Developing an EFI Open Science Policy for EFI

1   Background

At the 42nd meeting in Alghero (25 September 2018), the Board of EFI has recommended *that it would be beneficial for the EFI network if EFI could develop some competences in dealing with the matter of open science.*

In Stockholm (45th board meeting, May 2019), the Board further discussed this issue and decided that *EFI should develop a specific policy for Open Science, which will define principles and minimum requirements in relation to open access to scientific publications and research data. It was also agreed that this issue should be addressed during the 2019 EFI Annual Conference in Aberdeen to address three questions: (i) what is Open Science and who is promoting it; (ii) the issue of Open access to publications; (iii) examples from member organisations. An EFI working paper should be made available, and a survey about open science practices should be launched among member organisations.*

1. Open Science concept

Open Science represents a new approach to the scientific process based on cooperative work and new ways of diffusing knowledge by using digital technologies and new collaborative tools (European Commission, 2016). The rationale behind the Open Science movement is complex but one of its main arguments is: scientific knowledge funded from public money is a product of social collaboration and its ownership belongs to the community. From an economic point of view, scientific outputs generated by public research are a public good that everyone should be able to use at no cost. This may have several benefits: enable public debates about central questions (climate change, biodiversity, ecosystem services, health, ….) and in parallel promote innovation (bioeconomy) through direct access to the products of science (publications, data, codes, tools, methods….).

Open Science is frequently defined as an overarching approach that involves various elements aiming to remove the barriers for sharing outputs, resources, methods or tools, at any stage of the research process (Figure 1). As such, open access to publications, open research data, open source software, open collaboration, open peer review, open notebooks, open educational resources, open monographs, citizen science, or research crowdfunding, fall into the boundaries of Open Science. Nevertheless, the main focus is usually placed on two of these movements: **Open Access to scientific publications** and **Open Research Data** that are identified as central goals for promoting more open science.
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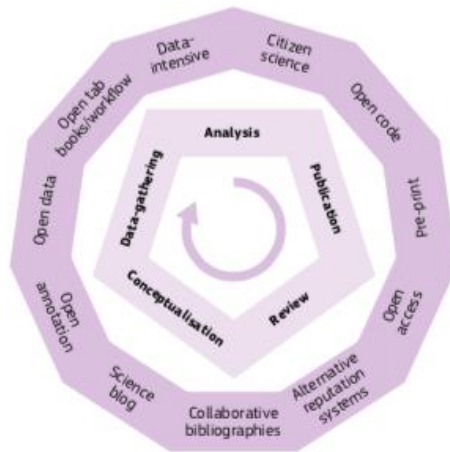
Figure 1: A general scheme for Open science (European Commission, 2016): the internal ring represents the usual research process from conceptualisation to publication; and the outer ones all the digital tools that might help making these steps more open, open access and open data being the most frequently addressed.

1.1 Open Access to scientific publications

Open Access to scientific publications refers to the practice of providing online access to scientific publications that is free of charge to the end-user and reusable. 'Scientific' refers to all academic disciplines.

The dominant type of scientific publication is the journal article. However, also open access to other types of scientific publications, (e.g., monographs, books, conference proceedings and "grey" documents) shall be considered.

There are two main routes to open access (European Commission, 2017):

1. **Self-archiving** / 'green' open access – the author, or a representative, archives (deposits) the published article or the final peer-reviewed manuscript in an online repository before, at the same time as, or after publication. Most publishers are currently accepting this scheme.
   In relation to green open access, PrePrint servers are available for un-published material and develop quite quickly (like bioRxiv in biology and life sciences).

2. **Open access publishing** / 'gold' open access - an article is immediately published in open access mode. In this model, the payment of publication costs is shifted away from subscribing readers.
   The most common business model is based on one-off payments by authors. These costs, often referred to as Article Processing Charges (APCs) are usually borne by the researcher's university or research institute or the agency funding the research. In other cases, the costs of open access publishing are covered by subsidies or other funding models. Gold open access transfer the cost of publishing from the reader to the author. This is mostly beneficial

to the scientific community and the public, but raises some ethical questions when it comes to the publishing market with the development of predatory publishers.

In this context, a number of public funding institutions in Europe, but also in China and international organizations, founded the S coAllition (https://www.coalition-s.org/), an initiative which promotes open access publishing. This initiative is based on the principle that no result of publicly funded research should remain behind a "paywall".

1.2   Open access to research data

Open access to research data refers to the need to make data (*sensu lato*, including digital data, maps, pictures, codes, large data bases…) accessible and reusable by a wide community. Where "research data" means information, in particular facts or numbers, collected to be examined and considered as a basis for reasoning, discussion, or calculation. Examples of research data include statistics, results of experiments, measurements, observations resulting from fieldwork, survey results, interview recordings and images. The focus is on research data that is available in digital form.

Users can normally access, mine, exploit, reproduce and disseminate openly accessible research data free of charge, under specific conditions indicated by the license of reuse attached to the data set. More importantly, such data set made available in a dedicated data repository, are granted a permanent identifier (DOI usually) and become a visible and citable production of the authors of the data set, with all rights associated to an open product (authorship is visible). This recognition can even be enhanced when a data paper is produced (i.e. a publication of a detailed description of the data set in a journal).

To be fully operational, this requires that the data follow the FAIR (findable, accessible, interoperable and reusable) principles, which define the format under which the data (and importantly the associated metadata) are made available. The FAIR principles are a guideline that almost every data management plan (whether open or not) should follow.

2 Open Science at EFI

2.1 Current situation

Until now, EFI has neither adopted an explicit statement about its contribution to Open Science policy nor has it been active in this area. Nevertheless, already at this point, the majority of publications published by EFI, such as What Science Can Tell Us and From Science to Policy -series, are openly available through the EFI website. However, EFI has not developed any specific requirements for repository characteristics or metadata requirements for science publication by EFI staff.

The approach mentioned above is also taken with the different EFI databases, maps and models. The majority is available for free use through EFI's website, although some require a potential user to register (free of charge). However, as above, no requirements were developed by EFI in terms of characteristics of repositories or metadata.

Finally, there is no established approach in relation to research data produced by EFI in cooperation with the member organizations.

2.2 Future plan

To increase the outreach and impact of its activities (research, policy support and communications) EFI is committed to actively engage in Open Science, by disseminating its research outcomes and results as widely as possible through open access and promote this approach throughout its network.

In this respect, EFI is planning to develop an **Open Science Policy** that will consider at least the following elements:
- open access to publications;
- open access to research data;
- promoting open science principles in activities funded through EFI.

The policy shall consider the following elements:
   a. **Open access to publications**:
       i. develop internal guidelines on open access to publications, including processes, timelines and deposits;

       ii. Type of publications to be included in the guidelines:
           o EFI published series publications, EFI published technical and research reports, and EFI published audio/video products, maps, models and databases;

- o peer-reviewed and non-peer reviewed scientific publications (co) authored by EFI staff;
- o publicly funded project related publications (incl. public deliverables) (co)authored by EFI staff.

b. **Open access to research data**:
  - i. develop internal guidelines on open access to research data, including processes, timelines, metadata and repositories;
    - o Type of research data to be included in the guidelines: any research data produced through publicly funded research projects.

c. **Promoting open science principles in activities funded through EFI**
  - i. for any activity (e.g., research, policy support, awareness raising), which is (co) funded by EFI, requirements in terms of open access to publications and data will be developed.

To develop the above-mentioned policy the following steps are proposed:
1. Launch a discussion with the EFI network on open science at the Annual Conference 2019 (September 2019);
2. Launch a survey with EFI member organizations on their experiences and institutional processes in relation to Open Science (November 2019);
3. Present results of the open science survey and main conclusions (February 2020) to the Board and the SAB;
4. Develop a draft EFI Open Science policy and submit it to EFI Board and SAB (April 2020)
5. Finalize the Policy and present it to the member organizations at the Annual Conference 2020 in Bonn (October 2020)
6. Start implementing the policy and related guidelines at institutional level (January 2021)

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