Decoding the Dream

- Log = K-12 educational system
- Mandates to move:
  - Mismatch between industrial economy and global, knowledge-based, innovation-centered economy
  - Political pressures to reduce funding for education *(seen as a cost rather an investment)*
- Rabbits = our individual initiatives;
  Big rabbit = our organizations where we share our initiatives

Transformation via Blended, Contextualized Learning Communities

Chris Dede, Harvard U.

Three Interwoven Technologies for BCLC

- Immersive virtual environments
- Social media
- Semi-immersive augmented realities via mobile devices

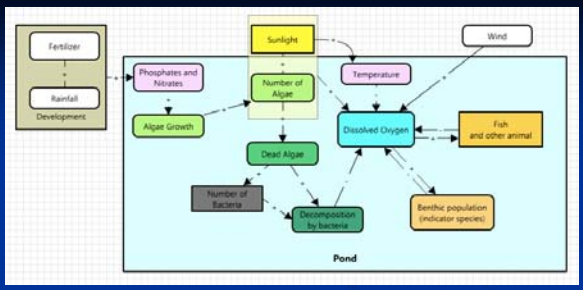
EcoMUVE

- Funded by the Institute of Education Sciences of the U.S. Department of Education.
- Middle school science
  - Ecosystems, Causal complexity.
- Two MUVE-based modules implemented over two weeks within a four week ecosystems curriculum.
- Timeline: July, 2008 – June 2012

Module 1: Pond Ecosystem

Modeled after Black's Nook Pond in Cambridge, MA

Naturalist	Microscopic Specialist	Water Chemist	Private Investigator
Find out how the populations of pond organisms: largemouth bass, bluegill, minnows, and great blue herons change over time.	Find out how the populations of microscopic bacteria, bluegreen algae, and green algae change over time.	Use the atom tracker to find out what happens to the carbon atom on different days.	Gather clues from the landscaper, the golf course manager, the utility worker, the park ranger, the birdwatcher, other people near the pond.
Use the field guide to learn about the different fish species.	Measure the dissolved oxygen in the water on different days.	Measure the dissolved oxygen in the water on different days.	Observe the weather on different days; collect measurements of temperature, cloud cover, and wind speed.
Use the atom tracker to find out what happens to the carbon atom on different days.	Use the atom tracker to find out what happens to the oxygen atom on different days.	Use the atom tracker to find out what happens to the phosphorus atom on different days.	Measure chlorophyll a in the water on different days.
Measure the turbidity in the water (and use your eyes) to see changes over time.	Measure the temperature in the water on different days.	Measure the pH in the water on different days.	Measure the temperature in the water on different days.
Measure the dissolved oxygen in the water on different days.	Measure chlorophyll a in the water on different days.	Measure the nutrients (phosphates and nitrates) in the water on different days.	Measure the nutrients (phosphates and nitrates) in the water on different days.
Work together to create a concept map that represents the causal relationships of the pond ecosystem based on whole team's observations.			



Interaction between Biotic and Abiotic Factors

Runoff causes increased phosphate levels, leading to increased plant growth. Plant decomposition by bacteria consumes oxygen, causing the eventual fish kill.

http://ecomuve.gse.harvard.edu

Contextualized Learning Community

A culture of learning, in which everyone is involved in a collective effort of understanding

- ✓ Shares and develops a repertoire of resources: experiences, tools, stories, ways of addressing recurring problems
- ✓ Allows a close connection between learning and doing
- ✓ The *shared context* empowers the informal and tacit aspects of knowledge creation and sharing

A Social Theory of Learning Based on Shared Experience

FIGURE ONE: COMPONENTS OF A SOCIAL THEORY OF LEARNING: AN INITIAL INVENTORY. SOURCE: ETIENNE WENGER.

A *Contextualized* Learning Community

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Blended (or Hybrid) Learning Community

- ✓ Asynchronous media enable convenient participation, deeper reflection, and archiving of insights
- ✓ Emotional and social dimensions rely on synchronous virtual interchanges
- ✓ Broader range of participants actively engage in dialogue

distributed across space, time, media

The Spectrum of Web 2.0 Media

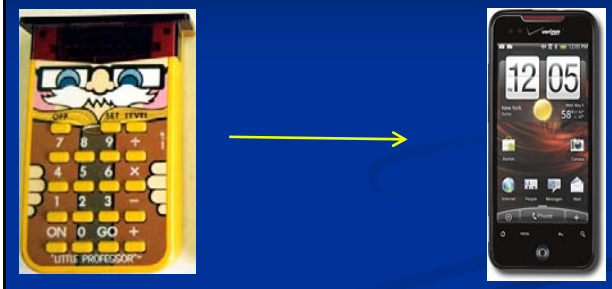
- Sharing
  - Social bookmarking
  - Photo–video sharing
  - Social networking
  - Writers' workshops and fan fiction
- Thinking
  - Blogs
  - Podcasts
  - Online discussion forums
  - Twitter
- Co-Creating
  - Wikis–collaborative file creation
  - Mashups–collective media creation
  - Collaborative social-change communities

May 2009 *Educational Researcher*

Jenkins' Framework for New Literacies

- ***Play*** — Experimenting with one's surroundings in problem solving
- ***Performance*** — Adopting alternative identities for improvisation and discovery
- ***Simulation*** — Interpreting and constructing dynamic models of real-world processes
- ***Appropriation*** — The ability to meaningfully sample and remix media content
- ***Multitasking*** — Scanning one's environment and shifting focus to salient details
- ***Distributed cognition*** — Fluently using tools that expand mental capacities
- ***Collective intelligence*** — Pooling knowledge with others toward a common goal
- ***Judgment*** — Evaluating the reliability and credibility of different information sources
- ***Transmedia navigation*** — The ability to follow the flow of stories and information across multiple modalities
- ***Networking*** — The ability to search for, synthesize, and disseminate information
- ***Negotiation*** — The ability to travel across diverse communities, discerning and respecting multiple perspectives, and grasping and following alternative norms

1976 2012



The Evolving Mobile Experience

Always On, Always Connected Devices

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Beyond "Old Wine": Augmented Reality

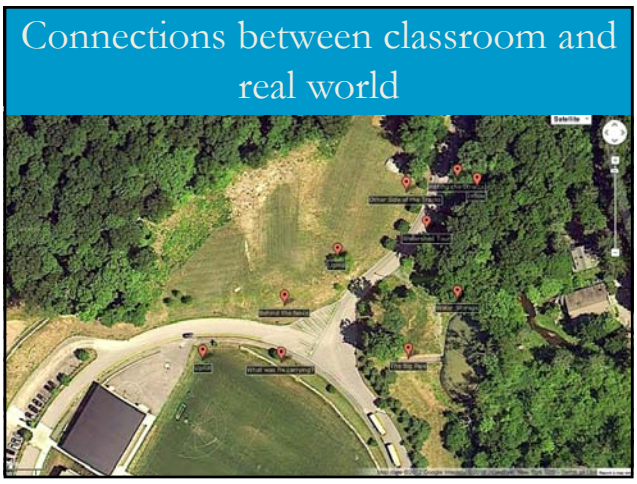
Augmented realities utilize *mobile, context-aware* technologies that enable participants to interact with digital information, videos, visualiazations, and simulations embedded within a physical setting.

- Location-aware AR presents digital media to learners as they move through a physical area with a GPS-enabled smartphone or similar mobile device
- Vision-based AR presents digital media to learners after they point the camera in their mobile device at an object (e.g., QR code, 2D target).


Sheung Wan
Kowloon (W)
Connaught Place
Airport Express Station
Edinburgh Place
Kowloon


android
(Conner Flynn)
EcoMUVE is going Mobile
http://ecomobile.gse.harvard.edu


(Zonkio.com)
Starch
Glucose


Connections between classroom and real world

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BCLC Enables Personalized Learning

School Day Extension | 24/7 Access | More Data for Analytics

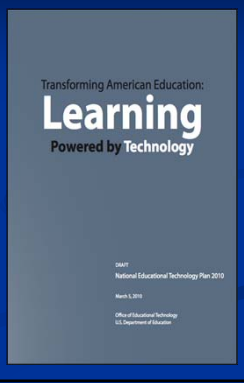
Dede & Richards, Eds. *Digital Teaching Platforms*, TCP, 2012

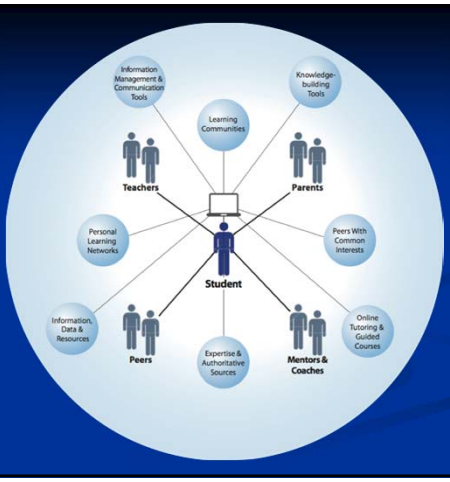
From Player Piano to Jazz Combo

Many Possible Elephants

The 2010 NETP

- Response to Congressional mandate for five-year plan for educational uses of technology
- Plan for *transforming* education with technology in response to urgent need to remain competitive in a global economy
- Reflection of increased understanding of how to support learning and of growing capabilities enabled by technology





Transformation of Formal Education

Core Principles of Professional Development

- Teachers teach as they were taught.
- The important issue is not technology usage, but changes in content, pedagogy, assessment, and learning outside of school.
- Continuous peer learning is the best strategy for long-term improvement.

A Different Model of Pedagogy

- Experiences central, rather than information as pre-digested experience (for assimilation or synthesis)
- Knowledge is situated in a context and distributed across a community (rather than located within an individual: with vs. from)
- Reputation, experiences, and accomplishments as measures of quality (rather than tests, papers)

Professional Development: Communities of "Unlearning"

- Developing fluency in using emerging interactive media
- Complementing presentational instruction with collaborative inquiry-based learning
- Unlearning almost unconscious assumptions and beliefs and values about the nature of teaching, learning, and schooling

All People Can Ride the Elephant