New Evidence on Interdisciplinarity

HOW CAN WE TEACH IT?

Dave Morrison
Plymouth University
The Issues

- Conceptual Debate
  - Breadth or depth or both?
  - Individual or collaborative or both?

- Evidential Sources
  - Circular, self-identified, and testimonial cases
  - Inconsistent presumptions of disciplinarity or boundaries
  - Little comparative evidence of success or quality of outcomes
New Approach/New Perspective

What interdisciplinarity isn’t may be more important than what it is

Triangulation needed with other types of evidence

- Psychology of:
  - Expertise
  - Categorisation
  - Knowledge Transfer
  - Collaborative Cognition
Experts/Expertise...

- Expertise has value beyond ‘more knowledge’ (Chi 2006)
  - Demonstrably better cognitive ability within subject
  - Academic standards make this quality locatable externally

- Experts consistently unable to communicate expert knowledge (Ericsson 2006)
Knowledge Transfer

- **Breadth instead of depth** a common approach (Repko 2008; Dane 2010)
  - Transfers only surface ideas (Chi & VanLehn 2012)
  - Slow, many false connections, do not *understand* connections
  - Undermines cognitive gains of expertise in each subject

- **Experts are better at transfer**
  - Transfer via deep knowledge connections
  - Faster, more accurate, and can explain/expand ideas
  - Requires *explicit* and *on-going* instruction as expertise is developed

**ID is not** ‘adequacy’ or breadth instead of depth
Breadth is essential, loss of expertise is not
Categorisation

- Experts *less* able to define or agree on boundaries of discipline than non-experts (Medin et al. 1997; Becher & Trowler 2001; Hofer 2004)
  - Nuanced personal epistemologies/experience
  - Non-experts see positivistic and problem-specific boundaries

- Always an optimal, most mutually understood, category (Medin et al. 1997)
  - = ‘Discipline’ in academia
Collaboration

- **Transactive Memory Systems (TMS)** (Lewis and Herndon 2011)
  - Not shared knowledge, shared knowledge of who has what knowledge

- **TMS shows comparatively superior performance** (Zhang et al. 2007)
  - Faster, more reliable, and deeper solutions
  - More creative and nuanced solutions
  - Additive skillsets and expertise
  - Consistently updated expertise

**ID is not both individual and collaborative**

Pedagogies and outcomes are not similar

**ID is not individual**

Collaboration shows the results ID rhetoric claims
(and we already have the term ‘polymath’)

Disciplines: Describe, not Define

- Boundaries, purpose, and properties differ based on expertise and perspective of the observer.

- Can overlap with other disciplines *without* challenging disciplinarity of either.
  - ‘Fish-scales’ (Campbell 2009)
  - Using traits ‘of other disciplines’ is a normal disciplinary activity

- A structure for *core* expertise to be developed, located, and through which *stewardship* of standards is maintained.
  - Phonebook of expertise

**ID is *not* exceeding/crossing disciplinary boundaries**
Interdisciplinarity is:

1. A set of basic skills for working collaboratively across different personal expertises.

2. The act of doing such work
Pedagogies of Interdisciplinarity

- Subject expertise must remain core

- Learners must collaborate across subjects

- Explicitly embed skills of (at least...):
  - Knowledge transfer
  - Collaboration skills
  - Goal/task interdependence
  - Translation of own expertise to others

- These are the Learning Outcomes
  - Demonstration of skills, not knowledge

- Must begin at the beginning and build to the end
Literature and practice focuses on:

- Teaching students to translate external expertise inward
- **Puts responsibility for expert analysis on non-experts**
- Fundamental source of surface/failed interdisciplinarity

A different approach:

- Teaching students to translate *own* expertise outward
- **Responsibility for expertise remains with experts**
References


