



Open access to scholarly communication: Issues and challenges

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Abstract

Open access (OA) means unrestricted online access to peer-reviewed scholarly research. Open access is primarily intended for scholarly journal articles, but is also provided for a growing number of theses, book chapters, and scholarly monographs. The advent of Open Access (OA) has changed the landscape of accessing digital information globally. OA offers valuable free, full-text, online resources for all health-related professionals, regardless of the practice setting. Because much scholarly information may now be accessed without charge, nurses worldwide can reach a higher level of information competency a prime requirement for evidence-based practice. This article provides a brief account of the OA movement, introduces new terminology, discusses various publishing models, and elucidates issues surrounding the choice to publish in OA journals. Advantages and disadvantages of open access.

Keywords: open access (OA), online resources

Introduction

The two ways authors can provide open access are (1) by self-archiving their journal articles in an open access repository, also known as 'green' open access, or (2) by publishing in an open access journal, known as 'gold' open access. With green open access authors publish in any journal and then self-archive a version of the article for *gratis* public use in their institutional repository^[10], in a central repository (such as Pub Med Central), or on some other open access website. With gold open access, authors publish in open access journals, which provide immediate open access to all of their articles, usually on the publisher's website. Hybrid open access journals are subscription journals that provide gold open access only for those individual articles for which their authors (or their author's institution or funder) pay an open access publishing fee. Widespread public access to the World Wide Web in the late 1990s and early 2000s fueled the open access movement, and prompted both the green open access self-archiving of non-open access journal articles and the creation of gold open access journals. Conventional non-open access journals cover publishing costs through access tolls such as subscriptions, site licenses or pay-per-view. Some non-open access journals provide open access after an embargo period of 6–12 months or longer (see delayed open access journals). Active debate over the economics and reliability of various ways of providing open access continues among researchers, academics, librarians, university administrators, funding agencies, government officials, commercial publishers, editorial staff and society publishers.

Definitions

The Budapest statement defined open access as follows: There are many degrees and kinds of wider and easier access to this literature. By 'open access' to this 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.

The Bethesda and Berlin statements add that for a work to be open access, users must be able to "copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship."

Open Access Movement

During the last decade the Open Access (OA) movement has taken hold, starting in the basic sciences followed by the health sciences. Open Access provides people ability to access information electronically by searching and linking to full-text, peer-reviewed materials without a fee in order to read or download, copy and distribute, or print the information (Bethesda Statement, 2003). More succinctly, "OA removes price barriers such as subscriptions, licensing fees, pay-per-view fees, and permission barriers such as copyright and licensing restrictions" (Suber, 2007, para. 1). If materials are published via the OA model, consumers can access them without having to pay subscription fees and can distribute the materials freely without needing to seek permission from copyright holders.

Concept of Open Access

What does Open Access mean?

Open Access provides the means to maximize the visibility,

and thus the uptake and use, of research outputs. Open Access is the immediate, online, free availability of research outputs without the severe restrictions on use commonly imposed by publisher copyright agreements. It concerns the outputs that scholars normally give away free to be published – peer-reviewed journal articles, conference papers and datasets of various kinds.

There are two main roads to provide Open Access:

- Green road to Open Access through repositories and/or self-archiving
- Golden road to Open Access with Open Access publications.

Gold open access: Open access journal

One option for authors who wish to make their work openly accessible is to publish in an open access journal ("gold open access"). There are many business models for open access journals ^[1]. Open access can be provided by traditional publishers, who may publish open access as well as subscription-based journals, or open access publishers such as Public Library of Science (PLOS), who publish only open access journals. An open access journal may or may not charge a publishing fee; open access publishing does not necessarily mean that the author has to pay. Traditionally, many academic journals levied page charges, long before open access became a possibility. When open access journals do charge processing fees, it is the author's employer or research funder who typically pays the fee, not the individual author, and many journals will waive the fee in cases of financial hardship, or for authors in less-developed countries. Some no-fee journals have institutional subsidies. Examples of open access publishers ^[11] are Bio Med Central and the Public Library of Science.

Self-archiving: green open access

Self-archiving, also known as green open access, refers to the practice of depositing articles in an institutional repository or a subject repository. Green open access journal publishers endorse immediate open access self-archiving by their authors. Open access self-archiving was first formally proposed in 1994 by Stevan Harnad in his "*Subversive Proposal*". However, self-archiving was already being done by computer scientists in their local FTP archives in the 1980s, later harvested into Cite Seer. What is deposited can be either a preprint, or the peer-reviewed post print – either the author's refereed, revised final draft or the publisher's version of record. To find out if a publisher or journal has given a green light to author self-archiving, the author can check the Publisher Copyright Policies and Self-Archiving list on the SHERPA RoMEO web site. To find out by journal, the author can check the E-Prints Romeo site, which is derived from the SHERPA/RoMEO dataset. The E-Prints site itself also provides a FAQ on self-archiving. Extensive details and links can also be found in the Open Access Archivangelism blog and the E-prints Open Access site.

Open Access Issues

As with any new movement, there are advantages and disadvantages to consider. Four major issues related to OA include: peer review, author-related publication fees,

copyright and licensing, and the related practice of author self-archiving. Unfortunately, even large universities have seen significant cuts in library budgets due to recent economic challenges (White & Creaser, 2007). The economic downturn has resulted in publishers increasing journal prices (Van Orsdel & Born, 2009). Given these conditions, information access is, and will continue to be, a global problem. The guiding characteristic of Open Access (OA) material is that it may be accessed via the web without charge. This offers practitioners and educators worldwide a higher level of information currency and competency.

Open Access provides people ability to access information electronically by searching and linking to full-text, peer-reviewed materials without a fee in order to read or download copy and distribute, or print the information. Scientists have long recognized that the impact of their research is modulated by limited access to their published work. With the advent of the Internet came the realization that research could be equally available to all, not just to the well financed. In December 2001 human rights proponents gathered for the Open Society Institute meeting. During the meetings a suggestion was made to garner global support and create open information access within the scientific community (Budapest Open Access Initiative, 2001). A draft was created during that meeting, and formalized two months later, in February 2002 as the Budapest Initiative. The United States (US)- and the United Kingdom (UK)-based biomedical community convened in April 2003 and drafted a set of publishing principles guiding scientific dissemination. These principles were finalized and published in June 2003 as the Bethesda Statement. Four months later, in October 2003, the European scientific community responded with the Berlin Declaration, calling for support by European researchers to engage in Open Access.

Author-Related Publication Fees

Although nursing journals have generally not required article processing charges to publish in the traditional, subscription-based-journal model, in other disciplines it is common practice. Using the OA model, fees are essentially eliminated for the end user and are borne on the front end. These fees are called publication fees and can range from \$600 to \$1500. Publication fee requirements for OA journals can usually be found in the "Instructions for Authors." "Happily, not all OA journals charge author-related publication fees. Less than half of the OA journals (47%) required publication fees (Kaufman-Wills Group, 2005). Shifting the cost of publication from the end user to the author should not be of concern however, since departments, schools, or universities will often subsidize or reimburse fees. Recent research in the UK, revealed that grants covered 41% of processing charges, while departmental indirect costs covered 15%, central administration covered 13%, and only 18% came from author's own resources (SQW Consulting, 2008). In addition, various publishers have policies in place to reduce or waive charges if authors cannot pay the publication processing charges.

Peer Review Policies

Publications in the Open Access model still require peer review and/or quality control policies. Many use the traditional pre-publication, blind, peer review model, while

the most recent OA resource uses an open post-publication peer review system, in which peers can comment/review the article in an open-forum format online, and in which consumers can read the comments, post their own comments regarding the quality of the work, and/or respond to the comments of others.

Licensing and Copyright Laws

Open Access does not imply there is no copyright attached to the open document; rather, in most cases the Creative Commons Attribution License (CCAL) model is used. Founded in 2001, the CCAL states users are free to share, adapt, or use the work as long as they give attribution in the manner specified by the author or licensor (Creative Commons Attribution License, 2010). In other words, use freely but do not plagiarize! The Attribution License is one of six codes under the Creative Commons License.

Author Archiving Policies

Parallel with the OA movement, the issue of author archiving has also surfaced. When an author publishes in an OA journal, their article is automatically uploaded into any number of global OA repositories. However, what many authors are not aware of is that even if an author publishes in a journal that uses the traditional, subscription-based publishing model, or U.S. Fair Use guidelines, they may be able to self-archive the article in an institutional repository, and/or on a personal webpage, thus providing

Publishing Models

The presence of these mixed models indicates that publishers acknowledge the OA movement and are finding ways to be responsive, while retaining traditional avenues for generating revenue. Although the Open Access publishing model has taken a firm hold, three other publishing models continue to exist. One is the historical, subscription-based system; two other models mix the concepts, and provide OA “options.” The mixed models include the hybrid, and the delayed-open-access model. The hybrid model is typically a subscription-based journal that offers authors the opportunity to turn their article into an Open Access article by paying an article processing charge (APC) prior to publishing it. This model makes it possible to have subscription-based articles and Open Access articles in the same digital journal issue. On the other hand, the delayed access model starts out as a subscription-based publication, but after a wait embargo of typically 6 months to 12 months, the article is released and is identified on the publisher’s website as OA. Publications from the delayed access model can also be automatically deposited in a central, open-access repository after the wait embargo is complete. The presence of these mixed models indicates that publishers acknowledge the OA movement and are finding ways to be responsive, while retaining traditional avenues for generating revenue. Authors and potential authors must be aware of these different models in order to design publishing activities to align with their philosophical values of knowledge accessibility.

Considering the emphasis on achieving evidence-based practice, the global nursing community must...decide how best to participate to maximize the OA impact on the science of

nursing. Most science-based disciplines have used the OA model for several years, but participation among healthcare publishers and authors remains minimal. Zuber (2008) analyzed OA library holdings from 83 U.S. institutions. He reported that the discipline with the highest percentage of Open Access journal holdings was engineering with 36%, followed by business at 15%, and physical science at 13%. Medicine was near the bottom at 3%. The OA movement is now firmly grounded in the digital landscape. Considering the emphasis on achieving evidence-based practice, the global nursing community must increase its awareness of the OA phenomenon, acknowledge the potential it has for increasing the dissemination of nursing knowledge globally, and decide how best to participate to maximize the OA impact on the science of nursing.

Business models

Open Access means free online access to scientific and scholarly information. This inevitably leads to the shifting of the financial burden from the end-users of scholarly information, such as readers and libraries, to the authors, libraries and research organisations who make the information available, and research funding bodies. After all, it still costs money to publish scholarly information and make it available online. However, in many cases, the article processing charges (APCs) are covered by dedicated funds administered by universities and research institutions. In addition, almost 70% of OA journals do not charge APCs at all.

There is a list of OA journal business models and a list of OA book business models available.

- Author-Pays model, author pays publishing fee
- Research funder subsidies, funding organisations pay author fees
- Institutional membership, author fees are paid as a lump sum
- Publishing support funds, institutions reserve funds for author fees
- Hybrid business model, journals mix subscription based and author pays content
- Community-fee model, societies fund journals by both subscriptions and membership fees
- Institutional subsidies, institutions support their own university presses
- Consortium business model: the SCOAP3 initiative
- Other financing options.
- Copyright issues
- Just like with traditional reuse of material for education and research, copyright issues must be considered when implementing Open Access strategies or operating Open Access repositories and Open Access journals.

Publisher copyright policies & self-archiving

By now, most publishers allow their authors to self-archive their articles in institutional repositories or on their own personal websites. However, conditions and restrictions are frequently imposed. For example, authors are often obliged to observe an embargo period between the publication date and the date on which the document is made openly accessible online. The SHERPA/RoMEO Listings provide information on the self-archiving policies of individual publishers. Many

of those authors whose publishers do not yet allow self-archiving supplement their standard publishing agreements with contract addenda which enable them to provide open access to their work in parallel with publication.

Open content licenses

In order to give authors and users of open-access contributions legal certainty, such contributions should be distributed only under an open-content license. Repository operators must pay particular attention to the liability risks involved in the operation of a repository. Moreover, data-protection aspects play a very important role when it comes to open access to research data.

Creative Commons

Creative Commons is a non-profit organization devoted to expanding the range of creative works available for others to build upon legally and to share. The organization has released several copyright licenses known as Creative Commons licenses. With a Creative Commons license, you keep your copyright but allow people to copy and distribute your work provided they give you credit — and only on the conditions you specify yourself.

There are four primary mechanisms that can be used to enable Open Access:

- **Open Access Publishing:** Authors can choose to publish their research articles in a growing number of journals that meet the full definition of Open Access. Articles are free to all interested readers, and the publishers place no financial or copyright barriers between the readers and the article. Open Access publishing is the fastest growing segment of the scholarly publishing market, and journal options are now available for nearly every area of research. A comprehensive list of Open Access journals is provided by the Directory of Open Access Journals (DOAJ).
- **Digital Repositories:** Authors can choose to deposit their research articles in digital archives (often called Digital Repositories or Institutional Repositories) which conform to the standards of the Open Archives Initiative (OAI), and enable readers to freely access and fully reuse the article text. This allows any author to make their work available under Open Access conditions regardless of the journal or the article are published in. There are more than 2,000 open Digital Repositories available for authors to use around the world, and a comprehensive listing of is available through the Directory of Open Access Repositories (Open DOAR).
- **Effectively Managed Author Rights:** As the authors of a research paper, you have ability to ensure that your article can be accessed and used by the widest possible audience. Tools such as Addenda to traditional Copyright Transfer Forms are readily available, proven resources that can help you understand open licenses, and to publish your articles under full Open Access conditions. Visit the SPARC Author Rights page to learn more.

Open Access Benefits

There is a growing body of evidence indicating clear benefits of publishing in OA journals. This is the case both when developing and developed countries use OA resources and

when institutions archive OA materials. Being aware of all research done on a certain topic will impact networking and increase connectedness at a global scale.

Author-Related Benefits of Open Access

Publishing in OA venues results in wider dissemination and quicker citing by other authors, thereby increasing the impact factor (Antelman, 2004; Harnad *et al.*, 2008^[4]; Lawrence, 2001; McVeigh, 2004). Of note, Hajjem, Harnad, and Gingras (2005) found that articles from OA journals were cited anywhere from 36% to 176% more frequently than articles in non-OA journals. Eysenbach (2006) also documented that OA articles had both increased citation rates and were cited earlier in time. Additionally, Wagner's (2010) findings supported the hypothesis of citation advantage. Wagner found 39 studies showing a citation advantage for OA publications, and only 7 studies that concluded there was no advantage over traditional publication. Citation frequency plays an important role in the calculation of the Institute for Scientific Information (ISI) Web of Science impact factor.

Advantages of Open Access to data

Like everything in life, open access has its good and bad sides. As part of open access week, we'll give a brief rundown of some of the positive and negative aspects of publishing open access.

- *Free for all:* The core idea of open access is the basis of its key advantage—articles are freely available for anyone who wishes to read them. For readers and libraries, the benefits of not having to pay for an individual article or journal subscription are obvious. And for those that believe that publically funded research should be freely available to all, mandates to make the outcomes of these funding programs free to the public are now becoming the norm.
- *Increased readership:* For authors, publishing open access rather than behind a pay wall can help open up their research to a wider audience. In an era where the number of articles being published is skyrocketing, open access can help an article to be more discoverable online. And ultimately, an increased number of readers can convert into an increased number of citations for the author.
- *Access for researchers in developing countries:* The lack of access to subscription-based journals is a commonly cited problem for researchers in low-income countries. Open access can help provide scientists in such countries with the opportunity to participate in the international research community, with some open access journals even offering discounted or waived publication fees for papers from low-income countries.
- Open Access makes knowledge available to all, without the barrier of affordability and without restrictions on using it to inform and develop related areas of research.
- Open Access enables unrestricted use of knowledge for teaching, conference presentations and lectures.
- Open Access offers authors enhanced visibility and offer the potential for greater usage of their work and higher impact.
- Open Access brings new audiences to scholarly content, helping expand readership.

- Open access reduces the pressure on library budgets for purchasing books and journals and enables librarians to devote more time to connecting their users with high quality content.

Disadvantage

- *Publication fees:* While the end user doesn't have to pay to read an open access article, someone has to pay for the costs of publication. Often, it is the responsibility of the author—perhaps through their employer or a research grant—to cover these costs. In times of austerity and funding cuts, this can discourage researchers from going open access.
- *Lack of quality control:* While not a problem for reputable publishers, some argue that open access models incentivize journals to publish more articles. Journals have to cover their costs and when a large portion of their revenue comes from publication fees, they may be encouraged to publish more articles, with a negative impact on overall quality. This debate was recently reignited with the acceptance of a spoof article by a *Science* editor in many open access journals.
- *Sustainability:* Some argue that traditional paid access models ensure publishers are adequately compensated for the substantial role they play. Whether open access models can sustainably support the research publication infrastructure in the long term remains to be seen.

Students

Students have an especially large stake in the debate about access to research. Expanding access will pay great dividends to students in a variety of ways:

A complete education: students in any discipline need access to the latest research to have a complete education in their field of study and hit the ground running after graduation. Limited access to research makes students settle for the information that is available rather than that which is most relevant. Open Access can ensure students get the best possible education and are not artificially limited by the selection of scholarly journals their campuses are able to provide.

If your professors can't read it, they can't teach it: when professors can't access the most recent research, they are deprived of the opportunity to bring that material into the classroom. With science advancing at an ever-increasing pace, it's crucial that professors have access to cutting-edge research, so students' education isn't outdated before they even finish a course. This problem was recently highlighted by Dr. Gary Ward in a press conference for the Federal Research Public Access Act:

In my role as educator, I often find myself teaching my graduate and medical students what I have access to rather than what they most need to know. Just as one example, in a recent lecture I was preparing for our medical students... I was only able to access about two thirds of the articles that I needed in order to make sure that I was providing these budding young doctors with everything they needed to know about the subject. I can tell you that's extremely frustrating to me as an educator and it's clearly not in the best interests of my students. This problem isn't unique to the University of

Vermont. Every academic institution faces this problem — from the best-funded private institutions down to the small liberal arts colleges and community colleges. It's just a question of degree.

Research for papers: it's a familiar story; you're writing a paper for class and you need to cite articles from peer-reviewed journals. Eventually, you find an article that looks good — maybe via a search engine, a footnote from another source, or a reference in an index. You search the Web for the full text, but you can't get past the abstract. You look on your library's Web site but they don't have a subscription. You're stuck. Maybe that article would have been a major source for your work — you'll never know. You don't have access. Open Access changes that. No more worrying about whether you're on the campus network or if your library has a subscription. If you're online, you have access, period — anywhere in the world.

The current system puts students from smaller schools at a disadvantage: due to the staggering price of journal subscriptions, not even the largest, most well-funded institutions can provide their students with the complete scholarly record. Students at smaller or less well-funded colleges and universities must make do with their fraction of access their library can afford. Students at community colleges, who are a significant portion of students in higher education, suffer even more severely.

Researching beyond the degree: many students, especially on the graduate level, pursue degrees in order to become qualified researchers. Whether they become professors, doctors, lawyers, or entrepreneurs, they will continuously rely on access to research in order to make an impact in their respective field. Yet, students' access to journals expires along with their library card at graduation. If they take a job at another university, that institution may have a very different level of access than what they need, and if they take a job outside of the university setting, they will no longer have the library to provide them any access to journals.

Researchers

Better visibility and higher impact for your scholarship: Studies have shown a significant increase in citations when articles are made openly available.

Avoiding duplication: no researcher wants to waste time and money conducting a study if they know it has been attempted elsewhere. But, duplication of effort is all-too-possible when researchers can't effectively communicate with one another and make results known to others in their field and beyond.

Research is useless if it's not shared: even the best research is ineffectual if others aren't able to read and build on it. When price barriers keep articles locked away, science cannot achieve its full potential.

Text mining: today millions of articles are published every year, so many that a researcher could only hope to read a small subset of all articles in a given field. Text mining could be very beneficial by giving researchers an over-arching view of a particular field and uncovering trends and connections within their own field and between seemingly unrelated fields

that no human researcher could discern. However, when many articles are inaccessible due to subscription barriers or being posted in non computer-readable formats, these tools cannot reach their true potential.

In a nutshell, the main advantages of Open Access to research data are:

- Research results based on data can be verified and critically examined.
- Unnecessary duplication of research work can be avoided.
- Data can be analyzed comprehensively and made use of, for example in follow-up projects.
- The research process can be accelerated through data sharing.
- New findings can be achieved by merging data from different sources.
- The merging of data brings an informal added value and yields higher-quality data products, for example indices and data bases.
- Data sets which are collaboratively assembled and jointly used are more cost efficient.
- Open Access promotes re-use of data by the public and by industry.

Libraries and librarians

Many librarians have been vocal and active advocates of open access. These librarians believe that open access promises to remove both the *price barriers* and the *permission barriers* that undermine library efforts to provide access to the journal literature, as well as helping alleviate the serials crisis. Many library associations have either signed major open access declarations, or created their own. For example, the Canadian Library Association endorsed a Resolution on Open Access in June 2005. Librarians also educate faculty, administrators, and others about the benefits of open access. For example, the Association of College and Research Libraries of the American Library Association has developed a Scholarly Communications Toolkit. The Association of Research Libraries has documented the need for increased access to scholarly information, and was a leading founder of the Scholarly Publishing and Academic Resources Coalition (SPARC) There is a question, however, as to the extent to which open access will solve the serials crisis. In a *Nature* Web Focus forum, Kate Worlock discusses whether open access is truly the answer to the crisis, or if it is simply an ends to a means in a world with shrinking library budgets. The argument from the publisher is that while the cost of publications have "undisputedly risen more sharply than the library budgets," the library budget is too small of a portion of the university's (in this example) overall budget at roughly 2%. An increasing number of libraries provide hosting services for open access journals. A 2008 survey by the Association of Research Libraries found that 65% of surveyed libraries either are involved in journal publishing, or are planning to become involved in the very near future. In 2013, open access activist Aaron Swartz was posthumously awarded the American Library Association's James Madison Award for being an "outspoken advocate for public participation in government and unrestricted access to peer-reviewed scholarly articles".

Conclusion

As we here talk about the open access facility its advantages and disadvantages. Open access is very beneficial for students as well as researchers. OA provide a large amount of reading material. it is very useful source. In my library we try to fulfill the need of the user through NET, Wi-Fi and by taking membership of DELNET. As a librarian we have to help them in searching their information. Guide them in searching the related site.

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