Interdisciplinary learning and teaching provision: findings from a UK study

Prof Catherine Lyall
University of Edinburgh

Sheffield 7/4/16

Outline

1. Background and remit
2. What we learned from the literature
3. What we learned from data gathering
4. What we reported back on
5. Some prompts for discussion

Acknowledgements

Project team: Laura Meagher

Ann Kettle

Justyna Bandola

Advisers: Sian Bayne

Jens Dolin

Paul Hibbert

Katrine Lindvig

Morven Shearer

Sponsors: Higher Education Academy

Institute for Academic Development

A personal interdisciplinary journey

'An essential guide for researchers and research managers in how to do interdisciplinary projects'

Philip Lowe, Director of the UK Research Councils'
Rural Economy and Land-Use Programme

Interdisciplinary Research Journeys

Practical strategies for capturing creativity

Catherine Lyall, Ann Bruce,
Joyce Tait, Laura Meagher

Contract with HEA

- Provide a literature review of interdisciplinary provision (national and international perspective)

- Map scale and type of current interdisciplinary provision; classify different forms; identify UK plans for future – expansion, steady state or reduction

Higher Education Academy | TRANSFORMING TEACHING INSPIRING LEARNING

Interdisciplinary provision in higher education

Current and future challenges

Catherine Lyall, Laura Meagher, Justyna Bandola and Ann Kettle

In partnership with the University of Edinburgh

HEA's key research questions

1. What are the **pedagogies** that are likely to provide distinctive opportunities for interdisciplinarity?

2. What are the key elements of **effective practice** that are identified within the literature?

3. What are the **principles supporting interdisciplinarity** in undergraduate and postgraduate taught education?

Deliverables

1. a **review of the literature** about the effectiveness of interdisciplinary provision and the pedagogies which provide distinctive opportunities for interdisciplinarity

2. the **results of a survey** indicating the scale of interdisciplinary provision and a **typology** of different approaches to interdisciplinarity

3. **case studies** of effective approaches to promoting, evaluating and sustaining interdisciplinarity

Methodology

❖ literature review

 pedagogy related to interdisciplinarity, including international good practice

❖ document analysis

 sample of ID (sustainability; international development; social dimensions of health; games design; and culture); UCAS search for related UG and PGT courses; sample of 150 contacts

❖ on-line surveys (1) directors of these ID programmes (2) Pro-VC overview (3) online JISC communities

 scale &type of current ID provision; future plans; opportunity for some 'snowball' sampling

❖ semi-structured interviews

 17 (two-thirds programme directors) from different types of institutions

❖ case studies

 selected purposively to illustrate a range of types of ID offerings at different sorts of institutions and the processes of programme development

❖ international dimension and 'critical friend'

 University of Copenhagen study of pedagogical issues from ID 'experiments' at UC

❖ integrative analysis and reporting

Themes identified in the literature

1. Case studies presenting implementation of interdisciplinary teaching projects
2. Teaching strategies aimed at specific fields (e.g. medical sciences, law and engineering)
3. Outcomes and challenges of interdisciplinary education
4. Broader context of interdisciplinarity e.g. sociocultural

Drivers identified in literature

1. Individual-level – personal connections between academics
2. University-level – such as university strategy, university regulation regarding specific courses
3. External drivers
   - requirements of professional bodies
   - availability of funding e.g. US NSF IGERT
   - international initiatives e.g. Education for Sustainable Development by UNESCO
4. Trends in education and workforce
5. Nature or evolution of the discipline, e.g. neuroscience, synthetic biology, law, environmental studies

Arguments for ID teaching

1. Educational benefits – the ability to critically assess one's stand by viewing it from another discipline's point of view
2. The reality of modern workplace requiring multi-professional team work
3. The global challenges (global warming, pandemics, international crime, migration, etc.) requiring critical thinking and holistic approaches

Woods, 2006

Scale and locus of provision

- Interdisciplinary programmes and courses most commonly (but not exclusively) at PGT level or senior UG years

- Scale of ID provision quite broad:
  - single workshops and courses
  - UG degree programmes
  - Master's and PhD programmes

Surveys

- Two on-line surveys
  - 'ProVCs', invited by HEA
  - Directors of programmes
    - sustainability; international development; social dimensions of health; games design; and culture
    - only 12% response rate
- Shorter surveys: HEA Conference attendees, SEDA, Interdisciplinary Curriculum Group

Over the past 5 years, do you think that ID courses or programmes have:
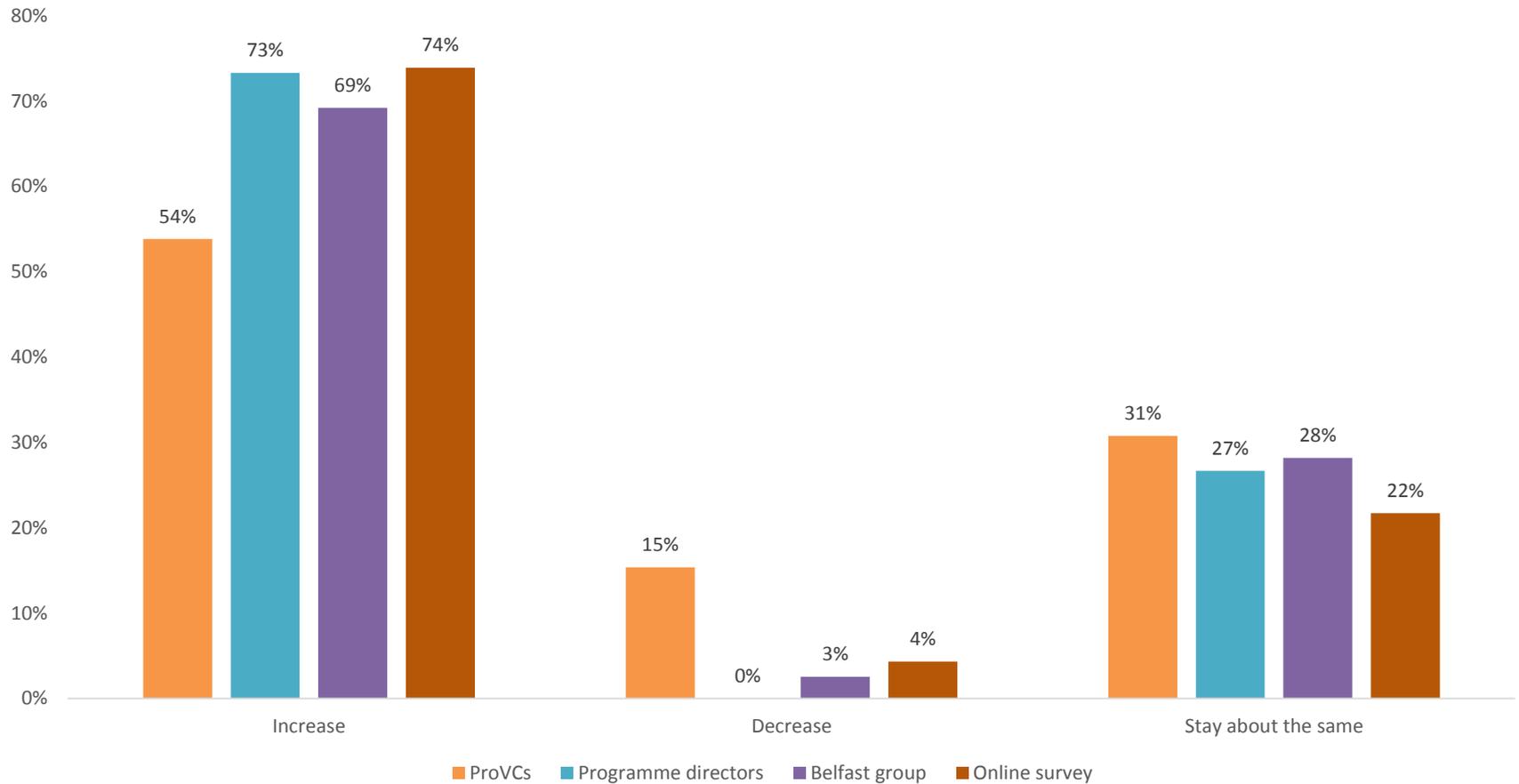
N=113, % of the respondents

In the next 5 years, do you think they will
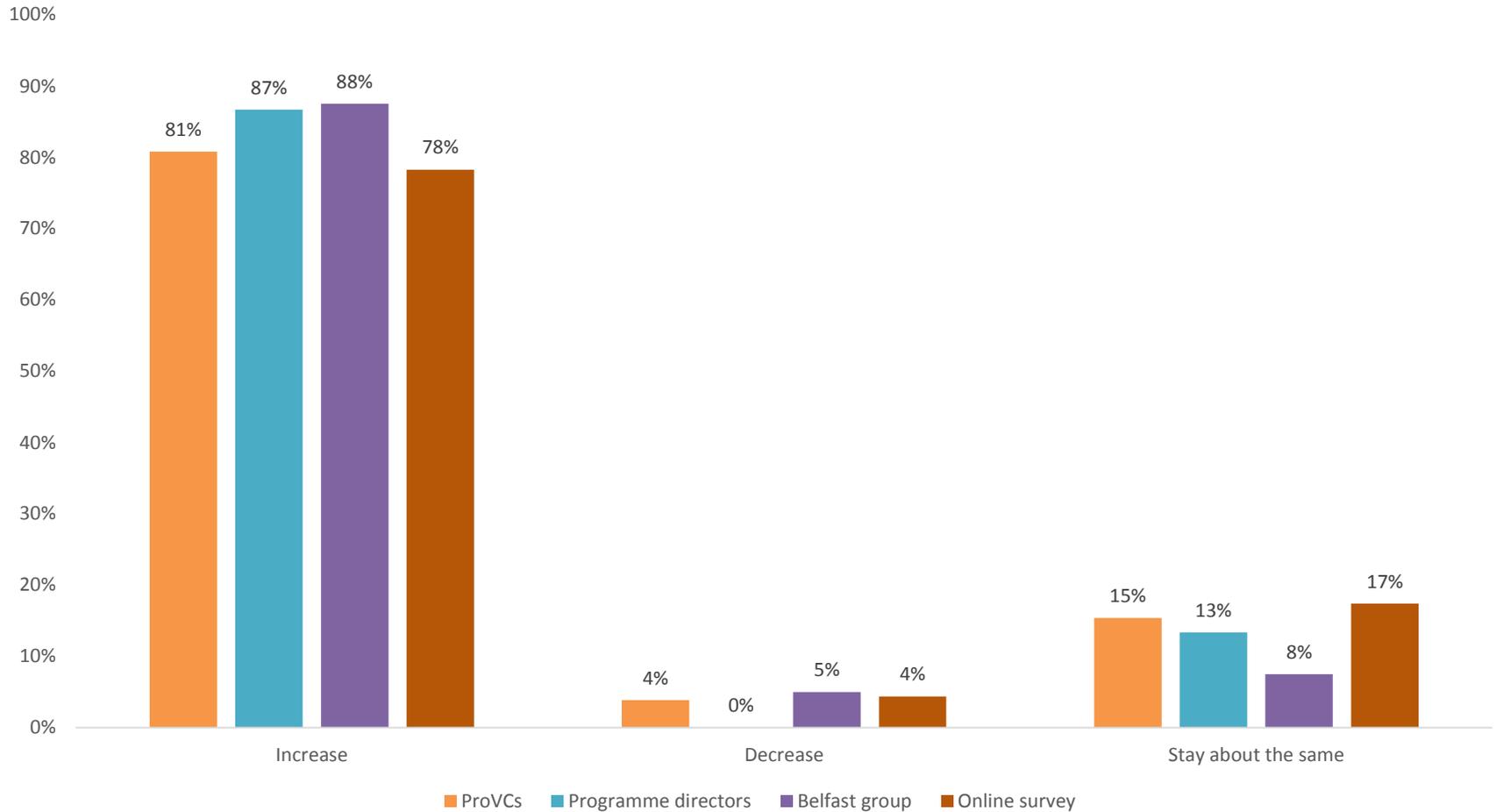
N=113, % of the respondents

ID education is a 'live' topic in the UK:

- more ID undergraduate programmes
- more ID taught postgrad programmes

But different views on what is driving this:

- professional needs and employability (university leaders)
- alignment with complex societal issues and the interests of individual academics (university teachers)

Degree of integration

Q: Is interdisciplinary provision actually *an aggregate of different pre-existing modules from different courses, with only one or two new modules tailored to be integrative*?

More agreement from university leaders than from programme directors

Staff development

Strong agreement with *helpful to have access to a body of good practice in ID provision*

But responses showed little support for ID teaching in current staff development

Challenges

- **Cultural change**
  - comfort zones, 'silo mentality', institutional structures & incentives, understanding of interdisciplinarity

- **Assessment**
  - difficult to identify external examiners

- **Administrative barriers**
  - teaching credit, finances, timetabling

- Interdisciplinary integration takes **effort**
  - bringing together fields, staff members

Interdisciplinary pioneers

Individuals who develop interdisciplinary provision are pioneering champions often working against the status quo:

"There is a small group of (academics) who are the innovators, who think interdisciplinarity is exciting, ...really devoted to undergraduate students and think interdisciplinarity is a part of their education" (ProgDir interviewee)
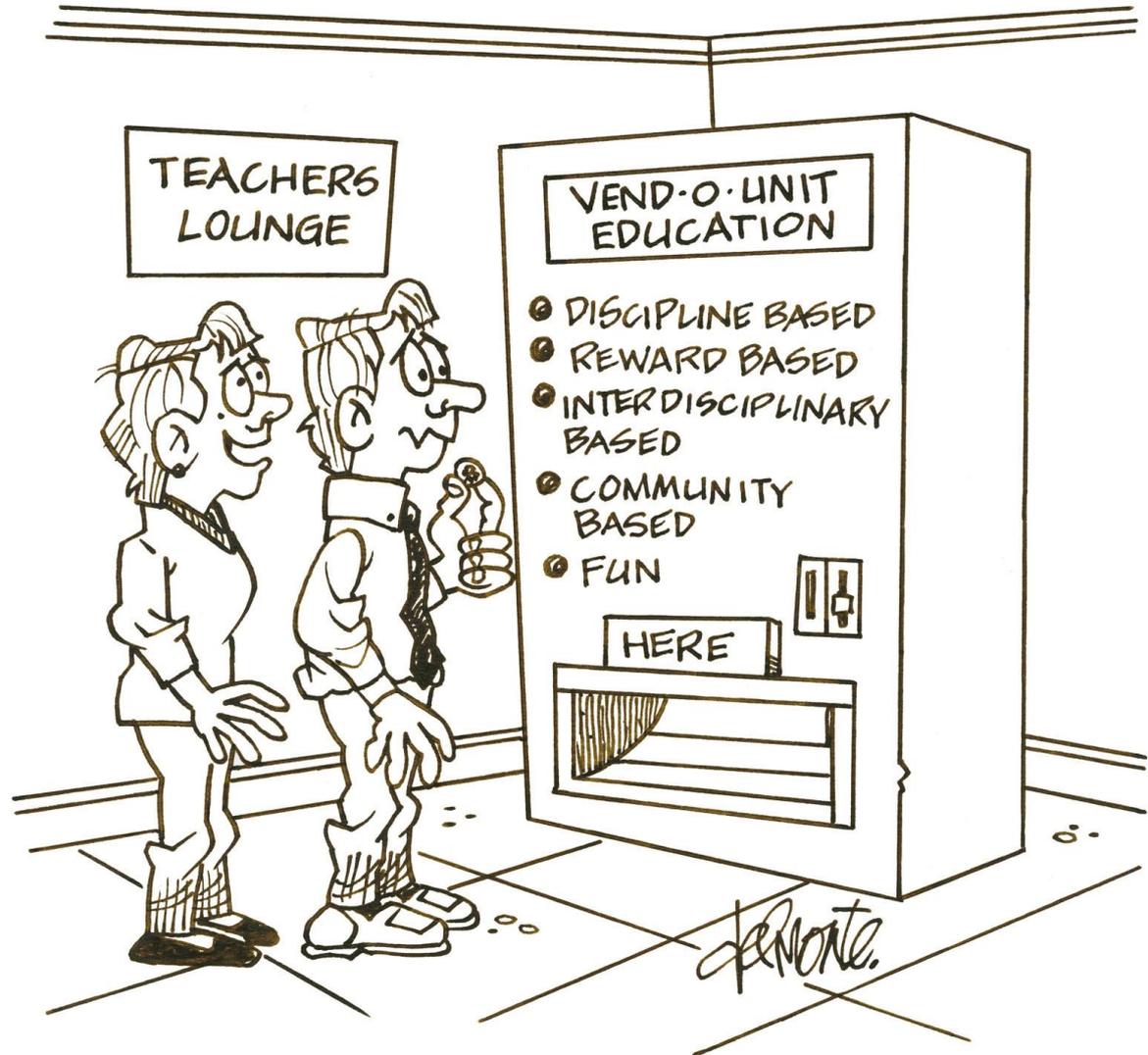
Conservatism?

- Demand, or not?
  - parents?
  - employers?
  - university management?

'I was thinking more, we'd like to be just behind the wave'

(Dean, quoted by ProgDir interviewee)

The word 'interdisciplinary' clearly denotes a spectrum of experience ….

"Well, which approach shall we try this year?"

Integrative vs. interdisciplinary?

Integrative learning - umbrella term for structures, strategies, and activities that bridge numerous divides (e.g. experiences inside and outside the classroom)

Interdisciplinary learning - a subset of integrative learning that fosters connections among disciplines

Klein, 2005

Rigour in ID learning

The rigor in interdisciplinarity can only come from knowing how, why, and what to integrate

(Szostak, 2007)

- learning broadly about multiple different topics not beneficial to students, unless they learn how to integrate knowledge

- teaching students how to integrate different theories and methods (Szostak, 2007)

Agents of integration?

Primarily, it is the student's responsibility to integrate the various contributions of different teachers/modules in the programme

Views of directors split:

    40% agreed

    47% disagreed

Pedagogies, typologies & principles

1. Pedagogies for interdisciplinarity

2. Typology of approaches to interdisciplinarity

3. Principles supporting interdisciplinarity

Strategy	Pedagogical techniques
Co-teaching	• Advanced planning and negotiation with co-teacher • Co-advising with industry representatives • Taking turns in teaching • Creating learning community • Co-creation of syllabus and case studies
Interactive methods	• Project-based learning (PBL) • Case study methods • Role-playing • Simulations • Virtual methods • Peer-assessment and review • Peer Assisted Learning (PAL) • Small-group teaching
Programme-level strategies	• Interdisciplinary electives • Core courses covering material from different perspectives • Research work from the initial stages of graduate school

There is no unique or single pedagogy for integrative interdisciplinary learning

(Klein, 2005; also DeZure, 2010)

Typology – or not?

- Different scales
  - one-off workshops
  - single course modules or units
  - sometimes full degree programmes
- Different aims (not always fully articulated)
  - general awareness of knowledge beyond the student's immediate degree discipline
  - ability to go further and apply that knowledge
  - a more root-and-branch transformation of the student's way of thinking and viewing the world

Principles for Development of ID Education

1. A whole institution approach
2. Clarity of purpose
3. Adequately resourced

Conceptualising ID education

- ID as a 'threshold concept' (Meyer & Land 2005)?

- Or as a 'commonplace' (Myers & Mcnaughten 1998) [rhetorical tradition of frequently used arguments]?

- A powerful 'trope' [a word used figuratively; sometimes an overused theme or device]?

Some concluding thoughts

- Variation in ID provision unsurprising given early stage of evolution within UK HE
- Guard against 'pluridisciplinarity' where students are sole agents of integration
- Tension between institutionalisation and the 'mission for insurgency' inherent in ID
- Does theory lag behind practice?
  - where is the debate about underlying 'curriculum ideologies' (principles, ideas, beliefs and epistemologies) that underpin ID learning?

c.lyall@ed.ac.uk

http://tinyurl.com/idwiki

Workshop 1: Laura Meagher, Interdisciplinary integration: whose responsibility?

Case studies

1. Extracurricular experience in interdisciplinary project teams
2. Piloting an interdisciplinary module
3. New interdisciplinary UG degree programme
4. Professional education PGT masters degree
5. Liberal arts UG bridging arts & sciences
6. Top-level, institutionalised support for interdisciplinary undergraduate education at a major US university

Opportunities of ID L&T

For academics: Intellectual excitement, stimulation of new thinking and influence on research – nearly all directors. Also creativity, new relationships, keen students

For students: 'Reflection of reality'; employability; competencies (ability to synthesize, appreciation of diverse perspectives, flexible & critical thinking)

For institutions: New markets; new curriculum; research impact; 'more interesting, better educated students'