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Thematic Network of Geography Teaching and Training in Higher Education

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Vision for ICT?

- Using ICT to develop pupils as learners
- Improving ICT:pupil ratios
- Using ICT to develop pupils as learners
- Anywhere anytime learning
- Transformed learning, pedagogy and curriculum
- Placing ICT at the centre of pupils’ learning
- Developing flexibility as learners
- Developing ICT skills
- Developing creativity
- Having a whiteboard in every class
- Developing independence and/or collaboration
- Developing creativity
- Developing ICT skills
- Improving ICT:pupil ratios
- Using ICT to develop pupils as learners

Vision for ICT?
Technology pros and cons

Access to wealth of resources

Information overload, quality issues

New forms of dialogue

Literacy skills issues

New forms of community

Learner identity and confusion

Speed of access, immediacy

Lack of permanency, surface

Virtual representations

Lack of reality, real is fake
Learning by doing

Key characteristics of learning

Through experience

Through dialogue

In the company of others

Socially situated

Through reflection

Cognition

Social learning

Communities of practice

Constructivism

Papart

Paiget

Kolb

Dewey

Jarvis

Lave

Wenger

Laurillard

Vygotsky

Mercer

Kolb

Dewey

Paiget

Constructivism

Cognition

Social learning

Communities of practice
Reality check... repackaging the box

- Passive learning
- Pedagogical bias
- Mismatch of resources to tasks

- Learner and tutor confusion!
  - Identity and roles
  - Plethora of resources and tools
  - Lack of clarity of what is important and when
The missing link

Plethora of tools and resources
*Enormous potential but underused*

Wealth of knowledge about learning
*Didactic/behaviourists models predominate*

Gap between the *potential* of the technologies
(confusion over how they can be used)
and
*application* of good pedagogical principles
(confusion over which models to use)
Creating a Knowledge Ecology

Learning Culture
- Responsibility for future

Knowledge Management
- Sustainable change

Learning Platform
- Student Success

Learning Community
- Cooperation

Continuous Improvement
- Future Growth

Information and Communication Technology
- Change Agent
ePedagogy: Principles & Practice

Professor Lachlan M. MacKinnon,
Head of School of Computing & Creative Technologies,
University of Abertay Dundee
Overview

• Why ePedagogy?
  • Changing face of classroom teaching
  • Personalisation of learning
  • Social Constructivism
  • Formative assessment as a path to formal examination
  • The big picture – lifelong and workplace learning
• Conclusions and references
Why ePedagogy?

Chinese Proverb:  Tell me and I will forget,

Show me and I may remember,

Involve me and I will understand!

• Existing pedagogy based on human interaction

• Learning environments introduce new opportunities:
  – Not shovelware
  – Not course administration
  – Virtual communities, human computer interaction

• Need formal underpinning for future development
Changing face of classroom teaching

• Search for resources now a task of filtering, not of finding.

• Potential for external influence

• Ever-growing curriculum, need to cover more material, so: more information-giving => less added value

• Administrative burden => more pupil-led activity
Personalisation of learning

- Potential for multi-modal information representation to meet personal learning needs
- Material structured around assessment points as learning objects, rather than instructivist linear path, gives pupils more freedom to explore
- Availability of technology and resources supports “whenever, wherever” learning
- Can this be accommodated within a high school learning situation?
Social Constructivism

Based on the work of Piaget and others, learning embedded in social experience

- Constructivism is wrongly often seen as ill-structured, but the basic concepts of “discovery learning” require a clear and well-structured learning model

- Learning is a social activity:
  - Learning from the actions of others (vicarious)
  - Learning from the experiences of others (oral tradition)
  - Learning from personal interaction (active learning)
  - So it must be embedded in social context!!
Social Constructivism

- Role of the teacher is in “scaffolding” and “fading”
- Role of the pupil is in constructing their own understanding through interaction with peers, tutors, virtual communities and learning objects
- Role of the technology is to provide the mechanisms for interaction, the learning objects constructed and represented in different formats, and the report and feedback mechanisms.

We need to encourage pupils and teachers to see the technology as an enabling tool in a social and learning context.
Formative assessment as a path to formal examination

Fundamental to the concept of learning objects, provides:

- Motivation: pupils get regular feedback on performance
- Engagement: use of dynamic media engages, use of static media for retention
- Structure: allows the freedom to construct understanding and then test it out as part of teaching plan

• Will be ignored if not validated by teacher!!!
The big picture – lifelong and workplace learning

- Schools need to prepare pupils for a lifetime of learning, the world we now live in demands it.
- eLearning is one of the most important areas of research and development, now on a global basis:
  - In Europe, the K2 project
  - In USA, the MIT OpenCourseware project
  - International standards, IEEE LOM, SCORM
  - In Schools, Edugames, ScholarCards, BBC Bitesize and many, many more, and, of course, SCHOLAR
Conclusions

- The availability of information and resources is now greater than it has ever been, and as a result the role of the teacher is changing.
- Pupils need to learn how to explore these resources and construct their own understanding, guided rather than taught, but structure is vitally important.
- Tools like SCHOLAR offer a reliable and consistent standard of leaning objects, linked with formative assessment, to aid this.
- Pupil-led study MUST be planned
Conclusions

• Planning and use of formative assessment will support achievement in content-based examination.

• Preparation of pupils for the world of work or for further study should address the key concepts of lifelong learning and continuous development.

• The ultimate goal of the teaching process should be “metacognition”, the pupils learn how to learn, specifically understanding their own learning process.
References

- Boyle, T, “Towards a theoretical base for educational multimedia design” Journal of Interactive media in Education Vol 2, July 2002
- Rovai, A,P “Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks.” The Internet and Higher education Vol 5, 2002, 319-332
- Hamid, A, A “E-Learning Is it the e or the learning that matters?” The Internet and Higher education Vol 4, 2001, 311-316
Constructivist social /cultural/ situational

Vygotsky    Wenger    Laurillard
What is e-Learning?

- There are many definitions, DfES (2003) suggest

“If someone is learning in a way that uses information and communication technologies, they are using e-learning.”

(“Towards a unified e-learning strategy”)

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**If someone is learning in a way that uses information and communication technologies, they are using e-learning.”

(“Towards a unified e-learning strategy”)**
Continuum of e-Learning

Basic ICT usage  E-enhanced  E-focused  E-intensive

Basic ICT usage
- Eg PowerPoint presentations

E-enhanced
- Access to online resources. Use of Bb for announcements, lecture notes, student communication

E-focused
- Discussion boards, online assessment tests, interactive learning materials

E-intensive
- Whole modules/awards delivered and moderated online

E-learning at Glamorgan

- All Glamorgan Schools
- 1000 modules across Awards
- Computing, some Business, Care Sciences
- Business (ECW), Care Sciences and Computing in development
Positive and Negative Students’ Perceptions of On-line Learning

- Top five negative aspects of on-line learning
  - Technical problems (29%)
  - Isolation (20%)
  - Lack of support (16%)
  - Lack of student interaction (14%)
  - Absence of face-to-face opportunities (14%)

- Top five positive aspects of on-line learning
  - Flexibility (89%)
  - Opportunities to interact with peers (17%)
  - Access to wide resources (11%)
  - Effective mode of learning (7%)
  - Opportunities to interact with tutors (6%)
Key Benefits

✓ Widening access
✓ Aiding equal opportunities
✓ Assisting those with specific needs
✓ Improving quality of delivery
✓ Immediate access to information
✓ Global collaboration
✓ Simulations and games
✓ Computer mediated conferences
✓ Learning Communities
Towards Digital Fluency – Allison Littlejohn

A presentation to the
Dundee University eLearning Summit
By

Allison Littlejohn

Professor of Learning Technology
Faculty of Education and Social Work
University of Dundee
Digital natives

- Virtual
- Formal
- Informal
- Face-to-face
Digital natives

Focus on *learning* not teaching

- **Instructivist:** focus on teaching
- **Dialogic:** emphasises discussion
- **Constructivist:** based on knowledge construction

Mayes and de Frietas (2004) 
JISC ePedagogy Review
Dialogic: learning through discussion and feedback

During a teaching session, students are asked to answer a MC question.

Students justify their answers to their peers.

Discussion of conflicting ideas leads to learning.

Littlejohn (2003) ASCILITE
Constructivist: learning by constructing new ideas

1. Resources sourced by students are uploaded to a shared workspace

2. These can be shared across project teams

3. Resources combined to construct new designs

4. Concept generation documented as a map

Nicol, Littlejohn, Grierson (2005) BJET
Constructivist: learning by constructing new ideas
Towards digital fluency

- e-Tools
- learning literacies
- e-Learning
- e-Resources
Towards digital fluency

- e-Tools
- e-Learning
- e-Resources
Towards digital fluency

- e-Tools
- e-Learning
- e-Resources
Institute for Learning Technology

Mission
A focal point for international, eLearning research at the University and beyond

Aims
- interdisciplinary
- across all sectors
- international in focus

e-Tools
e-Learning
e-Resources
Institute for Learning Technology

Short term strategy
1. Establish critical mass
2. Develop partnerships
3. Link with University support structures

Medium term strategy
1. Ensure long-term sustainability
2. Establish cross-sector research
3. Develop a cross-faculty presence and
4. Nurture international reputation
5. Impact on practice
* Multiple perspectives and representations of concepts and content are presented and encouraged.

* The student plays a role in mediating and controlling learning.

* Teachers serve in the roles of guides, monitors, coaches, tutors and facilitators.

* Goals and objectives are driven by the student or in the negotiation with the teacher or system.

* Activists, opportunities, tools and environments are provided to encourage metacognition, self-analysis, regulation, reflection and awareness.
* The learner’s previous knowledge constructions, beliefs and attitudes are considered in the knowledge construction process.

* Learning situations, environments, skills, content and tasks are relevant, realistic, authentic, and represent the natural complexities of the “real world”.

* Primary sources data are used in order to ensure authenticity and real-world complexity.

* This construction takes place in individual contexts and through social negotiation, collaboration, and experience.

* Knowledge construction and reproduction is emphasized.
Problem-solving, higher-order thinking skills and deep understanding are emphasized.

Errors provide the opportunity for insight into students’ previous knowledge constructions.

Knowledge complexity is reflected in an emphasis on conceptual interrelatedness and interdisciplinary learning.

Exploration is a favored approach in order to encourage students to seek knowledge independently and to manage the pursuit of their goals.

Learners are provided with the opportunity for apprenticeship learning in which there is an increasing complexity of tasks, skills, and knowledge acquisition.
Exploration is a favored approach in order to encourage students to seek knowledge independently and to manage the pursuit to goals.
• GUIDES
• MONITORS
• COACHES
• TUTORS
• FACILITATORS
Constructivist Learning
Summary

CONSTRUCTIVIST

INDIVIDUAL LEARNING
- Case Study
- Self-Instructional
- Materials
- Questions and answers

Teaching & Learning

TRADITIONAL INSTRUCTIONAL
FACILITATED LEARNING
Professor/Tutor/Student
- Lectures
- Presentations
- Textbooks

SOCIAL CONSTRUCTIVIST
COLLABORATIVE LEARNING
Professor/Tutor/Student
- Case Study
- Problem Based Learning
- Discussion Forum
- Teamwork

Main evolution
Other way of evolution
References


• GUIDES
• MONITORS
• COACHES
• TUTORS
• FACILITATORS
A teacher leads and directs. They exhibit and explain to the students what they need to know.
When a Teacher monitors they watch and keep track of what the students are doing.
A coach instructs and directs students.
A tutor teaches and guides usually individually and in a special subject.
A teacher helps to make the student have a better understanding and to learn easier.
Effective learning

Ineffective learning

Accessible resources

Inaccessible resources

How interactive is the resource?

Highly interactive or multisensory

Text and images with low level interactivity

Text and images online

How engaging is the learning task?

Passive tasks (e.g., "make notes on...")

Active tasks (e.g., "create a presentation on...")

Collins - McNaught Learning Engagement Model (July 2002)
Shades of grey: Domains of e-learning

- Most need
- Not easy
- Not interesting
- Not important
- Most advice
- Distant
- Passive
- Active
- Significant

Blended
What I want my students to understand

Understanding the atmosphere
- Temperature changes with height
- Ozone layer influences temperature change
- Three atmospheric layers, each with different properties

Understanding hair
- The structure of hair
- Hair types
- The growth of hair and the hair cycle
<table>
<thead>
<tr>
<th>Sample 1</th>
<th>Observation/recall</th>
<th>compare/evaluate/synthesise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding the atmosphere</td>
<td>Word drop down</td>
<td>Powerpoint animation</td>
</tr>
</tbody>
</table>

| Sample 2                              |                      |                             |                             |
| Understanding hair                    | Word drop down       | Excel simulation            | Powerpoint animation        | Word drag & drop              |
Drag and drop resources.

Software fix: use mouse keys for motor impaired.
Use windows magnifier for visually impaired.

Hardware fix: use mouse emulator for motor impaired. Tactile pad for blind?

Pedagogical fix: games, simple models or tactile materials (fuzzy felt / lego) for blind.
Sample alternative: offline drag and drop:

9 volunteers

Aberdeen
Cardiff
Colchester
Dundee
Exeter
Glasgow
Manchester
Pembroke
Swansea
Software fix: use mouse keys (Alt+Arrow) for motor impaired. Use windows magnifier for visually impaired.

Hardware fix: text reader (some struggle with forms)

Pedagogical fix: blind students work in pairs with sighted peers.
Software fix: use notes field for blind users.

Hardware fix: Magnifier software for visually impaired.

Pedagogical fix: audio tape or practical simulation with plasticine (ozone formation) or pipe-cleaners and rolled up paper (split ends).
Software fix: Change cell or text colour to suit colour blind users or dyslexics. Make slider bar fatter for motor impaired users. Use zoom tool for visually impaired.

Hardware fix: Mouse emulator for slider bar

Pedagogical fix: blind students could work with tactile graph (eg fuzzy felt string) for atmosphere or tactile models for the hair growth.
Accessible for whom?

Facets of accessibility:

Physiological  I can’t see it
Psychological  I can’t do it
Learning style  It would make more sense in pictures
Perceptual  They look the same to me
Cognitive  I can’t get my head round it
Linguistic  What does that actually mean?
Types of “Fixes”

**Software fixes** – using keyboard shortcuts for motor impaired or visually impaired students; using ALT tags and descriptive captions in web pages; using notes fields in Powerpoint. May involve third party software – screen magnifiers, screen readers.

**Hardware fixes** – using mouse emulators or tactile pads, minidisc recorders, daisybook readers.

**Pedagogical fixes** – using other teaching methods (usually non-ILT) to deliver equivalent learning experiences. The equivalent experience of an interactive drag and drop on screen in NOT a screen-readable linear text. It is more likely to be a practical experience or tactile version using fuzzy felt or braille cards.
Hardware

- Tracker balls
- Concept keyboard
- Tactile tablet
- Braille printer
- Mouse emulator

Software

- Simple navigation
- Speech to text / text to speech
- Alt tags and transcripts
- Font or colour adjustments
- Alt tags and transcripts
- Font or colour adjustments

Pedagogy

- 1:1 learner support
- Tactile alternatives
- Work in a pairs/groups
- Videos/animation
- Simple navigation
- Speech to text / text to speech
- Alt tags and transcripts
- Font or colour adjustments
Staff training implications

- Competence

- Time since training

- Regular use of new skills
- No use of new skills
Who gets what training?

- Teacher – specialist college/unit
- Teacher – mainstream FE
- Learning support assistant
- Web developer
- Librarian

The diagram illustrates the distribution of training across different roles, with categories for hardware, software, and pedagogy.
Accessibility – myth or magic?

Myths –

• You can’t use “inaccessible” resources online

   *Not true..... Resource can be highly accessible to one student but inaccessible to another. The key is that no student should be unable to access understanding or learning experiences. Good design practice can make materials more widely accessible*

• You have to have multiple versions of everything you do in case you ever come across a disability

   *Not true.... but you need to know how you will adapt to meet any particular disability.*

• You should design resources so they are accessible to all

   *Nothing is accessible to all (except telepathy!)*