Futures 53 (2013) 22–32

Contents lists available at ScienceDirect

Futures

journal homepage: www.elsevier.com/locate/futures

Preparing for an interdisciplinary future: A perspective from early-career researchers☆

Helen Bridle [a], Anton Vrieling [b], Monica Cardillo [c,*], Yoseph Araya [d], Leonith Hinojosa [e]

[a] Heriot-Watt University, Institute for Biological Chemistry, Biophysics and Bioengineering, Earl Mountbatten Building 3.16, EH14 4AS Edinburgh, United Kingdom
[b] University of Twente, Faculty of Geo-Information Science and Earth Observation, PO Box 217, 7500 AE Enschede, The Netherlands
[c] University of Montpellier 1, Faculty of Law, Institut d'Histoire des Anciens Pays de Droit Ecrit, 39 Rue de l'Université, 34060 Montpellier cedex 2, France
[d] Birkbeck College, University of London, Department of Geography, Environment and Development Studies, Malet Street, WC1E 7HX, United Kingdom
[e] The Open University, OpenSpace Research Centre, Milton Keynes MK7 6AA, United Kingdom

ARTICLE INFO

Article history:
Available online 25 September 2013

Keywords:
Interdisciplinarity
Transdisciplinarity
Applied research
Collaboration
Research career
Communication

ABSTRACT

Increasingly, research is moving towards more interdisciplinary endeavours. Effective collaboration between people from different disciplines is necessary to maximize the potential benefits of interdisciplinarity for future research activity. This paper analyses an approach to fostering the skills required for successful cross-disciplinary collaboration from the perspective of an interdisciplinary group of early-career researchers. Our reflection on how specially designed encounters can help to shape future interdisciplinary research initiatives draws on the discussion of a four-day workshop, a post-event survey, and a review of other experiences. We conclude that interdisciplinary encounters are an effective means to support the development of future interdisciplinary researchers, with a major advantage of this approach being the opportunity for open communication. Depending on the organiser's aim, we distinguish between "cultivation" and "development" encounters. Among the multiple factors that produce successful interdisciplinary encounters, we found that selection of a theme, participants and location need to be tailored to the encounter's particular objectives. We recommend that funding bodies and other members of the research community should take note of the effectiveness of encounters to foster interdisciplinarity and generate space to develop more innovative and high-impact research that delivers solutions to the challenges facing humanity in the future.

1. Introduction

Interdisciplinary research and collaboration can provide substantial benefits to scientists, practitioners and policy makers [1–4] and it is predicted that the future of research is increasingly interdisciplinary [5]. A growing body of research in the futures field, and elsewhere, has described the characteristics and quandaries of interdisciplinary research, including the

* Corresponding author. Tel.: +33 6 19576475.
E-mail addresses: h.l.bridle@hw.ac.uk (H. Bridle), a.vrieling@utwente.nl (A. Vrieling), cardillo.monica@gmail.com (M. Cardillo), y.araya@bbk.ac.uk (Y. Araya), leonith.hinojosa-valencia@open.ac.uk (L. Hinojosa).

0016-3287/$ – see front matter © 2013 The Authors. Published by Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.futures.2013.09.003

issue of evaluating its quality [5–8]. A particular area of interest has been the discussion about the various logics of interdisciplinarity [1], and its benefits, risks and challenges [9–15]. While this is an interesting debate, much less work has considered the crucial question of how to build interdisciplinary capacity, particularly from the perspective of early-career researchers. Nevertheless, a recently published future model of academia stressed the need to invest in the development of future researchers [16] and this is especially the case for the particular challenges of interdisciplinary research [17]. The focus of this paper is therefore on the training and development of early-career researchers to cope with the challenges of interdisciplinarity, avoid the risks and hopefully reap the benefits of the predicted future interdisciplinary research landscape.

Although there are no widely accepted definitions of interdisciplinarity, in this paper we agree with Hicks et al. [12] who define it as the 'production of research which crosses disciplinary boundaries'. Interdisciplinarity is not new, however; academic disciplines are flexible and have frequently been combined to form new disciplines to provide better answers to emerging questions. More recent is the collaboration between distant disciplines, for example between natural and social sciences. We could call this big interdisciplinarity, as opposed to small interdisciplinarity, which implies collaboration between similar disciplines [18]. Increasingly such collaboration does not only involve academics, but also policy makers and other stakeholders may be involved in a variety of ways. For example, stakeholders can help to co-define research problems and to develop models [19], but also actively participate in data collection and scientific experiments [20]. In analogy to other authors [21,22], in this paper we specifically refer to the term 'trans-disciplinarity' only when non-scientific knowledge is incorporated or non-academic actors are involved in the research process. When this aspect is less relevant for our discussion, we follow the above-mentioned definition by Hicks et al. [12]. With Petts et al. [14], we acknowledge, however, that interdisciplinarity is not a uniform approach to research, but instead covers a continuum of approaches.

While different rationales may exist to embark on interdisciplinary endeavours [1], a common view is to consider interdisciplinarity as a means to address complex problems that cannot be dealt with from a single disciplinary perspective alone. Such problems require people from different disciplinary perspectives to work together, sharing ideas, theories and practice to reach appropriate solutions. For interdisciplinary research to be effective in addressing these problems, therefore, the conditions must be created in which appropriate interactions can be fostered between researchers, including those at an early stage in their careers. The benefits and opportunities that interdisciplinary research creates for early-career researchers are several. Exposure to interdisciplinarity can help them to understand the wider impact of their research and their "home" discipline while also contributing to wider societal questions. Interdisciplinarity may also enhance their ability to ask innovative questions with wider impact. Exposure to interdisciplinary research can also have practical career benefits, since funding is becoming increasingly available in this area to assist in solving complex (societal) issues. Thus, fostering interdisciplinary thinking and exposing young researchers to people from different disciplines (creating networks) can help their career progression by increasing their potential to secure funding.

Adopting interdisciplinarity also carries risks, and the institutional structures within which early-career researchers have to develop may restrict the options available to them. Some of these risks relate to the difficulties of obtaining lectureship positions in an area without having studied that discipline at undergraduate level and the disadvantages of not having a mainstream disciplinary expertise at the time of competing for research grants. A main obstacle towards interdisciplinary research careers is therefore the fact that academia and reward systems are still largely organized along disciplinary divides [12]. Because interdisciplinary research may compromise an individual researcher's progress within her/his discipline, this obstacle may create a risk for young researchers with less-secure academic positions [23,24]. This obstacle can become prohibitive if their peers put a high value on disciplinary research output. In addition, interdisciplinary research entails learning from other disciplines, which requires time investment [5] and thus could limit research output in the start-up phase of such research.

Embarking on interdisciplinary collaboration is not restricted to a specific career stage. However, early-career researchers may be particularly motivated to engage in interdisciplinarity through their desire to contribute to societal benefits [3,24]. Because early-career researchers are at a formative stage of their research career [5,25], however, they may need structured induction to understand and evaluate the opportunities and risks before deciding to make an enduring commitment. Recent years have seen an increasing number of initiatives to foster interdisciplinary research, including more integrative graduate education [26], interdisciplinary workshops and research funding [for example, the new European funding scheme "Horizon 2020"; 27], and interdisciplinary training programmes and workshops [5,21,26]. However, we find that among the factors that explain their sometimes limited effects [28] the perspectives from early-career researchers themselves on the topic are largely lacking.

This paper provides a new viewpoint on fostering future interdisciplinarity capacity from the experience of a group of early-career researchers based in Europe who participated in an interdisciplinary encounter organized by the European Science Foundation in August 2012 (see Box 1). We discuss interdisciplinary encounters, defined as short (2–7 days), targeted meetings that have the aim of fostering interdisciplinary thinking, openness, and collaboration. We analyse the elements that make encounters an effective means to foster interdisciplinarity and suggest that, to overcome obstacles towards interdisciplinary research and reap its potential benefits, incentives are needed from within academic institutions, research organizations, and funding agencies [see also 23]. Our opinions are complemented by the views of other early-career researchers through a survey, undertaken after the summit, which was designed to provide viewpoints on how the other participants understood interdisciplinarity and its relevance to their research, their assessment of the encounter organization, and how they valued the experience gained. Additionally, this paper makes recommendations on the design of encounters for capacity building and calls upon funding bodies, and other members of the research community, to invest in this type of initiative to develop researchers ready for the demands of the interdisciplinary future of academia.