

Open Science and its role in universities: A roadmap for cultural change

Executive summary

Open Science, perhaps more properly termed Open Scholarship in English, represents a culture change in the way stakeholders in the research, education and knowledge exchange communities create, store, share and deliver the outputs of their activity. For universities and other stakeholders to embrace Open Science principles, policies and practices, there needs to be a culture change in these organisations if this transition is to be successfully negotiated. Section I of this paper sets out the nature of that cultural change for universities, suggesting ways in which change can be successfully embedded in organisations and what has to happen to effect that vital change. There are challenges, which the paper identifies, which mean that this transition will not be straightforward to deliver.

Section II discusses the eight pillars of Open Science identified by the European Commission:¹ the future of scholarly publishing, FAIR data, the European Open Science Cloud, education and skills, rewards and incentives, next-generation metrics ('Altmetrics'), research integrity and citizen science. It analyses what the introduction of Open Science approaches means at university level in each of these eight themed areas and identifies the benefits which accrue to the individual academic, the institution, the user of research/educational outputs and to other stakeholders in the research/educational chain. Research funders have a particular role to play in working with institutions to bring about such fundamental change. For each of the eight Open Science areas, recommendations about what universities can do are formulated. Whilst they have been developed on the basis of LERU universities' experience, the recommendations are relevant to universities across the globe and can serve as a roadmap in their journey to embrace Open Science. Evidently, they imply a broader supportive environment and productive interactions with external stakeholders, too.

Section II identifies real challenges in universities embracing Open Science principles and values. How willing are individual researchers to move from traditional models and practices to new systems and values which are to a large extent untried and untested over time? Consider the theme of scholarly publishing. To what extent will writers of research monographs accept Open Access to such products as the future publication model? Do individual journal titles have a future, or are research platforms such as Wellcome Open Research² the future of scholarly publishing in those disciplines where the article is the main form of research output? How should such outputs be evaluated? Do traditional metrics work in an open environment? Are open approaches recognised in evaluation systems, such as academic promotion? How is the cost of doing Open Science calculated and who pays for what? These are all questions which any move to an Open Science system and values poses.

The paper offers a set of high level conclusions in section III, which underline the value of Open Science approaches, but also indicate the profound challenges in any such development. A transition to Open Science is a process, not a single event. Such a transition will take years to effect, not months or days. To transition at the institutional level, we suggest universities should develop a programme of cultural change, which is necessary to support the changes in principle and practice which Open Science brings. Universities can establish advocacy programmes, which should identify the benefits of Open Science approaches, whilst being realistic about the challenges. They may wish to draw up a communication strategy, which enables the whole university body to become familiar with Open Science practices, and they may want to appoint a senior manager to lead Open Science approaches across all eight pillars of Open Science.

In a first appendix all 41 recommendations in each of the eight areas are grouped together for easy reference. Open Science represents a complex and multi-dimensional process of transition, different for every university. The recommendations in this LERU paper do not represent a prioritisation of topics, nor an exhaustive list of actions to be taken by universities. They, and the paper as a whole, are intended to serve as a roadmap to accompany universities' efforts towards Open Science, leaving room for each institution to carve out its own path, strategy and actions.

In a second appendix a set of 37 questions is provided, which universities can use to measure their progress in implementing Open Science approaches institutionally. These questions can be used iteratively over a period of time to measure a university's growth in Open Science activity and any remaining challenges.

1 Collected from European Commission – Open Science: <https://ec.europa.eu/research/openscience/index.cfm>; last accessed 2 May 2018.

2 Wellcome Open Research: <https://wellcomeopenresearch.org/>; last accessed 17 April 2018.

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