Educating the Net Generation

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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 & kinesthetic
- 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
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

– Kaiser Family Foundation, 2003
Neuroplasticity

• The brain reorganizes itself throughout life: *neuroplasticity*

• Stimulation changes brain structures; the brain changes and organizes itself based on the inputs it receives

• Different developmental experiences impact how people think

• For example, language learned later in life goes into a different place in the brain than when language is learned as a child
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
Multi-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 proximity

– Lenhart, Simon & Graziano, 2001
Self-service

• People are doing more things for themselves online
  ? Online banking
  ? Online shopping
  ? Learning

• Informal learning
  ? Organic
  ? Contextualized
  ? Activity and experience-based
  ? Self-activated, under the learner’s control
  ? Open-ended engagement

Individualized

- 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; Rainie, 2005; Apple, 2005; Forrester, 2005
Internet 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

—Prensky, 2006
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

Windham, 2005
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
## Information fluency

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Define</td>
<td>Use IT tools to define information need</td>
</tr>
<tr>
<td>Access</td>
<td>Collect and retrieve information</td>
</tr>
<tr>
<td>Manage</td>
<td>Organize, classify</td>
</tr>
<tr>
<td>Integrate</td>
<td>Synthesize, summarize, compare</td>
</tr>
<tr>
<td>Evaluate</td>
<td>Determine quality, relevance, currency</td>
</tr>
<tr>
<td>Create</td>
<td>Adapt, design, invent information</td>
</tr>
<tr>
<td>Communicate</td>
<td>Communicate to specific audience</td>
</tr>
</tbody>
</table>

– Katz, et al, 2005
Connecting in virtual worlds

- Students to 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
Collaboration by design

? images courtesy of Jim Twetten, Iowa State University
Hallway vs. passageway

? images courtesy of Nancy Chism, IUPUI
Informal space

Deviled egg plate

Bolt ‘em down

? images courtesy of Nancy Chism, IUPUI
Engaging
Educational value from:

Challenging ideas & people

Active engagement with challenges

Supportive environment

Real-world activities

Social activity

Unbounded by time or place

–Terenzini, 2005
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
Real-world
National Ecological Observatory Network

- Remote & collaborative environments
- Widely distributed sensors
- Real-time data collection and analysis
Active

• 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
Visual
Simulations

http://workbench.concord.org/modeler/ss3.html
Formal vs informal
Expansion of the “classroom”

• Lecture hall
• Informal meeting areas
• Virtual classrooms
• Cyber café
• Multi-use spaces
• Project rooms

? images courtesy of Emory’s Cox Hall Computing Center
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
• Team projects
• Spontaneous interactions
• Mingle, share, make connections
Student work areas
Library or information commons

• Space for interaction and exchange
• Access to integrated resources and support (writing, IT, reference)
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
- Displays of artwork, artifacts, or research
Suggestions
#1: Remember the basics

- **Coverage model**: Learning is not just about covering content; it’s about developing competency
- **Scarcity**: Learning is not constrained by a scarcity model anymore
- **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
- **It's 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: Employ active learning strategies

- Make learning interactive and experiential
- Consider peer-to-peer approaches
- Utilize real-world applications
- Emphasize information literacy in courses
- Mix online and face-to-face
- Encourage reflection
- Create opportunities for synthesis
- Use informal learning opportunities
- Use non-text media
#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
#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

? Van Eck, 2006
saper vedere

? DaVinci