Using technologies to disrupt traditional pedagogies

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A premise…

• Effective technology-based learning requires:
  – Rethinking learning activities
  – Exploring how interactions are facilitated and managed
  – Choosing the right technological tool for the pedagogical task
• and for widespread implementation
  – Disruptive innovations and pedagogies!

On academic shovelware…

• thus…
  The extent to which you have taken advantage of the expanded horizons for communicating ideas with a new medium is the extent to which the material cannot then be reproduced in the older medium.

But 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.

What is the student experience?

- Access
  - Access content
  - Easy to access material
- Personal benefits
  - Saves students money
  - Completes tasks at convenient times
  - Enables juggling work/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
- Benchmarking against others
- Ask an uncomfortable question
- Connected to instructors

Disruptive innovations

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

Disruptive technology

- Low quality use
- High quality use

Time

Low quality use

High quality use

Performance

Textbooks and representation of ideas

Disruptive innovations

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


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
Sustaining innovations

Teachers choose…

• Sustaining technologies — such as the interactive whiteboard
• Technologies that support control and familiar pedagogies

but even then students rule!

Students choose…

• Disruptive technologies
  – SMS
  – Instant messaging
  – Blogs
  – Sound, text and video communications
  – Virtual communities
• and strategies which are expedient and collaborative as needed

Roles for technology in learning

• Supporting students’ information age skills
  – Establishing reliability and authority of resources
  – Working in multiple modalities
  – Competence in working with multiple tools and contexts — multiliteracies
  – Focus not just on selecting, cutting and pasting but creativity and construction
  – Working collaboratively across virtual contexts

ICT in the next 5 years

• Teachers see ICT as tools for understanding the world
• Students in an IT literate society communicate in multiple modes of representation
• Low student-to-computer ratio
• High bandwidth access in the classroom and from home
• Specialized tools and projects for all subjects
• New learner mobile tools — Origami project

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Contexts for effective technology use

- Classrooms are about groups led by teachers
- In the classroom, the technologies that are used are more likely to be those that support existing teacher practices
- Thus, we need to modify the learning tasks to fit the matches
- We can be more efficient if we recognise better matches between technology, learning task and context

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 the “open commons”

Quest Atlantis —3D MUVE

Games for learning

1. Empathy for a complex system
2. Simulation of experience and preparation for action
3. Distributed intelligence via the creation of smart tools
4. Focus on performance before competence
5. “Cross-functional teams” with goals
6. Situated meaning compared with abstract understanding
7. Open-endedness of problem or challenge
8. Include assessment of performance

Learning Objects?

- “Any digital resource that can be reused to support learning.” (Wiley, 2002)
- But essentially digital resources (assets) and learning activities
Focus on learning activity design using low cost, fast tools …

Turning learning management systems on their head …

LAMS — reusable pedagogical objects

http://www.lamsfoundation.org/

LMSs vs Digital repositories

- allow the instructor to organize resources in a predetermined structure which prescribes a fixed learning strategy.
- 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.
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
http://www.dlese.org/dds/index.jsp

Community plumbing — a disruptive pedagogy?
• Extant data sources with new adding meanings
  - Mashup technologies — creating new data linkages
  - Weatherbank (Google earth, live cams, local data)
  - Amazting — Alternative data retrieval and representation
  - citeUlike
  - YouTube
• And non-meanings
  - Uncyclopedia

Exploring other tools for collaborative learning
Establishing social networks

Creating shared resources

WIKIs

- Free!
- Accessible
- Small group oriented
- Extensible

Early collaborative problem solving

- LEGO robots
  Kindergarten students solving problems and constructing narratives

Exploring other tools for group construction

Virtual field trips as disruptive pedagogy

Focus on science processes not facts

- Collaboration between NASA, ACA, and ICT Innovations Centre
- Overview of the site and resources
- Focus on data for scientific exploration and inquiry processes

Virtual field trip — WIKI

- extend resources and enable collaboration
- ensure everyone can be a scientist
- create a resource that exhibits currency and relevance
- students can contribute to the shared resources and their contributions acknowledged

http://pilbara.mq.edu.au/wiki/Main_Page
Exploring tools for personal reflection and critique

Blogs in learning

- Promotes equity
  - allows the emergence of a community of learners not based on who can talk loudest.
- Expands ways of teaching content
  - provides rapid way of presenting new internet links in a personal diarised form... allows construction of personal post-lecture essays and feedback on an instant website.
- Informal and outside the institutional framework:
  - they can become the focus of negative criticisms of teaching and institutions.
- But can a free-flowing, non-institutional media, be institutionalised?
  - are enforced blogs actually blogs?

Blogging as a disruptive pedagogy

- Teaching first year literature — writing poetry
- Requirement to present work for an audience
- Rest of class gets to critique ideas
- Author gets to choose what to present in the blog
- Somewhere between a conversation and an essay

Blogging as a disruptive pedagogy — 2

- Later year students can undertake poetry and literature writing not confined to a class group
- Learning Communities
  - Poetry Community; Debating; Review Community (Books, Films, Plays); Short Story Community
- Audience may be more than the one class
  - Earlier years may have later years commenting on their work
  - General public may also show and interest and also contribute making learning public!

Student response

- Blogging has created a great launching pad for my creative writing. Because of its ease and accessibility my writing does not end up in some forgotten scrapbook, its amazing to think that peers, tutors and even the world have access to my work!
  — Shaun

Activity types

<table>
<thead>
<tr>
<th>Pedagogical focus</th>
<th>Activity/problem typology (Jonassen)</th>
<th>Learning outcome intended</th>
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<tbody>
<tr>
<td>Rule focus</td>
<td>Logical Problems</td>
<td>Practice strategies</td>
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<td>Incident focus</td>
<td>Scenarios</td>
<td>Linking ideas</td>
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<td>Strategy focus</td>
<td>Troubleshooting</td>
<td>Generating new strategies</td>
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<td>Role focus</td>
<td>Dilemmas</td>
<td>Multiple perspectives</td>
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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.

Comparing continuums

<table>
<thead>
<tr>
<th>Engagement Continuum</th>
<th>Engaged Learning Continuum</th>
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<tbody>
<tr>
<td>Passive Interest</td>
<td>Transfer</td>
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<tr>
<td>Dynamic Interaction</td>
<td>Translate</td>
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<tr>
<td>Flow</td>
<td>Transcend</td>
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Searching for the disruptive!

<table>
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<tr>
<th>Presentational</th>
<th>Teacher use</th>
<th>Student Use</th>
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<tr>
<td>Generative</td>
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<tr>
<td>Representational (transduction)</td>
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<th>e-learning possibilities</th>
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Matching technology and pedagogy

- Thinking cannot be separated from doing.
- Thinking and solving problems are uniquely affected by context.
- Cognitive and physical activity use artefacts that are to hand as tools.
- Contexts usually contain other people.
  - Social nature of learning
  - “The map is not the territory”
- Understanding is interpretation.

“... our assumption that students are brain-dead leads to pedagogies that deaden their brains. When we teach by dripping information into their passive forms, students who arrive in the classroom alive and well become passive consumers of knowledge and are dead on departure when they graduate... we rarely consider that students may die in the classroom because we use methods that assume they are dead.”

Parker Palmer, The Courage to Teach
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