 2, 2018**

**Learning is More Personal**

5G to AR: Here are 7 technologies to watch in 2018, Edward C. Baig, USA Today

(e.g., Augmented hearing)

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 fuese 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.

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.
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://deepzen.io/
1) http://curtbonk.com/deepzen1.html
2) http://curtbonk.com/deepzen2.html

September 17, 2018
Learning is More On Demand
Talk to Books
https://books.google.com/talktobooks/

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

MOOC Trends and Recent Data

Some Weird Things Are Going On...
Weirdness #1: Never Stop Learning!
Asha Kanwar, President and CEO, Commonwealth of Learning (COL), PCF9 Conference, Edinburgh, Scotland

Inclusion

- 1.86 million disabled children have not completed primary school
- 50% of disabled children are out of school in developing countries
- Access to tertiary education for people with disabilities is 2%

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

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.

September 10, 2019
Learning is More Massive
Transforming Access
Simon Nelson, CEO, FutureLearn, PCF9 Conference, Edinburgh, Scotland

(The would require around 13 new universities to be built each week, each serving 20,000 students, if they were to be education "frontier" that in another timezone, 200,000 students, in order for them to have education to current levels. This would be an enormous challenge.)

December 17, 2019
Learning is More Massive: Weirdness #2: Online Degrees Slowdown: A Review of MOOC Stats and Trends in 2019
Dhawal Shah, Class Central

December 17, 2019
Learning is More Massive
Online Degrees Slowdown: A Review of MOOC Stats and Trends in 2019
Dhawal Shah, Class Central

Weirdness #3: Winter Discounts
December 15, 2019
Learning is More Massive
Coursera <no-reply@m.mail.coursera.org>
Ends TOMORROW: 50% off top tech Specializations

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

Weirdness #5: Hundred+ MOOC Clubs
September 11, 2019
250 MOOCs and Counting: One Man’s Educational Journey, Chronicle of Higher Education
https://chronicle.com/article/250-MOOCs-Counting-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.”

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

November 20, 2019
Learning is More Massive
Who’s Completing Microcredentials?
Lilah Burke, Inside Higher Ed
November 2019
Learning is More Massive
Benefits and Costs of MOOC-Based Alternative Credentials
2018-2019 Results from End-of-Program Surveys
Fiona Hollands and Aasiya Kazi, Teachers College
https://8606adb0-7829-4e6c-a502-3e181c6f3720.filesusr.com/ugd/cc7beb_a74e1be71afb4e72bb7f44adaf03d9eb.pdf

Suggested citation:

October 2018
Learning is More Massive
Benefits and Costs of MOOC-Based Alternative Credentials
2017 - 2018 Baseline Survey Results
Fiona Hollands and Aasiya Kazi, Teachers College
https://8606adb0-7829-4e6c-a502-3e181c6f3720.filesusr.com/ugd/cc7beb_a74e1be71afb4e72bb7f44adaf03d9eb.pdf

December 16, 2019
2020 Impact Report, edX

October 3, 2019
Learning is More Modular
Google IT Professional Certificates
Coursera Blog
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/

Tired of MOOCs...?

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

November 19, 2020
Technology Tomorrow
Washington Post
By 2025, there will be over 80 billion devices connected to the Internet (Washington Post, Source:
Charter Spectrum Network)

October 19, 2019
1. Medical Robot Remote Doctor Visits
Sci-Fi gadgets that are now a reality
Edmund C. Baig, USA Today
August 1, 2018
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-
https://www.coursera.org/learn/machine-learning

October 1, 2019
4. Brain Wave Trackers
How China Is Using Artificial Intelligence in Classrooms | WSJ
Video (1:43): https://www.youtube.com/watch?v=JMLsHI8aV0g&feature=emb_logo
A growing number of classrooms in China are equipped with artificial intelligence cameras and brain-wave trackers. While many parents and teachers see them as tools to improve grades, they’ve become some children’s worst nightmares.

October 12, 2018
3. 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 educational 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.

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.

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
http://curtbonk.com/mandarin.html

January 30, 2017
7. Professor Einstein PDA’s
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)
http://www.usatoday.com/story/tech/2017/01/30/robotic-barista-now-serving-really-fast/95888780/
8. Robot Collaborators/Partners

Hey, Alexa: Can a robot with AI or your voice assistant help you feel less lonely?

Edmund C. Baig, USA Today

9. Talking to Dead People

Old Musicians Never Die. They Just Become Holograms

Mark Binelli, The New York Times

10. Instructional Designer Morphs into Learning Environment Engineer

Poll:
Evolution or Revolution?

Me and my minions think it’s a revolution...!
But we are entering a jumping off point...
(South University of Science and Technology of China, Wednesday June 10, 2015)

Any Questions or Comments?

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