DARE
The Diversity Approach for Research Evaluation

Dr Frédérique Bone (SPRU), University of Sussex
With: Michael Hopkins, Joshua Hutton, Jordi Molas-Gallart, Ismael Rafols, and Puay Tang
DARE

What is new about DARE?
What is DARE?

• Evaluation aims to provide evidence of impact, usually by looking at outputs.
  → But outputs may take a long time to arise

• Research and innovation increasingly involves collaboration, in larger and more complex teams.

• Diversity is considered as desirable

DARE is a tool for understanding:
  → Variety in team composition
  → How collaborators work together
  → Understand processes (that affect outcomes)
What is DARE?

• Looking at Research
  → How knowledge is produced as a team

• Specific problem of translational research:
  Translational research is aiming at making the best use of basic biomedical understanding in healthcare and society.
  Previous research:
  • Identify stages of translation
  • The time it usually takes to ‘translate’ results into practice (17 years)

This does not help policy makers to intervene.

→ We believe that DARE is a useful tool to understand collaboration (and how it leads to desirable outcomes).
DARE

Presentation of the tool.
DARE: looking at Diversity

• In order to show the contribution of a research collaboration:
  • How diverse is the team behind the initiative? (i.e. the challenges to overcome)
    → Looking at the diversity Stirling (2007) and Ràfols (2014)

• Dimensions facilitating interactive learning (Boschma, 2005):
  • Cognitive proximity
  • Geographic proximity
  • Social proximity
  • Institutional proximity
  • Organisational proximity
Example: Geographic dimension

Collaboration to understand the cause of a neglected disease.

Circles: represent collaborators

Size: represents their level of involvement

Colour: represents the collaborators organisation
Example: Geographic dimension

What is the geographical breadth of the collaboration?

Distance:
- Same department (3 minutes) (0/5)
- Same university, same campus (15 minutes’ walk) (1/5)
- Same city/metropolis (up to 2 hours) (2/5)
- Same region/country (up to 4-5 hours by train) (3/5)
- Same continent (flight or long train needed) (4/5)
- Other continent (5/5)

Diversity: 0.74
Example: Geographic dimension

What is the geographical breadth of the collaboration?

Distance:
- Same department (3 minutes) (0/5)
- Same university, same campus (15 minutes’ walk) (1/5)
- Same city/metropolis (up to 2 hours) (2/5)
- Same region/country (up to 4-5 hours by train) (3/5)
- Same continent (flight or long train needed) (4/5)
- Other continent (5/5)

Diversity: 0.74
DARE: looking at cohesiveness

• In order to show the contribution of an initiative we use the Diversity framework developed by Stirling (2007) and Ràfols (2014):
  • How diverse is the team behind the initiative – the challenge to overcome
    ➔ Using the Diversity measure
  • How much the initiative has helped to bridge the identified diversity – how much interaction has been achieved
    ➔ Using the Cohesiveness measure
    ➔ Dynamic component (i.e. before and after the initiative)
Example: Geographic dimension

What is the bridging effort existing before the collaboration?

Diversity: 0.74
Example: Geographic dimension

What is the bridging effort existing before the collaboration?

Intensity:
- no meeting (intensity = 0)
- yearly meeting (intensity = 1/5)
- every 6 month meeting (intensity = 2/5)
- monthly meeting (intensity = 3/5)
- weekly meeting (intensity = 4/5)
- daily meeting (intensity = 5/5 = 1)

Diversity: 0.74
Cohesiveness Before: 0.32
Example: Geographic dimension

What is the bridging effort realised after the collaboration?

Links based on interactions during project

Diversity: 0.74
Cohesiveness Before: 0.32
Cohesiveness After: 0.53
DARE: looking at processes

• In order to show the contribution of an initiative we use the Diversity framework developed by Stirling (2007) and Ràfols (2014):
  • How diverse is the team behind the initiative – the challenge to overcome
    → Using the Diversity measure
  • How much the initiative has helped to bridge the identified diversity – through how much interactions has been achieved
    → Using the Cohesiveness measure
    → Dynamic component (i.e. before and after the initiative)

• This captures a dynamic record of the collaboration, in which the diversity represents a landscaping exercise at the outset of the initiative and the cohesiveness represents changes achieved.
Cognitive dimension

Bibliometric approach:
- Distance between individuals is based upon the journals they cite and whether they are similar.
  (Zhou et al. 2012)

Diversity: 0.56
Cohesiveness Before: 0.34
Cohesiveness After: 0.41
Institutional dimension

Considering aspects:
- Care
- Open science
- Commercialisation
- Teaching
- Policy

Diversity: 0.28
Cohesiveness Before: 0.15
Cohesiveness After: 0.23
Organisational dimension

**Distance:**
- Same department or centre (0/2)
- Same organisation (1/2)
- Different organisation (2/2)

**Diversity:** 0.90
**Cohesiveness Before:** 0.41
**Cohesiveness After:** 0.64
Social dimension

Distance:
Having worked together before (0)
Knowing a bit (0.75)
Do not know (1)

Diversity: 0.92
Cohesiveness Before: 0.01
Cohesiveness After: 0.64
Summary chart: the diversity profile

Including in a single chart:

• All five diversity dimensions
• The measure of diversity
• The measure of cohesiveness before the start of the project
• The measure of cohesiveness after the start of the project
DARE as proof of concept

- The project aimed at developing a proof of concept of the approach
  - TRIaled on 8 cases in biomedical research
  - Based on
    - Interview data
    - Bibliometric data

- The tool is used to:
  - Understand differences between collaborators and bridging activities using maps and indicators
  - Understand how these have been bridged and outcomes using narratives
Conclusion

• DARE brings *early* insights on understanding underlying characteristics of teams.

• Why should policy-makers be interested in diversity?
  • Diversity may be desired by design (problems requiring more than one discipline)
  • Diversity may also be a barrier to overcome (too much diversity may make it difficult for participants to collaborate)

• The combination of DARE with output related measures, can help us to learn whether encouraging certain types of diversity improve desirable outcomes.
Future steps

- Development of the tool:
  - Adding other diversity dimensions
  - Adapting the tool for use with secondary data
  - Making the tool for general purpose:
    • For researchers
    • For other stakeholders (policy maker and funders)

- What use in the future:
  - Funders / policy-makers:
    • Understand the potential of funded teams
    • Understand and intervene when potential difficulties arise in collaborations
  - For researchers to build a better understanding:
    • how much diversity is helpful for specific outcomes
    • complementarity and synergies between dimension types

Create an understanding about both the potential and difficulties of a collaboration to enable a well informed intervention.
THANK YOU.

Contact: f.bone@sussex.ac.uk

Visit our website:

http://www.sussex.ac.uk/spru/research/dare/Cases.html