Description

Not everyone is aware of the movement in support of open science, a term coined in 2003 by an economist. Open science tries to make publicly funded academic research more widely available and accessible in its digital form to researchers in the scientific community. In its broadest use, open science policy extends this aim of open access publishing to those in the business/private sector and society at large, and to the notion of open data. There are certain policies in place for sharing and reusing academic research data. For effectively practicing open science, researchers need to get familiarized with all such policies. They also need to hone skills in certain areas.

Last July, the European Commission published an important open science report. It is based on the responses of 1,277 European-based researchers, to a survey carried out from March through May 2017. This report is informative and comprehensive. It mentions the key skills required by researchers, their background and training, as well as other factors for driving open science forward into reality.

Essential Skills

Researchers, librarians, and IT support personnel need to hone certain skills in order to adapt to the concept of open access publishing. These include supporting, developing, and managing research information systems and repositories, dealing with publishers and contracts, adopting new models for funding (e.g., crowdfunding), license/copyright counseling, bibliometrics, and reporting on research impact. Researchers must learn to navigate the changing publishing landscape and make correct decisions on where to submit and archive their work.

Data science management skills also play a central role in open science. The focus here is increasingly on big data, data analytics, and engineering of data. We need to keep in mind that some researchers have STEM (Science, Technology, Engineering, and Mathematics) degrees, while for others this is “add-on” learning. Researchers tend to struggle with handling big data sets and data mining. But both are increasingly valuable in open science, as is metadata creation. Properly annotating and documenting your data is also a good practice in itself, but obviously critical for open science platforms and open data.

Researchers should also develop skills in citizen science. This new concept represents a way of collecting data and doing collaborative research with non-scientists. To do this, researchers must know

how to engage citizens, and how to effectively communicate with these people and other stakeholders (e.g., NGOs and the mainstream media) outside the scientific community. Other skills here include being able to incorporate citizens into the research design and sampling methods, and also getting them involved in data analysis and interpretation.

Training

The above-mentioned skills should be made part of formal education systems. Most respondents are always keen on open science courses. But they are not well aware of the corresponding courses. The view reached is that research institutions should be mandated to offer skills training courses for practicing open science (including open data).

In this respect, one could imagine a fruitful role for online open science courses, especially if they are made available free of charge to researchers.

The format of such courses is a thorny issue and likely to be context-dependent. But one area of agreement is that researchers would rather develop some skills through actual practice than register for courses. This so-called “learning-by-doing” is necessary for honing certain skills (e.g., learning various aspects of science outreach, publishing, research integrity, teaching and student supervision, and effective networking and collaborations) required for practicing open science.

Other Factors?

Pushing open science practices cannot rest on the shoulders of researchers alone. There is a pressing need for more support from their home institutions. Specifically, the report calls for more support in the technical, legal, and professional aspects of implementing open science. Another key area is infrastructure support, especially for securely housing and curating the growing repositories of publications and their data. One way forward is by creating an open science cloud.

In addition, research institutes need to hire a professional workforce to support researchers practicing open science. Finally, to really propel open science forward, researchers need to be made aware of its value as a public good. This could be increased through the better publicizing of policy initiatives for open science. Another critical factor is offering incentives and rewards to researchers practicing open science. With these in place, more researchers will get on board and train their students in open science. This clearly implies that open science must carry weight in career advancement and evaluations by research funders and institutions.

The Big Picture

There is no shortage of major projects and initiatives for open science development. Obviously, researchers need to be made more aware of open science practices and policies. Policies vary across countries; however, policy-makers can help make open science a reality. By developing the core skill set described above, researchers can embrace, and not fear, open science and open data movements.

Do you tend to believe in open science? Have you published articles in open access journals? Please share your opinion by commenting in the section below.

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