(Overcoming) Barriers to Interdisciplinary Science

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Innogen – an interdisciplinary research centre

• ESRC Centre for Social and Economic Research on Innovation in Genomics (ca. £7M, 2002-2012)
• Part of the ESRC Genomics Network (£25M)
• 10 year investment studying the evolution of genomics and life sciences and their far-reaching social and economic implications
• Innogen ca. 60 staff & students (Edinburgh and Open University)
  – social scientists, economists, lawyers, interdisciplinary
• Stakeholders and research partners (nationally and internationally)
  – scientists, industry and private interest groups, policy makers and regulators, and citizens and public interest groups
Building our own interdisciplinary capacity

Doing ID Research

From PICT (1980s) to Innogen

Evaluating ID

e.g. IIIFP5
Bruce et al. (2004)
Lyall et al.
NERC study

Teaching ID

ID masterclasses
(ESRC RDI grant etc)

Theorising ID

Next steps?
We are not students of some subject matter, but students of problems. And problems may cut right across the borders of any subject matter or discipline.

(Popper, 1963, Conjectures and Refutations: The Growth of Scientific Knowledge)
Developing a shared research agenda
Building a team: distributing responsibilities
Achieving harmony: interdisciplinary integration
Overcoming institutional barriers
Reflections on the status of ID

...informants seemed to stress their limitations rather than their strengths...Often, they reflect socialization into disciplinary communities where depth of knowledge is emphasized and breadth of knowledge more often criticized (Lattuca 2001)

...the persistent linking of the concepts of interdisciplinarity and ‘real world problems’ has associated an interdisciplinary approach with instrumental, or applied research (Petts et al 2006)
Extrinsic knowledge goals

Intrinsic knowledge goals

**Incremental**
- New tools & technical knowledge

**Pragmatic**
- Practical, problem-solving

**Strategic**
- Discipline change
- Create new (sub) disciplines

**Short term** — **Long term**
• Academically-oriented ID research
  – Often longer-term collaborations
  – Discipline focused
  – Helps disciplines to evolve

• Problem-focused ID research
  – Shorter term collaborations
  – Directed to specific real world problems
  – Could be ID or transdisciplinary

*Interdisciplinary Research Journeys. Practical Strategies for Capturing Creativity* (Lyall, Bruce, Tait and Meagher, Bloomsbury Academic March 2011)
Recent cases and methods

- Earth Systems Science
  - Quantifying and Understanding the Earth System
- Climate Change
  - Tyndall Centre for Climate Change Research
- Rural Economy
  - Rural Economy and Land Use
- Energy
  - UK Energy Research Centre
- International
  - IHOPE, NSF-IGERT

Document analysis
semi-structured interviews
online survey
Q-method
bibliometric analysis
focus groups
workshop
learning visits
case comparison

Report to NERC: Lyall et al. (2011) *Identifying Key Success Factors in the Quest for Interdisciplinary Knowledge*
KEY SUCCESS FACTORS FOR INTERDISCIPLINARY PROGRAMMES
LOCUS OF INTERDISCIPLINARITY
At what level does ID integration take place?
e.g. individual  
project  
theme  
programme/initiative
CATALYSIS
Importance of ‘warm up’ activities
e.g. seed corn funding
early workshops
ongoing opportunities for integration
VISIONARY LEADERSHIP

Who provides the intellectual leadership?

e.g. the funders
director
managing expectations
ACTIVE MANAGEMENT

How will integration be managed?

- by one person
- by a team
- at what level of seniority
LEARNING AND CONTINUITY
What provision is made for capacity building?

- successive rounds of funding
- career development for ECRs
- organisational learning
Lessons for funders

• Interdisciplinary capacity-building is a long-term process
• Reflection and formative evaluation can inform organisational learning and capacity building
• Interdisciplinary training and education are necessary but interdisciplinary researchers must also see genuine prospects for career progression and continuity of funding
• Funding needs to:
  – be flexible, to allow programmes the time and space to evolve and realise their full potential
  – invest in liaison roles and less ‘visible’ processes (warm-up activities, seed-corn support, team-building interactions, network and community building, involvement of stakeholders)
Considerations for RCUK

• an interdisciplinary reviewers’ college
• shared administrative resources for interdisciplinary investments
• community-building events across different interdisciplinary capacity-building schemes and investments
• an Interdisciplinary Funders Forum
• an ‘Interdisciplinary Portal’ to co-ordinate and consolidate access to information about funding, training and other support dedicated to interdisciplinarity and its evaluation
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www.tinyurl.com/idwiki