Masterclass Part I: Ultra-Engaging Learning With Technology: Introducing the TEC-VARIETY and R2D2 Models
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Needed: New Models of Motivation and Engagement

October 22, 2019
Indian students wear boxes on their heads during exam to prevent cheating
Jessie Yeung, CNN

March 20, 2015
Bihar cheating scandal: What parents in India will do for good grades
Kunal Sehgal, CNN

Poll: What did Jean-Luc Picard say?

Motivation Research Highlights
(Jere Brophy, Michigan State University)
1. Supportive, appropriate challenge, meaningful, moderation/optimal.
2. Teach goal setting and self-reinforcement.
4. Novelty, variety, choice, adaptable to interests.
5. Game-like, fun, fantasy, curiosity, suspense, active.
6. Higher levels, divergence, dissonance, peer interaction.
7. Allow to create finished products.
8. Provide immediate feedback, advance organizers.
9. Show intensity, enthusiasm, interest, organizers.
10. Make content personal, concrete, familiar.
Intrinsic Motivation

"...innate propensity to engage one's interests and exercise one's capabilities, and, in doing so, to seek out and master optimal challenges (i.e., it emerges from needs, inner strivings, and personal curiosity for growth)


May 9, 2018
A Review of Innovative Teaching Methods
Academic Radiology

http://tec-variety.com/

March 2019
Twelve tips for integrating massive open online course content into classroom teaching
The Medical Teacher

https://www.researchgate.net/publication/331694465_Twelve_tips_for_integrating_massive_open_online_course_content_into_classroom_teaching

March 2019
Twelve tips for integrating massive open online course content into classroom teaching
MedEdPublish

https://www.researchgate.net/publication/331694465_Twelve_tips_for_integrating_massive_open_online_course_content_into_classroom_teaching

2019
Rachel H. Ellaway
Technology-enhanced Learning
Edited by Tim Swanwick, Kirsty Forrest and Bridget C. O'Brien.
© 2019 The Association for the Study of Medical Education (ASME). Published 2019 by John Wiley & Sons Ltd.
January 2020 Special Issue
Journal of Applied Instructional Design (JAID)
https://www.jaid.pub/vol-9-iss-1-2020

1. Risk
   - Low Risk
   - High Risk
   - Easy to Embed
   - Extensive Planning
2. Time
   - Free or Inexpensive
   - Enterprise Licenses
3. Cost
   - Low
   - High
   - Instructor-Focus
   - Student-Focus
4. Student-Centered

Examples of TEC-VARIETY

April 3, 2017
1. Tone/Climate:
   A. Sli.do
   https://www.sli.do/

June 18, 2018
1. Tone/Climate:
   B. Threaded Video Discussions and Questions (e.g., Flipgrid)
   Microsoft acquires social learning platform Flipgrid, Brian Heater, TechCrunch
   https://techcrunch.com/2018/06/18/microsoft-acquires-social-learning-platform-flipgrid/

   C. Instructor Course Introductions
   Lynne Innes (Scotland): https://vimeo.com/356645285
2. Encouragement, Feedback:
A. Voice/Audio Feedback
Vocaroo: http://vocaroo.com/

2. Encouragement, Feedback:
B. Self-testing Practice Exams
Human Embryology Animations
(Valerie O’Loughlin, Indiana University)

2. Encouragement, Feedback:
C. Poll Everywhere
Connect students across campuses
(School of Medicine, Flinders University)

January 23, 2020
3. Curiosity, Intrigue, Unknowns:
A. How dangerous is the Coronavirus?
Podcast, Sky News, UK
Whole podcast: http://curtbonk.com/coronapodcast.html
First 2 minutes of video: http://curtbonk.com/corona-2min.html
First 2 minutes of podcast: http://curtbonk.com/coronapodcast-2min.html

May 22, 2019
3. Curiosity, Intrigue, Unknowns:
B. This Japanese secret to a longer and happier life is gaining attention from millions around the world
Klein Mogi, CNBC

April 17, 2017
3. Curiosity, Intrigue, Unknowns:
C. 1st woman to officially run Boston Marathon
does it again, 50 years later
Emanuella Grinberg, CNN, USA Today
July 16, 2017
Julia Hawkins Sets 100-Meter Dash Record for Women 100 Years or Older
Joseph Zucker, CNN
http://bleacherreport.com/articles/2721985-julia-hawkins-sets-100-meter-dash-record-for-women-100-years-or-older
3. Curiosity, Intrigue, Unknowns:
D. Multimedia News
(e.g., This may be the oldest surviving Photo of a human, November 7, 2014, CNN, Brandon Griggs; But this image, taken in Paris, France, in 1838)

http://www.cnn.com/2016/01/07/health/google-cardboard-baby-saved/index.html

November 19, 2015
3. Curiosity, Intrigue, Unknowns:
F. New Discoveries in Science...
New daddy longlegs named after 'Lord of the Rings' character Smeagol, Mary Bowerman, USA Today

June 12, 2019
4. Variety, Novelty, Fun, Fantasy:
B. Your doctor may be playing medical video games at work. That could be good for your health
Edward Baig, USA Today

January 24, 2019
4. Variety, Novelty, Fun, Fantasy:
C. Coronavirus Outbreak Causes Surge In Plague Inc Downloads
Lara Jackson, Gamebyte
4. Variety, Novelty, Fun, Fantasy:
**D. Online Test/Quiz Review Games**
(e.g., Jeopardy Rocks)
https://www.jeopardy.rocks/r511merve/

4. Variety, Novelty, Fun, Fantasy:
**E. Kahoot!**
https://getkahoot.com/

October 10, 2018
4. Variety, Novelty, Fun, Fantasy:
**F. FutureMe.org**
Write a letter to the future
https://www.futureme.org/

February 21, 2017
4. Variety, Novelty, Fun, Fantasy:
**G. My classroom is like a,”**
http://wheeldecide.com/

January 14, 2019
5. Autonomy, Choice:
**A. Enroll in a MOOC and Reflect**
(e.g., see Class Central)

5. Autonomy, Choice:
**B. Tracking the Life of a Medical Professional**
(e.g., biography.com)
https://www.biography.com/scientist/alexander-fleming
5. Autonomy, Choice: C. Design Multimedia Glossaries
PS40 Final Assignment: Nate Wynne, Supersized Personal Course Glossary
http://natewynne1982.wix.com/p540courseglossary
Ozgur Ozdemir, December 2012
http://r685glossary.shutterfly.com/
Umida Khikmatillaeva, Dec. 2011, PS40
http://learningplanet.shutterfly.com/

Poll:
Any light bulbs going off in your head so far...?
A. Yes definitely***
B. Yes maybe!
C. Not yet (but hopefully soon...)

6. Relevance, Meaningfulness:
A. Weekly Guest Expert Chats
RS11 Chat with Mike Molenda, IU

March 20, 2018
6. Relevance, Meaningfulness:
C. Editing Wikipedia Pages
Women's-Studies Students Across the Nation Are Editing Wikipedia
Emma Kerr, The Chronicle of Higher Education
https://www.chronicle.com/article/Women-Studies-Students/242866
Samantha Erickson, left, of the Wiki Education Foundation; Tina Brock, a dean of the School of Pharmacy at UC San Francisco; and professor Amin Azzam discuss implementing the integration of Wikipedia pages on medical topics with students' work

7. Interactive, Collaborative:
D. Negotiate Meanings Online
(e.g., PiratePad: http://meetingwords.com/
MeetingWords, Google Docs, NowComment, MixedInk)
7. Interactive, Collaborative:
A. Guest Speaker Quotes
(Rey Junco, February 25, 2013)

7. Interactive, Collaborative:
B. Explore Simulations in Virtually Inspired
https://virtuallyinspired.org/portfolio/online-
eviro-
eering-
equipmen/

7. Interactive, Collaborative:
C. Virtual Mobile (at Virtually Inspired)
Virtual laboratory brings the opportunity for remote collaboration enabling students to conduct experiments, access, interpret, evaluate, and exchange relevant technical information.
https://virtuallyinspired.org/portfolio/online-
eviro-
lab/

7. Interactive, Collaborative:
D. Serious Gaming
A Serious Game for Massive Training and Assessment of French Soldiers Involved in Forward Combat Casualty Care.
Percy Military Teaching Hospital, Department of anesthesiology and intensive care, French Military Health Service, Clamart. May 21, 2018, David Vergun, Army News Service

8. Engagement, Involvement:
A. Mobile App First Responder Casualty Care Simulation, Training and Instrumentation recently prototyped a user-friendly medical app called the Tactical Combat Casualty Care All Combatant Cognitive Trainer, or TC3 ACCT. The new app provides a consistent, but personalized presentation of TC3 material to each learner on any mobile device

8. Engagement, Involvement:
B. Healthcare Scenarios and Simulations
High Fidelity Simulations
https://www.healthysimulation.com/high-fidelity-simulation/
January 2020

8. Engagement, Involvement:
C. Storytelling Strategies for the Design of Branching Virtual Patient Simulations
Kira King et al., Kynectiv
https://253f0a53-bb62-46af-b495-b4548d5d90.filesusr.com/ugd/c9b0ce_1a0143633f894eca965378d23c9b72a4.pdf

May 28, 2019

8. Engagement, Involvement:
D. 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/vrmedicine4b.html
A group of students could gather around a virtual heart as their professor takes it apart to show them the components. (Microsoft)

8. Engagement, Involvement:
E. Healthcare Scenarios and Simulations

8. Engagement, Involvement:
F. Interactive Labs and Simulations
http://phet.colorado.edu/en/simulation/energy-skate-park

8. Engagement, Involvement:
G. Interactive Timelines
(Dipity, xtimeline, Simile, TimeLineCurator, etc.)

July 28, 2017

9. Tension, Challenge, Controversy, etc.:
A. Scenario-Based Learning and Challenges
Modern medicine breathes new life into virtual training
Videos:
0:16:31 (http://curtbonk.com/vrmedicine.html)
0:16:37 (http://curtbonk.com/vrmedicine2.html)

49 50 51 52 53 54
9. Tension, Challenge, Controversy, etc.: B. Controversial Issue Debates

Pros:
- Universal Healthcare
- Frustration among patients
- Eliminates administrative costs

Cons:
- Costs
- Financial incentives
- Most universal health systems requiring new terms with private insurance

9. Tension, Challenge, Controversy, etc.: B. Embodied VR Experiences

https://embodiedlabs.com/labs

One example is pasted below.

Topic: End of Life Conversations

Summary: The learner will embody Clay Crowder, a 66-year-old veteran with stage IV, incurable lung cancer. During the simulation, the learner experiences receiving “bad news” from their doctor, discussing options with their family, and transitioning to hospice care. The learner will have conversations with family and members of the healthcare team about transitioning to hospice care. Get assistance from the hospice care team in understanding your symptoms and conflicts that may occur within your family. See the physical changes inside your body as it nears the end of life. Experience what you may happen at the end of your life.

Learning Outcomes:
- Experience what it is like to receive “bad news” from your doctor, and discuss your options.
- Have conversations with your family and members of the healthcare team about transitioning to hospice care.
- Get assistance from the hospice care team in understanding your symptoms and conflicts that may occur within your family.
- See the physical changes inside your body as it nears the end of life.
- Experience what may happen at the end of your life.

10. Yields Products, Goals: A. Database Collection Tools

Article Databases in Pinterest

September 3, 2017

Yields Products, Goals: B. Mindmap Recaps of Online Discussions

Mindmap of Week 2 of R511

https://bubbl.us/Mjg2MzMxOC84MjYzNjczL2UyODQzMzQ0NTQ2YzQwZDlmNDE3ZWE3OWYwMmJmYTI3

10. Yields Products, Goals: C. Goal Setting Tools

(e.g., I Done This, Milestone Planner, and 43 Things)

iDoneThis

Changing your life is hard. Doing it by yourself is harder.

10. Yields Products, Goals: D. Student Website Development

R511 Final Projects, December 12, 2017

“IST Construction, Co.”
Rob Elliot, Patrick Walsh, Erin Milanese, R511, December 2016
http://relliott.net/istconstruction/index.php

http://educbasdogan.wixsite.com/511final
Commitments:
Stop and Share:
Which principle(s) of TEC-VARIETY will you use?
- Tone/Climate
- Encouragement, Feedback
- Curiosity
- Variety
- Autonomy
- Relevance
- Interactive Engagement
- Tension
- Yields Products

Question: How can technology address diverse learner needs?

1. Auditory or Verbal Learners
   - Auditory and verbal learners prefer words, spoken or written explanations.

Part II: The R2D2 Model:
Read, Reflect, Display, Do...

The R2D2 Model
1. Read (Auditory and Verbal Learners)
2. Reflect (Reflective Learners)
3. Display (Visual Learners)
4. Do (Tactile, Kinesthetic, Exploratory Learners)

Read 1a. Choose from Online Tidbits Holistic Health and Fitness
https://www.army.mil/article/191402/army_launches_holistic_health_and_fitness_initiative
January 20, 2016
Read 1b. Listen to Podcasts
(e.g., preventive medicine podcast, NPR: https://www.npr.org/tags/206695374/preventive-medicine)

Read 1c. Twitter Fed Class Discussions
(e.g., OT: https://twitter.com/glenbourneteam)

February 11, 2020
Reflect 2a. Live Event Decision Making and Reflection

February 24, 2019
Reflect 2b. Big Issue Reflections
Can Students Handle the Big Questions?
Beth McMurtrie, The Chronicle of Higher Education
https://www.chronicle.com/article/Can-Students-Handle-the-Big/245753
https://godandgoodlife.nd.edu/syllabus/
https://www.youtube.com/watch?time_continue=104&v=EMKbtSC3-2I

April 13, 2016
Reflect 2c. Interpreting Interactive Graphs and Infographics
Tech billionaire announces $250 million in cancer immunotherapy funding, Jayne O'Donnell, USA Today
Reflect 2d. Student Life Advice Cases
British Medical Association (BMA)
https://www.bma.org.uk/features/masteringmedicalschool/

3. Visual Learners
- Visual learners prefer diagrams, flowcharts, timelines, pictures, films, and demonstrations.

Display 3a. Virtualize Words Used (e.g., Wordle, Tagxedo, Tagul, WordSift, Word It Out)

Display 3b. Short Educational Videos: Anchored Instruction/Macrocontext
CNN, BBC, TED, TED-Ed, ForaTV

Display 3c. Medical Training Videos: Anchored Instruction/Macrocontext
MEDtube (200,000 users, 20,000 records)

Summer 2011
Teaching Critical Thinking
Optometric Education, 36(3)
Display 3d. Bubbl.us, Cmap, Gliffy, Spicynodes, or Mindomo
https://journal.opted.org/articles/Volume_36_Number_3_Summer_2011.pdf
June 3, 2016

Display 3e. Explosion of Virtual Reality
VR Lets Med Students Experience What It’s Like To Be 74
Elyse Wanshel, Huffington Post
http://ht.ly/bSpe300XEPJ

January 20, 2017

Display 3f. You VR Takes You on a Tour of The Human Body
https://www.youtube.com/watch?v=s8WWa61f_U0

Display 3g. Multimedia Supplements
Online Anatomy and Biology
http://www.cyber-anatomy.com/
https://www.biodigital.com/

4. Tactile/Kinesthetic Learners
- Tactile/kinesthetic senses can be engaged in the learning process are role play, dramatization, cooperative games, simulations, creative movement and dance, multi-sensory activities, manipulatives and hands-on projects.

Do 4a. Sample Student Work
e.g., Interactive Archive/Gallery of best work (e.g., physical therapy, SDSU)

Do 4b. Case Decision Making
e.g., snake bite
January 29, 2020
Do 4c. Emergency Worker VR Training
No smoke, no water, no waste. VR could train the next generation of firefighters
Nell Lewis, CNN Business

A grassfire scenario in virtual reality, created by FLAIM Systems.
Firefighter trainees from the Cosumnes Fire Department are taught how to handle specific scenarios while wearing VR headsets.

Poll: How many ideas did you get from this talk?
1. 0 if I am lucky.
2. Just 1.
3. 2, yes, 2...just 2!
4. Do I hear 3? 3!!!!
5. 4-5.
6. 5-10.

Poll: Which do you prefer...
(A) TEC-VARIETY or (B) R2D2?

Any Questions or Comments?
Slides at: TrainingShare.com
Papers: PublicationShare.com
Free book: http://tec-variety.com/
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http://curtbonk.com/