How the Learning World Became Flat: Ten Knowledge Sharing and Technology Trends Equalizing Access to Learning

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Phases of Technology in Education

1. Technology to enhance learning/knowledge
2. Technology to extend learning/knowledge
3. Technology to transform learning/knowledge
4. Technology to share learning/knowledge

Phases of Technology in Education

Knowledge Sharing
(Fuji Xerox, p. 9)

"Knowledge sharing is the way (social) and means (technical) by which an individual, team, organization and/or community connects and communicates, to continually create, innovate, learn and act."

Poll #1: Should e-learning courses and material be shared?

- Yes
- No
- Not sure

Most are Scared to Share!!!
**Why Share?**

http://www.usdl.org/html/journal/3AN02_issues/article02.html.

![Figure 11. Reasons Why Respondents Posted to the WLH or MERLOT](image)

- Thomas Friedman, author of "The World is Flat":
- Tools for collaboration are changing the world
- [http://mitworld.mit.edu/video/266](http://mitworld.mit.edu/video/266)

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**Do You Share?**

1. Who has shared music in an iPod or MP3?
2. Who has used collab software? (Google Groups, Yahoo Groups, Sharepoint)
3. Who has used online phone services such as Skype or Google Talk?
4. Who has assigned teams online?
5. Who has embedded international exchanges or expert guests?
6. Who has used MERLOT, Connexions, or Jorum?

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**The Ten Forces that Flattened the World**

1. 11/9/01: World Trade Center attack.
2. 9/11/01: September 11 attacks.
3. Work Flow Software (e.g., PayPal and eBay)
4. Open-Sourcing (Self-organizing collaborative communities; Mozilla, Apache, etc.)
5. Mozilla/Firefox
6. Outsourcing (e.g., China, Mexico, Thailand)
7. Supply-Chaining (e.g., Walmart)
8. Insourcing (UPS fixing Toshiba laptops)
9. In-Forming (e.g., Google, Yahoo, MSN Web Search)
10. The Steroids: Digital, Mobile, Personal, and Virtual (e.g., wireless, file sharing, VoIP, video camera in phone)

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**Effects of interactive multimedia in distance learning**


"The advancement in technology is shaping every aspect of our life, including education. One decade ago, the Internet was not critical to education. However, now, it has become an integral part of learning process. Internet technology is having a dramatic effect on colleges and universities, producing what may be the most challenging period in the history of higher education."
Telegraph:
Flattening the world in 1860

How Lincoln won the Civil War
Mr. Lincoln’s T-Mails: The Untold Story of How Abraham Lincoln Used the Telegraph to Win the Civil War
by Tom Wheeler; Collins, 227 pages, $24.95.
by Rick Rechtin, Special for USA Today
Updated 11/26/2006 5:29 PM ET

- Wheeler argues that the use of the telegraph by Lincoln and his Union generals may have provided the advantage necessary to win the war.
- The telegraph was a killer app for its use along rail lines, enabling more efficient scheduling of trains—which, in turn, increased traffic and profits.
- With this breakthrough, telegraph lines exploded across the Northern parts of the USA. The Southern states, afraid that industrialization would change their way of life dramatically, moved far more slowly in establishing both railroads and telegraph lines.

The Ten Forces that Flattened the Learning World

1. Tools for Searching/Finding Media and Information Resources
2. Availability of Quality Online and Blended Learning Environments
3. Free and Open Source Software for Learning
4. Open CourseWare
5. Online Learning Object Repositories and Portals
6. Virtual Collaboration Software
7. Online Massive Gaming, Simulations, and Virtual Worlds
8. Learning Mobility and Portability
9. Personalized Learning Tools
10. Open Information Communities

Three Larger Trends

- The availability of tools and infrastructure for learning.
- The availability of free educational content and resources (OER—Open Educational Resources).
- A move towards a culture of open access to information, international collaboration, and global sharing.

The Ten Forces that Flattened the World

1. Tools for Searching/Finding Media and Information Resources: (e.g., Google, Yahoo!)
Google and Other Search Engines (Sergey Brin, Co-Founder)

Google Print Project

Google Video Project

The Ten Forces that Flattened the World

USA Today, 1A, February 9, 2007
Troubles Grow for a University Built on Profits, NY Times

President William J. Pepicello says the university meets the needs of working students. Robert Wanca, who is pursuing a bachelor's degree at the University of Phoenix, has criticized its standards.

1. eduCommons

Moodle sites

3. Sakai Project

4. Learn from MIT
Jan 4, 2007
How to go to M.I.T. for free
Online 'intellectual philanthropy' attracts students from every nation on earth.
By Gregory M. Lamb, The Christian Science Monitor

- By the end of this year, the contents of all 1,800 courses taught at one of the world's most prestigious universities will be available online to anyone in the world, anywhere in the world. Learners won't have to register for the classes, and everyone is accepted. The cost? It's all free of charge.
- The OpenCourseWare movement, begun at the Massachusetts Institute of Technology (MIT) in 2002 and now spread to some 120 other universities worldwide, aims to disperse knowledge far beyond the ivy-clad walls of elite campuses to anyone who has an Internet connection and a desire to learn.

Per David Wiley, Utah State University (October 2005)

"The first thing you should know is that there are many more schools than just MIT doing OCW now, including Johns Hopkins (ocw.jhsph.edu), Tufts (ocw.tufts.edu), Utah State University (ocw.usu.edu), and Foothill-DeAnza in California (sophia.fhda.edu)."
Per David Wiley, Utah State University (October 2005)

"When you consider the schools participating in consortia in South America, China, Japan, France, Utah, and other regions, the number of universities involved with open courseware in some manner reaches well into the hundreds. As of today there are currently 45 publicly accessible OCWs in the world in a number of languages."

Per David Wiley, Utah State University (October 2005)

"This is a message that should probably get out, also - not only is this movement worldwide and gaining momentum every day, it is also becoming a key part of international strategy to achieve equitable access to education for people everywhere."

Johns Hopkins OpenCourseWare Project

Tufts OpenCourseWare Project

University of Notre Dame

Japan OCW Alliance
Vietnam Fulbright Economics OCW

John Dehlin
Utah State University

“If you think about the tangible, practical, human value some of these courses could have in the world, particularly the 3rd world... it can get quite exciting (to me at least).”

USU OpenCourseWare Project

Shelley Henson, Center for Open and Sustainable Learning (COSL), Utah State University

CORE (China Open Resources for Education), OCW Mirror Site, China

The Biggest OCW Localization Volunteer Group in the World

OOPS! OpenSource OpenCourseware Prototype System
The Foundation of Fantasy Culture and Arts
OOPS' Operation

What's their Beliefs?
(Chu, Jan 1, 2007)
- Collective Minds is better than a single genius translator.
- Perfect Translation doesn't exist.
- 2,012 Volunteer translators
  1,125 courses adopted
  639 courses near completion
  (level 1)
- 126 courses already finished

Lucifer Chu, Chairman and Janitor of OOPS, Taiwan

The Ten Forces that Flattened the World

s. Online Learning Object Repositories and Portals (shared content)

Free Government Resources!
Utopia Univ of Texas
Diverse library and museum collections, research, and scholarly materials; http://utopia.utexas.edu/texas/

- The University of Texas holds vast and diverse library and museum collections, research and scholarly materials, and many other knowledge assets. What if they could be leveraged among all the citizens of the state of Texas and beyond? This is the vision underlying UTOPIA, an expanding knowledge gateway to university resources, conceived in 2002 and launched in 2004, that continues to grow with the breadth and depth of UT's resources.

Public Library of Science

Museum of Online Museums

Stanford Encyclopedia of Philosophy

Trend 5, Part 2:
Reusable Content Objects

- "Learning Objects are small or large resources that can be used to provide a learning experience. These assets can be lessons, video clips, images, or even people. The Learning Objects can represent tiny "chunks" of knowledge, or they can be whole courses." Claude Ostyn, Click2Learn

A. MERLOT

MERLOT is a repository of high-quality learning objects to support lifelong learning.
MERLOT.org

MERLOT People Metrics
(Gerald Hanley, October, 2005)

<table>
<thead>
<tr>
<th>Members</th>
<th>Birth Year 2001</th>
<th>Last Year 2004</th>
<th>This Year 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students</td>
<td>706</td>
<td>3,652</td>
<td>5,010</td>
</tr>
<tr>
<td>Faculty</td>
<td>2,864</td>
<td>11,563</td>
<td>14,754</td>
</tr>
<tr>
<td>Staff</td>
<td>736</td>
<td>2,522</td>
<td>3,122</td>
</tr>
<tr>
<td>Administrators</td>
<td>-</td>
<td>290</td>
<td>746</td>
</tr>
<tr>
<td>Librarians</td>
<td>-</td>
<td>146</td>
<td>280</td>
</tr>
<tr>
<td>Other</td>
<td>421</td>
<td>1,867</td>
<td>2,341</td>
</tr>
<tr>
<td>TOTAL # of Members</td>
<td>4,727</td>
<td>20,030</td>
<td>29,253</td>
</tr>
</tbody>
</table>

MERLOT Collection Metrics
(Gerald Hanley, October, 2005)

<table>
<thead>
<tr>
<th>Materials-Related Metrics</th>
<th>CSU 1999</th>
<th>Birth Year 2001</th>
<th>Last Year 2004</th>
<th>This Year 2005</th>
</tr>
</thead>
<tbody>
<tr>
<td># of Materials</td>
<td>2,732*</td>
<td>5,421</td>
<td>9,806 (226)</td>
<td>12,274 (226)</td>
</tr>
<tr>
<td>&quot;Persistence&quot; of Materials</td>
<td>N/A</td>
<td>N/A</td>
<td>97.3%</td>
<td>98.2%</td>
</tr>
<tr>
<td># of People who contributed materials</td>
<td>N/A</td>
<td>406* (7.5%)</td>
<td>1,423 (7.1%)</td>
<td>1,631 (7.0%)</td>
</tr>
<tr>
<td>Average # of materials edited per contributor</td>
<td>N/A</td>
<td>9.3*</td>
<td>6.9</td>
<td>6.6</td>
</tr>
</tbody>
</table>

http://cnx.rice.edu:8080/stats
Sept 2005 had "14.4 million hits representing about 1 million page views by about 430,000 folks from 157 countries." growing at a rate of about 1 million hits per month.

B. Connexions (Rice University)
http://cnx.rice.edu/

Connections Growth

>3500 modules (3-5 pages)
>180 courses (October 2006)
multiple languages
engineering, computer science, nanotech, physics, statistics, math, history, music, bio-diversity, botany, bio-info, IP, BRIT, UNESCO, UN, Sigma Xi, ... from authors worldwide

Usage September 2006
17 million hits
1.2M page viewers
520k unique users from 157 countries
C. Textbook Revolution

Digital History

D. JORUM (from UK)

E. Global Education and Learning Community (GELC) Technology in the Developing World

Kirkpatrick, Dec 22, 2006, CNN Money

The Global Education and Learning Community (GELC) aims to bring the principles of open source to education. Scott McNealy, former CEO of Sun Microsystems, is working to create a free universal curriculum from Kindergarten to 12th grade in every major subject. Any educator/researcher can contribute and it will be in any language.
F. Google Free Stuff
Education 2.0: Web-based services and other open technology alternatives are changing the nature of school software.

- Hoping to lure teachers and students, thus capturing the attention of a whole new generation of users, Google—the world's largest internet company—this year launched an online portal for educators, complete with lesson plans and other resources designed to help educators use the company's free online tools (such as Google Docs and Spreadsheets, an open alternative to Microsoft's Word and Excel) in their classes. The site also contains resources for using Google Maps in education, and Google last month ran an online project encouraging students from around the globe to brainstorm ways to slow or stop global warming—using the company's software to collaborate.

F. Google School Resources

Google enrolls teachers in online software crusade

Dec 3, 2006, USA Today
Michael Liedtke, Associated Press
Google enrolls teachers to spread work online software crusade
Palo Alto High School journalism teacher Esther Wojcicki helps student Allison Wyndham at a computer during journalism class in Palo Alto, Calif. Wojcicki is helping Google bring its online suite of software applications to classrooms across the country.

G. National Repository for Online Courses (NROC) Commons

H. National Repository for Online Courses (NROC) Commons

The Ten Forces that Flattened the World
6. Virtual Collaboration Software (async and sync)

Webcast Lectures (slides synched)
Online Groups...

Skype says it is used by 136 million people worldwide

The Ten Forces that Flattened the World

7. Online Massive Gaming, Simulations, and Virtual Worlds

Trend #3: Virtual Worlds/Virtual Reality/MMOG

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8. Learning Mobility and Portability (low cost wireless devices)

By Daniel Terdiman, CNET News.com
October 18, 2006, 4:00 AM PDT
When Linden Lab CEO Philip Rosedale (right) spoke to CNET News.com reporter Daniel Terdiman at CNET's "Second Life" headquarters this week, the auditorium was filled with almost all the visitors it could handle.
Computers for Peace
By Grace Rubenstein
GLEF

- Drop a laptop computer into the hands of a child in a remote Chinese village, and Nicholas Negroponte predicts a cascade of results will unfold: The child will encounter new knowledge and ways to express herself through images, words, and sounds. She may help her parents find markets for their products in other cities via cheap satellite Internet -- or even develop a business plan herself. One family's growing prosperity will lift the village's fortunes and expand opportunities for their neighbors.
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9. Personalized Learning Tools (Blogs, Podcasts, MySpace, Flickr, RSS, etc.)

Technorati and Google Blog

Video Blogging

Online Photos, e.g., FLICKR

Social Networking Software

- Classmates: http://www.classmates.com/
- Facebook: http://www.facebook.com/
- Friendster: http://www.friendster.com/
- Friendzy: http://www.friendzy.com/
- MySpace: http://www.myspace.com/
- Orkut: https://www.orkut.com/
- Tribes: http://www.tribe.net/
- YouTube: http://www.youtube.com/
Social Networking Software (Web 2.0)

The Ten Forces that Flattened the World
10. Open Information Communities (e.g., Wikipedia, YouTube)

Sharing Encyclopedias (Wikipedia; Jimmy Wales, Founder)

Sample Book (Learning Theories)
http://en.wikibooks.org/wiki/Main_Page

Sample Junior Book (Dinosaurs)
http://en.wikibooks.org/wiki/Main_Page
What can you do in a flat learning world?

- Consider Copyright Options
- Publish in Open Source Journals
- Attend Open Source Conferences

Terry Anderson, Athabasca University (October 2005)

"Our Creative Commons licensed book Theory and Practice of Online Learning has been downloaded over 55,000 times (full text) and more by individual chapters. Parts have been translated into 6 languages and we are nearly sold out the 500 copies we printed at $50 a pop. So it is quite a success story."

Open Source and Open Educational Resources Conferences

Comparison of Sharing Sites:
MERLOT, Connexions, CAREO, OCW, CORE, OOPS
Grace Lin, Univ of Houston, 2005
- Goals: Link people, share knowledge, access resources, searchable database
- Funding: fully, partial, none
- Audience: higher education, students, teachers
- Content contributors: faculty, volunteers

Comparison of Sharing Sites:
- Role in knowledge sharing: producers, consumers
- Distinguishing features: creativity, structure, faculty community, rigorous review process
- (Different Affiliations, accomplishments, license, language(s), mission, etc.)

Sharing Questions (today)
- For what purpose will people share?
- Who will continue to maintain or update such sites?
- Will these "share" sites bridge the digital divide?
- How will copyright issues be addressed?
- What happens when one did not mean to share his or her course contents or ideas, or, at least, not as widely?

Sharing Questions (future)
- How will such learning objects of today be viewed in 100 or 200 years?
- What new technologies will emerge and be used for knowledge sharing?
- Will online sharing become expected of all faculty members around the planet?
- If so, how will that change the face of higher education?
- What collaborations are possible between corporate world and OOPS, OCW, MERLOT, etc.?

Poll #2: So who is still too scared to share???
Quote Continued...
A Final Quote:
It's a long, long road...
With many a winding turn.
That leads us to who knows where?...

It's a long, long road
From which there is no return
While we're on the way to there
Why not share

(The Hollies, 1969; He Ain't Heavy,
He's My Brother; B. Scott - B. Russell)

Computers for Peace; By Grace Rubenstein; GLEF, Interview with Nicholas Negroponte, MIT

- In an ideal world, what is your single greatest hope for this project?
- A three-step hope: World peace through the elimination of poverty through education through learning. Education is the goal; learning is the means. A lot of learning can happen without teaching. We're banking on that.

The Learning is Flat!
The End!!!