EDUCAUSE Live!

The *Horizon Report*: Emerging Technologies Today and Tomorrow

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EDUCAUSE Learning Initiative
GUEST PRESENTERS

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6 emerging technologies on 3 three adoption horizons

1 year or less

2-3 years out

4-5 years out
KEY QUESTIONS

• Technologies most important to teaching, learning, or creative expression
• Missing technologies
• Trends expected to have a significant impact on core missions
• Key challenges related to teaching, learning, or creative expression
Project Timeline

- Wiki Orientations
- Press Clippings
- Research Questions
- 1st Pass Rankings
- Review Short List
- 2nd Pass Rankings
- Produce Report
- **Bibliometrics/Altmetrics.** Impact factors have a decisive role to evaluate and validate a researcher's work. But how do we determine the impact factor? There are alternative ways and methods to determine the impact factor of a researcher, like altmetrics. 
  

- **Big Data** mentioned in learning analytics. According to IBM we create 2.5 quintillion bytes of data every day, 90% of the data in the world today was created in the last 2 years. - [DaveP](http://www.twitter.com/davep) Dec 2, 2012 8:51 am - [Holly.Lu](http://www.twitter.com/holly.lu) Dec 2, 2012 10:36 am Agree - inexpensive or free Big Data tools are coming into primetime use. - [rubenr](http://www.twitter.com/rubenr) Dec 3, 2012 5:37 am

- **Content Curation:** as defined by the [EDUCAUSE Learning Initiative](http://www.educause.edu): "An emerging class of online tools, including Pinterest, Scoop.it, EduClipper, and others, allows users to quickly and easily gather, organize, and share collections of online resources, particularly visual content. These applications make it easy to collect and post disparate bits of content, providing visual groupings at a glance that can reveal important patterns. In academic settings, they can facilitate more visual thinking and discussion among students while providing a means to share collections of online content." - [jochen.robos](http://www.twitter.com/jochen.robos) Nov 30, 2012 2:58 pm This makes me think of personal learning environments with the students' own curated content - [Holly.Lu](http://www.twitter.com/holly.lu) Dec 2, 2012 10:36 am Evernote is a great tool that can integrate web content as well as personal notes, scanned images, pictures etc. - [lisa.koster](http://www.twitter.com/lisa.koster) Dec 2, 2012 5:26 pm agreed. - [lauren.pressley](http://www.twitter.com/lauren.pressley) Dec 2, 2012 6:52 pm Indeed. - [Melissa.Langdon](http://www.twitter.com/melissa.langdon) Dec 2, 2012 10:13 pm

- **Flexible Displays.** The rollout of Samsung's OLED flexible screen technology heralds a new era for computing device manufacturers ([http://www.gmanetwork.com/news/story/284202/scitech/technology/samsung-eyes-flexible-oled-devices-by-2013](http://www.gmanetwork.com/news/story/284202/scitech/technology/samsung-eyes-flexible-oled-devices-by-2013)). This technology further promises to be "lightweight, rugged and unbreakable" ([http://www.wired.com/gadgetlab/2012/05/apple-flexible-displays/](http://www.wired.com/gadgetlab/2012/05/apple-flexible-displays/)). Although Apple hasn't released flexible screen devices, it appears that there are plans for them to do so ([http://techcrunch.com/2012/09/27/apple-patents-in-screen-speakers-flexible-displays-and-tactile-keyboards-for-future-iphones-and-ipads/](http://techcrunch.com/2012/09/27/apple-patents-in-screen-speakers-flexible-displays-and-tactile-keyboards-for-future-iphones-and-ipads/)). Moreover, prototypes for "epaper" flexible screen technologies are now available ([http://gizmodo.com/5854045/finally-an-electronic-paper-display-i-can-crumple-up-and-throw-away](http://gizmodo.com/5854045/finally-an-electronic-paper-display-i-can-crumple-up-and-throw-away)) ([http://liliputing.com/2012/03/lg-introduces-6-inch-flexible-e-paper-display.html](http://liliputing.com/2012/03/lg-introduces-6-inch-flexible-e-paper-display.html)) and hold the potential to help not only ebook manufacturers reinvent and rethink the construction of readers—but also tablet manufacturers as well. The notion of the tablet and ebook are already converging, and flexible screens may further move that convergence along. In addition to the portability aspect, the implications for flexible screens for classroom applications are profound. Interactive surfaces needn't be limited to large, specially made tabletop computing devices. Flexible screens could be integrated into furniture designs in ways that are "smart" and in ways that can be made to accept wireless display signals, such as from a teacher's station. - [jason](http://www.twitter.com/jason) Nov 28, 2012 9:13 am


Tools Let Public Contribute To Massive Interactive Online Biodiversity Encyclopedia
Another crowdsourcing project, this time for genetic data.  

TransferJet Wireless Data Gadgets Coming Next Year
Transfer data from one gadget to another; Using radio spectrum (around 4.5GH), TransferJet relies on close physical proximity.

Video Appears in Paper Magazines
http://news.bbc.co.uk/2/hi/technology/8211298.stm
The BBC reports in the how the September 2009 issue of Entertainment Weekly will include an advertisement featuring a video greeting card.

Visible Past: Where Information Searches For You
Visible Past is a location-aware learning environment being developed at Purdue University. It is based around the idea of space and time attributes. The team behind the project believes that Visible Past can be used as a learning tool in schools.

Will Google Wave reshape enterprise IT?
Google blew the minds of developers with the introduction of its innovative Google Wave, a new approach to real-time collaboration that is just now entering enterprise computing.

Using search trends for forecasting.
One example of using internet user activity for forecasting. Saw other examples using Google Trends or Twitter, particularly...

The Tweeting House: Twitter + Internet of Things
## TRENDS

In the UK's biggest ever bid rumours swirl as bid rumours gained 1.4 per mile amid talk that shareholder approval is in the event of a house.

<table>
<thead>
<tr>
<th>Key Movers</th>
<th>Share price (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>12.0</td>
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<tr>
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<td>11.5</td>
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<td>5.5</td>
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<tr>
<td></td>
<td>5.0</td>
</tr>
</tbody>
</table>

PartyGaming

Short price per share
OPEN

18. Increasing Openness

- Access
- Sustainable environment
- Coming together

Drawing: David Sibbet,
The Grove International
NEW ALTERNATIVES
"POST-COURSE ERA"

By Randy Bass

The Problem of Learning in Higher Education

EDUCAUSE Review March/April 2012
DATA! DATA! EVERYWHERE!

II. BIG DATA, BIG NETWORKS are washing over all of us.
CHALLENGES
faculty development

pace of adoption

scholarly communication

cultural change

demands for personalization

competition
2008

1 year or less
• Grassroots video
• Collaboration webs

2-3 years
• Mobile broadband
• Data mashups

4-5 years
• Collective intelligence
• Social operating systems
2009

1 year or less
- Mobiles
- Cloud computing

2-3 years
- Geo-everything
- The personal web

4-5 years
- Semantic-aware applications
- Smart objects
<table>
<thead>
<tr>
<th>Duration</th>
<th>Technologies</th>
</tr>
</thead>
</table>
| 1 year or less| • Mobile computing  
• Open content                                                                   |
| 2-3 years     | • Electronic books  
• Simple augmented reality                                                    |
| 4-5 years     | • Gesture based computing  
• Visual data analysis                                                            |
2011

1 year or less
• Electronic books
• **Mobiles**

2-3 years
• Augmented reality
• Game-based learning

4-5 years
• Gesture-based computing
• Learning analytics
2012

1 year or less
• Mobile apps
• Tablet computing

2-3 years
• Game-based learning
• Learning analytics

4-5 years
• Gesture based computing
• Internet of things
<table>
<thead>
<tr>
<th>1 year or less</th>
<th>2-3 years</th>
<th>4-5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>• MOOC</td>
<td>• Gaming and gamification</td>
<td>• 3D printing</td>
</tr>
<tr>
<td>• Tablet computing</td>
<td>• Learning analytics</td>
<td>• Wearable technology</td>
</tr>
</tbody>
</table>
Massively Short MOOC Presentation
FIGURE 1. Educational Delivery Models, 2012

- Instructional Design Team Including Faculty
  - Master Course
  - Outsource
  - Institutional Barrier

- Course Design
  - Faculty Team
    - Flipped Classroom
  - Individual Faculty
    - Faculty-Specific Course

- Facilitators & Participants
  - Face-to-Face
  - Blended/Hybrid
  - Online Course

- Modality
  - Fully Online
  - Cohort-Based
  - Self Paced

Source: http://www.educause.edu/ero/article/online-educational-delivery-models-descriptive-view
To MOOC or not to MOOC

- 55% said they were undecided about their plans to offer MOOCs
- 33% said they had no plans to offer MOOCs
- 9% said they were in the planning stages to offer a MOOC
- 3% said they currently offer a MOOC

Source: http://www.onlinecolleges.net
Got SMOOC?

Success and the MOOC
Emerging Student Patterns in Coursera-style MOOCs

- No-Shows
- Observers
- Drop-Ins
- Passive Participants
- Active Participants

Source: http://mfeldstein.wpengine.netdna-cdn.com/wp-content/uploads/2013/03/studentPatternsInMoocs3-2.jpg
MOOC COMPLETION RATES: THE DATA

Source: http://www.katyjordan.com/MOOCproject.html

- How big is the typical MOOC? - while enrollment has reached up to ~180,000, 50,000 students enrolled is a much more typical MOOC size.
- How many students complete courses? - completion rates can approach 20%, although most MOOCs have completion rates of less than 10%.
- Clicking on data points on the chart will display further details about each course, including a link to the data source.
- To switch between charts showing completion rate plotted against total enrollment, or length of course, or to view all the data as a table, click on the links above the chart.
- ‘Completion rate’ is typically defined as the number who earned a certificate of completion or ‘passed’ the course but there is some variation in the data - you can filter according to different criteria at the top right.

Search

Filter by completion criteria
1 (missing this field)
12 Certificates issued
1 Certificates issued for 'studio track'

Filter by platform
22 Coursera
2 EdX
1 MITx
1 Udacity

Filter by university
1 Cal Tech
4 Duke University
1 Ecole Polytechnique Fédérale de Lausanne
1 Georgia Tech
3 Johns Hopkins University

Filter by assessment type
8 Auto and peer grading
16 Auto grading only
2 Peer grading only
COMPLETION RATES AND ASSESSMENT TYPE • COMPLETION RATES AND COURSE LENGTH • BROWSE AND COMPARE ALL DATA

Filter by completion criteria
1 (missing this field)
12 Certificates issued
1 Certificates issued for 'studio track'
3 Completed assignments
1 Completed assignments (optional)
1 Completed course
1 Number who took final exam
5 Passed course
1 Strong final score

Filter by platform
22 Coursera
2 EdX
1 MITx
1 Udacity

Filter by university
1 Cal Tech
4 Duke University
1 Ecole Polytechnique Fédérale de Lausanne
1 Georgia Tech
3 Johns Hopkins University

Auto and peer grading
Auto grading only
Peer grading only
3.091x Introduction to solid state chemistry

This MIT course ran at EdX from 2012-10 to 2013-01. 7.3% completed the course out of a total of 28512 students enrolled on the course.

Link to data source.
Internet History, Technology and Security

This University of Michigan course ran at Coursera from 2012-07 to 2012-09. 10.1% completed the course out of a total of 46000 students enrolled on the course.

Link to data source.
Introduction to Sociology

This Princeton University course ran at Coursera from 2012-06 to 2012-07. 3.2% completed the course out of a total of 40000 students enrolled on the course.

Link to data source.
HOW TO TAKE A MOOC AND GET COLLEGE CREDIT

START
Complete massively open online course.

CLASS
Get noncredit certificate of completion.

PROOF

PORTFOLIO
Use course in prior learning portfolio.

ENROLL
Enroll in college with 3 prior learning credits.

PASS
Get credit recommendation from authorized group.

REVIEW
Academic expert decides MOOC is worth 3 credits.
## More on MOOCs

<table>
<thead>
<tr>
<th>Company</th>
<th>Number of unique users*</th>
<th>Number of course enrollments</th>
<th>Number of courses offered</th>
<th>Course completion rate</th>
<th>Sample courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursera</td>
<td>2.09 million</td>
<td>7 million</td>
<td>210</td>
<td>9%**</td>
<td>Think Again: How to Reason and Argue; Introduction to Finance</td>
</tr>
<tr>
<td>edX</td>
<td>525,000+***</td>
<td>462,000+</td>
<td>21</td>
<td>4.6%**</td>
<td>Circuits and Electronics; Foundations of Computer Graphics</td>
</tr>
<tr>
<td>Udacity</td>
<td>460,000</td>
<td>975,000</td>
<td>19</td>
<td>5%-14%</td>
<td>HTML5 Game Development; Artificial Intelligence for Robotics</td>
</tr>
<tr>
<td>Udemy</td>
<td>500,000</td>
<td>800,000</td>
<td>6,000</td>
<td>18%</td>
<td>An Entrepreneur's Checklist; Advanced Excel Training</td>
</tr>
</tbody>
</table>


**At Coursera, 30% of students who attempt the first assignment ultimately complete the course. EdX figure is based on spring 2012 Circuits course only. Twenty-four percent of students who completed the first problem set actually passed that edX course.

***Not all edX users who have created usernames have registered for a course.

Source: the companies
2 afternoons
23 speakers
- keynote/plenary sessions
- institutional projects
2 activities
Lots of discussion and interaction
Learning and the MOOC

Resource list: [http://tinyurl.com/elimoooc](http://tinyurl.com/elimoooc)

- Getting the MOOC Off the Ground: What You’ll Need to Deploy
- Weaving the MOOC Into Campus Practice
- MOOC Quality Assurance and Analytics
- Exploring MOOC Delivery Options
“In January, it [Facebook] said for the first time that more of that audience was coming from mobile devices than from PCs.”

MIT Tech Review
Where the Money Is
Wireless network operators account for most of mobile revenues.

Source: Benedict Evans, Enders Analysis
“In 2009, [Microsoft’s] software was on 90 percent of personal computers. At the end of 2012, it’s on just 23 percent of devices sold, when smartphones, tablets, and PCs are all accounted for.

That was fast.”
iPods Changed Media Industry... iPhones Ramped Even Faster... iPad Growth (3x iPhone) Leaves “Siblings” in Dust

First 10 Quarters Cumulative Unit Shipments, iPod vs. iPhone vs. iPad

Source: Apple, as of Q3:12 (10 quarters post iPad launch).
Android ‘Phone’ Adoption Has Ramped Even Faster – Nearly 6x iPhone
iPad = 48% of American Kids Want One for Christmas While 36% Want a Mini...

Interest in Buying in Next 6 Months Among USA Kids Ages 6-12

<table>
<thead>
<tr>
<th>Device</th>
<th>Interest in Buying</th>
</tr>
</thead>
<tbody>
<tr>
<td>iPad</td>
<td>48%</td>
</tr>
<tr>
<td>Nintendo Wii U</td>
<td>39%</td>
</tr>
<tr>
<td>iPad Mini</td>
<td>36%</td>
</tr>
<tr>
<td>iPod Touch</td>
<td>36%</td>
</tr>
<tr>
<td>iPhone</td>
<td>36%</td>
</tr>
<tr>
<td>Kinect for Xbox 360</td>
<td>33%</td>
</tr>
<tr>
<td>Computer</td>
<td>31%</td>
</tr>
<tr>
<td>Nintendo 3DS / 3DS XL</td>
<td>29%</td>
</tr>
<tr>
<td>Tablet Computer other than iPad</td>
<td>29%</td>
</tr>
<tr>
<td>Nintendo DS / DS Lite / DSI / DSI XL</td>
<td>28%</td>
</tr>
<tr>
<td>Sony PlayStation 3</td>
<td>26%</td>
</tr>
<tr>
<td>Microsoft Xbox 360</td>
<td>25%</td>
</tr>
<tr>
<td>E-Reader</td>
<td>21%</td>
</tr>
<tr>
<td>Nintendo Wii</td>
<td>20%</td>
</tr>
<tr>
<td>Smartphone other than iPhone</td>
<td>20%</td>
</tr>
<tr>
<td>Kindle Fire</td>
<td>19%</td>
</tr>
<tr>
<td>Smart TV</td>
<td>19%</td>
</tr>
<tr>
<td>PlayStation Portable</td>
<td>18%</td>
</tr>
<tr>
<td>Android Smartphone</td>
<td>16%</td>
</tr>
<tr>
<td>PlayStation Vita</td>
<td>14%</td>
</tr>
<tr>
<td>PlayStation Move</td>
<td>14%</td>
</tr>
<tr>
<td>Samsung Galaxy (Note or Tab)</td>
<td>9%</td>
</tr>
<tr>
<td>Other Mobile Phone</td>
<td>8%</td>
</tr>
<tr>
<td>Microsoft Surface</td>
<td>6%</td>
</tr>
<tr>
<td>Apple TV</td>
<td>4%</td>
</tr>
</tbody>
</table>

Source: Nielsen, 11/12
Record Volume Of Apps Downloaded On Christmas Day
Impressive 29%+ of USA Adults Own Tablet / eReader. Up from 2% less than three years ago.

% of USA Adults Who Own Tablet Computers or eReaders, 4/09 – 1/12

Source: Pew Research Center, 1/12.
Global Smartphone + Tablet Shipments Exceeded PCs in Q4:10

Global Unit Shipments of Desktop PCs + Notebook PCs vs. Smartphones + Tablets, 2005-2015E

Q4:10: Inflection Point
Smartphones + Tablets > Total PCs

Note: Notebook PCs include Netbooks. Source: Katy Huberty, Ehud Gelblum, Morgan Stanley Research. Data and Estimates as of 9/12.
169 Years In, Standalone Compact Camera Shipments Were Surpassed By Smartphone (with Camera) Shipments in 2008

Worldwide Smartphone vs. Standalone Compact Camera Shipments
2001 – 2012E

- Smartphone Shipments (MM)
- Total Compact Camera Shipments (Digital + Film) (MM)

Units Shipped (MMs)

Magnitude of Upcoming Change Will be Stunning - We are Still in Spring Training
Robbie Kendall-Melton, Associate Vice Chancellor for Academic Affairs: eLearning

Tennessee Board of Regents

http://tinyurl.com/elirobbie
\[
\frac{\sqrt{81}}{3} = 3
\]
PROPERTY
PRIVATE
* Discovr (discover new apps)
* GoClass (for both Apple & Android)
* iSwifter (to run FLASH)
* NearPod (currently only for the iPad)
* EyeDecide (Medical)
* Word Lens (automatic translations)
* MyScript (Math Computations)
* Sign4Me (Sign Language)
* iMuscle (Fitness & Health)
* Heart Pro III (Medical)
* The Elements (Science)
* Prognosis (Problem Based App)
* Bitsboard (Language Development)
* Toca Boca Hair Salon I & II
* Health Map (Health & Medical)
* Skitch (Productivity Tool for Writing on iPad)
* CloudOn (Microsoft Office: WORD/PPT.Excel)
* KOBO (1.5 Free million books)
* Wattspad (100,000 free books)
* Behavior Breakthrough (Acting Out Behaviors)
* Access My Library (Databases, Books)
* Soundhound (recognizes humming, songs, etc.)
* Bible.is
* Our Choice (interactive College Text Book)
* Quakes
* iBooks
* ROMA (virtual history)
* PetWorld 3D (Character Edcation)
* Roambi (Business App)
* Browser4two (opening two browsers)
* DualBrowser (opening two browsers)
* Pyramids 3D

* Real Racing HD 2
* Shrek Karting (multiplayers)
* MoneyReader (visually impaired)
* Dinosaur Zoo (interactive book)
* POMT (zooming into the cells of a hand)
* FrogDissertation (dissecting a frog)
* Google Translate (two way translation/no typing)
* Back in Time
* Video Time Machine
* Skee-Ball HD
* Let's Create! Pottery (Lite & HD)
* Verbally (communication board)
* PuppetPal (communication)
* iCookbook (voice activation)
* Accuradio (music)
* Symphony Pro (composing music)
* Toca Boca Band
* Khan Academy
* Tap to Talk
* Art Authority
* Phonemic Chart
* ClearTune
* Timeline Maker
* Toy Story I (free)
* Pictello (create book with photos)
* AroundMe (places around you)
* Strings (augmented reality)
* Zappar (augmented reality)
* Visual Body Circulatory
* Sounds Right