

Open Science: Definitions and Description

Open Science has generated its own specialist vocabulary. This document gives the main definitions and describes some of the operation of Open Science.

Open Science

- *Knowledge is open* if anyone is free to access, use, modify, and share it — subject, at most, to measures that preserve provenance and openness. (Open Knowledge Foundation: <http://opendefinition.org/od/>);
- *Open Science* is the conduct of science in such a way that others can collaborate and contribute, where research data, laboratory notes and other research processes are freely available, with licence terms that allow re-use, redistribution and reproduction of the research (FOSTER: <https://www.fosteropenscience.eu/foster-taxonomy/open-science-definition>);
- *Open Science* is commonly held to encompass: Open Source Software, Open Data, Open Access, Open Notebooks.

Open Research Data

- *Research data* can be defined simply as whatever is either produced in the research process or evidences research outputs such as articles;
- The *European Commission's* definition is: "information, in particular facts or numbers, collected to be examined and considered and as a basis for reasoning, discussion, or calculation" (*Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020* - http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf);
- *Examples* include: statistics, results of experiments, measurements, observations resulting from fieldwork, survey results, interview recordings, images;
- *Open data* are deposited in institutional or specialist repositories and licensed appropriately so that prospective users know clearly any limitations on re-use.

Open Access (OA)

Open Access generally refers to the outputs of research, such as journal articles, as distinct from research data.

Toll Access (TA)

- *Toll Access* is the traditional method of access to research outputs such as journal articles;
- This access can be by means of institutional or personal *subscription* to journals, or to aggregations of content, or by means of paying publishers for access to individual articles.

Open Access: Long Definition: Budapest Open Access Initiative (BOAI) 2002

The BOAI definition is seminal; it was agreed in 2002 and reaffirmed in 2012:

By "*open access*" to ... literature, we mean its free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other

than those inseparable from gaining access to the internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors control over the integrity of their work and the right to be properly acknowledged and cited. (<http://www.budapestopenaccessinitiative.org/boai-10-recommendations>)

Open Access: Peter Suber's Short Definition

Open Access literature is "digital, online, free of charge, and free of most copyright and licensing restrictions".¹

Gratis and Libre OA

- *Context*: intellectual property laws generally offer limited "fair dealing" or "fair use" exemptions;
- *Gratis OA* is free of charge to access but subject to the limits of fair dealing; it removes toll barriers but not permission barriers;
- *Libre OA* is both free of charge and free of at least some legal and licensing restrictions; it removes toll barriers and at least some permission barriers;
- *The BOAI definition* is libre.

Green and Gold OA

There are two routes to Open Access, Green and Gold.

Green OA

- *Green OA* is delivered through self-archiving: authors deposit manuscripts in institutional or disciplinary repositories;
- *Relies on* a recent but well established infrastructure of repositories;
- *Is easy and cheap*: each article only incurs a very small portion of the overhead costs of setting up and running repositories;
- Does not incur the *overheads of peer-review*;
- However, deposited articles may be, most often have been, *peer-reviewed for publication* in traditional Toll Access journals;
- *Is compatible* with subscription journal publishing: scholars can publish in TA journals and, through self-archiving, still make their articles OA;
- *Embargo period* is typically imposed by publishers, generally of between 6 and 12 months;
- Depends on *authors' obtaining rights* from publishers to deposit and make articles available;
- *Is hospitable to many other types of document*, notably pre-prints, theses, and research datasets.

Gold OA

- Offers articles that are *paid for by the authors* or their institutions or funders;

¹ Suber, P. *Open access*. MIT Press, 2012. Available at: https://mitpress.mit.edu/sites/default/files/9780262517638_Open_Access_PDF_Version.pdf

- These may be in either completely OA journals or in hybrid journals, containing both OA and TA articles;
- Articles are *peer-reviewed* for publication;
- Incurs much the *same costs* for the editorial and peer review process as TA journal publishing;
- Is always *immediate*, while Green OA is often subject to time embargoes imposed by subscription journal publishers;
- Provides access to the *published version* of an article, while Green OA generally provides access only to the author's final peer-reviewed manuscript, without the formatting or pagination of the published version;
- By its nature is confined to *post-prints*;
- Generally obtains rights and permissions direct from the *rights-holder* (usually the author);
- Gold OA is delivered through journals: these may be completely OA or hybrid, where some articles are OA and others toll access;
- Both Green and Gold OA are gratis. Green OA generally is only gratis; Gold OA may be libre.

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