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<tr>
<td><strong>Author(s)</strong></td>
<td>Hedberg, J</td>
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<tr>
<td><strong>Citation</strong></td>
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Moving on from e-Learning: Searching for disruptive pedagogies

John G Hedberg
Macquarie University, Sydney

A premise...

• Online learning requires:
  – A rethinking of learning activities
  – Exploration of how interactions are managed and facilitated
  – Choice of the right tool for the pedagogical task
• and for widespread implementation
  – Disruptive innovations and pedagogies!

On academic shovelware...

• The extent to which a student gains the same pedagogical benefit from a printout of your Web resources as from the resources themselves is the extent to which you have done nothing of pedagogical value by using the Web. (Fraser, 1999)

What is happening now?

• ATN Universities survey of 20,000 students and 800 staff
  – provide a description of the use of e-learning;
  – determine the impact of the use of e-learning;
  – provide information to assist in the further development of programs to support the use of e-learning.


Limited models of learning

How teachers use e-learning

<table>
<thead>
<tr>
<th>Purpose</th>
<th>No.</th>
<th>%</th>
<th>Low %</th>
<th>High %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplement face-to-face</td>
<td>724</td>
<td>66.2</td>
<td>39.0</td>
<td>77.1</td>
</tr>
<tr>
<td>Partial alternative to face-to-face</td>
<td>100</td>
<td>9.4</td>
<td>2.4</td>
<td>13.1</td>
</tr>
<tr>
<td>Support block/intensive mode</td>
<td>64</td>
<td>6.0</td>
<td>3.7</td>
<td>12.2</td>
</tr>
<tr>
<td>Online unit supplemented with print/electronic materials</td>
<td>41</td>
<td>3.9</td>
<td>1.4</td>
<td>9.0</td>
</tr>
<tr>
<td>Support print-based distance teaching and learning</td>
<td>66</td>
<td>6.2</td>
<td>2.3</td>
<td>31.7</td>
</tr>
<tr>
<td>Teach fully online unit</td>
<td>67</td>
<td>6.3</td>
<td>2.2</td>
<td>12.2</td>
</tr>
<tr>
<td>Total</td>
<td>1130</td>
<td>100.0</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
How teachers use e-learning

Types of use:

1. **Information only**
   - (52.5% average, 25.6% low, 71.6% high)

2. **Information and unmoderated discussions**
   - (15.5% average, 9% low, 24.3% high)

3. **Information and moderated discussions**
   - (31.9% average, 15.4% low, 53.0% high)

---

What is the student experience?

- **Access**
  - Access content
  - Easy to access material

- **Personal benefits**
  - Saves students money
  - Complete tasks at convenient times
  - Juggle studies

- **Disadvantages**
  - Time commitment
  - Inadequate computer skills

- **Learning connections**
  - Discuss ideas
  - Stay connected to other students
  - Gauge progress on discussion board
  - See other students’ questions
  - Ask an uncomfortable question
  - Stay connected to teaching staff

---

Disruptive innovations

- A new technological innovation that displaces an existing dominant technology (Clayton Christensen, 2003)

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Disruptive innovations

- The decline of Aristotelian dialogue with the rise of textbooks.
- Ramus and his “method” in the 1500s


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Textbooks and representation of ideas
Dialogic literacy

- In every kind of knowledge-based, progressive organization, new knowledge and new directions are forged through dialogue. The dialogue in Knowledge Age organizations is not principally concerned with narrative, exposition, argument, and persuasion (the stand-bys of traditional rhetoric) but with solving problems and developing new ideas. (Bereiter & Scardamalia, 2005)

Sustaining innovations

- The obverse of disruptive innovations

Using what the technology affords!

- Technology has enabled visual and aural information display within software
- Prevailing educational theory is based more on situativity and cognition, and is problem-focused
- Technology supports constructivist philosophical orientation
- Increased recognition of social collaboration as part of learning
- Computer-Mediated Communication allows collaboration breaking the nexus of time and location
- Increasing modularisation of individual elements that are retrieved from databases and employed in varied contexts

Anatomy of e-Learning

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Interactive</th>
<th>Digital Asset</th>
<th>Support</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create</td>
<td>Diagram/Map</td>
<td>Drawing</td>
<td>FAQ</td>
<td>Self-test/Quiz</td>
</tr>
<tr>
<td>Analyze</td>
<td>Journal</td>
<td>Diagram/Map</td>
<td>Links to ideas</td>
<td>Journal</td>
</tr>
<tr>
<td>Synthesize</td>
<td>Tutorial</td>
<td>Map</td>
<td>Self checking</td>
<td>Progress</td>
</tr>
<tr>
<td>Analyze</td>
<td>Case study</td>
<td>Text</td>
<td>Collaboration with others</td>
<td>Hypothesis</td>
</tr>
<tr>
<td>Apply</td>
<td>Presentation</td>
<td>Simulation</td>
<td>Links to further resources</td>
<td>Classification</td>
</tr>
<tr>
<td>Understand</td>
<td>Game</td>
<td>Animation</td>
<td>Game</td>
<td>Plan</td>
</tr>
<tr>
<td>Recall</td>
<td>WebQuest</td>
<td>Video Clip</td>
<td>Simulation</td>
<td>Visual</td>
</tr>
<tr>
<td></td>
<td>Experiment</td>
<td>Audio Clip</td>
<td>Audio Clip</td>
<td>representation</td>
</tr>
<tr>
<td></td>
<td>Role playing</td>
<td>Musical score</td>
<td>Musical score</td>
<td>Game</td>
</tr>
<tr>
<td></td>
<td>Troubleshooting</td>
<td></td>
<td></td>
<td>Simulation</td>
</tr>
<tr>
<td></td>
<td>Diagnosis</td>
<td></td>
<td></td>
<td>Presentation</td>
</tr>
<tr>
<td></td>
<td>Composing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Searching for disruptive pedagogical innovations …
Example practices & tools

- Games as a learning strategy
- Learning objects
- Digital Repositories
- Creative uses of the technologies (building on multiple modalities and multi-literacies!)
- Social networks and the internet
- Communities of learners and communities of practice
- Open source software and new tools — blogs and wikis

Quest Atlantis — 3D MUVE

Learning Objects?

- “Any digital resource that can be reused to support learning.” (Wiley, 2002)
- But essentially digital resources (assets) and learning activities

Digital asset reusability

- Oral Physiology
  Learning outcome: Memorize names of teeth
  Activity: Experiment
  Assessment: Hypothesis
- Oral Anatomy
  Learning outcome: Identify names of teeth
  Activity: Identification
  Assessment: Labeled diagram
- Forensic Science
  Learning outcome: Identify different teeth shape
  Activity: Case study
  Assessment: Naming
- Anatomy
  Learning outcome: Evaluate the age of teeth
  Activity: Case study
  Assessment: Progress
- Anthropology
  Learning outcome: Identify different teeth shape
  Activity: Classification
  Assessment: Naming
- Restorative Dentistry
  Learning outcome: Describe methods to restore teeth
  Activity: Case study
  Assessment: Diagram

Reuse attributes

- Isolating digital assets from activities?
- Level of granularity?
- Particular teacher dependency?
- Design reusability?
- Identifying key attributes?
- Generic templates or shells?
- Transferability to other domains?

Content object options

- Information display
  - Matrix display eg choosing columns to match
  - Swapping representation mode eg data to graph
  - Hierarchy eg organisational chart
- Process eg flowchart
- Conceptual models
  - Presenting models of real world phenomena
  - Manipulating parameters to “see” relationships
- Contextual representation
  - Data linked to context
  - Collect evidence from context
Object for multi-modal representation

LAMS — reusable pedagogical objects

Moving learning management systems toward digital repositories …

LMSs vs Digital repositories

<table>
<thead>
<tr>
<th>Learning Management Systems (LMS)</th>
<th>Digital Libraries</th>
</tr>
</thead>
<tbody>
<tr>
<td>allow instructor to organize resources in a predetermined structure which prescribes a fixed learning strategy.</td>
<td>allow users to take control of their choice of resources, choosing ways of representing and using the resources, creating new resources and even developing their own learning strategies.</td>
</tr>
</tbody>
</table>

G-portal project

- digital repository that affords multimodal representations
- hosting digital assets, that students can use it to solve an authentic problem based on real world resources.
- allows students to explore the information, process the information, solve the problem posed and perhaps even form new attitudes and reflections of their role in the natural environment

The G-portal

- G-portal provides more than just a spatial context for accessing Geographic information
**The-G-portal**
- G-portal provides for conversion of information between representational forms

**PBL with Digital Libraries**
- PBL with Digital Libraries

**Social networks**
- Social networks

**Blogs & social assessment**
- Blogs can allow individual students to present their ideas and manage the process
- Students can critique each others work
- Students can review work within the same class but also across different years — vertical assessment

**Exploring other tools for collaborative learning**

**Activity types**
- **Rule focus**
  - Logical Problems
  - Story Problems
  - Rule using problems
- **Incident focus**
  - Scenarios
  - Decision making
  - Case study tasks
- **Strategy focus**
  - Troubleshooting
  - Diagnosis and solution problems
  - Strategic performance tasks
- **Role focus**
  - Dilemmas
  - Social dilemmas
Engagement Continuum

• To be engaged is to be enticed into interacting
• The more attentive the learner is to the task, the more complete the engagement
• Our goal is to “crank up” the engagement continuum

Engaged learning continuum

• Transfer
  - Transfer conventional instructional tools, strategies, communication, and delivery to a technology-enhanced learning environment
• Translate
  - Redefine and shift conventional instructional tools, strategies, communication, and delivery to the technology-enhanced learning environment
• Transcend
  - Go beyond conventional instructional tools, strategies, communication, and delivery to invent new paradigms for teaching and learning

Comparing continuums

<table>
<thead>
<tr>
<th>The Engagement Continuum</th>
<th>Engaged Learning Continuum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive Interest</td>
<td>Transfer</td>
</tr>
<tr>
<td>Dynamic Interaction</td>
<td>Translate</td>
</tr>
<tr>
<td>Flow</td>
<td>Transcend</td>
</tr>
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</table>

Engaged learning continuum

• Transfer
  - Transfer conventional instructional tools, strategies, communication, and delivery to a technology-enhanced learning environment

Searching for the disruptive!

<table>
<thead>
<tr>
<th>Teacher use</th>
<th>Student Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentational</td>
<td>Using PowerPoint in a lecture</td>
</tr>
<tr>
<td>Using PowerPoint to report back</td>
<td>Building a game using a web page</td>
</tr>
<tr>
<td>Generative</td>
<td>Using an outliner to generate a text structure</td>
</tr>
<tr>
<td>Representational (transduction)</td>
<td>Using Excel to convert numbers &amp; to show relationships</td>
</tr>
<tr>
<td>Write a script then use iMovie to create a narrative documentary</td>
<td></td>
</tr>
</tbody>
</table>

e-learning possibilities

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Passive Interest</th>
<th>Dynamic Interaction</th>
<th>Flow state</th>
</tr>
</thead>
<tbody>
<tr>
<td>e-Learning</td>
<td>Transfer</td>
<td>Translate</td>
<td>Transcend</td>
</tr>
<tr>
<td>Applications</td>
<td>Web resources</td>
<td>Interactions</td>
<td>Media databases</td>
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<td></td>
<td>PPT presentations</td>
<td>Notes</td>
<td>Presentations</td>
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<tr>
<td></td>
<td>e-Reserves</td>
<td>Interactive e-notes</td>
<td>WikiQuizzes</td>
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<tr>
<td></td>
<td>Webinar</td>
<td>Blogs</td>
<td>Dynamic knowledge collection</td>
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<tr>
<td>Learning outcomes</td>
<td>Visual literacy</td>
<td>Collaboration</td>
<td>Critical thinking</td>
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<td></td>
<td>Computer literacy</td>
<td>of</td>
<td>Alternative learning</td>
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<td></td>
<td>Comprehension</td>
<td>Cooperation</td>
<td>strategies</td>
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<td>Accessibility</td>
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<td>Information analysis</td>
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<td>Time management</td>
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<td>Problem-solving</td>
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<td>Community building</td>
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<td>Reflection</td>
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<td>Contextual learning</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Community building</td>
</tr>
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</table>

Next steps for disruptive pedagogies

• Recognize students’ time poverty
  - Use the affordances of blended learning and appropriate technologies to help them cope with this
• Increase integration of activities and learning strategies that support integration
• Use portfolios to indicate learning journey and illustrate a trajectory
• Facilitate student benchmarking of work (against other students) and support networks and relationships
• Rethinking learning activities such that technology is integral to understanding not an “add-on”
• Changing assessment to focus on using concepts in problem solving (rather than recall of information)
Contact

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References