

Open science, an undefined model with many challenges

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Ciencia Abierta, un modelo por definir con muchos retos por delante

ABSTRACT RESUMEN

Open science is an approach to scientific research based on collaboration, on openness and transparency at each stage of the research process (including, data collection, peer review, dissemination, evaluation, etc.) and on the enhancement of its accessibility to society. Nevertheless, it is an area that is still being profiled and that isn't well-known by researchers. The objective of our text is to present the studies published in this monographic issue and we can match them up in three topics: open science, research data and open access. After that, we want to point on four main challenges and uncertainties that, at this moment, can be a threat to the growth and implantation of open science: there are a top-down leadership, different speeds in their components, serious risk of a monopoly and a lack of promotion policies.

La ciencia abierta es una manera de concebir la investigación científica que se basa en el trabajo colaborativo, en la apertura y transparencia de todas las fases de la investigación (recogida de datos, revisión por expertos, difusión, evaluación, etc.) y también en la aproximación de la ciencia a la sociedad. De todas formas, es un ámbito que aún se está perfilando y que es poco conocido por parte de la mayoría de los investigadores. El objetivo del texto es presentar los diversos estudios que se publican en el número monográfico y que se centran en tres grandes ámbitos: la ciencia abierta, los datos de investigación y el acceso abierto. En segundo lugar, también se describen los cuatro principales retos e incertidumbres que, en estos momentos, amenazan el crecimiento e implantación de la ciencia abierta: liderado por las élites, velocidades distintas en sus componentes, riesgos de monopolio y pocas políticas de promoción.

KEYWORDS PALABRAS CLAVE

Open science; Open access; Research data; European Comission; Policies

Ciencia abierta; Acceso abierto; Datos de investigación; Comisión Europea; Políticas

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1. What is open science

Open science is a new approach to scientific research based on collaboration, openness and the transparency of each phase in the research process (including, data collection, expert review, dissemination and evaluation, etc.), at the same time as it seeks to bring science closer to the society it serves. Open science represents a radical transformation of the way in which scientific research is carried out and how its system of evaluation operates: in short, a veritable paradigm shift with respect to that of the current system (Anglada & Abadal, 2018; Packer & Santos, 2019).

Today, it is a broadly defined concept comprising many different elements, ranging from open access to research publications – promoted since the beginning of 2000 – and open science data – as required by European projects since 2014 – to lesser known elements that include open peer reviews, citizen science and new evaluation models. Each of these elements has followed its own path of evolution, advancing at its own speed, often with little interaction with the other elements. As such, open science can be understood as an “umbrella” concept, its potential lying in its parts rather than in the whole.

The organisation that has done most to promote this new model and which has placed it firmly on the global agenda is undoubtedly the European Commission (EC), thanks to its publication of the concept paper, *Digital Science in Horizon 2020* (2013), and subsequent documents, in particular, its recommendations on access to and preservation of scientific information (European Commission, 2018). The EC has likewise created an open science portal (European Commission, 2019) that brings together studies and news related to open science.

The open science literature is expanding rapidly and is already difficult to summarise. However, readers seeking a clear overall vision of the concept of open science can usefully consult the bibliographic review published by Vicente & Martínez (2018), one of the first monographic studies undertaken on the question by Bartling & Friesike (2014), and the training materials developed by the FOSTER project (2019).

2. Several research lines

In this monographic issue of *Hipertext.net*, academics and practitioners were encouraged to send original research papers related to open access, open data, open peer review and new models of evaluation or studies of policies aimed at implementing the new model. The outcome of this call can be grouped in three main blocks:

a) Open science

De Filippo & D'Onofrio (2019) undertake an analysis of public policies currently being implemented in seven Latin Ameri-

can countries to support open science and, in parallel, they conduct a bibliometric study of scientific publications on this subject.

Placing their focus on the Digital Humanities, Rio Riande & Tóth-Czifra (2019) analyse how the processes of open science might be introduced in this area of activity. They centre their attention on the OpenMethods project and explore the possibilities it offers for the development of a more open Digital Humanities.

b) Research data

Marín-Arraiza et al. (2019) focus on the support given to data management by libraries and the authors analyse and assess lines of action taken by libraries in both Europe and Latin America.

Morales & Codina (2019) explore and evaluate the basic qualities of the web interface of data repositories, a fundamental infrastructure for ensuring the success of the shift in model. The analytical protocol proposed includes indicators of the user interface, data location, access and reuse, conservation, dissemination, evaluation and institutional commitment.

c) Open access

The main initiatives in the open dissemination of scientific production have been ushered in under Plan S, launched by European funding agencies to accelerate the transition to open access. Abadal et al. (2019) analyse the main tenets of this proposal, as well as the critical reactions it has generated.

Here, much can be learned from reading the contributions of both Spanish and Latin American authors who have analysed open science from a multitude of perspectives, taking into consideration not only the situation in Europe, which has been perhaps the driving force behind the movement, but also that in Latin America. Despite being a global phenomenon, the importance of studying and interpreting the different approaches taken in different parts of the world is more than apparent.

3. The future of open science

Thus, we are dealing with an approach that is still taking shape and about which little is known (at least, with any accuracy) among most researchers. In addition to these uncertainties – typical of the early stages of any shift in model – there are various challenges that currently threaten to undermine its growth and implementation. Below, we highlight four of these.

a) Movement led by elites

Although a number of pioneering proposals in open science

have been promoted by private researchers, in general, initiatives have not been generated from the base; rather, the push has come from research managers, above all from the EC's Directorate-General for Research. Yet, until these new principles have been assimilated and adopted by researchers, it will be difficult to advance much further. This is one of the tasks that needs to be taken on by research managers and funding agencies.

b) Different velocities

It needs to be borne in mind that each of the basic elements under the umbrella of open science (be it open access, open data, citizen science, etc.) is advancing at its own speed (open access evolving more rapidly, for instance, than open data). What's more, in some areas, basic structures have still to be defined, the case, for example, of evaluation of science, a field in which the indicators to be applied to open science have yet to be agreed.

c) Risk of monopoly

Mirowski argues that open science does not represent any kind of revolution seeing it simply as a new expression of neoliberalism. In his article *The future(s) of open science* (Mirowski, 2018), he warns of the possible monopoly that might emerge within open science. The author argues that research service firms are behaving in a similar fashion to the way Facebook and Google have behaved in providing general internet services. That is, these firms are integrating the wide range of services that have existed until now (scientific databases, impact indexes, research data management, author profiles, journal management, etc.) into large research support platforms and in so doing are gaining market dominance and reducing competition. Clearly, this is one of the risks associated with the development of open science, but lessons can be learned from the internet services sector and it should be possible to propose measures that can go some way to preventing the creation of near-monopoly environments.

d) Inadequate support policies

In another article, Abadal & Anglada (2019) analyse the policy situation in Europe, while De Filippo (2019) does the same for Latin America. In both cases, however, it is clear that, to date, there have not yet been any global actions or political programs focused on open science (nor for that matter on open access or open data) that promote the development and adoption of these new practices among researchers.

In short, open science represents a far-reaching transformation in the way scientific research is undertaken, but it is a model that has yet to be fully defined, being based rather on the accumulation of separate elements and not on their full integration into a whole (the umbrella concept, described

above). Moreover, the challenges and uncertainties that have still to be faced are notable (especially, the poor degree of diffusion achieved among researchers, the risks associated with a monopoly of services, the paucity of support policies, etc.) and researchers will need time to assimilate the new model and to put it into practice before they can dispel these lingering doubts.

In spite of these challenges, it is to be hoped that in the medium term researchers will succeed in integrating all these elements in a global vision and that their widespread adoption will represent a veritable revolution in the way they conduct their research and generate scientific knowledge.

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