You Say You Want a Revolution?
Open Access on the March

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What Is Open Access?

Open access refers to peer-reviewed, scholarly literature that is both free to access and free to use. The most widely adopted definition was formulated at the 2002 Budapest Open Access Initiative (BOAI)) on Feb. 12, 2002 (www.opensocietyfoundations.org/openaccess/read) and describes how the internet and new technologies could be used to advance the traditions of scientists to disseminate research outputs. BOAI explains:

> An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the internet. The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds. Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge.

A significant amount of scholarly material is already freely available throughout the internet; therefore it is this second aspect of the Open Access definition that sets apart Open Access content. Many publishers and other content providers may make their content freely-accessible to *read*, so it is this second aspect of the Open Access definition that sets apart Open Access content: it is only scholarly content that is *free to read* <u>and</u> *free to use, re-use, re-distribute, remix, and revise* that meets the standard criteria for Open Access.

BOAI goes on to break down this differentiation between free to access and free to use:

> By "open access" to [peer-reviewed research 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.

Traditional copyright licenses are designed to maximize restrictions on usage. In contrast, Creative Commons (CC) licenses take the opposite approach and delineate what types of rights users are offered. Creators of all types of content—scholarly and otherwise—may use CC licenses to grant users specific types of reuse and remix rights and to specify other licensing nuances. The Creative Commons Attribution license, referred to as "CC-BY," has become the norm within the open access field; this license grants users full rights for any sort of usage and reuse such as text mining, translations, and reprints as long as the original creator is properly attributed and cited.

Open Access By the Numbers

By the end of 2012:

"Green" Open Access:	More than 3,300 Open Access registered Open Access Repositories[1]
"Gold Open Access"	More than 8,500 Open Access journals[2] More than 1,250 Open Access books from 35 publishers[3]
Open Access Policies	More than 160 Institutional Mandates and 50+ Funder Mandates

[1] Registry of Open Access Repositories (ROAR): http://roar.eprints.org/
[2] Directory of Open Access Journals (DOAJ): http://www.doaj.org
[3] Directory of Open Access Books (DOAB): http://www.doabooks.org/
[4] ROARMAP: Registry of Open Access Repositories Mandating Archiving Policies: http://roarmap.eprints.org/

The open access literature generally focuses on implementing open access in two ways:

1. The "gold" open access route. Authors publish articles in open access journals, i.e., peer-reviewed, scholarly journals, which make their materials freely and openly accessible.

2. The "green" route. Authors publish an article in any sort of traditional peer-reviewed journal but retain the right to deposit a copy of the preprint in an open access repository.

The gold and the green routes have become the two accepted routes for achieving open access, although the details surrounding implementation, best practices, and sustainable business models are still evolving.

Any author can choose to publish in an open access journal or deposit an article into an open access repository if he/she has permission according to the copyright transfer agreement signed at the time of publication acceptance. Even so, uptake of open access has been most successful when it is tied to open access policies—in conjunction with either research funders' policies, or, to a lesser extent, institutional policies which require deposit of manuscripts into repositories.

Why Open Access?

While many arguments can be made in favour of open access, most are tied to the idea that access to knowledge is for the good of society. The following present some key arguments:

The public should have access to publicly funded research. Organizations such as the U.S.-based Alliance for Taxpayer Access (ATA; http://taxpayeraccess.org) use this argument. The ATA website argues: "American taxpayers are entitled to the research they've paid for. The Alliance for Taxpayer Access works to ensure that the published results of research funded with public dollars are made available to the American public, for free, online, as soon as possible."

Most researchers only have access to a small subset of all published research results through personal, organizational, or library-licensed journal subscriptions.

Open access accelerates the research and development cycle. The European Commission notes in its Policy Initiatives: Open Access (http://ec.europa.eu/research/sciencesociety/index.cfm?fuseaction=public.topic&id=1294&lang=1), "As all research and innovation builds on earlier achievements, an efficient system for broad dissemination of and access to research publications and raw data can accelerate scientific progress." Thus, the results of research initiatives—disseminated through formal publications but also via datasets collected as part of research efforts—have the potential "to spark innovation and accelerate private sector development, advance science, lead to medical breakthroughs, and inform public policy."

Access to knowledge is a human right. Article 27 of the Universal Declaration of Human Rights states: "Everyone has the right to … share in scientific advancements and its benefits" (www.un.org/en/documents/udhr/index.shtml). This connection between open access and human rights is of particular importance within the United Nations context. On May 14, 2012, Ms. Farida Shaheed, special rapporteur in the field of cultural rights, presented her report, "The Right to Enjoy the Benefits of Scientific Progress and Its Applications," to the Twentieth Session of the Human Rights Council, In this report, the Shaheed recommends, in part:

(c) States ensure freedom of access to the Internet, promote open access to scientific knowledge and information on the Internet, and take measures to enhance access to computers and Internet

connectivity, including by appropriate Internet governance that supports the right of everyone to have access to and use of information and communication technologies in self-determined and empowering ways;

(d) Universities, research and funding institutions adopt mandatory open-access policies for journals and repositories of research

Advances in technology support innovation—if research and data are openly licensed. The internet and advances in technology have opened up new avenues for dissemination, peer review, collaboration between scientists, searching, and browsing. High-speed computing allows scientists to analyze data and scholarship through computational techniques such as text mining—methods that are restricted by traditional copyright but could lead to scientific breakthroughs by analyzing massive datasets compiled across many different research projects. Additional iterations of analysis on the same data, building upon existing research or combining or comparing data from multiple projects to examine it in new ways, increase the potential impact of research funding.

Increased visibility for authors. As Cameron Neylon, advocacy director of PLOS (Public Library of Science), stressed during his Berlin 10 presentation, "It's not about where you publish, but who you reach." ("Research Assessment to Support Research Impact," Berlin 10 Presentation, Nov. 7, 2012; http://berlin10.org/programme.html). If authors aim to reach as many readers as possible, it helps to have articles freely available through as many channels as possible—not locked up behind paywalls. Plus, the open access infrastructure—mainly repositories and open access journals running article-level metrics—can provide deeper metrics for authors about who reads their articles, where their articles are downloaded and how many times, and other types of analytical data referred to as "altmetrics." Within an open ecosystem, this type of statistical data can be viewed by authors, research funding agencies, and institutions.

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