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/

New Technologies =
New Delivery Methods...
CLO, September 2011
Active Learning Centers
Union Street Center “Collaborative Café”

University of Minnesota
Student-Centered Active Learning Environment with Upside-down Pedagogies
http://scaleup.ncsu.edu/MinnVideo/MinnVideo.html

Audience Poll:
Raise your hands if learning technology has ever transformed your life.
Change not possible as an accountant… 
(Life as a CPA, 1981-1986)

Decided to Read, Read, Read…
(e.g., People like Albert Bandura, Howard Gardner, Roger Schank, Elliot Soloway, etc.)

Took Correspondence & TV Courses
(thanks to Bob Clasen and Charles Wedemeyer, the University of Wisconsin)

Fast Forward 25 Years…
“Anyone can now learn anything from anyone at any time.”

Now we have…
The Web of Learning
The Triple Convergence

<table>
<thead>
<tr>
<th>The Flat World P’s</th>
<th>The Open World P’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Processes Leveled</td>
<td>1. Piping/Infrastructure</td>
</tr>
<tr>
<td>2. Playing Field Equalized</td>
<td>2. Pages of Content</td>
</tr>
<tr>
<td>3. Participants</td>
<td>3. Participatory Culture</td>
</tr>
</tbody>
</table>

It is very open!
(e.g., Korea, Saudi Arabia, Norway, etc.)

The World Open at the University of Batangas
(February 21, 2012)

The World is Open at ICODEL 2012
February 22-24, 2012

WE-ALL-LEARN:
Ten Forces that Opened the Learning World
- Web Searching in the World of e-Books
- E-Learning and Blended Learning
- Availability of Open Source and Free Software
- Leveraged Resources and OpenCourseWare
- Learning Object Repositories and Portals
- Learner Participation in Open Info Communities
- Electronic Collaboration and Interaction
- Alternate Reality Learning (e.g., MMOG, Second Life)
- Real-Time Mobility and Portability (e.g., iPhone)
- Networks of Personalized Learning (Blogs, RSS)
Audience Participation!

1. WE

2. ALL

3. LEARN!!!

Open Yale Courses:
http://open.yale.edu

Khan Academy:
http://www.khanacademy.org

TED: Technology, Entertainment and Design

GETideas Channel, Cisco (Education Thought Leader Series uploaded to YouTube)
http://www.youtube.com/user/GETideas4g4
Blazing internet speeds in South Korea
Washington Post, March 24, 2012,
http://www.washingtonpost.com/world/2012/03/24/gIQAx3NbYS_graphic.html

Average measured Internet speed, by country

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country</th>
<th>MEGABITS PER SECOND</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>South Korea</td>
<td>16.7</td>
</tr>
<tr>
<td>2</td>
<td>Hong Kong</td>
<td>15.5</td>
</tr>
<tr>
<td>3</td>
<td>Japan</td>
<td>14.0</td>
</tr>
<tr>
<td>4</td>
<td>Korea</td>
<td>8.9</td>
</tr>
<tr>
<td>5</td>
<td>Netherlands</td>
<td>8.5</td>
</tr>
<tr>
<td>6</td>
<td>Switzerland</td>
<td>7.6</td>
</tr>
<tr>
<td>7</td>
<td>Czech Republic</td>
<td>7.2</td>
</tr>
<tr>
<td>8</td>
<td>Japan</td>
<td>7.0</td>
</tr>
<tr>
<td>9</td>
<td>Romania</td>
<td>6.8</td>
</tr>
<tr>
<td>10</td>
<td>Denmark</td>
<td>6.6</td>
</tr>
<tr>
<td>11</td>
<td>United States</td>
<td>4.1</td>
</tr>
<tr>
<td>12</td>
<td>Global</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Note: South Korea is third quarter of 2011, South Korea is measured from a 2 Mbps or greater.

In South Korean classrooms, digital textbook revolution meets some resistance, Washington Post, March 24, 2012,
http://www.washingtonpost.com/world/2012/03/21/gIQAxiNGYS_story.html?wpisrc=emailtoafriend

February 2012
Seeds for Empowerment, Tanzania
Getting Juice for Technology (generator)

Ahn Young-joon/AP - Teacher Yeon Eun-jung, right, helps student Jeong Ho-seok study on a tablet PC during a lesson at Sosu Elementary School in Gwesan, South Korea in July. The country is now scaling back a plan to digitize classrooms by 2015.

February 2012
Seeds for Empowerment, Tanzania
(Paul Kim turning it on!)

Framework #2: The TEC-VARIETY Model

- Tone/Climate
- Encouragement, Feedback
- Curiosity
- Variety
- Autonomy
- Relevance
- Interactive
- Engagement
- Tension
- Yields Products
Framework #3: The R2D2 Method
1. Read (Auditory and Verbal Learners)
2. Reflect (Reflective Learners)
3. Display (Visual Learners)
4. Do (Tactile, Kinesthetic, Exploratory Learners)

Framework #4: From Tinkering to Tottering to Totally Extreme Learning...

Tinkering

Tinker #1. Cases and Video Scenario Learning (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

Tinker #2. Webcast Lectures (Tegrity, Echo360, Mediasite, etc.)

Tinker #3. Timeline Tools (e.g., USA Today, August 26, 2011)
Tinker #4. Video Animations and Simulations

Tinker #5. Collaborative Groups
(Google Docs, Ning, Google Groups, MSN Groups, Yahoo Groups)

Tinker #6. Case Learning and Role Play (Kelley Direct, IU)

Tinker #7. Online Experiments
(e.g., psychology)

Tinker #8. Reading from Open Access Journals; Listen to Open Access Podcasts

Tinkering #9.
Tracking the Life of a Scientist
(e.g., Brian J. Ford, independent scientist)
http://www.youtube.com/user/tellymonitor
http://www.labnews.co.uk/news/prehistoric-revolution/
http://www.youtube.com/embed/kjmNnRFHCzk?rel=0
Origins of Humans, Brian J. Ford, Microbiologist, Cambridge, UK
http://www.youtube.com/user/tellymonitor#p/a/u/1/LhGeApsKjasr
Origin of Humans, BBC Programs and Living cells: http://www.youtube.com/user/tellymonitor
Secret Weapons: http://www.youtube.com/user/tellymonitor
Dinosaurs (Laboratory News, April 7, 2010): http://www.laboratorynews.co.uk/newspages/laboratorynews

Origins of humans with Brian Ford

Tinker #10. Online Portals of Rich Data
United Nations Opens World Digital Library, Turning the Pages from the British Library, etc. (history, culture, literature, writing, art, etc.)

Tinker #10b. Online Art
Google Art Project, NBC Nightly News, April 3, 2012
http://www.msnbc.msn.com/id/30326193/vp/46945084/4694508

Tinker #11. Using Online Encyclopedias
(e.g., the Encyclopedia of Earth:
http://www.eoearth.org/

Tinker #11. Educational Videos: TED-Ed
http://education.ted.com/

Tottering
February 9, 2012
A first-hand look inside a flipped classroom, eSchool News, Meris Stansbury
http://www.eschoolnews.com/2012/02/09/a-first-hand-look-inside-a-flipped-classroom/

February 12, 2012:
Mooresville’s Shining Example (It’s Not Just About the Laptops), ALAN SCHWARZ, NY Times

February 21, 2012
Rethinking Learning with Salman Khan, Stanford Graduate School of Business

February 21, 2012
Let’s use video to reinvent education, TED, March 2011
http://www.ted.com/talks/salman_khan_let’s_use_video_to_reinvent_education.html

Totter #1.
Wikibooks, Wiki-Glossaries, Wiki-Syllabi (Ron Owston, York University, Toronto)

March 20, 2012
Georgetown Learning Initiatives
Wikipedia Public Policy Initiative
http://georgetown.edu/Pages/
Totter #2.
Student Films and Documentaries
http://vimeo.com/33090590 (Verily)
http://vimeo.com/33123125 (Anjali)
http://www.youtube.com/watch?v=iQZXHvuZ3rbw&feature=youtu.be (Yue)

March 20, 2012
Georgetown Learning Initiatives
Social Justice Documentary
http://gli.georgetown.edu/#soliya

Totter #3. Bridges to World of Expert and Practitioners
(e.g., Invite, Watch, or Listen to Online Conferences, Expert interviews, blogs, chats, etc.)

Totter #4. Global Class Videoconferencing and Remote Lands

March 20, 2012
Georgetown Learning Initiatives
Soliya Connect
http://gli.georgetown.edu/#soliya

Totter #5. Combining Asynchronous and Synchronous Events
Totter #6. Multi-Site Events  
(e.g., William and Mary, March 3, 2011)

Totter #7. Podcast Productions and Virtual Performances for students of pronunciation class  
(e.g., Tzu-Su Chen, Taiwan)

Totter #8. Video Blogging

Totter #9. Uploading Mobile Books  
(e.g., BookRix, http://www.bookrix.com/)

Totter #10. Podcasting Medical Lectures  
(School of Dentistry, University of Michigan)

Totter #11. Online Instructor Q&A  
April 1, 2012, Piazza: https://piazza.com/
Totter #12. Lessons on iPad
(e.g., ShowMe: http://www.showme.com/)

Totter #13. Student Collaborative Knowledge Building and Sharing
(e.g., Popplet: http://popplet.com/)

The Prophet of Tottering...
Michael Wesch, Kansas State
February 12, 2012

We are entering a jumping off point...

Totally Extreme Learning...
Extreme Learning Defined
(Bonk, 2011)

"Extreme learning can involve learning while on a boat at sea near the North Pole or when sailing around the world. It also occurs when tracking the blog and podcasts postings of those in similar adventures such as riding a bike or a car around the world or through the Americas. Extreme learning also includes more sedate and passive forms of learning including watching an online video in TED, LinkTV, CurrentTV, or YouTube."

Extreme Learning continued...
(Bonk, 2011)

"Through extreme learning Web resources, those stuck behind prison walls, injured and in a hospital bed, or unemployed and unable to pay for college tuition can learn to be more productive members of society. Others might be in transition from one career to another and find open educational resources and OpenCourseWare can arouse new interests and confidence" (see Iiyoshi & Kumar, 2008).

Visual Representation of the Dimensions and Impact of Extreme Learning

Totally Extreme #1. Immediate Science
Ida (a transitional species) 47-Million-Year-Old Fossil the Missing Link? (May 20, 2009)

Totally Extreme #2. Live Science
(Nautilus Live allows people to watch expeditions live & listen to scientists in control rooms a discoveries made)
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.  
**Google Earth Archeology Research**  
(e.g., 450 sites of interest in Afghanistan found by David Thomas, La Trobe Univ., Melbourne, Australia)

Totally Extreme #5.  
**Adventure Learning**  
(e.g., GeoThentic, Earthducation, Polar Husky, GoNorth; Aaron Doering, Univ of Minnesota; cars and bikes—Dan Grec and Mark Beaumont)

Totally Extreme #6.  
**Virtual High School Learning by Boat**  
(e.g., Bridey Fennell and her family sailing and learning in the Caribbean)

Totally Extreme #7.  
**Kids Learn Online, Teach Online**  
(e.g., the World’s Youngest Teacher; Adora Svitak)

Totally Extreme #9. iPod Learning from MIT OCW (e.g., Wendy Ermold, University of Washington)


Totally Extreme #11. Learning from Localized OER and OCW (e.g., Opensource OpenCourseware Prototype System (OOPS), Lucifer Chu, Janitor of OOPS)

Totally Extreme #12. Open Teaching and Massive Open Online Courses (i.e., MOOC, David Wiley, George Siemens, Ray Schroeder)

Totally Extreme #13. International and Global Education and Competitions (e.g., Global Game Jams, online role play, Global Videoconferencing)
Totally Extreme #14. 
Telepresence and Teleportec Systems 
(e.g., Cisco and HP) 

Totally Extreme #15. 
Military Mobile Learning from War Zones 
(U.S. Army Learning Concept for 2015; 2011, January 15). 
http://www.youtube.com/watch?v=KD9NGAV3-3k (4:26 minutes) 

Totally Extreme #16. 
Online Language Learning 
(e.g., 300,000 people per month listening to 
ChinesePod, co-hosted by Jenny Zhu, John Pasden, 
and Ken Carroll) 

Totally Extreme #16. 
More Online Language Learning and 
Conversations 
(e.g., PalTalk, iTalki, Palabea, Babbel) 

Totally Extreme #17. 
Shared Online History Videos 
(e.g., “History for Music Lovers” with over 50 songs including: 
Trojan War “Tainted Love” by Soft Cell; Charlemagne “Call Me” 
by Blondie, Cleopatra, Napoleon, Shakespeare, the Vikings) 

Totally Extreme #18. 
MBAs from War Zones...!
Totally Extreme #19.
Learn Anytime, Always On/Mobile.
Will Technology Kill the Academic Calendar? Online, semesters give way to
students who set their own schedules, Marc Parry, Chronicle of Higher Ed,
October 10, 2010

Robert Johnson, who championed the open-format Learn Anytime
program at a two-year college in Louisville, Ky., checks students’ e-
mail while waiting for a flight. “Everything I need to do today, I can do
on my phone,” says Robert Johnson...He often grades papers and
communicates with students from a cafe near his home.

Totally Extreme #20. Pocket School and
Videoconferencing in Developing World
(Paul Kim, Stanford and Seeds for Empowerment in Rwanda, India,
Mexico, Tanzania, etc.)

February 2012
SMILE: Stanford Mobile Inquiry-based
Learning Environment

February 2012
Seeds for Empowerment, Tanzania
(Alex Bonk and the kids...)

March 20, 2012
SMILE: Stanford Mobile Inquiry-based
Learning Environment

March 20, 2012
SMILE: Stanford Mobile Inquiry-based
Learning Environment
**Extreme Learning Stories**

**Mobile Storytelling and Pocket Schools**
(e.g., Paul Kim, Stanford & Seeds for Empowerment)

**Totally Extreme #21.**
Students/Instructors Publish Own Books
(e.g., Apple’s new electronic textbook initiative)

**Totally Extreme #22.**
Massive Open Online University
University 2.0 - Sebastian Thrun (Livestream)
http://www.livestream.com/accounts/50648/events/698/videos/1133910
http://www.youtube.com/watch?v=5KnqoIYrftk

**January 23, 2012**
Udacity- Sebastian Thrun
http://www.udacity.com/

**February 15, 2012**
Guess what! You just got into MIT! Free ride! Kind of!
Marketplace Tech Report, John Moe,

**February 16, 2012**
Online Badges and Certifications from OER
University of Illinois at Springfield, Ray Schroeder
https://sites.google.com/site/opencontinuinged/
Extreme Learning Areas

1. Adventure Learning and environmental education,
2. Virtual Education (formal as well as informal),
3. Social Change and Global Learning,
4. Language Learning,
5. Shared online video,

Visual Representation of Extreme Learning

1. Virtual Education
   Open High School of Utah, Khan Academy, Michigan Virtual School

2. Online Language Learning
   ChinesePod, LiveMocha, Babbel

3. Portals of OER
   OER Commons, Open College Textbooks, WorldBridges.net
4. Social Change and Global Education
SierraClub, Longitude, iCivics

5. Shared Online Video
TED, CurrentTV, YouTube, Explo.TV, ClipChef, Big Think, etc.

6. Adventure and Environmental Learning
PenguinScience, Impossible2Possible, EARTHducation

"Coolest" Extreme Learning Websites

<table>
<thead>
<tr>
<th>Categories</th>
<th>Coolest websites</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Online Language Learning</td>
<td>Live Mocha, BBC Learning English, Englishpod</td>
</tr>
<tr>
<td>2. Virtual Education</td>
<td>MIT OpenCourseWare (OCW), Khan Academy, Open University UK, OpenLearn, John Hopkins OpenCourseWare</td>
</tr>
<tr>
<td>3. Social Change/Global Education</td>
<td>NASA for Educators, Florida Virtual School, Smithsonian</td>
</tr>
<tr>
<td>4. Adventure/Outdoor Learning</td>
<td>Earth education, Jon Bowermaster, National Geographic Education, Academic Earth, Discovery News Video</td>
</tr>
<tr>
<td>5. Learning Portals</td>
<td>MERLOT, Wonder How To Videos, Link TV</td>
</tr>
<tr>
<td>6. Shared Online Videos</td>
<td>Academic Earth, Discovery News Video, Link TV</td>
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Future: Extreme Learning Featured site (ELF Awards)

HOPES: Humanity’s Open Platform for the Exchange of Stories
Sample HOPES Stories

Web Platform Storytelling System

HOPES Mobile Platform Storytelling Entrance

DREAMS: Design Research for an Engaging and Active Mobile System

Extreme Learning “Stretches the Edges” of Humanity
What are your Extreme Learning HOPES and DREAMS?
Website: www.Extreme-Learning.com
Slides at: TrainingShare.com
Book: http://worldisopen.com/

Info and Contact:
Dr. Curt Bonk – CJBonk@Indiana.edu
Write to me: curt@worldisopen.com
Website: www.extreme-learning.com