

## (Overcoming) Barriers to Interdisciplinary Science

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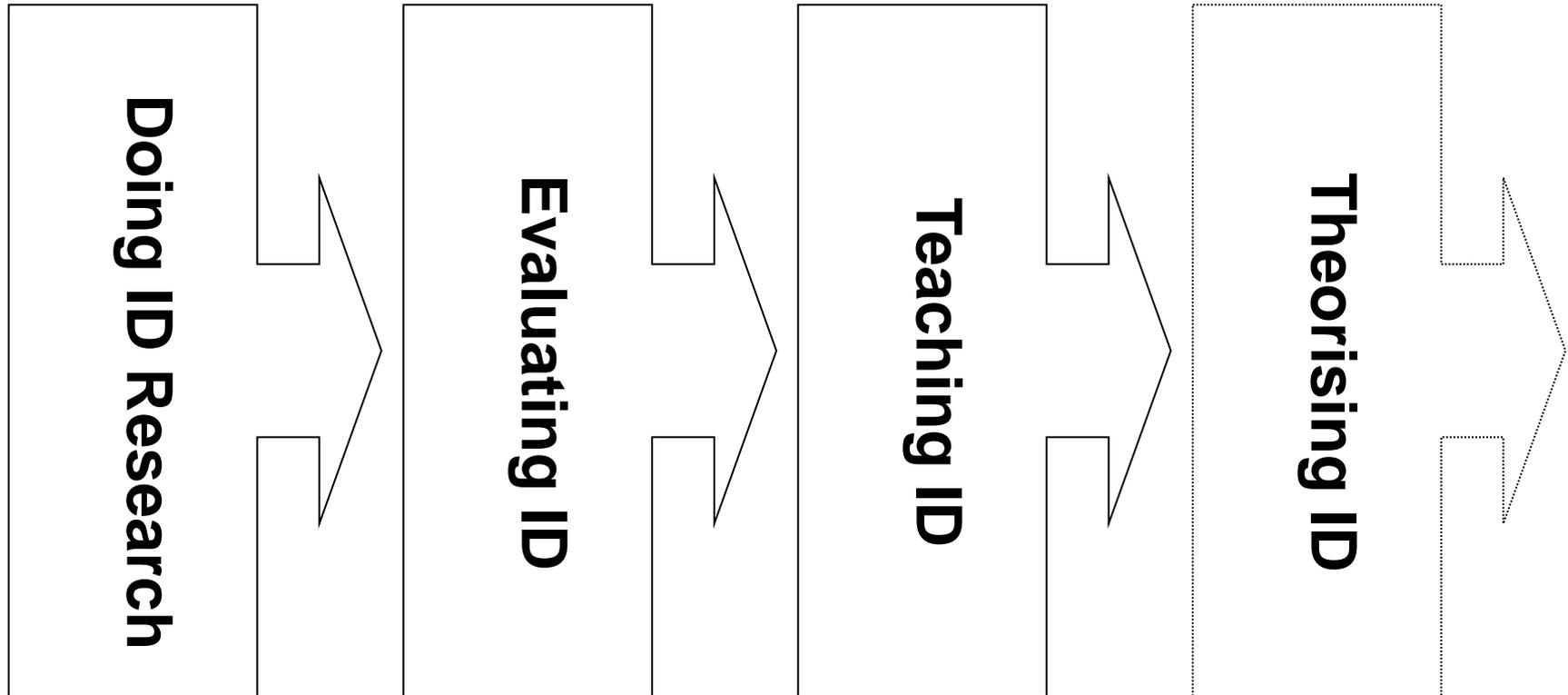
# Acknowledgements

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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



From PICT  
(1980s) to  
Innogen

e.g. IIFP5  
Bruce et al.  
(2004)  
Lyall et al.  
NERC study

ID  
masterclasses  
(ESRC RDI  
grant etc)

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



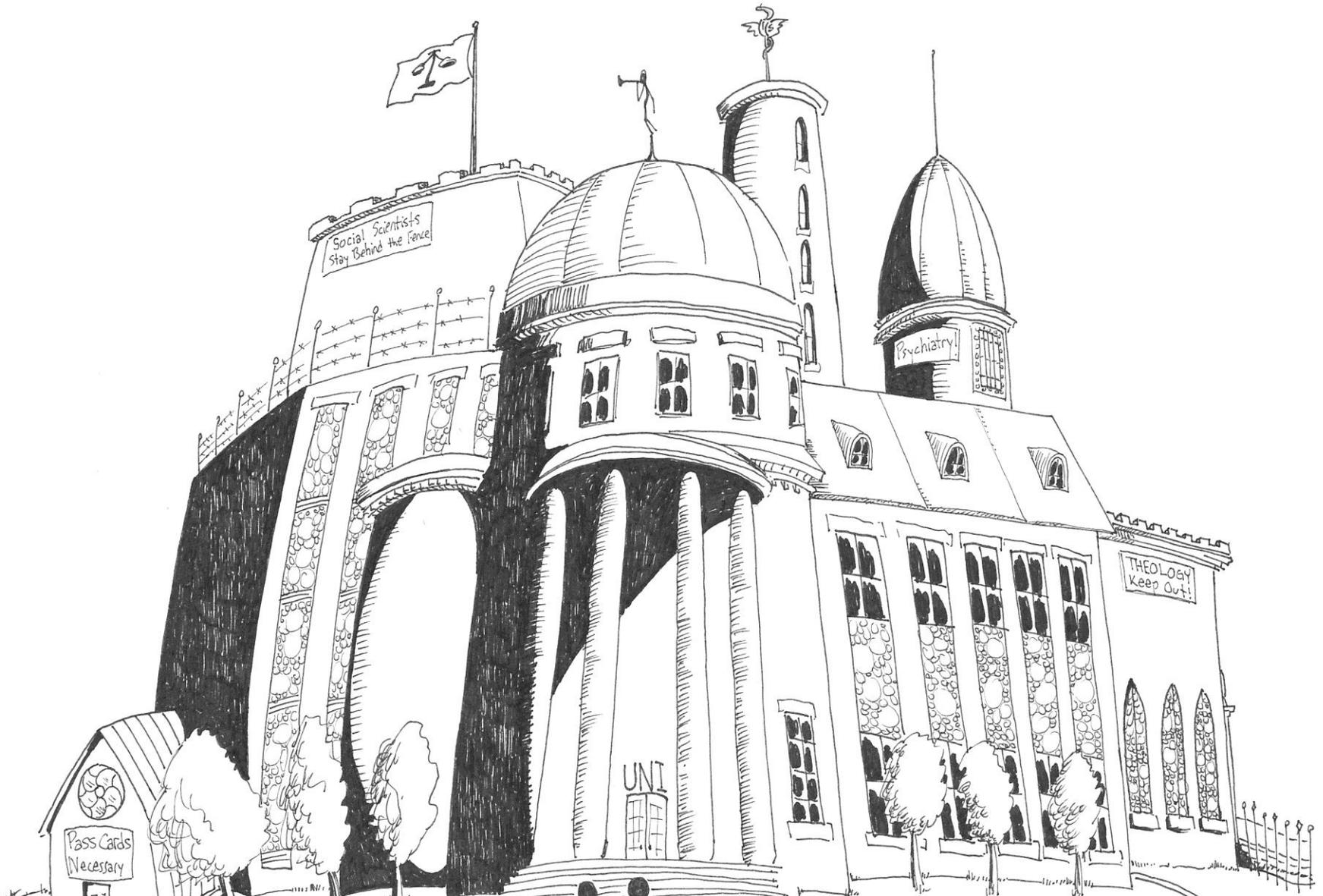
# Building a team: distributing responsibilities



# Achieving harmony: interdisciplinary integration



# Overcoming institutional barriers



# Reflections on the status of ID

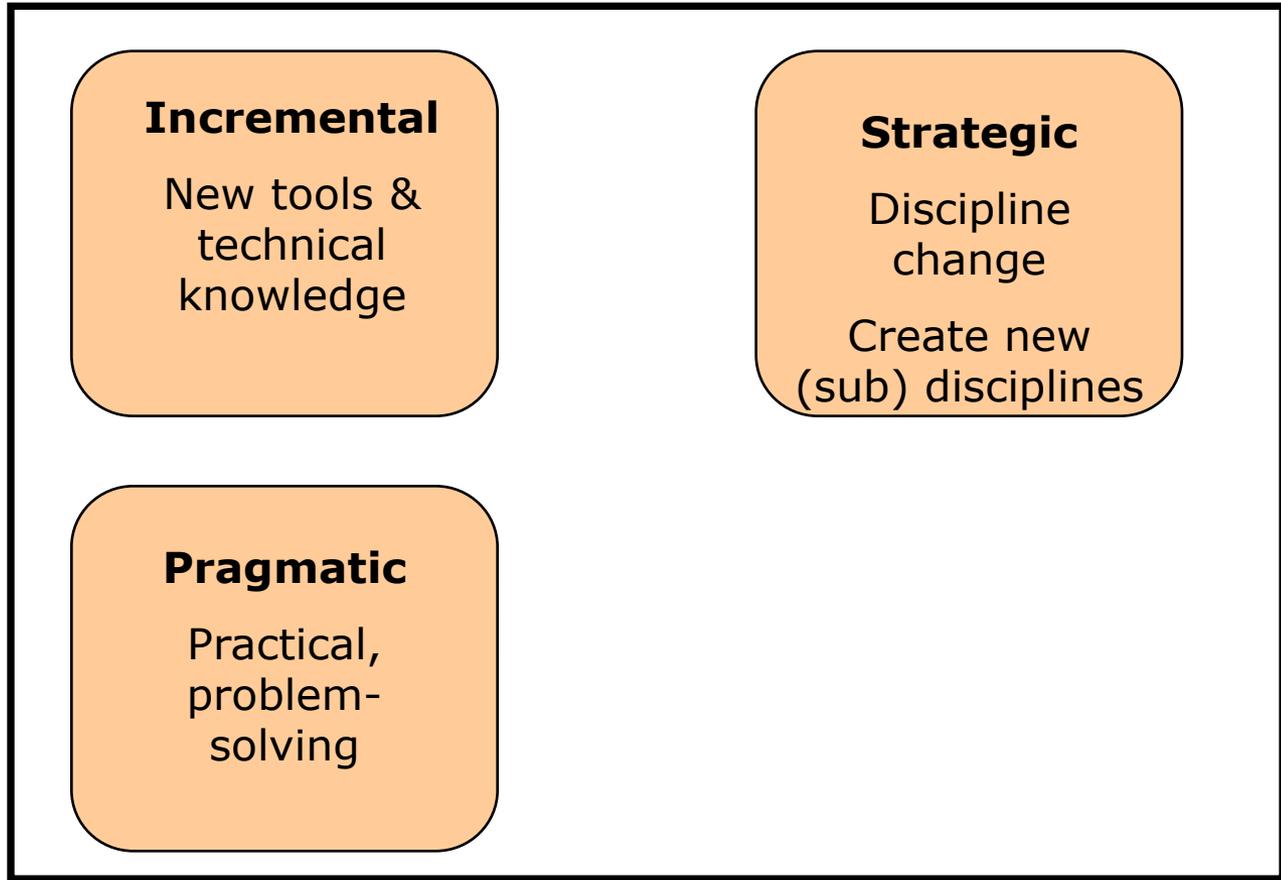
...informants seemed to stress their limitations rather than their strengths... Often, they reflect socialization into disciplinary communities where depth of knowledge is emphasized and breadth of knowledge more often criticized (Lattuca 2001)

...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)

**Intrinsic  
knowledge  
goals**



**Extrinsic  
knowledge  
goals**



**Incremental**

New tools &  
technical  
knowledge

**Strategic**

Discipline  
change

Create new  
(sub) disciplines

**Pragmatic**

Practical,  
problem-  
solving

**Short  
term**



**Long  
term**

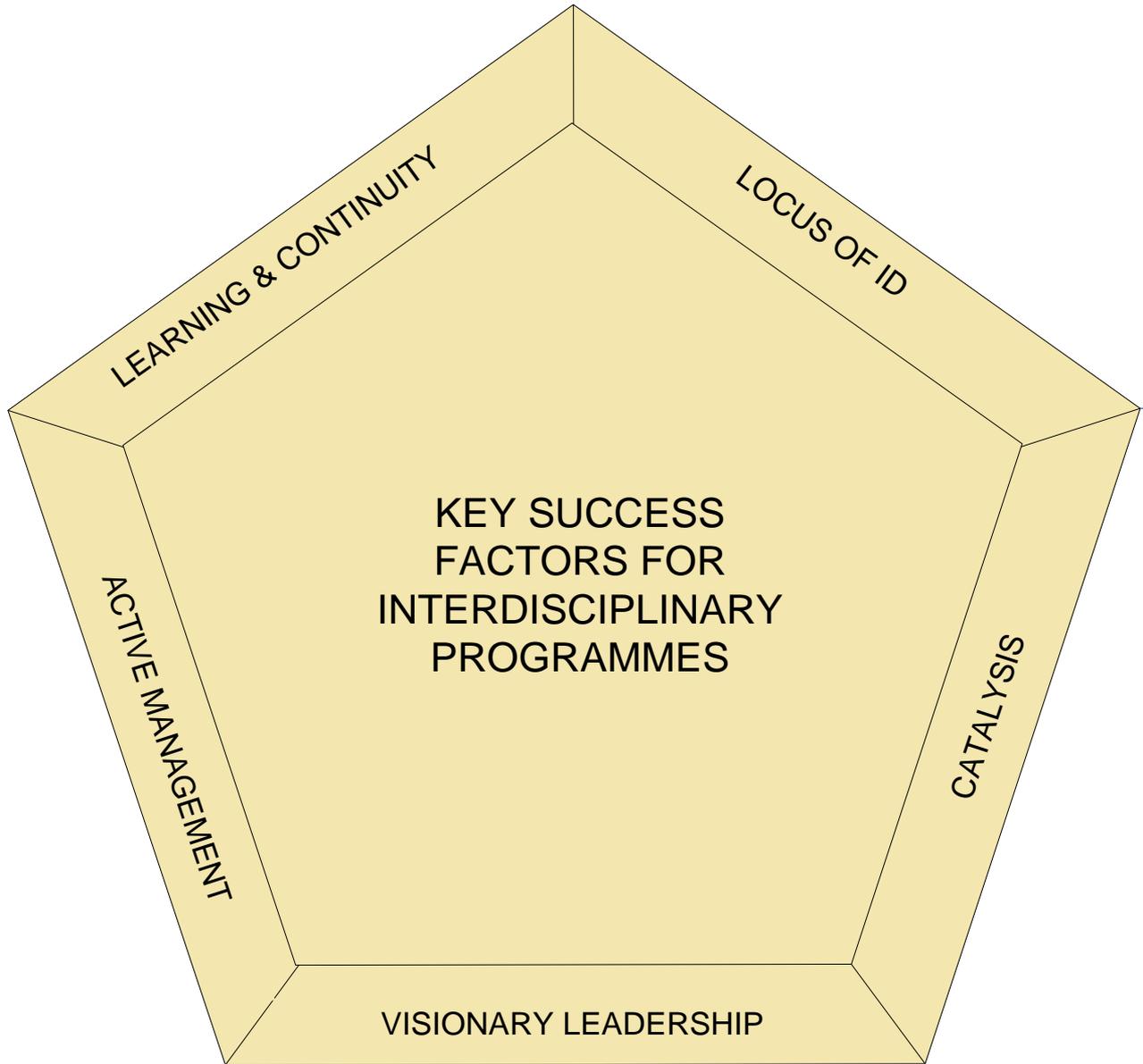
- *Academically-oriented ID research*
  - Often longer-term collaborations
  - Discipline focused
  - Helps disciplines to evolve
- *Problem-focused ID research*
  - Shorter term collaborations
  - Directed to specific real world problems
  - Could be ID or transdisciplinary

*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

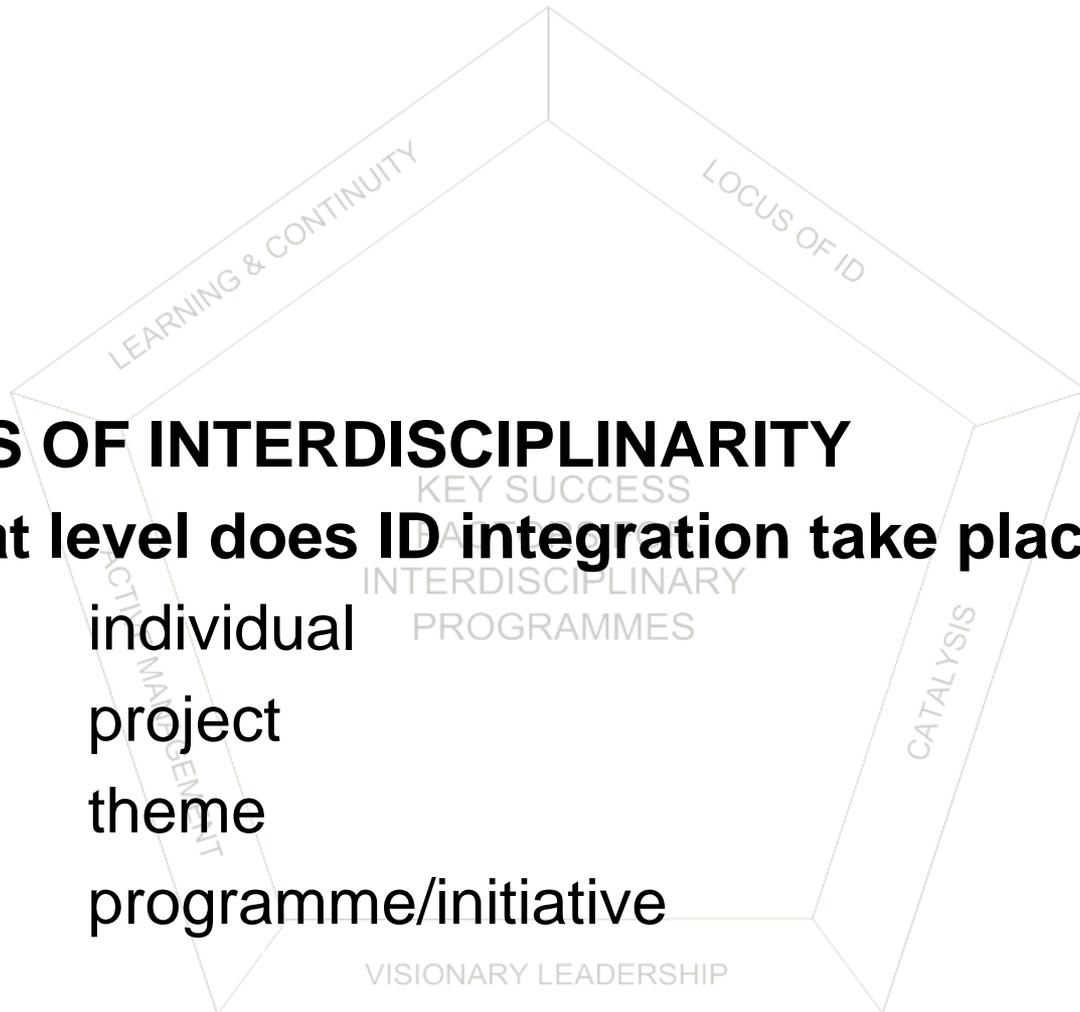
document analysis  
semi-structured  
interviews  
online survey  
Q-method  
bibliometric analysis  
focus groups  
workshop  
learning visits  
case comparison



# 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?

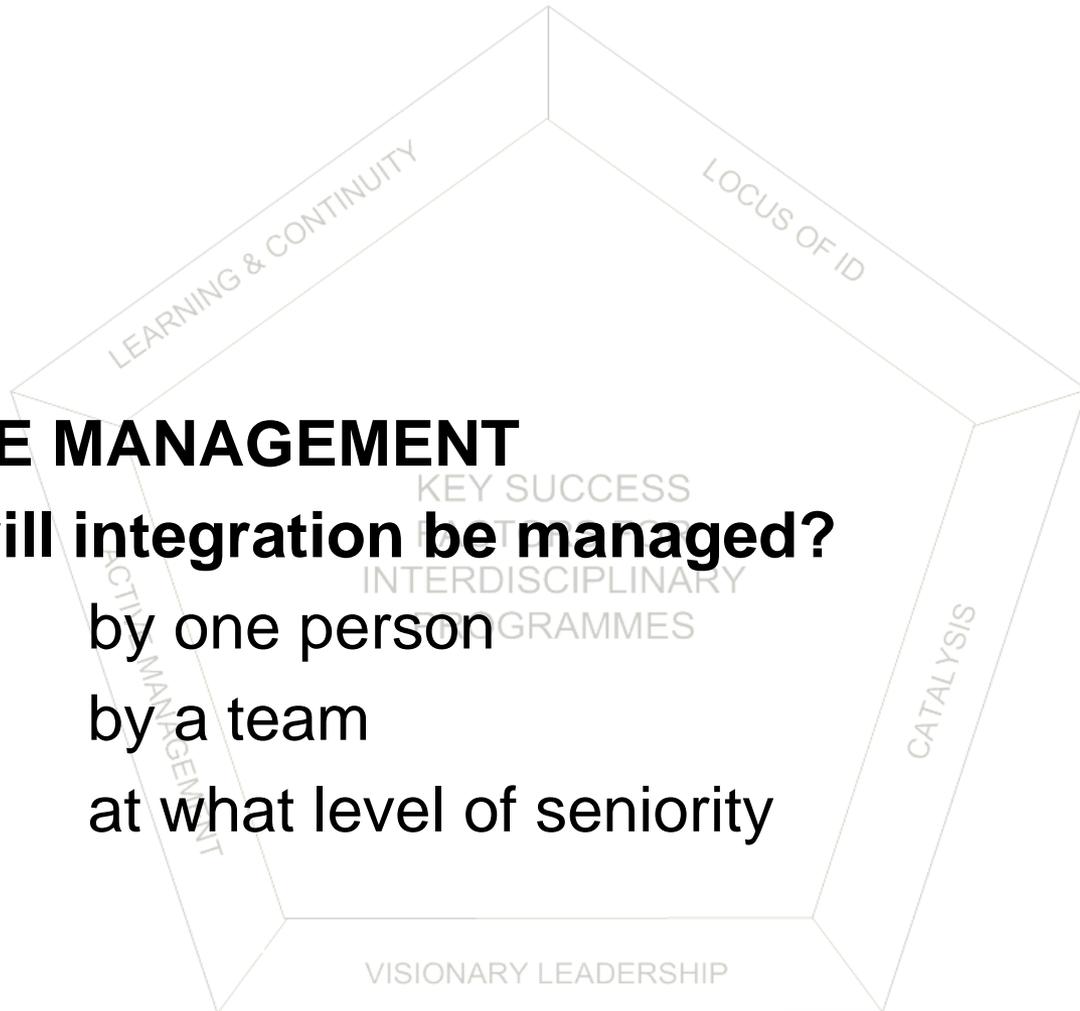
- e.g. the funders
- director
- managing expectations

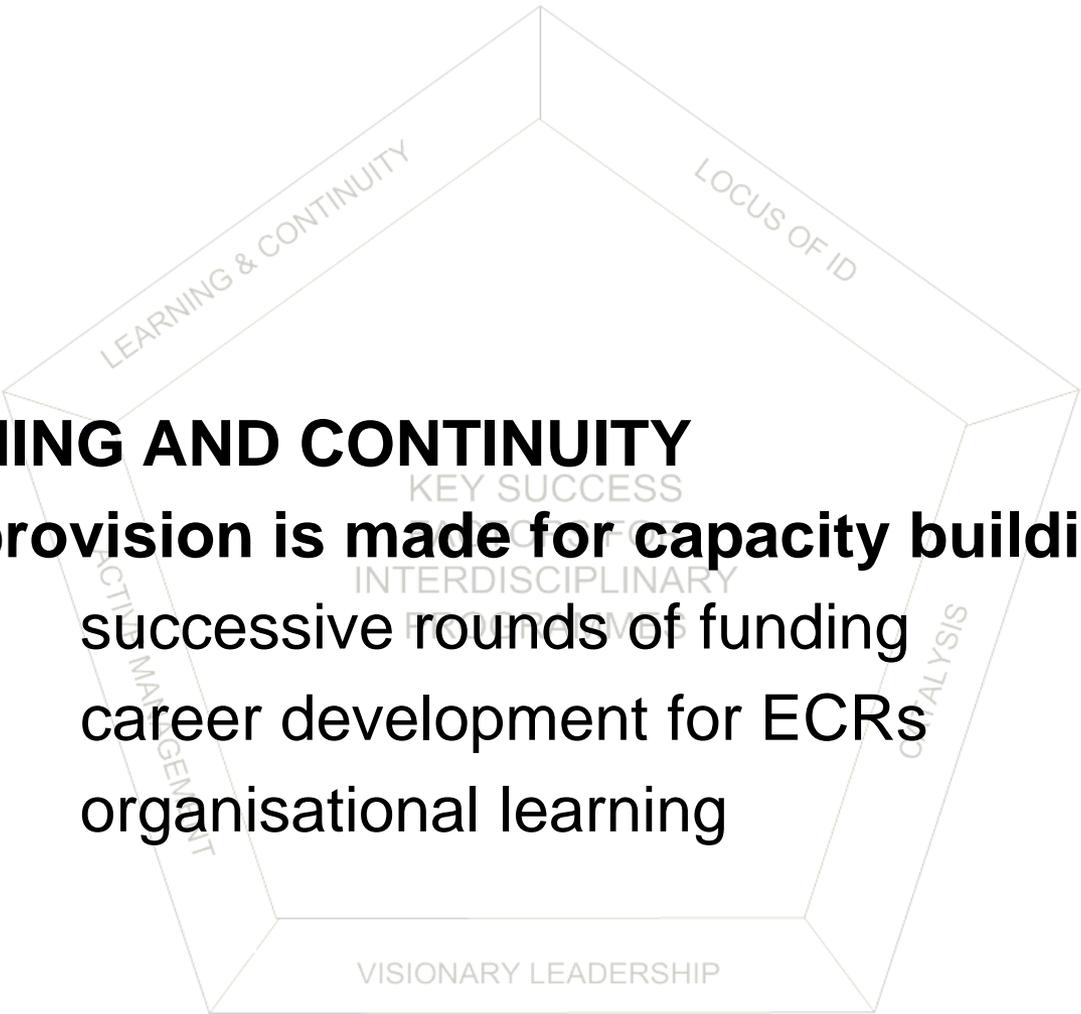


# ACTIVE MANAGEMENT

How will integration be managed?

- e.g. by one person
- by a team
- at what level of seniority





## LEARNING AND CONTINUITY

**What provision is made for capacity building?**

e.g. 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](http://www.tinyurl.com/idwiki)