

Stretching the Edges of Technology-Enhanced Teaching: From Tinkering to Tottering to Totally Extreme Learning

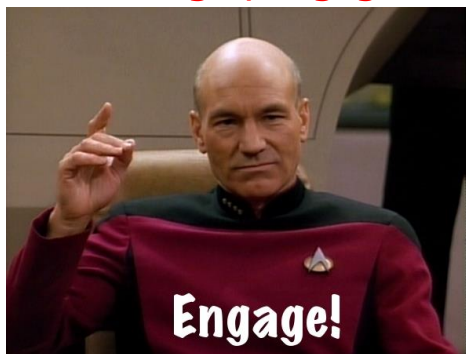
Curtis J. Bonk, Professor, Indiana University
 cjbonk@indiana.edu
<http://mypage.iu.edu/~cjbonk/>



What did Jean-Luc Picard say?



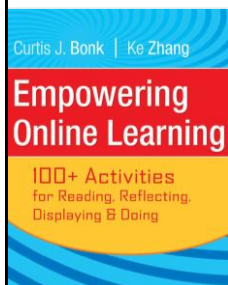
That's right, Engage!



How can technology address diverse learner needs?



Framework #1: The R2D2 Model



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/>)

Read 1b. Follow on Twitter

<https://twitter.com/USArmy>
<https://twitter.com/electricians>

Read 1c. Online Crossword Puzzles

(e.g., <http://www.eclipsecrossword.com/>)

Create Online Crossword Puzzles!

<http://www.eclipsecrossword.com/>

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. Big Issue Reflections

(Big Questions Online (BQO)), January 8, 2013

(e.g., Do We Have Souls?)

<https://www.bigquestionsonline.com/content/do-we-have-souls>

Reflect 2b.

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

<http://www.usatoday.com/tech/news/story/2011-09-22/steve-jobs-dies/50672498/1>
<http://www.usatoday.com/news/entertainment/story/2011-09-25/Steve-Luther-Step-2-Historical-Map-Washington-A-Center-Book/12134701250p-3.html>
<http://www.usatoday.com/story/life/movies/2013/04/10/harrison-ford-jackie-robinson/2001783/>

The screenshot shows a virtual timeline with several entries. One entry features a photo of Steve Jobs with an Apple logo and the text 'Steve Jobs, Apple co-founder, dies'. Another entry shows a map of Washington, D.C. with the text 'Martin Luther King Jr. Historical Map of Washington, A Center Book'. There are also images of Harrison Ford and Jackie Robinson.

Reflect 2c. Workplace and Field Reflections

The collage includes several images: Gen. Raymond T. Odierno in a meeting, a medical team in a hospital setting, and soldiers in a field. Below the images is a caption: 'Gen. Raymond T. Odierno & the way ahead for the 82nd Airborne Division's 1st Brigade'. A small text block below the caption reads: 'U.S. Army Gen. Raymond T. Odierno, commanding general of Multinational Force Iraq, explains the way ahead for the 82nd Airborne Division's 1st Brigade. The Army's first fully augmented airborne and assault brigade, currently deployed in an honor province in Camp Buhayrah Iraq, Oct. 27, 2008. In the past the general stressed the need to increase the capabilities of Iraq civil and security-force institutions. U.S. Army photo by Sgt. Michael J. Blackwell.'

3. Visual Learners

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

The diagram is a circle divided into four quadrants: 'Reading' (top), 'Doing' (left), 'Displaying' (bottom), and 'Reflecting' (right). Each quadrant contains a list of activities. To the right of the diagram are images of 'HoloDeck Adventures' and a person speaking into a microphone.

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

<http://shellyterrell.com/2010/02/14/12-word-cloud-resour-ces-tips-tools/>

The image shows two word clouds. The top one is a circular cloud with words related to military operations and Afghanistan. The bottom one is a circular cloud with words related to military logistics. To the right is a rectangular word cloud with words related to war and records.

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

The image shows two screenshots. The left one is for 'Inspiration Maps for iPad' showing a tablet interface. The right one is a screenshot of 'bubbl.us' showing a concept map with 'Critical thinking' at the top, connected to 'Cooperative learning', 'Creativity', 'Brainforming', and 'Motivation'. The number '8346' is also visible in the map.

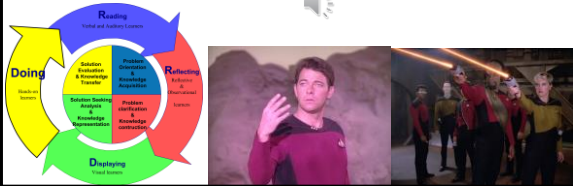
Display 3c. Interactive Map Timelines (adults with college degrees by county, May 7, 2012)

http://hotdyscampus.com/article/Keith_Sampson_interviews_Josh_Kelzer_on_interactive_Graphics_for_Higher_Education

The screenshot shows an interactive map of the United States titled 'Adults With College Degrees in the United States, by County'. The map is color-coded by county, with darker shades of blue representing higher percentages of adults with bachelor's degrees. A legend on the right indicates that the percentage for the entire country is 27.5%.

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.



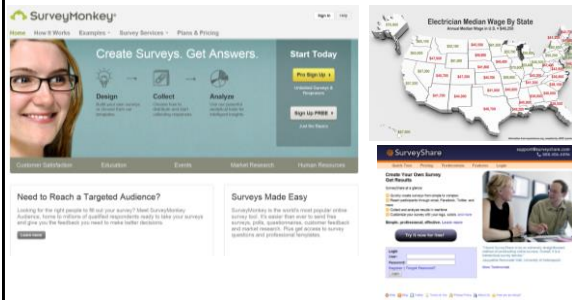
Do 4a. Student Class Documentaries

Umida's R546 Documentary Project

http://www.youtube.com/watch?v=EMLTzqCV_5A



Do 4b. Survey Research and Market Analysis (e.g., SurveyShare, Zoomerang, SurveyMonkey)



Do 4c. Book Trailers for Readers

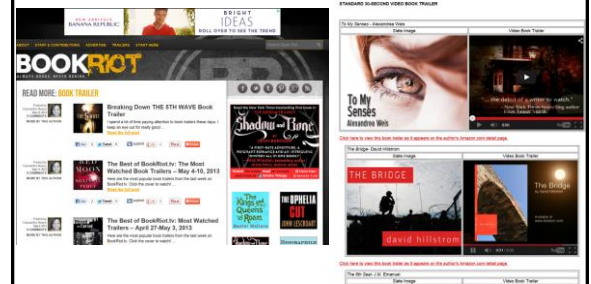
<http://www.booktrailersforreaders.com/How-to-make-a-book-trailer>

http://www.booksurge.com/content/Video_Book_Trailer_Samples.htm

<http://www.thebooklife.com/2012/01/upcoming-2012-ya-book-trailers.html>

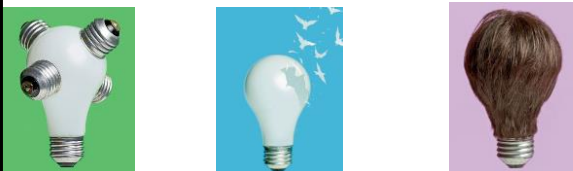
<http://thebooklife.com/category/book-trailer/>

<http://scottwesterfeld.com/blog/2009/09/leviathan-trailer/>



Poll #1: Any light bulbs going off in your head so far...?

- Yes definitely
- Maybe
- No

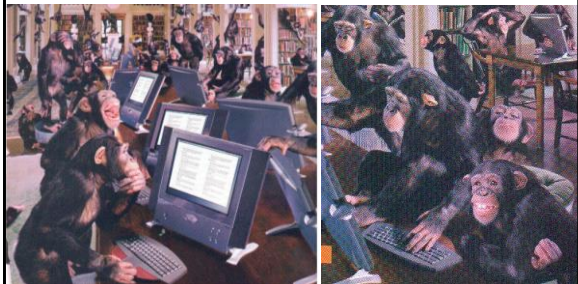


Poll #2: What phase of the R2D2 Method did you get the most ideas from ?

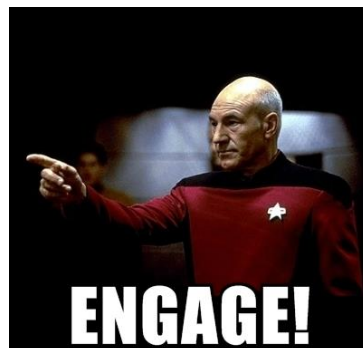
- Read (Auditory and Verbal Learners)
- Reflect (Reflective Learners)
- Display (Visual Learners)
- Do (Tactile, Kinesthetic, Exploratory Learners)



Part II: How do we apply these ideas?



Where to next?

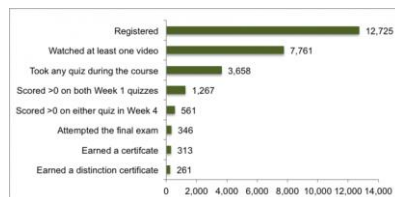


Sleepy U?



February 24, 2013 Big (MOOC) Data, Inside Higher Education, Dayna Catropa

<http://www.insidehighered.com/blogs/strategy/big-mooc-data>



Duke

Bioelectricity: A
Quantitative Approach

Robert C. Bevilacqua

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How do
we engage
online?

What was it that he said?



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)

See: Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. NY: Plenum Press.



Motivation Research Highlights (Jere Brophy, Michigan State University)

1. **Supportive**, appropriate **challenge**, **meaningful**, moderation/optimal.
2. Teach **goal** setting and self-reinforcement.
3. Offer **rewards** for good/improved performance.
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.



Ok, Million Dollar Question: What words come to mind when I say that I want to motivate learners?



Framework #2: 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



Examples of TEC-VARIETY



1. Tone/Climate: Social Ice Breakers

A. 8 nouns (adjectives, verbs)

- List of nouns: (e.g., pirate, computer, traveler, roadrunner, wind, bookworm, musician, mentor, etc.)
- <http://www.momswhothink.com/reading/list-of-nouns.html>
- List of adjectives: (e.g., lazy, powerful, shy, bored, exotic, cooperative, sloppy, rebel, etc.)
- <http://www.momswhothink.com/reading/list-of-adjectives.html>
- List of verbs: (e.g., coordinate, entertain, amuse, push, unite, beg, dream, publicize, etc.)
- <http://www.momswhothink.com/reading/list-of-verbs.html>



1. Tone/Climate: B. Video Course Intros

<http://www.youtube.com/watch?v=jWOUygnKlQ>



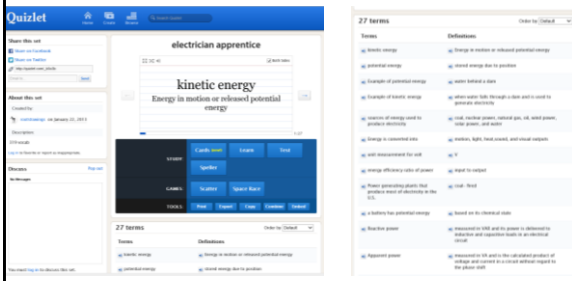
2. Encouragement, Feedback, etc.: A. Voice Feedback

Vocaroo; <http://vocaroo.com/>
<http://vocaroo.com/i/s0F4hvHRHbgu> (East Central)



2. Encouragement, Feedback, etc.: B. Quizlet (online quiz tools)

<http://quizlet.com/>



2. Encouragement, Feedback, etc.: C. Create Screencasts

(Jing, GoView, Screener, slide from Zaid Ali Alsagoff [zaid.alsagoff@gmail.com])



URL: <http://zaidali.com/blog/2008/07/02/5-free-screencasting-tools-for-teacher/>

2. Encouragement, Feedback, etc.: D. Blog and Website Polling (e.g., Poll Everywhere, BlogPolls, BlogPoll, MicroPoll)

<http://www.pollerywhere.com/>

Instant Audience Feedback

What's Your Favorite Animal?

100% LION
40% TURTLE
20% GRANDPA

3. Curiosity, Fun: E. Create Cartoons, Movies, and Animations (e.g., Go Animate, xtranormal, PowToon, etc.)

Create Cartoons, Movies & Animations!

Go Animate
xtranormal.com
PowToon

3. Curiosity, Fun, Fantasy, Control: A. Online Database Activities (e.g., WolframAlpha)

<http://www.wolframalpha.com/>

WolframAlpha

AC bridge circuit

A Quick Introduction to Wolfram Alpha by Stephen Wolfram

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

http://espn.go.com/sports/endorance/story/_/id/8979487/fauja-singh-101-caps-career-10k-hong-kong

Fauja Singh, 101, finishes last race

HONG KONG — The world's oldest marathon runner ran his last race on Sunday at the age of 101.

Fauja Singh, the world's oldest marathon runner, ran his last race Sunday in Hong Kong.

3. Curiosity, Fun: C. Online Quiz Games Jeopardy Labs

<https://jeopardylabs.com/play/ganttpardy>

Jeopardy Labs

I've Got Your Back
The Secret C's
They Got Skills and They Know It
We Are the World
Justice League

4. Variety, Novelty, Fun, Fantasy: A. Timers (Random.org, Stopwatches, coins, playing cards, dice, Countdown Timers, Stopwatch Bombs, etc.; <http://www.online-stopwatch.com/countdown-timer/>)

RANDOM.ORG

00:01:39

Coin Flipper

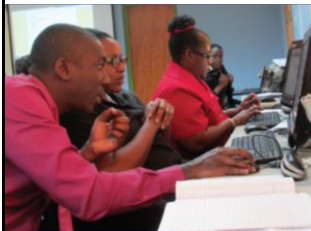
Stopwatch Bombs

5. Autonomy, Choice:

A. Commonwealth of Learning, March 2013

http://www.col.org/news/Connections/2013Mar/Documents/Connections_March2013.pdf

ONLINE COURSE DEVELOPMENT FOR TEACHER EDUCATION IN JAMAICA



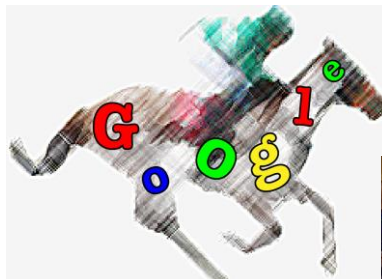
Workshop on OER use and re-use for teacher educators in Jamaica



5. Autonomy, Choice:

B. Online Resource Search (Class Google Jockeys)

(links to text, soundtracks, video clips, etc.)



Poll #3:

Which of the first 5 motivational principles will you use the most?

- A. Tone/Climate
- B. Encouragement/Feedback
- C. Curiosity/Fun
- D. Variety/Novelty
- E. Autonomy/Choice/Flexibility



6. Relevance, Meaningfulness:

A. Video Scenario Learning

(Franklin University, cost and forensic accounting course)

http://video.franklin.edu/Franklin_acc1 managerial Accounting /cost-behavior-player.html

http://video.franklin.edu/Franklin_acc1/232/common/traudScenario02.html

Cost Behavior

Variable Cost

Direct materials in cars
Energy used in the water-heating
Fuel used by a trucking company
Printing materials used for products

Fixed Cost

Advertising costs
Manager salaries
Depreciation expense
Insurance rental
Salaries of guard



6. Relevance, Meaningfulness: B. Design Multimedia Glossaries

Ozgur Ozdemir, December 2012

<http://r685glossary.shutterfly.com/>

Umida Khikmatillaeva, Dec. 2011, P540

<http://learningplanet.shutterfly.com/>

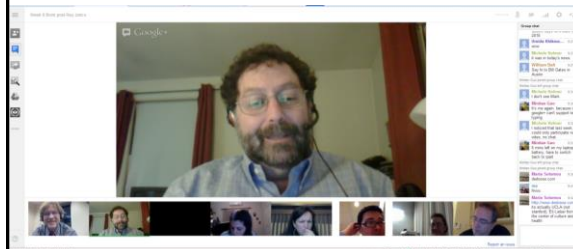


7. Interactive, Collaborative:

A. Collaboration and Discussion in

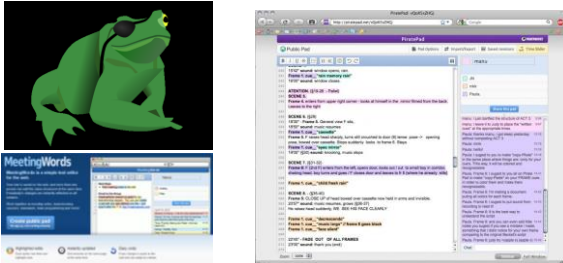
Google Hangouts

(January 29 and February 25, 2013)

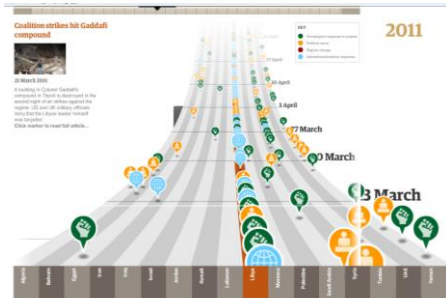


7. Interactive, Collaborative: B. Negotiate Meanings Online (e.g., PiratePad: <http://meetingwords.com/>)

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!

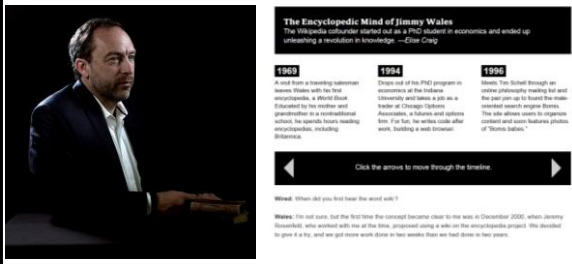


8. Engagement, Effort: A. Arab spring: an interactive timeline of Middle East protests, The Guardian, Garry Blight, and Sheila Pulham, July 12, 2011 <http://www.guardian.co.uk/world/interactive/2011/mar/22/middle-east-protest-interactive-timeline>



8. Engagement, Effort: B. Life on Timeline

How Jimmy Wales' Wikipedia Harnessed the Web as a Force for Good, Ted Greenwald, March 19, 2013, Wired Magazine
<http://www.wired.com/wiredenterprise/2013/03/jimmy-wales-wikipedia/>



9. Tension, Challenge, etc.: A. Decision-Making Scenarios (e.g., Articulate Storyline) http://articulate.demos.s3.amazonaws.com/broken_co-worker/story.html



10. Yields Products, Goals: A. Final Product Video Summaries

Piercarlo Abate: <http://www.youtube.com/watch?v=-TURzH00aU>
Gagnam: <http://www.youtube.com/watch?v=7Q429lqzZaU&feature=youtu.be>
Miguel Lara (Web 2.0 FREEDOM): <http://www.youtube.com/watch?v=8cmCFw9iW8>



10. Yields Products, Goals: B. I Done This, Milestone Planner, and 43 Things



Poll #4:

Which of the last 5 motivational principles will you use the most?

- A. Relevance/Meaningfulness
- B. Engagement/Effort
- C. Interactive/Collab/Community
- D. Tension/Challenge/Dissonance
- E. Yielding Products/Goals



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



Poll #5:

Do you feel "MOTIVATED" to try any of this out?

- A. Yes, R2D2
- B. Yes, TEC-VARIETY
- C. Yes, both
- D. Neither



Poll #6: How many new ideas did you get so far?

- 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.
- 7. More than 10.

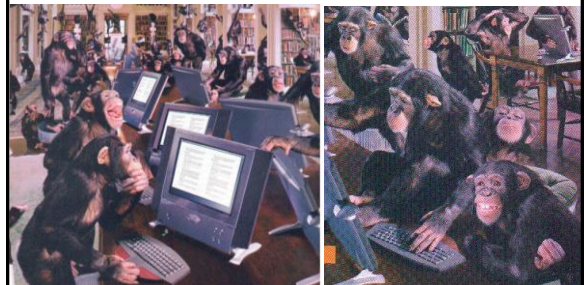


Part III:

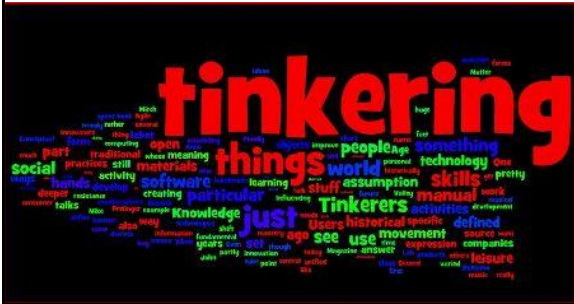
Wait, we are not done yet!



From Tinkering to Tottering to Totally Extreme Learning...



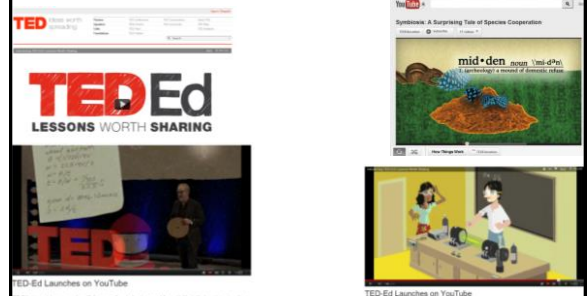
Tinkering



Tinker #1.

Educational Videos: TED-Ed

<http://education.ted.com/>



Tinkering #2.

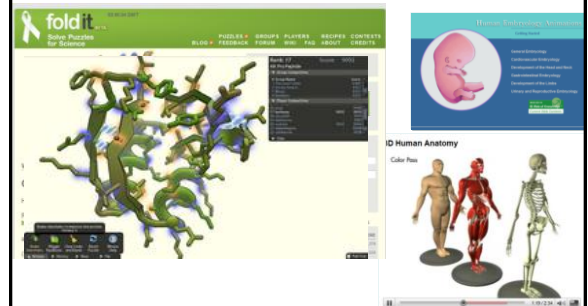
Tracking the Life of a Scientist (e.g., Brian J. Ford, independent scientist)

<http://www.youtube.com/user/tellymonitor#p/a/u/1/LhGeApsKiasr>
<http://www.labnews.co.uk/news/prehistoric-revolution/>
<http://www.youtube.com/embed/kjmNnRFHCzk?rel=0>

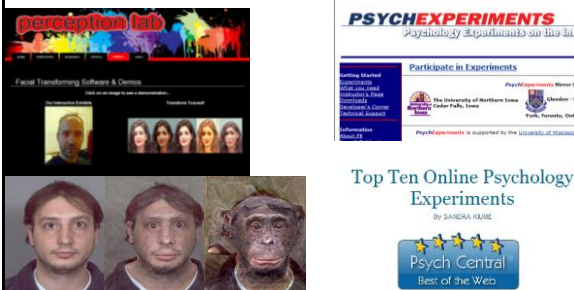
LaboratoryNews



Tinker #3. Video Animations and Simulations



Tinker #4. Online Experiments (e.g., psychology)



Tinker #5.

Anchor Course Concepts and Activities in Brief Shared Online Videos



Tinker #6. Online Practice Tests and Quizzes

The image shows two screenshots from an online learning platform. The left screenshot is titled 'Introduction' and describes a four-hour online course reviewing Article 250 of the 2005 National Electrical Code. It includes a photo of a black star-shaped plug being inserted into a green electrical outlet. The right screenshot is a quiz interface for 'Electrical Safety' with a list of questions and a small image of an electrical panel.

Tottering



Totter #1. Combining Asynchronous and Synchronous Events (flipping classes)

A collage of images illustrating flipped classrooms. It includes a screenshot of a video conference with participants, several diagrams showing different class models (e.g., 'Flipped Classroom', 'Hybrid'), and photos of two men, likely educators, speaking or presenting.

Totter #2. Uploading Mobile Books (e.g., BookRix, <http://www.bookrix.com/>)

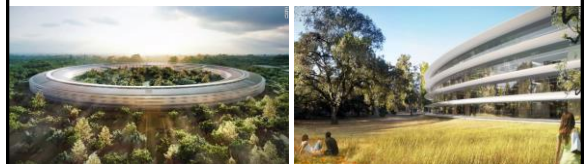
The image shows the BookRix website interface on the left, which promotes reading more than 14,132 books online for free. On the right, a mobile device screen displays a page from a book, demonstrating the use of mobile devices for learning.

Totter #3. Student Collaborative Knowledge Building and Sharing (e.g., Popplet: <http://popplet.com/>)

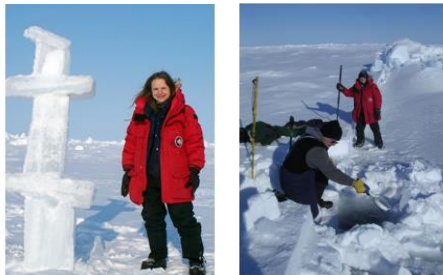
A screenshot of the Popplet website interface. It features a 'What is Popplet?' section, a 'Check out these Popples!' section with various user-created popplets, and a 'Check out our preview video:' section. The site encourages collaborative knowledge building and sharing.

You Want Totally Extreme?

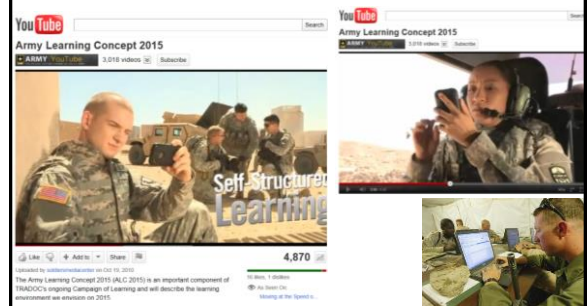
Apple's new 'spaceship' campus: What will the neighbors say?, Doug Gross, CNN, May 22, 2012
http://www.cnn.com/2012/05/22/tech/innovation/new-apple-campus/index.html?hpt=hp_biz1



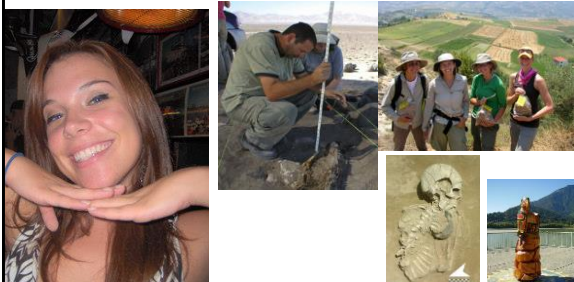
Totally Extreme #1.
iPod Learning from MIT OCW
 (e.g., Wendy Ermold, University of Washington)



Totally Extreme #2.
MBA's from War Zones...!



Totally Extreme #3.
Blogging Field Archeology Research
 (e.g., Lily Henry Roberts, UCLA digging in Hope, BC,
 Stó:lō First Nation people from 12,000 years ago)



Totally Extreme #4.
Virtual High School Learning by Boat
 (e.g., Bridey Fennell and her family sailing and
 learning in the Caribbean)



What 3 things did you learn?



Who is Content Now?
And Who is Stretched Now?
 Website: www.Extreme-Learning.com
 Slides at: TrainingShare.com
 Book: <http://worldisopen.com/>
 Dr. Curt Bonk – CJBonk@Indiana.edu

