The Open University

Hybrid Digital/Material/ Networked Learning – scruffy mongrel or sleek new breed?

Practices and implications of blending physical and digital resources for learning in HE

2nd eSTEeM Annual Conference, 26th March 2013

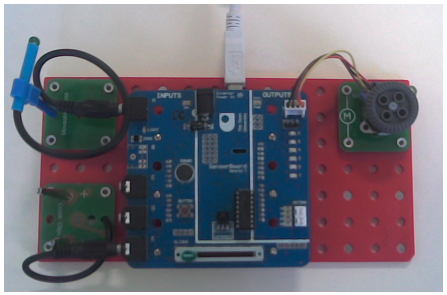
The Open University

Hybrid digital/material/networked learning

- Technological change is leading to the blurring of boundaries between the digital and material world e.g. the internet of things
- The emergence of networked learning resources that go beyond the purely digital
- These developments may have potential for radical innovation in education
  - We know a lot about student learning in a laboratory setting and in fieldwork.
  - We know a lot about students' learning online.
  - What happens when we put the two types of learning together?
- Absent from the literature on networked learning

Examples of hybrid digital material networked learning

- Open University: the PIRATE project telescope, the SenseBoard in TU100 My Digital Life, Biological Oxygen Demand experiments
- 3-D printing, RFID, weather station, Raspberry PI already used in some schools
- There is a growing number of devices in use in homes, business
- What are the implications for the practice of education?



The ‘Mongrel’ Project

- The ‘Mongrel project’ - came out of the Infinite Bandwidth Zero Latency (IBZL) eSTEeM project
- Investigating the experiences and implications of using such digital/material/networked combinations (or ‘hybrids’) for science and technology learning.
- Question: Is this hybrid a sleek new breed or learning, or a scruffy mongrel of mixed parentage?

What we will do

- Carry out a ‘state of the art’ review to establish the key themes, opportunities and obstacles that are emerging from these experiences.
  - The first stage of the research involves a systematic literature review.
  - Second stage - four mini case studies
  - Third stage – would like to invite educators from other institutions to share their experiences

What we hope to discover

- The project is exploratory and it is probably too early to expect to identify ‘best practice’ but we hope to:
  - identify emerging issues and opportunities in the literature
  - demonstrate issues through a series of case studies
  - produce an initial framework for thinking about them
- With a view to informing STEM education in the OU.

Systematic(ish) literature review

- **Documented** approach to reviewing literature
  - Define & refine research search terms ("**What are we going to look for?**")
  - Identify databases and search engines ("**Where are we going to look?**") and query using the search terms.
  - Create and apply the **inclusion & exclusion** criteria filters
  - **Verify** the sub-selection is representative

(Hidalgo et al, 2011)

Sampling items for detailed review

- Coding
  - Discipline (HEA JACS)
  - Type/focus
    - Technology/pedagogy
    - Descriptive/Evaluative
    - Review
- Cross coder reliability checking

Where are we looking?

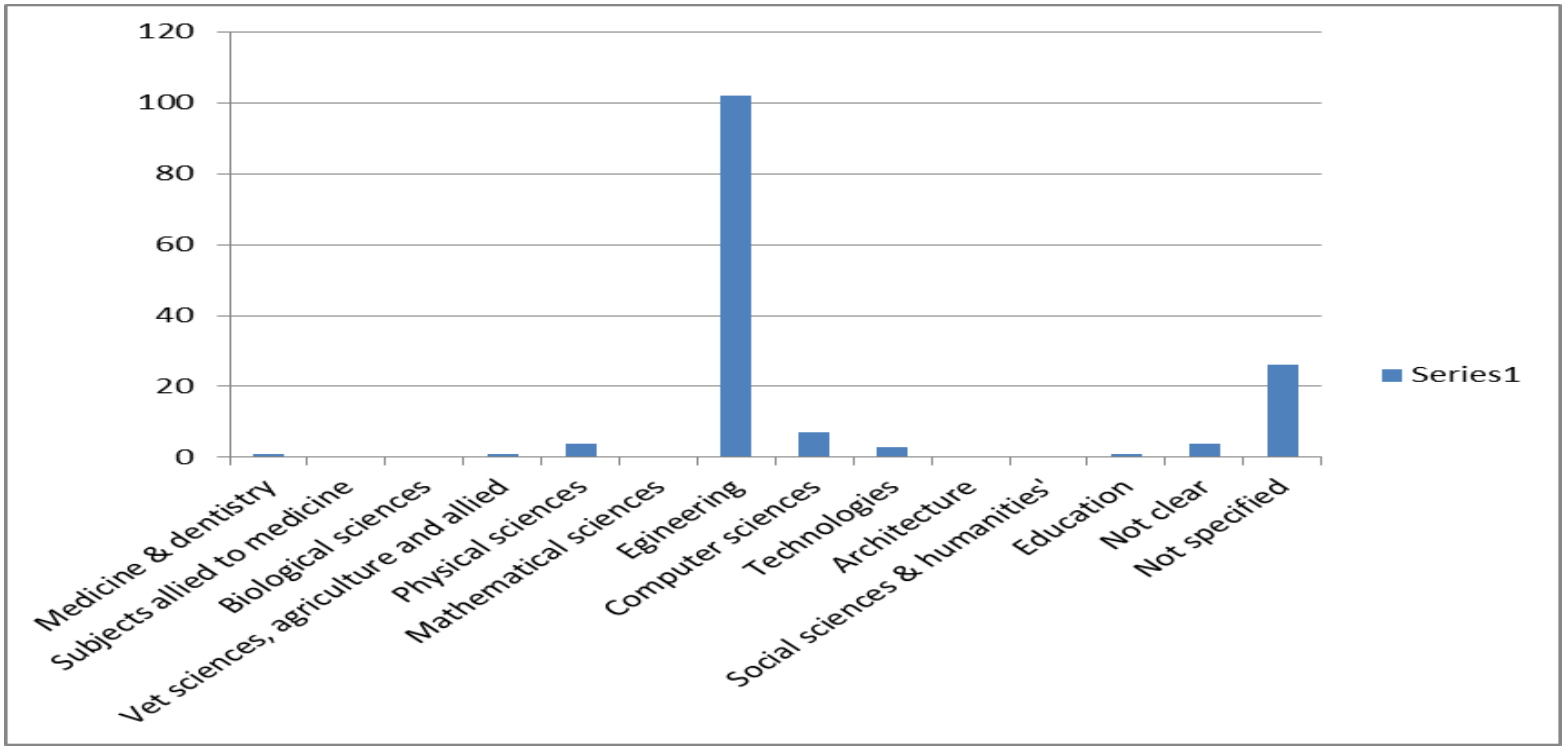
- Web of Science
- ERIC
- ERA
- ORO
- And some grey literature

What are we looking for?

- Learning/education +
  - Internet of things
  - Remote laboratories
  - Ubiquitous computing
  - Instrumentalised environments
- ….

What have we found so far?

- 265 journal & conference articles
  - Coded c. 140 for sampling



Here's where you can help…

Audience participation time ….

This is our definition of a hybrid digital material networked learning:

– ‘Hybrid’ learning refers to objects and practices which combine digital and material elements (Knutsen et al, 2011) in ways which may be of value in the context of networked learning.

1. Questions:
   a) Are there any examples from your own practice or discipline?
   b) What language or terms do you use to describe these ‘hybrids’?
2. Where could you use a ‘hybrid’ in your teaching?

Knutsen, J., Martinussen, E. S., Arnall, T., & Morrison, A. (2011). Investigating an “Internet of Hybrid Products”: Assembling Products, Interactions, Services, and Networks through Design. Computers and Composition, 28(3), 195–204