

Exploring Barriers to Interdisciplinary Research (IDR)

Daniele Rotolo d.rotolo@sussex.ac.uk

SPRU, Science Policy Research Unit - University of Sussex

Michael Hopkins m.m.hopkins@sussex.ac.uk

SPRU, Science Policy Research Unit - University of Sussex

Extended abstract

Interdisciplinary research (IDR) – i.e. research that builds on a set of theories, concepts, tools, data, and methods that are not available within a single discipline or specialty – is conceived as capable of generating novel knowledge to address complex societal problems such as climate change, sustainability, population ageing, etc. Such expectations have attracted widespread attention from researchers, decision makers, and funders (e.g. National Academy of Sciences, 2005; Nurse, 2015). As a result, there has been growing pressure on research organizations to steer their ‘monodisciplinary’ research trajectories towards interdisciplinary approaches (Spelt, Biemans, Tobi, Luning, & Mulder, 2009).

Considerable research efforts have also gone into the development of quantitative and qualitative methodological approaches to assess IDR. These include qualitative measures of IDR collaborations based on participants’ self-assessments and quantitative approaches based on bibliometrics (Wagner et al., 2011). This research has provided evidence of a growth of IDR since the 1970s (Gingras & Larivière, 2010) and that IDR has a considerable impact on citation count (Uzzi, Mukherjee, Stringer, & Jones, 2013; Yegros-Yegros, Rafols, & D’Este, 2015). Nonetheless, our understanding of which barriers may hinder researchers from undertaking research that crossed the boundary of a single discipline is somewhat limited. To address this gap, we surveyed three groups of stakeholders in the UK Higher Education (HE) system: (i) researchers, (ii) managers in HE institutions, and (iii) managers in research funding organizations.

We identified a sample of 16,625 researchers on the basis of the authors’ contact details reported in Web of Science publication records from 2013 to 2015. We used the corresponding author’s email extensions to identify researchers based in UK HE institutions – 109,698 distinct email addresses hosted at UK HE institutions were initially identified from 219,182 publications. Corresponding author’s email extensions was also used to draw a sample of researchers stratified by region (NUTS-1 level). A sample of 1,080 managers in HE organizations was identified examining the websites of 15 UK HE institutions, while the contact details of 962 managers in research funding organizations were retrieved from funding calls released by 741 UK funders from 11 May 2015 to 10 May 2016.

The survey response rate was about 13%, 34%, 23% in the case of researchers (i.e. 2,183 responses), managers in HE institutions (i.e. 367 responses), and managers in research funding organizations (i.e. 94 responses), respectively. We perform a survey analysis including post stratification weights to correct for discipline, career stage, and gender bias that the sample of respondent may have introduced. This analysis revealed barriers to IDR in relation to (i) collaboration, (ii) career, (iii) evaluation, and (iv) funding. For example, respondents were particularly concerned with the need of more time and resources for IDR to enable researchers to identify partners and to develop shared languages (especially, in the case of researchers in Science and Engineering). Also, recruitment and promotion criteria were reported to hinder considerably IDR efforts since IDR is often perceived as being less rigorous than more established lines of research (especially, in the case of researchers in Social Science and Arts & Humanities). In this regard, the publishing of the outcomes of IDR efforts in leading disciplinary journals were also found to be more challenging. Finally, all stakeholder groups perceived that IDR is less likely to be funded than monodisciplinary research.

References

- Gingras, Y., & Larivière, V. (2010). The historical evolution of interdisciplinarity: 1900-2008. In *11th International Conference on Science and Technology Indicators* (pp. 100–101).
- National Academy of Sciences. (2005). *Facilitating Interdisciplinary Research. Public Policy*. WASHINGTON, D.C.: National Academies Press.
- Nurse, P. (2015). *Ensuring a successful UK research endeavour - A Review of the UK Research Councils*. London, UK.
- Spelt, E. J. H., Biemans, H. J. A., Tobi, H., Luning, P. A., & Mulder, M. (2009). Teaching and learning in interdisciplinary higher education: A systematic review. *Educational Psychology Review*, 21(4), 365–378.
- Uzzi, B., Mukherjee, S., Stringer, M., & Jones, B. (2013). Atypical Combinations and Scientific Impact. *Science*, 342(6157), 468–472. <https://doi.org/10.1126/science.1240474>
- Wagner, C. S., Roessner, J. D., Bobb, K., Klein, J. T., Boyack, K. W., Keyton, J., ... Borner, K. (2011). Approaches to understanding and measuring interdisciplinary scientific research (IDR): A review of the literature. *Journal of Informetrics*. *Journal of Informetrics*, 165(1), 14–26.
- Yegros-Yegros, A., Rafols, I., & D'Este, P. (2015). Does interdisciplinary research lead to higher citation impact? the different effect of proximal and distal interdisciplinarity. *PLoS ONE*, 10(8), e0135095.