New Era in Education

Technology & Digital Learning
Panel Discussion
New Era in Education: Technology and Digital Learning
Moderator: Dr. Dean Antonio Cantu, Chair of Teacher Education, Bradley University, USA
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In ancient Greece, the Elder Sophist used the term “techne” to refer the process of applying knowledge systematically to the practical art of instruction. They formulated cognitive rules, systematically analyzed subject matter and devised effective instructional materials.
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Distance Learning: A History of Flexibility

- **1728**: The first recorded instance of distance learning occurs in Boston, USA, when a "Caleb Phillips" advertises private correspondence courses in shorthand in the Boston Gazette.
- **1840s**: Sir Isaac Pitman runs correspondence courses teaching his revolutionary shorthand system. Pitman shorthand is still widely used today.
- **1858**: The University of London becomes the first university to offer distance learning degrees.
- **1892**: The term "distance education" is first used in a pamphlet by the University of Wisconsin–Madison in the USA.
- **1906**: Having pioneered the use of the term, the University of Wisconsin begins recording lectures and sending them to students in phonograph form.
- **1918**: The University of the Cape of Good Hope becomes The University of South Africa. Today, it is the largest university in Africa and is a dedicated distance learning institution.
- **1969**: Harold Wilson's Labour Government founds the Open University in 1969. It becomes the first institution to deliver ONLY distance learning, primarily using radio and television broadcasts to deliver content.
- **1970**: Athabasca University (Canada's Open University) was founded.
- **1974**: FernUniversität in Hagen (Germany's Open University) was founded.
- **1989**: Tim Berners-Lee proposes the development of an online document sharing system which he described as a "web of notes with links". This became the World Wide Web.
- **1995**: At Penn State University in the US, Jerrold Maddox teaches the first course delivered over distance via the web. It is called "Commentary on Art".
- **1999**: The term eLearning is coined.
- **2012**: Nearly 400,000 students study by distance learning in the UK, while one-third of all undergraduates study part-time.
- **2013**: UK Government makes student loans available to distance learning and part-time undergraduate students for the first time.
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Number of users online at one time, in millions:

- Feb. 24, 2012: 32
- March 3, 2012: 35
- April 10, 2012: 40

Due to its market prowess, Microsoft bought Skype for $8.5 billion in 2011.

It plans to integrate Skype functionality in many Microsoft products, ensuring that Skype's influence in online communication will grow quickly.

Where are Skype users?

- 17% U.S.A.
- 11% Other Americas
- 56% Europe, Middle East, and Africa
- 16% Asia Pacific
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The Fuss Over Flipped Classrooms

Supporters Say:

#1: More one on one time with teacher

The teacher can spend their class time working one-on-one with the students who require extra help. More one-on-one time also translates into better student-teacher relationships.

Instead of...

#2: Students learn at own pace

The ability to pause, rewind, and rewatch videos allows students to spend more time learning about concepts they find challenging. Meanwhile, students who have mastered a concept need not waste time reviewing with the rest of the class.

#3: Encourages Mastery Learning

In the traditional teacher led classroom, students are constantly pushed and pulled along to the next concept, even when they have not understood foundational concepts. The flipped model ensures that students do not move forward until they have demonstrated understanding of the concept.

100%

#4: Levels the playing field

Parents from lower socio-economic backgrounds are, on average, less educated and more likely to work evening jobs. The flipped model ensures that all students, regardless of socio-economic background, are supported at home.

#5: Addresses Absenteeism

The videos are available for students who miss class because of illness, sports, school trips, and family vacations. For teachers, this means no more make-up assignments.

#6: Excellent Diagnostic Tool

With the help of computer software, teachers can quickly identify areas where students are excelling and areas where students are struggling.

#7: Students teach students

Some students "get it" the first time around. The flipped model allows the teacher to quickly identify these students, and to put these students to work as peer tutors.

#8: Involves Parents

Having the videos available online 24/7 enables parents to learn the content directly from the teacher. Parents are better equipped to help their sons and daughters.
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A quality education is not a luxury or a privilege. It is a right no matter where you are in the world. Access to technology is also a right that brings equality to all students and educators around the world and even within our own communities.

An estimated **101 million children** in the world are not in school.

Of the 2.2 billion children in the world, **1 billion are living in poverty**.
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SOLUTION

Technology is only part of the answer - And, providing access to technology is only part of the answer to enable children to achieve more.

- United States
  - NRI = 5.33
  - Global Rank = #7

- Denmark
  - NRI = 5.29
  - Global Rank = #1

- Sweden
  - NRI = 5.60
  - Global Rank = #1

- Nicaragua
  - NRI = 2.99
  - Global Rank = #128

- Peru
  - NRI = 3.54
  - Global Rank = #89

- Libya
  - NRI = 3.05
  - Global Rank = #126

- Algeria
  - NRI = 3.17
  - Global Rank = #117

- Brazil
  - NRI = 3.90
  - Global Rank = #56

NRI = Networked Readiness Index
- The world's most comprehensive and authoritative international assessment of the impact of Information Communications Technology on the development process and the competitiveness of nations.
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21st Century Skills & Differentiation
The Digital Generation

• Wired differently, neurologically different

• Have developed hyperlinked minds

• Brains able to process information in parallel not linear fashion
Millennials Will Benefit And Suffer Due to Hyperconnected Lives

February 29, 2012

While experts see many young people becoming nimble analysts and decision-makers because of their embrace of the networked world, they also warn that some constantly-connected teens and young adults will lack deep engagement with people and knowledge by being hyperconnected.

These are among the findings of an online survey of technology stakeholders and critics about the future of the internet who were asked whether the always-on connection to people and information among the younger generation (those under 35) will turn out to be a net positive or a net negative by 2020.

Opinion was divided on the impact of hyperconnectivity.

Some of those surveyed saw the positive side: The young are learning more and they are becoming more adept at finding answers to deep questions, in part because they can search effectively and access collective intelligence via the internet. Others saw the negative: Hyperconnected young people do not retain information; they spend most of their energy sharing short social messages, being entertained, and being too distracted to engage deeply with people and knowledge.

Read the full report for more comments from the experts on the hyperconnectivity question, their recommendations and their predictions for the future.
Here is a sampling of their predictions and arguments:

- The environment itself will be full of data that can be retrieved almost effortlessly, and it will be arrayed in ways to help people – young and old – navigate their lives. Quick-twitch younger technology users will do well mastering these data streams.

- **Millennials’ brains are being rewired to adapt to the new information-processing skills they will need to survive in this environment.**

- “Memories are becoming hyperlinks to information triggered by keywords and URLs. We are becoming ‘persistent paleontologists’ of our own external memories, as our brains are storing the keywords to get back to those memories and not the full memories themselves,” argued **Amber Case**, CEO of Geoloqi.

- There is evidence now that “supertaskers” can handle several complicated tasks well, noted communications expert **Stowe Boyd**. And some survey respondents noted that it is not necessarily only young adults who do this well.

- **Young people accustomed to a diet of quick-fix information nuggets will be less likely to undertake deep, critical analysis of issues and challenging information. Shallow choices, an expectation of instant gratification, and a lack of patience are likely to be common results, especially for those who do not have the motivation or training that will help them master this new environment. One possible outcome is stagnation in innovation.**
Who owns what?

As some devices grow ubiquitous in American life, others remain the domain of the young. But Millennials are not always more likely to own certain gadgets – take a look at the following charts to see how your age group’s gadget ownership stacks up.

The percentage of adults* in each generation who own the following devices:

* "Adults" = Americans age 18+

- **Laptop computer**: 18-34: 70%, 35-46: 61%, 47-56: 49%, 57-65: 43%, 66-74: 30%, 75+: 10%
- **iPod/MP3 player**: 18-34: 74%, 35-46: 56%, 47-56: 42%, 57-65: 26%, 66-74: 16%, 75+: 3%
- **Game console**: 18-34: 63%, 35-46: 63%, 47-56: 38%, 57-65: 19%, 66-74: 8%, 75+: 3%
- **e-Book reader**: 18-34: 5%, 35-46: 5%, 47-56: 7%, 57-65: 3%, 66-74: 6%, 75+: 2%
- **iPad/tablet**: 18-34: 5%, 35-46: 5%, 47-56: 4%, 57-65: 3%, 66-74: 1%, 75+: 1%

**Generations defined**

- **Millennials**: Ages 18-34
- **Gen X**: Ages 35-46
- **Younger Boomers**: Ages 47-56
- **Older Boomers**: Ages 57-65
- **Silent Gen.**: Ages 66-74
- **G.I. Gen.**: Age 75+
How Teachers Are Using Technology at Home and in Their Classrooms

A survey of Advanced Placement and National Writing Project teachers shows that digital tools are widely used in their classrooms and professional lives. Yet, many of these high school and middle school teachers worry about digital divides when it comes to their students’ access to technology and those who teach low-income students face obstacles in bringing technology into their teaching.

Kristen Purcell
Director of Research, Pew Research Center’s Internet & American Life Project

Alan Heaps
Vice-President, The College Board

Judy Buchanan
Deputy Director, National Writing Project

Linda Friedrich
Director of Research and Evaluation, National Writing Project
### Digital tools AP and NWP teachers are using in their classrooms

Percent of AP and NWP teachers who say they and/or their students use the following digital tools in the classroom or in completing assignments...

<table>
<thead>
<tr>
<th>Tool Description</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A projector that is connected to a laptop or desktop computer or other digital device</td>
<td>97%</td>
</tr>
<tr>
<td>A computer lab or computer workstation devoted to student computer use</td>
<td>96%</td>
</tr>
<tr>
<td>A cell phone and/or a smartphone</td>
<td>73%</td>
</tr>
<tr>
<td>A computer/laptop cart available at your school</td>
<td>71%</td>
</tr>
<tr>
<td>A digital camera other than a cell phone</td>
<td>67%</td>
</tr>
<tr>
<td>A digital video recorder other than a cell phone</td>
<td>55%</td>
</tr>
<tr>
<td>An interactive whiteboard</td>
<td>52%</td>
</tr>
<tr>
<td>An e-book reader</td>
<td>45%</td>
</tr>
<tr>
<td>A tablet computer</td>
<td>43%</td>
</tr>
</tbody>
</table>
What do AP and NWP teachers have students do online?

Percent of AP and NWP teachers who say they have students do each of the following...

- Do research or search for information online: 95%
- Access or download assignments from an online site: 79%
- Submit assignments online: 76%
- Develop, share or post their work on a website, wiki or blog: 40%
- Participate in online discussions: 39%
- Edit or revise their OWN work using a collaborative web-based tool such as GoogleDocs: 36%
- Edit OTHERS’ work or give others feedback using a collaborative web-based tool such as GoogleDocs: 29%
- Post their own work online where people OTHER THAN their classmates or teachers can see it: 22%

Source: Teacher data from the Pew Research Center’s Internet & American Life Project Online Survey of Teachers, March 7 to April 23, 2012, n=2,462 middle and high school teachers.
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You (2012) vs. Your Kid (2025)

65% of today’s grade school kids will end up at jobs that haven’t been invented yet.

- United States department of labor

Are our education systems well equipped to prepare the students for a world that doesn’t exist yet?

Education

2012

Emerging technologies that are likely to influence education in the upcoming decades.

The contemporary classroom today, with its grades and deference to the clock, is an inheritance from the late 19th century.

2025

Virtual teachers

Digitalized classrooms

Gamification

By 2020, 50% of high school courses will be delivered online. (projected)
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EDTECH CHEAT SHEET
Understanding New Trends in Educational Technology

Trying to keep up with all of the new buzzwords in the booming Educational Technology sector can leave you feeling like a kindergartner in a calculus class.

Don’t tell your teacher, but we put together a little cheat sheet to keep you informed on what’s happening inside and outside of today’s most innovative schools.

Think we’re missing any major terms or trends? Let us know on Twitter.
@GoBoundless

MOOC?  Gamification?  Virtual Classroom?  Digital Storytelling?
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1:1 Technology
Providing every student with a laptop or tablet to make learning more individualized, increase independence and extend academics beyond the classroom. Also: much cooler than just giving out stickers.

Asynchronous Learning
A student-centered teaching method that uses online resources to facilitate learning without requiring students and instructors be in the same place at the same time. Yes, students—you can wear your pajamas to class.

Course Management System (CMS)
Class websites can be a big undertaking.
A CMS keeps teachers and students organized with digital resources for class discussion, document management, homework submission and course scheduling.

Digital Storytelling
Once upon a time*, there were students and instructors who used digital tools to tell exciting stories in educational ways, like showing off research or building course assignments.

*It was 2012.

Adaptive Learning
Software that adapts its content and pacing to the current knowledge level of the user, so it’s almost like having a personal tutor for your education.

Blended Learning
A sure recipe for success: Mix one part students learning at school and one part students engaging with content delivered online. Blend well for best results.
Optional—Adjust when, where and how students use the online content.

Differentiated Learning
Programs or tools to present learning materials in creative ways that match every student’s individual learning style, from typical lectures to fun games and quizzes.

Though the tools used depend on the student, the learning goals are the same for all.

E-Books
Put down your highlighters and Post-its. E-books are completely digital and are usually read on computers or e-readers.

Electronic Classroom
A classroom equipped with multimedia devices to enhance the learning experience.
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Gamification
Using game design and mechanics to drive motivation and increase engagement in learning.
Let the games begin!

Individualized Learning
When a group of students all receive the same content but work through it at their own pace—anything from slow and steady to fast and furious.

Informal Learning
Learning that occurs outside a traditional school, i.e. forget having to lug around that heavy backpack.

Instructional Technology
Combining education and technology to enhance a curriculum. Instructors can alter how they deliver content to students depending on the technology available at their school. Hopefully, but not always, more advanced than Morse code...

Learning Platform
An interactive online service organized around a specific topic that gives users the ability to submit and receive information and learning materials.

Lifelong Learning
There’s no rule that says learning stops after a certain age.
Lifelong learning continues education informally for personal enrichment, usually after finishing formal education.

Massive Open Online Course (MOOC)
A course in which materials and instruction are delivered over the Internet to users around the world. The course is designed to connect instructors with learners interested in a common topic and works best with a large user-base and open content.

Of course, the first step toward completing the course is learning how to pronounce MOOC...

Extra credit! How do you pronounce MOOC?
Hint: Try to sound like a cow with something caught in its throat.
NETS in Action: Strengthening and Assessing 21st Century Skills

<table>
<thead>
<tr>
<th>Creativity and Innovation</th>
<th>Facilitate and Inspire Student Learning and Creativity</th>
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<tbody>
<tr>
<td>Communication and Collaboration</td>
<td>Design and Develop Digital-Age Learning Experiences and Assessments</td>
</tr>
<tr>
<td>Research and Information Fluency</td>
<td>Model Digital-Age Work and Learning</td>
</tr>
<tr>
<td>Critical Thinking, Decision-Making and Problem-Solving</td>
<td>Engage in Professional Growth and Leadership</td>
</tr>
<tr>
<td>Digital Citizenship</td>
<td>Promote and Model Digital Citizenship and Responsibility</td>
</tr>
<tr>
<td>Technology Operations and Concepts</td>
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</tbody>
</table>
Evidence of 21st Century Skills

- Reflection
- Communication & Collaboration
- Critical Thinking Problem-Solving & Decision Making
- Research & Information Fluency
- Creativity & Innovation
- Digital Citizenship
- Technology Operations & Concepts

Artifact

Validation

Student Project
UNLEASHING THE POTENTIAL OF EDUCATIONAL TECHNOLOGY

EXECUTIVE SUMMARY

Educational technology holds the promise of substantially improving outcomes for K-12 students, but there are significant challenges in bringing new educational technology products for this population to market. It is difficult for producers of these technologies to demonstrate the effectiveness of their products to potential buyers and market fragmentation creates barriers to entry by all but the largest suppliers. The spread of broadband Internet and Common Core State Standards have improved the landscape for educational technologies, but these factors alone are likely insufficient for a “game changing” advance. Working together, stakeholders can form a plan of action to provide local school systems with easy access to good information about the effectiveness of various educational technology products and give prospective developers of these products access to customers on a scale sufficient to make it worthwhile for them to enter the market. The payoff – in the form of more effective and more widely utilized educational technologies, leading to better outcomes for students – could be enormous.

Source: http://www.whitehouse.gov/sites/default/files/unleashing_the_potential_of_educational_technology.pdf
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In the first round, each presenter has 5 minutes to introduce her/his research and the issues and trends in the respective areas. The first round will last no more than 30-40 minutes total.
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Dr. Timothy McNichols

Dr. Timothy McNichols is a lecturer in the School of Creative Technologies at the Institute of Art, Design & Technology in Dublin, Ireland. His teaching interests include undergraduate courses in Applied Research Methods in Computer Science, Contemporary Issues in Multimedia as well as a postgraduate course in Consumer Cyberpsychology. Tim employs a variety of teaching and learning methods in practice including Virtual Reality. Tim has consulted on various Enterprise Ireland innovation projects involving social media and education, online market research, consumer behavior analysis and social media strategy. His research has been published in a variety of business and information systems journals (Decision Sciences, IJTM, IJNVO, IJLC, IJM), book chapters, and conference proceedings. Tim has a BA (UCLA), MSc (South Bank Univ, London), and Ph.D (Trinity College, Dublin). Tim was a recipient of the Government of Ireland IRCSS Senior Research Scholarship.
Dr. Linda Castañeda

Biography

Linda is Senior Lecturer in Educational Technology in the Department of Didactics and School Organization at the University of Murcia (Spain). She is also member of GITE (group of Research in Educational Technology).

She is Educationalist from the University of Murcia and PhD in Educational Technology by the University of Balearic Islands (Extraordinary Doctorate Award and European Mention). She has spent some periods of working in research visiting at the Knowledge Media Institute at the Open University of UK, The Group of Research in e-learning of the University of Oxford, and The Centre for Education and New Technologies (CENT) from the Universitat Jaume I of Castellón (Spain).

With her background in Educational Technology, she has participated in national and international research projects centred on the use, integration and evaluation of Information and Communication Technologies in Education, e-learning, and the impact of those on the Social, Curricular and Organizational change. Currently, her research is around Web 2.0 in education and training, Personal Learning Environments and Emergent Technologies and Pedagogies.

Dr. Castañeda has participated in a wide variety of international events as speaker and has published some books (her last book about PLEs is completely available on the internet http://www.um.es/ple/libro) and papers in specialized journals and conferences.

She teaches in degrees related to Education. She is lecturing at the Faculty of Education, in the degrees of Pedagogy, Social Education, Future primary school teachers, and also in the Masters of Technology Enhanced Learning.
Assistant professor, teacher education, earned her Ph.D. from the University of Texas at Austin in science education, specializing in education technology. Prior to joining Northeastern Illinois University – NEIU, she worked as a science education faculty member at DePaul University. Kim was the director of the InSTEP (Inquiry-based Science and Technology Program), which created strategies for teachers to use to counter the lack of interest in science during the middle school years. It used innovative technology to explore various science investigations to support their interest.
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Dr. Michail Bukhtoyarov and Co-Author, Anna Bukhtoyarov

Dr. Mikhail Bukhtoyarov

Siberian Federal University, Krasnoyarsk, Russia

Earned his first degree in Teaching English and German from Krasnoyarsk Pedagogical University, Russia and defended his PhD in Social Philosophy on the issues of emerging global society. He became the finalist of Muskie Academic Exchange Program and earned his MEd in Instructional Technology from Kent State University, Ohio, the USA. Currently he teaches Philosophy to undergraduate and graduate students. He teaches Instructional Design and Technology at university staff at Siberian Federal University. He is also the Head of U CAN School blended learning project for rural area students.

His research interests include social and philosophical problems of information society and globalization and the impact of technology on education.

Ms. Anna Bukhtoyarov

Siberian Federal University, Krasnoyarsk, Russia

Earned her first degree in Teaching English and History from Kamchatsky, Pedagogical University, Russia. After working at public schools she changed her career to become a librarian. She became a finalist of Muskie Academic Exchange Program and earned her MLS from Kent State University, Ohio, the USA. On coming back to Russia she was working for World Wildlife Fund (WWF). Then moved to Krasnoyarsk where she started teaching at Siberian Federal University. Currently she teaches English language to students and Instructional Design and Technology at university staff. She is also involved in U CAN School blended learning project for rural area students. Last year she started doing her PhD in Education.

Her research focuses on the impact of globalization in education and new ways of teaching/learning based on the current instructional technologies.
In the second round, each presenter has 10 minutes to focus on best practices relative to the issues addressed in the first round. The second round will last no more than 50 minutes total.
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Dr. Hanna Kim
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Dr. Michail Bukhtoyarov and Co-Author, Anna Bukhtoyarova
In the third round, we have 20 – 30 minutes in which the moderator will make some general comments and then facilitate a question-and-answer session with the audience.