**Stretching the Edges of Technology**

Enhanced Teaching: From Tinkering to Tottering to Totally Extreme Learning

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**Tinkering**

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**Tinker #1. Infographics**

**April 17, 2014**

3. Issues of Age, Gender, and Course Type

Infographic: Global MOOC statistics
eCampus News, Meris Stansbury
http://www.ecampusnews.com/research/infographic/moocs-global-436/
Infographic: https://magic.piktochart.com/output/1747660-moocs

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**Tinker #2.**

Human Embryology Animations
(Valerie O'Loughlin, Indiana University)

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**Tinker #3. Shared Online Video**

(e.g., TV Lesson)
(expert videos)

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**Tinker #4. Simulations**
Tottering

Totter #1. Multiple Guest Experts
Sara de Freitas and Jim Hensman, U of Coventry, UK
https://connect.iu.edu/p2ie1yx6z6x/
Jay Cross, Berkeley
https://connect.iu.edu/p4bytsoronh/

Totter #2. Sign up for a MOOC
Programming for Everyone
Chuck Severance, University of Michigan
https://www.coursera.org/course/pythonlearn
Open Knowledge: Changing the Global Course of Learning
September 2, 2014 to December 12, 2014, Stanford
https://class.stanford.edu/courses/Education/OpenKnowledge/Fall2014/about

Totter #3. Author Mobile Books
(e.g., BookRix, http://www.bookrix.com/)

You Want Totally Extreme?

Totally Extreme #1.
Teaching 54,000 People Around the World
By Kannan Sankaran, Epoch Times, August 5, 2013
http://www.theepochtimes.com/n3/229640-best-moocs-for-free-online-higher-education/ MOOC at UPenn; Recession Fuels Explosion of Online Learning Video:
http://on.aol.com/video/recession-fuels-explosion-of-online-learning-517885097
Totally Extreme #2.
Teach from Vietnam to the World
BBC News Asia, August 14, 2013
Even though he is now very elderly Vinh Bao (age 96) still teaches music, using his computer to coach pupils across the globe.

Totally Extreme #3.
Adventures of a Teenage Polyglot
http://www.nytimes.com/2012/03/11/nyregion/a-teenage-master-of-languages-finds-online-fellowship.html?_r=1&pagewanted=all

Totally Extreme #4.
Getting MBAs from War Zones...!

Totally Extreme #5.
iPod Learning from the Ice using MIT OCW (e.g., Wendy Ermold, University of Washington)

Totally Extreme #6.
Videoconferencing to Schools from the International Space Station
International Space Station Commander, Chris Hadfield, performs a revised version of David Bowie’s Space Oddity.
http://www.youtube.com/watch?v=lc8BcBZ0tAI&feature=player_embedded

Totally Extreme #7.
October 27, 2012
MOOC Office Hours in Other Countries
Chuck Severance, (U Michigan/Coursera) in Barcelona
http://www.youtube.com/watch?v=ZtNHvm5v8TI
Part II: TEC-VARIETY and R2D2 Models

Motivation and Engagement

What did Jean-Luc Picard say?

That’s right, Engage!

Engage!
Poll #1: Million Dollar Question:
What words come to mind when I say that I want to motivate learners?

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, minimize anxiety.
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)


Framework: TEC-VARIETY for Online Motivation and Retention
1. Tone/Climate: Psych Safety, Comfort, Belonging
2. Encouragement, Feedback: Responsive, Supports
3. Curiosity: Fun, Fantasy, Control
4. Variety: Novelty, Intrigue, Unknowns
5. Autonomy: Choice: Flexibility, Opportunities
6. Relevance: Meaningful, Authentic, Interesting
7. Interactive: Collaborative, Team-Based, Community
8. Engagement: Effort, Involvement, Excitement
9. Tension: Challenge, Dissonance, Controversy
10. Yields Products: Goal Driven, Products, Success, Ownership

Introducing the "TEC-VARIETY book..."
http://tec-variety.com/
### Examples of TEC-VARIETY

<table>
<thead>
<tr>
<th>Low Risk</th>
<th>High Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Easy to Embed</td>
<td>Extensive Planning</td>
</tr>
<tr>
<td>Free or Inexpensive</td>
<td>Enterprise Licenses</td>
</tr>
<tr>
<td>Instructor-Focus</td>
<td>Student-Focus</td>
</tr>
<tr>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

#### 1. Tone/Climate: A. Video Introductions, e.g., Flipgrid

- [http://flipgrid.com/#429f88c5](http://flipgrid.com/#429f88c5)

#### 1. Tone/Climate: B. Video Course Intros

- [http://www.youtube.com/watch?v=kOdFRFDdbW0](http://www.youtube.com/watch?v=kOdFRFDdbW0)

#### 2. Encouragement, Feedback, etc.: A. Voice Feedback

- [http://vocaroo.com/i/s1ao2YOFyPl3](http://vocaroo.com/i/s1ao2YOFyPl3) (Singapore)

#### 2. Encouragement, Feedback, etc.: B. Online Practice Tests and Quizzes
2. Encouragement, Feedback, etc.: C. Blog and Website Polling
(e.g., Poll Everywhere, BlogPolls, BlogPoll, MicroPoll)
http://www.polleverywhere.com/

3. Curiosity, Fun:
A. Something in the News
(e.g., Fauja Singh, 101, finishes last race, February 24, 2013)

C. Tracking the Life of a Scientist
(e.g., Brian J. Ford, independent scientist)
http://www.youtube.com/user/tellymonitor#p/a/u/1/LhGeApsKjas
http://www.labnews.co.uk/news/prehistoric-revolution/

4. Variety, Novelty, Fun, Fantasy:
A. Random Lists (Random.org—clocks, coins, playing cards, dice, integers, passwords, jazz scales, lists, sequences, etc.)

3. Curiosity, Fun:
B. Something in the News
New 'massive' dinosaur skeleton discovered, USA Today, September 5, 2014 (Dreadnoughtus)

Goofy dinosaur blends Barney and Jar Jar Binks, SF Gate, Seth Borenstein

4. Variety, Novelty, Fun, Fantasy:
A. Random Lists (Random.org—clocks, coins, playing cards, dice, integers, passwords, jazz scales, lists, sequences, etc.)
5. Autonomy, Choice:
A. Class Central
  https://www.class-central.com/
  http://oedb.org/open/

B. Attend Webinar (pick weeks and reflect)
Cathy Davidson, The End of Higher Education
  http://connectedcourses.net/thecourse/why-we-need-a-why/

5. Autonomy, Choice:
C. Design Multimedia Glossaries
  Ozgur Ozdemir, December 2012
  http://r685glossary.shutterfly.com/
  Umida Khikmatillaeva, Dec. 2011, P540
  http://learningplanet.shutterfly.com/

6. Relevance, Meaningfulness:
A. Video Scenario Learning Accounting Interviews and Preparatory Course Review Modules (Franklin University, cost and forensic accounting course)
  http://video.franklin.edu/Franklin/acct/managerialAccounting/cost-behavior-player.html
  http://video.franklin.edu/Franklin/acct/342/common/fraudScenario02.html

B. Case-Based Learning: Instructor Cases (e.g., Mark Braun, IU)

7. Interactive, Collaborative:
A. Negotiate Meanings Online (e.g., PiratePad: http://meetingwords.com/)
  MeetingWords is a simple text editor for the web. Your text is saved on the web, and more than one person can edit the same document at the same time. Everybody’s changes are instantly reflected on all screens. Work together on meeting notes, brainstorming sessions, homework, team programming and more!
7. Interactive, Collaborative:  
B. Guest Speakers  
Designing a New Learning Environment  
Professor Paul Kim, Stanford University  
http://venture-lab.org/education/lectures/45

8. Engagement, Effort:  
A. Guest Speaker Quotes  
(Rey Junco, February 25, 2013)

8. Engagement, Effort:  
B. Medical Simulations and Practice Cases  
The School of Medicine, University of Virginia  
http://uvamagazine.org/articles/adjusting_the_prescription/  
The newly expanded Medical Simulation Center lets medical trainees practice skills and case scenarios in clinical settings that mimic actual situations. Outside the operating room, a technology specialist manipulates vital signs on a patient simulator and controls the cameras recording the session.

8. Engagement, Effort:  
C. Heat Map on Misconceptions  
October 1, 2014, Smart Sparrow  
http://www.smartsparrow.com/

8. Engagement, Effort:  
D. Map Trend Interpretations  
e.g., Global Forest Watch (April 2014)  
http://www.globalforestwatch.org/map/3/ -3.72/27.00/ALL/grayscale/loss/596
8. Engagement, Effort:
E. Google Map Gallery
September 16, 2014
http://maps.google.com/gallery/

9. Tension, Challenge, etc.:
A. Controversial Issue Debates
Scholarly journal retracts 60 articles, smashes ‘peer review ring’, Fred Barbash, Washington Post

10. Yields Products, Goals:
A. Business Plans and Virtual Mentoring toward Goals,
September 22, 2014, Chronicle of HE
http://chronicle.com/article/Start-Up-Slow-Down/148923/?cid=at&utm_source=at&utm_medium=en

B. Multimedia Assignments and Final Product Video Summaries
Piercarlo Abate: http://www.youtube.com/watch?v=_TURzHO0aU
Qi Li, Gangnam: http://www.youtube.com/watch?v=7Q429lqxZaU&feature=youtu.be
Miguel Lara (Web 2.0 FREEDOM): http://www.youtube.com/watch?v=8cmCFWi9lW8

C. Write Wikibook Chapters
http://en.wikibooks.org/wiki/Web_2.0_and_Emerging_Learning_Technologies
http://en.wikibooks.org/wiki/Web_2.0_and_Emerging_Learning_Technologies/Andragogy_and_Technology

D. Fresh Writing, Interactive Archive of Exemplary First-Year Writing Projects
(University of Notre Dame, September 24, 2014)
https://freshwriting.nd.edu/
The End... (Part #1)
Two Cheers for Web U!
A. J. Jacobs, New York Times

New Metaphor:
Instructor as Curator

New Metaphor:
Instructor as Concierge

Audience Poll #2:
Any light bulbs going off in your head so far...? If so, where?
A. Yes definitely
B. Maybe
C. No

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

I just love it when they "make it so!"
February 20, 2013
Star Trek-like holodeck may be closer to reality than you think
Matt Hartley, Financial Post, Canada

http://business.financialpost.com/2013/02/20/star-trek-like-holodeck-may-be-closer-to-reality-than-you-think/?__lsa=054d-d58d

Question: How can technology address diverse learner needs?

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

1. Auditory or Verbal Learners
   • Auditory and verbal learners prefer words, spoken or written explanations.
Read 1a. Collect and Listen to Interactive Stories
(e.g., Meograph: http://www.meograph.com/)
Timelines with Oral Histories, Slavery and the Making of America
Time and Place, PBS:

Read 1b. Grammar Checkers
(e.g., Grammarly, Ginger, GrammarCheck, PaperRater, and SpellCheckPlus)
http://www.grammarly.com/

Read 1c. Twitter Fed Class Discussions
https://twitter.com/HeartCPR

2. Reflective and Observational Learners
• Reflective and observational learners prefer to reflect, observe, view, and watch learning; they make careful judgments and view things from different perspectives

Reflect 2a. Workplace Internship, Practicum, and Field Experiences

Reflect 2b. Video Scenario Learning
Reflect 2c. Text-and Picture-Based Scenario and Case-based Learning

Reflect 2d. Big Issue Reflections (Big Questions Online (BQO)), May 27, 2014 (e.g., What makes us generous? What is the difference between knowledge and understanding?)

Reflect 2e. Reflect on Virtual Timelines (Dipity, xtimeline, Simile, etc.)

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. Interactive Map Timelines (adults with college degrees by county, May 7, 2012)
Display 2c. Reflections on Interactive Maps
Mapping the Dead: Gun Deaths Since Sandy Hook, Huffington Post, March 22, 2013
http://data.huffingtonpost.com/2013/03/gun-deaths

Display 3d. Interactive Timeline Maps, October 22, 2014
Second immigration wave lifts diversity to record high: Edward Greg Toppo and Paul Overberg, USA Today

Display 3e. Big Data Visualization Tools, January 20, 2014, 6.00x Introduction to Computer Science and Programming MITx on EdX Course

Display 3f. Student Collaborative Knowledge Building and Sharing (e.g., Popplet: http://popplet.com/)

Display 3g. Concept Mapping and Timeline Tools (Bubbl.us, Cmap, Gliffy, Mindmeister, or Mindomo)

Display 3h. Videos for clinical education (Sungkyunkwan University School of Medicine, Seoul, Korea, www.mededu.or.kr)
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.
DC Circuit Construction Kits
Do 4b. Student Mobile App Creation
The App Builder: http://www.theappbuilder.com/
Mintian Guo (April 2013): http://myapp.is/r685final

Do 4c. Student Class Documentaries
Umida’s R546 Documentary Project
http://www.youtube.com/watch?v=EMLTzqCV_5A

Poll #3: Which do you prefer…
R2D2 or TEC-VARIETY?

Poll #4: 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 #5: Who is Stretched Now?
Try TEC-VARIETY...Try R2D2
Slides at: TrainingShare.com
Papers: PublicationShare.com
Book: http://tec-variety.com/
Dr. Curt Bonk – CJBonk@Indiana.edu