

Open access journal

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Open access (OA) journals are scholarly journals that are available online to the reader "without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself."^[1] They remove price barriers (e.g. subscription, licensing fees, pay-per-view fees) and most permission barriers (e.g. copyright and licensing restrictions).^[1] While open access journals are freely available to the reader, there are still costs associated with the publication and production of such journals. Some are subsidized, and some require payment on behalf of the author.^[1]

Some open access journals are subsidized and are financed by an academic institution, learned society or a government information center. Others are financed by payment of article processing charges by submitting authors, money typically made available to researchers by their institution or funding agency.^[2] Sometimes these two are referred to respectively as "gold" and "platinum" models to emphasize their distinction,^{[3][4]} although other times "gold" OA is used to refer to both paid and unpaid OA.^[5]

In 2009, there were approximately 4,800 active open access journals, publishing around 190,000 articles.^[6] As of October 2015, this had increased to over 10,000 open access journals listed in the Directory of Open Access Journals.^[7] A study of random journals from the citations indexes AHSCI, SCI and SSCI in 2013 came to the result that 88% of the journals were closed access and 12% were open access.^[8]

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Openness

There are several varieties of open access journals, including full open access journals with all content open access; hybrid open access journals where only some of the content is open access;^[9] and delayed open access journals where the content is made open access after a delay (e.g. 12 or 24 months). Open access journals are one of the two general methods for providing open access. The other one

(sometimes called the "green road to open access," as opposed to the "gold road" above) is self-archiving in a repository.^[10] The publisher of an open access journal is known as an "open access publisher", and the process, "open access publishing".

History

Many journals have been subsidized ever since the beginnings of scientific journals. It is common for those countries with developing higher educational and research facilities to subsidize the publication of the nation's scientific and academic researchers, and even to provide for others to publish in such journals, to build up the prestige of these journals and their visibility. Such subsidies have sometimes been partial, to reduce the subscription price, or total, for those readers in the respective countries, but are now often universal.

The first digital-only, free journals were published on the Internet in the late 1980s and early 1990s. These journals typically used pre-existing infrastructure (such as e-mail or newsgroups) and volunteer labor and were developed without any intent to generate profit. Examples include *Bryn Mawr Classical Review*, *Postmodern Culture*, *Psycoloquy*, and *The Public-Access Computer Systems Review*.^[11]

One of the very first^[12] online journals, *GeoLogic*, *Terra NOVA*,^[13] was published by Paul Browning and started in 1989. It was not a discrete journal but an electronic section of *TerraNova*. The journal ceased to be open access in 1997 due to a change in the policy of the editors (EUG) and publishing house (Blackwell).

Full-blown scientific journals followed. In 1998, one of the first open access journals in medicine was created, the *Journal of Medical Internet Research*,^[14] publishing its first issue in 1999. One of the more unusual models is utilized by the *Journal of Surgical Radiology*, which uses the net profits from external revenue to provide compensation to the editors for their continuing efforts.^[15]

In the biological and geological sciences, paleontology came into the forefront in 1998 with *Palaeontologia electronica*,^[16] Their first issue received 100,000 hits from an estimated 3,000 readers, comparable to the subscription numbers of their peer print journals.^[17] One challenge to digital-only biological journals was the lack of protection afforded by the International Code of Zoological Nomenclature to scientific names published in formats other than paper, but this was overcome by revisions to the Code in 1999 (effective January 1, 2000).

The number of open access journals increased by an estimated 500% during the 2000-2009 decade. Also, the average number of articles that were published per open access journal per year increased from approximately 20 to 40 during the same period, resulting in that the number of open access articles increased by 900% during that decade.^[6]

Financing open access journals

Open access journals divide into those that charge publication fees and those that do not.

Fee-based open access journals

Fee-based open access journals require payment on behalf of the author. The money might come from the author but more often comes from the author's research grant or employer. In cases of economic hardship, many journals will waive all or part of the fee. (This includes instances where the authors come from a less developed economy). Journals charging publication fees normally take various steps

to ensure that editors conducting peer review do not know whether authors have requested, or been granted, fee waivers, or to ensure that every paper is approved by an independent editor with no financial stake in the journal. While the payments are often incurred *per article published* (e.g. BMC journals or PLOS ONE), there are some journals that apply them *per manuscript submitted* (e.g. Atmospheric Chemistry and Physics) or *per author* (PeerJ). A 2013 study found that only 28% of journals in the Directory of Open Access Journals (DOAJ) required payment by the authors, however, this figure was higher in journals with a scientific or medical focus (43% and 47% respectively), and lowest in journals publishing in the arts and humanities (0% and 4% respectively).^[18]

No-fee open access journals

No-fee open access journals use a variety of business models. As summarized by Peter Suber:^[19] "Some no-fee OA journals have direct or indirect subsidies from institutions like universities, laboratories, research centers, libraries, hospitals, museums, learned societies, foundations, or government agencies. Some have revenue from a separate line of non-OA publications. Some have revenue from advertising, auxiliary services, membership dues, endowments, reprints, or a print or premium edition. Some rely, more than other journals, on volunteerism. Some undoubtedly use a combination of these means".

Debate

Advantages and disadvantages of open access journals are the subjects of much discussion amongst scholars and publishers. Reactions of existing publishers to open access journal publishing have ranged from moving with enthusiasm to a new open access business model, to experiments with providing as much free or open access as possible, to active lobbying against open access proposals. There are many publishers that started up as open access publishers, such as BioMed Central and Public Library of Science.

An obvious advantages of open access journals is the free access to scientific papers regardless of affiliation with a subscribing library and improved access for the general public; this is especially true in developing countries. Lower costs for research in academia and industry has been claimed in the Budapest Open Access Initiative,^[20] although others have argued that OA may rise the total cost of publication.^[21]

The main argument against open access journals is the possible damage to the peer review system, diminishing the overall quality of scientific journal publishing. For example, in 2009, a hoax paper generated by a computer program was accepted for publication by a major publisher under the author-pays-for-publication model.^[22] In a similar incident, a staff writer for Science magazine and popular science publications targeted the open access system in 2013 by submitting to some such journals a deeply flawed paper on the purported effect of a lichen constituent. About 60% of those journals, including Journals published by the major academic publishers Sage Publications and Elsevier the Journal of Natural Pharmaceuticals, accepted the faked medical paper, although journals published by notable Open Access Publishers, Public Library of Science, BioMedCentral, and Hindawi Publishing Corporation rejected the fake article. This study did not also submit the fake article journals published under a subscription model.^[23] As a result, this experiment was criticised for being not peer-reviewed itself and for having a flawed methodology and lack of a control group.^{[24][25]} Many newer open access journals also lack the reputation of their subscription counterparts, which have been in business for decades. This effect has been diminishing though since 2001, reflecting the emergence of high quality professional open access publishers such as PLOS and BioMedCentral.^[26]

Opponents of the open access model continue to assert that the pay-for-access model is necessary to ensure that the publishers are adequately compensated for their work. Scholarly journal publishers that support pay-for-access claim that the "gatekeeper" role they play, maintaining a scholarly reputation, arranging for peer review, and editing and indexing articles, require economic resources that are not supplied under an open access model. Opponents claim that open access is not necessary to ensure fair access for developing nations; differential pricing or financial aid from developed countries or institutions can make access to proprietary journals affordable. Some critics also point out the lack of funding for author fees.^[27]

Tests of the open access citation advantage

There have been claims of higher citation rates for open access authors.^[28] However, a recent study concluded that overall citation rates for a time period of 2 years (2010/11) were 30% higher for subscription journals. After controlling for discipline, age of the journal and the location of the publisher, the differences largely disappeared in most subcategories except for journals that had been launched prior to 1996.^[29]

Two major studies^{[30][31]} dispute the claim that open access articles lead to more citations. Using a randomized controlled trial of open access publishing involving 36 participating journals in the sciences, social sciences, and humanities, researchers from Cornell University report on the effects of free access on article downloads and citations. Articles placed in the open access condition (n=712) received significantly more downloads and reached a broader audience within the first year, yet were cited no more frequently, nor earlier, than subscription-access control articles (n=2533) within 3 years.

There are many other studies, however, both major and minor, that report that open access does lead to significantly more citations. For example, a 2010 study – on a much larger and broader sample (27,197 articles in 1,984 journals) than the Cornell University study – used institutionally mandated open access instead of randomized open access to control for any bias on the part of authors toward self-selectively making their better (hence more citeable) articles open access. The result was a replication of the repeatedly reported open access citation advantage, with the advantage being equal in size and significance whether the open access was self-selected or mandated.^[32]

Current problems and projects

Identifying open access journals

There are several major directories of open access journals, most notably Directory of Open Access Journals (DOAJ). Each has its special standards for what journals are included. A list of possibly predatory open access publishing also exists.

Articles in the major open access journals are included in the standard bibliographic databases for their subject, such as PubMed. Those established long enough to have an impact factor, and otherwise qualified, are in Web of Science and Scopus. *DOAJ* includes indexing for the individual articles in some but not all of the many journals it includes.

New initiatives

Pioneers in open access publishing in the biomedical domain were journals like the BMJ, Journal of Medical Internet Research, and Medscape, who were created or made their content freely accessible in the late 90s.^[33] BioMed Central, a for-profit publisher with now dozens of open-access journals, published its first article in the year 2000.^[34] The Public Library of Science launched its first open

access journal, PLOS Biology in 2003, with PLOS Medicine following in 2004, and PLOS ONE in 2006.^[34]

Technology

In 1998, several universities founded the Public Knowledge Project to foster open access, and developed the open-source journal publishing system Open Journal Systems, among other scholarly software projects. As of 2010, it was being used by approximately 5,000 journals worldwide.^[35]

See also

- Copyright policies of academic publishers
- Creative Commons
- FUTON bias
- List of open access journals (Category)
- Mega journal
- Open access mandate
- Open Access Scholarly Publishers Association
- Open content
- Open data
- Predatory open access publishing
- Public domain
- Public Knowledge
- Software platforms to run open access journals

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Further reading

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