Listening to What We're Seeing

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Context

- Meaning is shaped by:
  - ? People
  - ? Culture
  - ? Technology
  - ? Our understanding of education
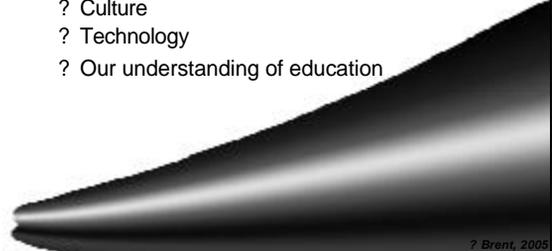
? Brent, 2005

Learners

Today's learners

- Digital
- Connected
- Experiential
- Immediate
- Social

Net gen learning preferences

- Peer-to-peer
- Interaction & engagement
- Visual
- Things that matter

Time-constrained learners

- *35%* of undergraduates are adult learners
- *87%* commute
- *80%* work
- *31%* of enrollment increases will be in adult learners

– NCES, 2003; Humphries, 2004

Types of learning

- Implicit
  - ? information is acquired effortlessly or unconsciously (speech patterns; social attitudes)
  - ? enables adaptation to new environments by being in them, observing and interacting
- Informal
  - ? learning occurs at home, work, among peers
  - ? over a lifespan, 90% of time is available for informal learning (79% for school age children)
  - ? involves skills and development of an identity ("learning to be")
  - ? Legitimate Peripheral Participation
- Formal

Neuroplasticity

- The lifelong ability of the brain to reorganize neural pathways based on new experiences
- Stimuli and activity change brain structures; the brain changes and organizes itself based on the inputs it receives
- Different developmental experiences impact how people think

Children age 6 and under

- *2:01* hours / day playing outside
- *1:58* hours using screen media
- *40* minutes reading or being read to
- *48%* of children have used a computer
- *27%* 4-6 year olds use a computer daily
- *39%* use a computer several times a week
- *30%* have played video games

Play outside · Use screen media · Reading
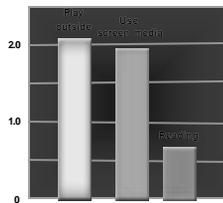
– Kaiser Family Foundation, 2003

Culture

Culture

- Culture is a system of
  - ? Shared beliefs
  - ? Values
  - ? Customs
  - ? Behaviors
- Students are often harbingers of social change
  - ? Relationships and social interaction
  - ? Self-expression
  - ? Multiple media
  - ? Meaning in the network

? Croom, 2005

Mulit-modal communication

- The Internet is a primary communication tool
  - ? *81%* email friends and relatives
  - ? *70%* use instant messaging to keep in touch
  - ? *56%* prefer the Internet to the telephone
- Communication with images
  - ? Cell phones
  - ? Flickr
- Communicating location
  - ? GPS
  - ? Finding others in proxim... *– Lenhart,*
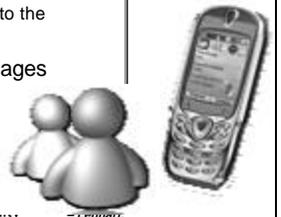
Do-it-yourself

- People are doing more things for themselves online
  - ? Online banking
  - ? Online shopping
  - ? Learning
- Informal learning
  - ? Organic
  - ? Contextualized
  - ? Activity and experie based
  - ? Self-activated, unde learner's control
  - ? Open-ended engagement

Choice

- MP3 players
  - ? 22 million American adults have MP3 players
  - ? 6 million have downloaded podcasts or Internet radio programs
  - ? Podcasting is expected to reach 12.3 million households by 2010
- Timeshifting (e.g., Tivo)
  - ? Choose what you want to watch
  - ? Choose when you watch
  - ? Fast-forward or skip

? Lomas, 2005; R

Web as information universe

Amateurs as authorities

- 34 million blogs (est.)
- 32 million blog readers
- 400,000 posts per day
- 16,000 posts per hour

—Lark, 2005

Alternate reality

- **5** hours: amount of time an 8th grader plays video games per week
- **77%**: By high school, the percentage of students who have played games
- **69%** have played games since elementary school
- **100%:** By college, nearly all students have experienced games
- **710 million** players worldwide
- **$10 billion**: Gaming industry revenue in 2004

—Jones, 2003; Castranova, 2005

Is it age or IT?

- How do you write most documents? long-hand or at a keyboard?
- Are you constantly connected? Laptop? PDA? Cell phone?
- How many windows are typically open on your computer?
- Are you a multitasker?
- Do you play video or computer games?
- Do you download music?
- Does your cell phone have a camera?

Technology

Rate of change

Digital Technology

Change

2006

Time
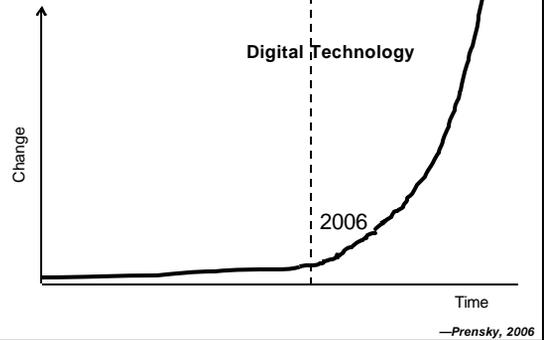
Interfaces shaping learning

- World to the desktop: access to
  - ? Distant experts
  - ? Collaboration
  - ? Mentors
  - ? Communities of practice
- Alice in Wonderland, multi-user virtual environment
  - ? Participants and avatars and artifacts interact
  - ? Shared virtual environments
- Ubiquitous computing
  - ? Wireless devices infuse resources in the real world
  - ? Smart objects; intelligent contexts

? Dede, 2005
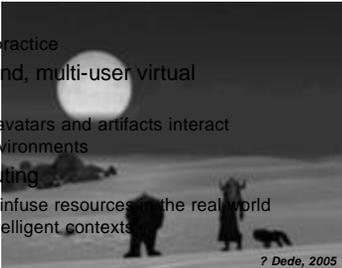
Implications

Connecting

Connecting with students

- Be engaging; challenge us
- Be responsive: answer voice mails and emails; office hours still matter
- Be seen: we'd like to see you and get to know you outside of class
- Set boundaries: tell us when you're available
- Be an active participant in class; show you are excited about the subject
- Ask students what they think
- Not everything needs to be on the Web

Network over content

- Rapid knowledge growth
- The information pace is too rapid for the current model of learning
- Learners will move into different—possibly unrelated—fields over their lives
- Personal knowledge is comprised of a network
- Informal learning is eclipsing formal learning

? Siemens, 2005

Social connections

- Social network
- Build your own profile
- Connect with other professionals
- Search for former classmates
- Find potential employees
- Experts' knowledge is organized around people and concepts
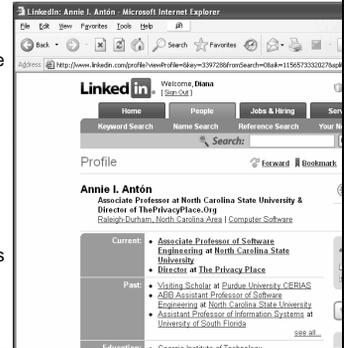
Connecting in virtual worlds

- Students meet and interact with others
- Hands-on learning; apply knowledge and skills in the game
- Rehearsal of skills
- Feedback and help, record-keeping, progress reports
- Role modeling, observational learning
- Interactivity
- Networking
- Interpersonal and social dynamics

? image courtesy of Rachel Smith, 2006

Collaboration by design

? images courtesy of Jim Twetten, Iowa State University

Hallway vs. passageway

? images courtesy of Nancy Chism, IUPUI
Bill Dittoe, University of Dayton

Engaging

5

Classrooms: Learning about

? image courtesy of Hal Abelson, MIT

Studios: Learning to be

? image courtesy of Phil Long, MIT

Active and collaborative

- SCALE-UP: Student Centered Activities for Large Enrollment Undergraduate Programs
- Class time spent on tangibles and ponderables
- Problem solving, conceptual understanding and attitudes are improved
- Failure rates are reduced dramatically
- "The job is not to teach physics but to teach thinking"

--Beichner & Saul, 2003

Studio approach

All work in progress is public

Thinking is shared

Learn from struggles & success

See choices, constraints, consequences

Social & intellectual practices visible

Enculturation into practice

--Brown, 2005

Participatory

- Goal is to live as long as possible and reproduce
- Ability to survive is linked to the genome; must figure out the genetics involved
- Mating is by "beaming" between hand-helds

Integrative

- Players briefed about rash of local health problems linked to the environment
- Provided with background information and "budget"
- Need to determine source of pollution by drilling sampling wells and ultimately remediate with pumping wells
- Work in teams representing different interests (EPA, industry, etc.)

? Klopfer & Squire, 2003

Learning-to-be

- National Ecological Observatory Network
- Remote & collaborative environments
- Widely distributed sensors
- Real-time data collection and analysis

Tropical-Extratropical Teleconnection Mechanism

--NSF, 2006

Visual

Simulations

http://workbench.concord.org/modeler/ss3.html
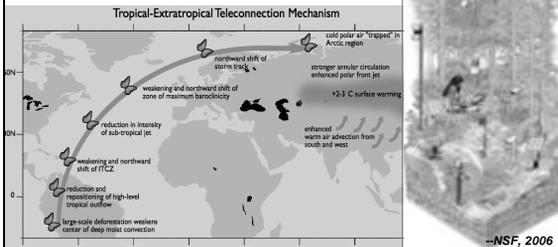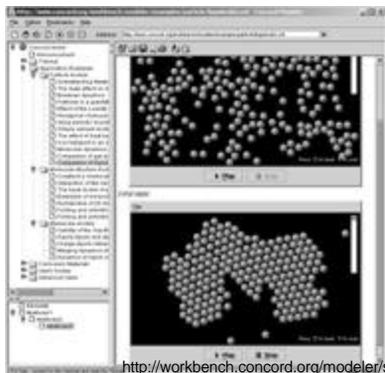
Experiential

- Conduct virtual experiments
- Warehouse of parts allows students to create their own experiments
- Lab prep

00:00:00

? Grisham 2004

Reconstruction

Ancient Spaces: Developed by the Faculty of the Arts, University of British Columbia

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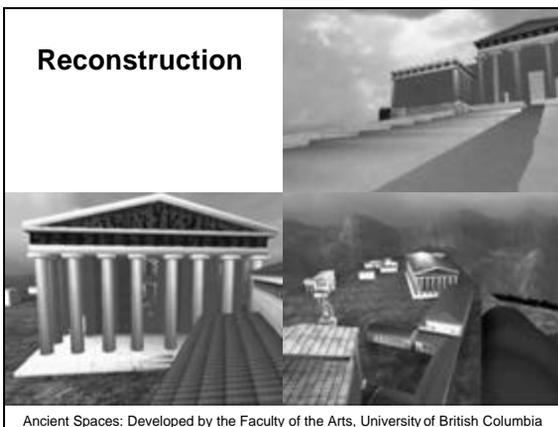
Formal vs informal

Social

- Students spend more time out of class than in it
- "Capture time" is particularly important for non-residential students
- Learning occurs through conversations, web surfing, social interactions
- Group work
- Spontaneous interactions
- Mingle, share, make connections

Student work areas

? image courtesy of ... Dayton

Library or information commons

- Space for interaction and exchange
- Food and talk allowed
- Access to integrated resources and support (writing, IT, reference)

? images courtesy of Nancy Chism, ... and Duke University

Seeing people, meeting people

- Making people visible to each other by using atria, cafés, or windows
- Movable furniture so small groups can form spontaneously
- Wireless access

? image courtesy of DEGW, MIT; Chism, IUPUI

Harmonize space with learning theory

- Flexibility (quick reconfiguration)
- Comfort (discomfort distracts from learning)
- Sensory stimulation (antiseptic environments don't focus attention)
- Technology support
- De-centered (no "front" of the room; spaces center on learning, not experts)
- Holistic (the entire campus is a learning environment)

? images courtesy of Emory's Cox Hall Computing Center; Chism

Suggestions

#1: Identify principles

- **Coverage model**: Learning is not just about covering content; its about developing competency
- **Knowledge construction**: Reasoning is not linear, deductive or abstract but begins from the concrete and assembles a "mosaic"
- **Interactivity**: This is a connected, interactive generation; collaboration and interaction are important learning principles
- **Formal & informal**: Learning can occur anywhere, anytime
- **Its not technology alone**: Technology must support good pedagogy

—Dede, 2005

#2: Involve students

- Students as consumers with a choice
- They have a unique perspective on their learning environment
- Input ranges from opinion to action
- Language and perspectives differ, not all students are alike
- "Spend a day in their shoes"

#3: Consider the options

- **Visual:** less reading, more visuals
- **Mixed delivery:** mix online, face-to-face
- **Engaging:** involvement similar to problem-solving or games
- **Manageable:** bite-sized chunks of information
- **Real:** capitalizes on real-world problems; information can be applied to real situations
- **Social:** interaction with others

#4: Redefine space

- Space shaped by learning rather than by instruction
- Socially catalytic space
- A shift from classrooms to learning complexes

- Service philosophy
- Technology integration
- Experimentation and innovation
- User involvement

3 photos courtesy of Shenley, Bullfinch, Richardson & Abbott

#5: Align technology with pedagogy

- Don't mistake use for integration
- Understand what you want students to do
- Consider the strengths and weaknesses of specific approaches
- Align media with learning outcomes and pedagogy

2 Van Eck, 2006
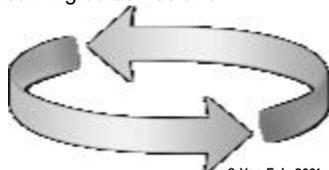
The goal is an organization that is constantly making its future rather than defending its past.

? *Hamel & Valiksngas, 2003*

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