Emerging Technology and New Library Spaces

How does technology affect the learning spaces of libraries from K-12 to the University?

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Director of Health Sciences Library and Medical Informatics
University of Central Florida, College of Medicine
Overview

- Polleverywhere.com Activity
- New Emerging Technologies – Horizon Report
- The World Market and Connectivity
- Unique Learning Styles, Study Styles of the Millennial Student
- Designing New Library/Media Center Spaces for the Learning Styles & Habits of Millennial’s
- Available e-Content . . . How it Becomes a Part of the “Library as Space”
- Library Trends and Challenges
MATERNITY

HE TEXTED ME! HIS DIAPER IS WET.
New Emerging Technologies – Horizon Report
Emerging Technologies to Watch in 2012

http://ncara.edublogs.org/2012/02/09/emerging-technologies-to-watch-2012/
The World Market and Connectivity
Chart 1: Global ICT developments, 2001-2011

Source: ITU World Telecommunication/ICT Indicators database.
By end 2011, 2.3 billion people (i.e. one in three) were using the Internet

Chart 6: Percentage of individuals using the Internet, 2001-2011, world and by level of development

Source: ITU World Telecommunication /ICT Indicators database.
Europe is the only region where the digital divide is narrowing.

<table>
<thead>
<tr>
<th>Regional IDI rank</th>
<th>Europe</th>
<th>Global IDI rank</th>
<th>Asia &amp; Pacific</th>
<th>Global IDI rank</th>
<th>Americas</th>
<th>Global IDI rank</th>
<th>Arab States</th>
<th>Global IDI rank</th>
<th>CIS</th>
<th>Global IDI rank</th>
<th>Africa</th>
<th>Global IDI rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sweden</td>
<td>2</td>
<td>Korea (Rep.)</td>
<td>1</td>
<td>United States</td>
<td>15</td>
<td>Qatar</td>
<td>30</td>
<td>Russian Fed.</td>
<td>38</td>
<td>Seychelles</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>Denmark</td>
<td>3</td>
<td>Japan</td>
<td>8</td>
<td>Canada</td>
<td>22</td>
<td>Bahrain</td>
<td>40</td>
<td>Belarus</td>
<td>46</td>
<td>Mauritius</td>
<td>74</td>
</tr>
<tr>
<td>3</td>
<td>Iceland</td>
<td>4</td>
<td>Hong Kong, China</td>
<td>11</td>
<td>Barbados</td>
<td>34</td>
<td>UAE</td>
<td>45</td>
<td>Kazakhstan</td>
<td>49</td>
<td>South Africa</td>
<td>91</td>
</tr>
<tr>
<td>4</td>
<td>Finland</td>
<td>5</td>
<td>Singapore</td>
<td>12</td>
<td>Antigua &amp; Barbuda</td>
<td>43</td>
<td>Saudi Arabia</td>
<td>47</td>
<td>Moldova</td>
<td>62</td>
<td>Cape Verde</td>
<td>101</td>
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<tr>
<td>5</td>
<td>Netherlands</td>
<td>6</td>
<td>Macao, China</td>
<td>14</td>
<td>Uruguay</td>
<td>50</td>
<td>Oman</td>
<td>53</td>
<td>Ukraine</td>
<td>67</td>
<td>Botswana</td>
<td>108</td>
</tr>
</tbody>
</table>

Source: ITU.
Mobile cellular:

- Total mobile-cellular subscriptions reached almost 6 billion by end 2011, corresponding to a global penetration of 86%.

- Growth was driven by developing countries, which accounted for more than 80% of the 660 million new mobile-cellular subscriptions added in 2011.

- In 2011, 142 million mobile-cellular subscriptions were added in India, twice as many as in the whole Africa, and more than in the Arab States, CIS and Europe together.

- By end 2011, there were 105 countries with more mobile-cellular subscriptions than inhabitants, including African countries such as Botswana, Gabon, Namibia, Seychelles and South Africa.

- Countries where mobile-cellular penetration increased the most in 2011 include Brazil, Costa Rica, Kazakhstan, Lao P.D.R. and Mali.
Speakers Sergey Brin and Larry Page: Co-founders of Google

Sergey Brin and Larry Page co-founded Google in 1998, and redefined the way people use the web. Now two of the world’s richest people, they still play an active role in the company, encouraging fresh approaches to Google’s unique culture and its expanding suite of services.

Why you should listen to them:

Sergey Brin and Larry Page invented Google: the technology, the company, the verb. How did their search business, relatively late to the game, come to rule the Web?

The answer might be found in the personalities of the Google founders. Brin and Page met in graduate school at Stanford in the mid-90s, and in 1996 started working on a search technology based on a new idea: that relevant results come from context. Their technology analyzed the number of times a given website was linked to by other sites — assuming that the more links, the more relevant the site — and ranked sites accordingly. In 1998, they opened Google in a garage-office in Menlo Park. In 1999 their software left beta and started its steady rise to web domination.

But technology alone doesn’t account for Google’s breakaway success. In fact, Google’s approach to site design and advertising may have been more radical than the technology itself: In an era when search engines were super-saturated with sponsor messages, Google broke the mold with their famously friendly and simple interface. Paid links were clearly identified; no pop-windows or banner ads were used; the homepage offered little more than their whimsical logo and a single search box. Customers loved it.

Brin and Page’s innovation-friendly office culture (beyond the famous free food, there’s the company’s “20 Percent Time,” which encourages engineers to spend a fifth of their time pursuing whatever projects (give their interest) has created fertile ground for spectacular successes beyond search, including AdSense/AdWords, Google News, Google Maps, Google Earth, and Gmail. The company’s belief in clean design and ethical ad sales, and its corporate philosophy — often simply stated as “Don’t be evil!” — continue to set the company apart.

In 2004, Brin and Page launched the company’s philanthropic arm, Google.org, focused on solving worldwide problems relating to poverty, energy and the environment. Google.org Director Larry Brilliant met Brin and Page through TED; his new position was announced at TED2004, just before he accepted his TED Prize.
(3)(a) By the 2015-2016 fiscal year, each district school board shall use at least 50 percent of the annual allocation for the purchase of digital or electronic instructional materials included on the state-adopted list.
Unique Learning Styles, Study Styles of the Millennial Student

Learning in the 21st Century: Taking it Mobile!
# Generational Differences

<table>
<thead>
<tr>
<th>Generation</th>
<th>Values</th>
<th>Characteristics</th>
<th>Sign of Independence</th>
<th>Communicating</th>
<th>Fiscal Philosophy</th>
<th>Leadership in Business</th>
<th>Mantra</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veterans (the “Silent Generation) born 1901-1942</td>
<td>Loyalty, Duty, Patriotism</td>
<td>Fearless, Risk-averse, Idealistic, Moral, Trust in authority</td>
<td>No generational sign</td>
<td>Write me a letter</td>
<td>Don’t spend what you don’t have</td>
<td>Command and control</td>
<td>Slow and steady win the race</td>
</tr>
<tr>
<td>Baby Boomers born 1943-1960</td>
<td>Individualistic, Entrepreneurial, Status-conscious</td>
<td>Liberal, Less religious, Cynical, Experimental, Social climbers</td>
<td>Extension of house phone in own bedroom</td>
<td>Write me a memo</td>
<td>Charge it!</td>
<td>Climb the corporate ladder</td>
<td>Keeping up with the Joneses</td>
</tr>
<tr>
<td>Generation X born 1961-1980</td>
<td>Education</td>
<td>Alienated, Tech savvy, Insecure, Challenge authority</td>
<td>Home computer</td>
<td>Email me</td>
<td>Save it for a rainy day</td>
<td>Challenge others and authority</td>
<td>I can do it myself</td>
</tr>
<tr>
<td>Millennials born 1981-today</td>
<td>Loyalty, Honor, Family</td>
<td>Confident, Social, Appreciate diversity, Goal-oriented, Multitaskers</td>
<td>Cell phone with internet access and texting capabilities</td>
<td>Well, you can Facebook me, but it’s probably faster to text</td>
<td>Money is made to be spent</td>
<td>Collaborate</td>
<td>Two heads are better than one</td>
</tr>
</tbody>
</table>
### Teen Gadget Ownership

<table>
<thead>
<tr>
<th>Device</th>
<th>Percent</th>
<th>Survey Month/Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell phone</td>
<td>77%</td>
<td>July 2011</td>
</tr>
<tr>
<td>Desktop or laptop computer</td>
<td>74%</td>
<td>July 2011</td>
</tr>
<tr>
<td>iPod or MP3 player</td>
<td>79%</td>
<td>Sept. 2009</td>
</tr>
<tr>
<td>Game console</td>
<td>80%</td>
<td>Sept. 2009</td>
</tr>
<tr>
<td>Portable gaming device</td>
<td>51%</td>
<td>Sept. 2009</td>
</tr>
</tbody>
</table>

**Sources:**
- The Pew Research Center’s Internet & American Life Project 2011 Teen/Parent Survey, April 19 – July 14, 2011. n=799 teens ages 12-17 and a parent or guardian.
- The Pew Research Center’s Internet & American Life project 2009 Parent-Teen Cell Phone Survey, conducted from June 26 to September 24, 2009. n= 800 teens ages 12-17.
Adult Gadget Ownership Over Time (2006-2012)
Percentage of American adults ages 18+ who own each device

Source: Pew Internet surveys 2006-2012
Texbooks in All Florida School Districts Required to Go Digital By 2015-16

FLAGLERLIVE | MAY 17, 2011

Backpacks for lugging heavy textbooks may be a thing of the past under a budget proposal approved by lawmakers that requires schools to adopt digital textbooks in four years.

Florida would be one of the first states in the country to set up a timeline for a conversion to electronic textbooks if this measure, which was contained in an education budget bill, is signed into law by Gov. Rick Scott.
E-reading Devices
The share of Americans who read e-books grew to 23 percent from 16 percent over the past year while the number of adults who read printed books fell to 67 percent from 72 percent, according to a study released Thursday by the Pew Internet & American Life Project.

E-reading device ownership

% of Americans who own e-book readers, tablet computers, or at least one of those devices

Source: Most recent data from Pew Research Center Internet & American Life Project Library Services survey. October 15-November 10, 2012. N=2,252 Americans ages 16 and older. Interviews were conducted in English and Spanish and on landline and cell phones. Margin of error is +/- 2.3 percentage points for the total sample.

* Surveys for December 2011 and November 2012 involved those ages 16 and older. Previous samples were of adults age 18 and older.
"Kindle, Nook, Sony Reader... I say, Hardwick, this sure is an impressive library."
The Health Sciences Library as the Center of Mobile Technology Integration

- Curriculum Integration
- Apps for the iPad
- E-Textbooks
- Library Lunch and Learns
- Faculty Training
- M1 through M4 Content
UCFCOM Class of 2013
(41 students)
88% brought Smart phones to school

<table>
<thead>
<tr>
<th>Mobile Device</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>iPhone</td>
<td>36.4%</td>
<td>12</td>
</tr>
<tr>
<td>iPod Touch</td>
<td>15.2%</td>
<td>5</td>
</tr>
<tr>
<td>Droid</td>
<td>21.2%</td>
<td>7</td>
</tr>
<tr>
<td>Blackberry</td>
<td>12.1%</td>
<td>4</td>
</tr>
<tr>
<td>Palm</td>
<td>3.0%</td>
<td>1</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>12.1%</td>
<td>4</td>
</tr>
</tbody>
</table>

answered question: 33
skipped question: 8

UCFCOM Class of 2014
(60 students)
84% brought Smart phones to school

<table>
<thead>
<tr>
<th>Mobile Device</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>iPhone</td>
<td>45.5%</td>
<td>20</td>
</tr>
<tr>
<td>iPod Touch</td>
<td>11.4%</td>
<td>5</td>
</tr>
<tr>
<td>Droid</td>
<td>15.9%</td>
<td>7</td>
</tr>
<tr>
<td>Blackberry</td>
<td>9.1%</td>
<td>4</td>
</tr>
<tr>
<td>Palm</td>
<td>2.3%</td>
<td>1</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>15.9%</td>
<td>7</td>
</tr>
</tbody>
</table>

answered question: 44
skipped question: 16
UCFCOM Class of 2015 (80 students)
85% indicated that they brought smart phones to school

<table>
<thead>
<tr>
<th>Mobile Device</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>iPhone</td>
<td>50.7%</td>
<td>38</td>
</tr>
<tr>
<td>iPod Touch</td>
<td>13.3%</td>
<td>10</td>
</tr>
<tr>
<td>iPad</td>
<td>57.3%</td>
<td>43</td>
</tr>
<tr>
<td>Droid</td>
<td>18.7%</td>
<td>14</td>
</tr>
<tr>
<td>Blackberry</td>
<td>10.7%</td>
<td>8</td>
</tr>
<tr>
<td>Palm</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>5.3%</td>
<td>4</td>
</tr>
</tbody>
</table>

answered question 75  
skipped question 4
UCFCOM Class of 2016 (100 students)
86% indicated that they brought smart phones to school

<table>
<thead>
<tr>
<th>6. Which brand of phone do you own?</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>iPhone</td>
<td>50.0%</td>
<td>36</td>
</tr>
<tr>
<td>Android</td>
<td>22.2%</td>
<td>16</td>
</tr>
<tr>
<td>Blackberry</td>
<td>12.5%</td>
<td>9</td>
</tr>
<tr>
<td>Palm</td>
<td>4.2%</td>
<td>3</td>
</tr>
<tr>
<td>Windows Mobile</td>
<td>2.8%</td>
<td>2</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

answered question 72
skipped question 0
Designing New Library/Media Center Spaces for the Learning Styles & Habits of Millennial’s
Library Space Sizes

- More study space and more small group study spaces.
- Library as a place to study
- Library as a place to learn
- Library as a place to “connect”
- Library as a place with an outlet!

Valencia College Osceola Campus, Building 4

UCF College of Medicine
For total square footage take the school capacity then take the percentage given and multiply it by the NSF/Occupant number. For example if the school capacity was 1000 the calculation for the Reading Room/Stacks would be 1000 x .1 = 100 x 37 = 3700 net square feet.

School Media Center
380 P-PS Reading Room/Stacks 10% cap 37
381 P-PS Technical Processing Area 10% cap 4
382 P-PS Production & Professional Library 10% cap 4
383 P-PS AV Storage Area 10% cap 6
384 P-PS Periodical Storage Area 10% cap 2
385 P-PS Closed Circuit TV (Production, 10% cap 7 Distribution, and Control)
386 P-PS Closed Circuit Storage Area 10% cap 5
387 P-PS Media Production Laboratory 10% cap 5
388 P-PS Copying Room 10% cap 2
389 P-PS Small Group Room (View & Preview) 5% cap 2
390 P-PS Group Projects and Instruction 10% cap 5
391 P-PS Media Maintenance and Repair 5% cap 2

Library Trends and Challenges for Higher Education
98% percent of physicians interviewed have embraced mobile computing devices to support their personal and professional workflows. Mobile device adoption is being driven by technology innovation including easy-to-use, low-cost, lightweight mobile devices, widespread cellular broadband availability (3G/4G), cloud-based ecosystem to support Internet-connected applications, and the emergence of location-based services.

MENLO PARK, CA, January 31, 2012. Today, Spyglass Consulting Group released its most recent healthcare study, Point of Care Computing for Physicians 2012. It shows significant trends on how US-based physicians are using mobile solutions at point of care to streamline productivity, enhance patient safety, and reduce the risk of medical errors.
Attend Professional Meetings...

SGEA - Lexington KY
MLA - Seattle, WA
GIR- Austin, TX
SC/MLA- Southern Chapter- Medical Library Association, Augusta GA
Cloud Computing Conference, Miami, FL
CONBLS Retreat 2012 - Hosted in Orlando, FL
E-textbooks workshop – for academic higher education, St. Mary, FL
FCALM- Florida Collaboration of Academic Libraries of Medicine
FHSLA – Florida Health Sciences Library Association
AAHSL- NEHSL Symposium

Source: http://www.aamc.org/icollaborative/meded/279516/resource296.html
## Buzzwords and Phrases

<table>
<thead>
<tr>
<th>IT/Technology</th>
<th>Medical Education</th>
<th>Patient Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Technology</td>
<td>Competency Based Medical education</td>
<td>patient and population centered science</td>
</tr>
<tr>
<td>Tablet Technology</td>
<td>affordable care act</td>
<td>Patents role in own care</td>
</tr>
<tr>
<td>apple iPads</td>
<td>online competency based student portfolio</td>
<td>Surgeons on twitter</td>
</tr>
<tr>
<td>imaging</td>
<td>digital literacy</td>
<td>Think beyond HIPPA</td>
</tr>
<tr>
<td>robotics</td>
<td>Medical Mindfullness</td>
<td>Rethinking clinical experience</td>
</tr>
<tr>
<td>Genomics</td>
<td>Participatory medicine</td>
<td>90,000 physician shortage by 2020</td>
</tr>
<tr>
<td>nanotechnology</td>
<td>Student ownership of the curriculum</td>
<td></td>
</tr>
<tr>
<td>Technology as a</td>
<td>designing medical education for today's</td>
<td></td>
</tr>
<tr>
<td>transformative tool</td>
<td>brain</td>
<td></td>
</tr>
</tbody>
</table>
Tablets in Higher Education

It will hold your complete works—
plus Marlowe’s, Chaucer’s & Dante’s.

Get thee hence!

STEVE JOBS & SHAKESPEARE
2011 US University Enrollment
19.1 million students

24.6 million trees
= one year’s worth of textbooks

Is it Time for E-Textbooks?

approximately
17 textbooks
Per student

11.6 textbooks = One tree

Cafescribe.com/savetrees
Emerging Technology Appeals to the Young . . .
Seniors are using it . . .
We use it for patient care . . .
Use in K-12 Education . . .
Public Libraries are Embracing Technology . . .

Nooks, iPads and Kindles

Available for checkout at the Circulation Desk

http://media.lib.ecu.edu/techsrv/E-Books-List.cfm
Libraries at the **CENTER** of a **PERFECT** Storm

Medical Library
Technology Medical Libraries NEED to Understand to Survive!

- Cloud Computing
- Decentralized Computing
- Bring Your own Device (B.Y.O.D.)
- Personal Computing Devices
- Death of the Desktop
- Extremely Interactive Education
- Personalized Education

- inkling
- DIY
- Bb

Chart showing:
- 31% Android tablet
- 12% Book reader tablet
- 9% iPad
- 9% iPod
- 9% Other tablet
- 7% Laptop
- 5% Netbook
- 4% Desktop
Available e-Content...How it Becomes a Part of the “Library as Space”
Current e-Textbooks- *Inkling*

“Up until now, digital textbooks were a flat — no value-added PDF version of the print edition, so you’re basically asking students if they prefer an inferior product,” Mr. MacInnis said. “So it’s no surprise students weren’t interested.”
Amazon.com sells more Kindle books than paperbacks and hardcovers

- Since April 1, 2011- for every 100 print books Amazon.com has sold, it has sold 105 Kindle books. This includes sales of hardcover and paperback books by Amazon where there is no Kindle edition. Free Kindle books are excluded and if included would make the number even higher.
- Amazon sold more than 3x as many Kindle books so far in 2011 as it did during the same period in 2010.
Match the Right **Content** to the Right **User** at the Right **Time** on the Right **Device**
So What about the STM e-Textbooks!

- Fueled by a predicted 42% compounded annual growth rate for the e-book market between 2009-2012. The book publishing industry is experiencing a rebirth - a paradigm shift in which its leaders are being asked to re-imagine the future of the book and the entire publishing process.

- Goal: create both traditional books and device-independent digital content products that consumers want to buy. (i.e.: eBooks, apps, other mobile content types).
The tipping point for digital textbooks is defined as that point on the industry/product continuum at which current financial variables and market factors make the eventual dominance of digital over print an inevitable outcome within 5-7 years.

Current Higher Education Textbook Market Sales

- $8.787 Billion for 2011
- $9 billion between 2013-2015

Mobile Device Study

- Android, Kindle Fire, Nook Tablet
- 6 weeks
- iPad maintained as current device
- All content available
- Broad ecosystem
- Concern about size of device; 7 inch devices bear look for clinical
RALPH, HAND ME YOUR NEWSPAPER, THIS FLY IS BUGGING ME.

WHAP CRUNCH...

...NOT YOUR ONLINE NEWSPAPER.
References


