

Global Shift Towards Open Access Publishing: Key Challenges for Research Community

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Abstract

Global shift from pay walled publishing towards open access publishing and transformation of OPEN ACCESS in different platforms like the Budapest Open Access Initiative, the Bethesda Statement and Berlin Declaration on Open Access to Knowledge is discussed. Various routes of open access publishing and its advantages and challenges are discussed. Types of Creative Commons Licenses and its effects in open access scenario are discussed. The various colours on different mode of self archiving policies framed by various publishers in SHERPA/ ROMEO databases are highlighted. Publishing trends in journal articles and books in open access mode as well as funding problems in “Gold” OA Publishing, implications in “Green” OA in self archiving etc are also discussed. Mandate of OA by various countries, funding agencies, employers and its impact etc is highlighted. The findings of the “DE Gruyer Open Author’s Survey” is highlighted to reflect the present trends like 26.8% of authors responded positively for having money to pay publications fee in the year 2016. Authors who published more papers than their average disciplinary colleagues in the last 3 years were more optimistic with regard to the availability of publication funds for them. As per this survey, the biggest group of researchers have funds for publications directly from their employers and an abundance of funding sources is mostly appearing for researchers working STEM (Science Technology Engineering and Mathematics) and is rare for Humanities and Social Sciences. Authors in peripheral countries often have less access to money from grants than their core counter parts. The frequency of paying articles processing charges decreases with career level, while its average amount increases. Authors who publish more papers than their average disciplinary colleagues are more likely to have access to national funding sources, institutional sources and grant money

Keywords: Creative Commons (CC) License, Open Access Publishing, SHERPA/ROMEEO Database, ROARMAP Database, Copyleft, Gold Open Access, Green Open Access

Introduction

Open access (OA) in traditional way can be defined as it is freely available information on public domain without any restrictions in accessing and

downloading. However, over a period of time the definition of “Open Access” has been evolved into different shapes across different platforms.

The term “Open access” was first formulated in three public statements in the 2000s: The Budapest Open Access Initiative in February 2002, The Bethesda



Statement on Open Access Publishing in June 2003, and the **Berlin Declaration on Open Access to Knowledge** in the Sciences and Humanities in October 2003.

The Budapest statement defined “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 cited¹

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.”¹

In actual practice Two degrees of open access can be distinguished as gratis open access, which is online access free of charge, and libre open access, which is online access free of charge plus various additional usage rights specified by various specific **Creative Commons licenses**. The Budapest, Bethesda, and Berlin definitions had corresponded only to Libre OA which almost all require attribution of authorship to the original authors. The differences between these two forms are well described by Peter Suber: “Gratis” access is free of charge. “Libre” access is free of charge and free for

some kinds of further use and reuse. Gratis access is compatible with an all-rights-reserved copyright, which allows no uses beyond fair use (or the local equivalent). Libre access is not compatible with an all-rights-reserved copyright, and presupposes some kind of open license permitting uses not permitted by default. As Peter Suber, gratis removes price barriers alone and libre removes price barriers and permission barriers.⁷

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Publishing Trends

In the past few years, there is a tremendous change in publishing trends. The number of open-access journals has risen steadily from 4% in 2004 to 12% by 2011 , in part because of funders’ views that papers based on publicly funded research should be made free for anyone to read and also number of citations increases parallel. It is found that an average of 43% of free articles have been published during 2008–11 , with the results varying by country and discipline . A report produced for the European Commission says that 50% of 2011 papers now free to read.⁹

According to Ulrichsweb (<http://www.ulrichsweb.com/ulrichsweb/analysis/>), about 24,000 peer-reviewed research journals exist worldwide, across all disciplines and languages, publishing about 2.5 million articles per year. As a consequence of the fact that most of their users at most universities and research institutes cannot access most of the 2.5 million articles published yearly due non subscription of majority of the content (because their universities / research Institute cannot afford the journal access-tolls), much of the potential research impact of those inaccessible articles is being lost. An article's research impact is the degree to which its findings are read, used, applied, built-upon, and cited by users in their own further research and applications. Research impact is a measure of the progress and productivity of research. To see that the journal-affordability problem and the article access/impact problem are not the same one need only note that even if all 24,000 peer-reviewed research journals were sold to universities at cost—i.e., with not a penny of profit—it would still be true that almost no university has anywhere near enough money to afford all. It would remain true even then that not all users could access all of the yearly 2.5 million articles, and hence that potential research impact would continue to be lost.¹⁰

Is there a way to make research articles accessible even to those users whose libraries cannot afford journal access to them? Yes, we have two routes, to make our research open and make articles open access:

Green Open Access

- ❖ The author makes the publication open access by archiving it in an institutional repository

(such as ePrints) or subject repository (such as PubMed Central or arXiv).

- ❖ The version archived is usually the final author version – the peer-reviewed, accepted manuscript.
- ❖ No charges are payable.
- ❖ Access may be subject to a publisher embargo period.

Gold Open Access

The publication is made open access via the publisher's website.

- ❖ An APC (article processing charge) is usually charged.
- ❖ The version made available is the final publisher's version.
- ❖ The publication is available immediately, with no embargo periods.

Hybrid Open Access: Hybrid Open Access is most commonly associated with Gold Open Access. This model is a mix of subscription charges and publication fees. If the author wishes his/her article to be published immediately in the open access model, he/she must cover the APCs – of course, only when the publisher requires that kind of fee. This way the article will be freely available, but that does not mean that the journal in which it will be published will be fully open access. The journal can be hidden behind a paywall, and the user or the library will have to pay a fee to gain access. In this model, only the articles for which the authors have covered APCs are available for free.

As per “Richard”, the publishing cost of an article varies from publisher to publisher. A paper that costs

US\$5,000 for an author to publish in Cell Reports, for example, might cost just \$1,350 to publish in PLoS ONE, \$1,600 in Royal Society of Chemistry — whereas PeerJ offers to publish an unlimited number of papers per author for a one-time fee of \$299.¹⁰

Data from the consulting firm Outsell in Burlingame, California, suggest that the science-publishing industry generated \$9.4 billion in revenue in 2011 and published around 1.8 million English-language articles — an average revenue per article of roughly \$5,000. Analysts estimate profit margins at 20–30% for the industry, so the average cost to the publisher of producing an article is likely to be around \$3,500–4,000. Most open-access publishers charge fees that are much lower than the industry's average revenue, although there is a wide scatter between journals. The largest open-access publishers — BioMed Central and PLoS — charge \$1,350–2,250 to publish peer-reviewed articles in many of their journals, although their most selective offerings charge \$2,700–2,900. Higher charges tend to be found in 'hybrid' journals, in which publishers offer to make individual articles free in a publication that is otherwise paywalled. Outsell estimates that the average per-article charge for open-access publishers in 2011 was \$660.¹⁰

How different book publishing in Open Access

The whole issue might be even more complicated in the case of books. Books are expensive in production. Labour intensive text editing is growing disproportionately with its length, so editing a book is more time consuming and more expensive than editing several academic articles. The high price of book processing makes it harder for authors and their institutions to bear the whole cost of book publication, which in conventional book publishing

is divided among numerous libraries. Both non-profit and commercial publishers that publish books in this model charge fees in the range of 5 to 15 thousand euros per book.

The following research funding agencies prefer to make the research done under these their funding make open access. Therefore, these agencies takes Article Process Charges for the authors for research done under these funding.

Research Councils UK (RCUK), Arthritis Research UK, Bloodwise, Breast Cancer Now, British Heart Foundation, Cancer Research UK, Parkinson's UK and the Wellcome Trust form the Charity Open Access Fund (COAF).¹¹

In response to the research community's expressed desire for OA, the latest Joint Information Systems Committee/Rights METADATA for Open archiving (JISC/RoMEO) survey of over 8,000 journals indicates that over 90% are already "green," that is, they have given their official green light to author self-archiving (<http://romeo.eprints.org/stats.php>).

About 1,200 journals (approaching 5% of the total 24,000) are even "gold," that is, they are OA journals, making all their own contents OA: <http://www.doaj.org/>. To cover their costs, however, many of these gold journals have had to adopt the OA journal cost-recovery model. Instead of the user-institution paying the journal access-tolls for incoming articles, the author-institution pays the journal peer-review and publication costs per outgoing article

Currently, the riskiness and unsettledness of this gold journal cost-recovery model make publishers more willing to go green rather than gold in response to the research community's demand for OA.

Publishers note that physics journals have been green since 1991, and yet there still has not been any cancellation pressure. Universities that can afford to pay for the official non-OA version do so. Users at universities that cannot afford the non-OA version use the authors' self-archived OA versions. One prominent "born-gold" journal — Journal of High Energy Physics (<http://www.iop.org/EJ/journal/1126-6708>) — has even successfully made the transition backwards from gold to green in order to make ends meet after a few years of being toll-free. Yet its contents remain 100% OA because 100% of its authors self-archive them.

Publishers have done their part in response to the research community's demand for OA by giving their green light to author-institution self-archiving. It is now time for more of the research community to take them up on it. It is not enough to sit and wait for all 24,000 journals to convert to gold. And it certainly is not fair for researchers to demand that publishers make all the sacrifices and take all the risk upon themselves while the research community does not bother to take the risk-free step of providing OA (which they purport to want and need so much) for their own articles — by simply self-archiving them. The research community is ready at last to update its existing "publish or perish" mandate to require also providing open access to the articles it publishes in the online era. The UK Parliament Science and Technology Committee has recommended (and the U.S. House of Representatives has already voted in favour of) legislation to the effect that as one of the conditions for receiving research funding it should be mandatory for the fundee not merely to publish but also to self-archive all the articles resulting from the funded research.¹⁵

Mandated Open Access

Open Access (OA) mandates generally come from one of two directions: some are imposed by funders and others are imposed by authors' institutions. Funder mandates tend to be powerful by their nature: when a grant provider says "you have to publish your results in an OA venue or you won't get further funding from us," authors have a real incentive to comply. The power of these mandates is, however, demonstrably less than absolute: even with such incentives, compliance is never perfect and is often far from perfect. Nevertheless, funder mandates are usually relatively powerful. Institutional mandates are a much more mixed bag. Some are powerful, many are not, and a great many of them are not even real. But it's interesting to note that patterns of "mandatoriness" can be discerned across countries. A spot-check of the **ROARMAP** database is instructive: Australian and British institutional mandates tend to be real, such as the ones at Victoria University and the University of Southampton. The Registry of Open Access Repository Mandates and Policies (ROARMAP) is a searchable international registry charting the growth of open access mandates and policies adopted by universities, research institutions and research funders that require or request their researchers to provide open access to their peer-reviewed research article output by depositing it in an open access repository. This site is powered by EPrints 3, free software developed by the University of Southampton. These generally require OA deposit without exception, though often allowing for temporary embargoes where required by publishers. Institutional mandates in the United States, however, are very rarely real, and while they may be called "mandates" colloquially, they often turn out to be little more than statements of institutional preference.¹⁶

Now a days many of research funding agencies are making mandatory to publish research results in open access. These mandates are applied as a condition of grant, so resulting research papers can have archiving conditions already attached before submission to any journal. This can mean that where publishers neither allow archiving nor comply with the mandate's requirements, that authors are unable to submit material to their journals.

- ❖ **SHERPA / ROMEO** databases used different colours to highlight various types of publisher's policies in Institute / Self Archiving:
- ❖ **Green:** can archive pre-print and post-print or publisher's version/PDF
- ❖ **Blue:** can archive post-print (ie final draft post-refereeing) or publisher's version/PDF
- ❖ **Yellow:** can archive pre-print (ie pre-refereeing)
- ❖ **White:** archiving not formally supported

on the colour categorisation of the publisher. A publisher can be Green, allowing both pre-print and post-print archiving, and yet fail to comply with a funder's archiving mandate. Where this happens, it is often because of a restriction on archiving the post-print in anything other than an institutional repository. As some mandates insist on deposition in a non-institutional or third-party repository (like PubMed Central) this can go against even Green publishers' standard terms.

Alternatively, it is possible for a publisher to be White, allowing neither pre-print nor post-print archiving, and yet comply with a mandate through a special arrangement for a particular funder's authors.

It is intended that RoMEO can assist authors in clarifying whether a particular journal or publisher will accept an article with an existing archiving requirement¹³

Which kind of open access is better for authors ?

This is a very complicated question. Academic reputation is orientated around the publisher. Author's general interest will be around Impact factor of the Journal, possibly the best journal for you is a fully open access one. That is great, because it is probably the best option for an author. Your open access work will be hosted on a professional platform, which is well optimized for search engines and it will have a DOI number so it will be discoverable. What is also important, is that everyone will have access to the final, typeset pdf, which will make citations easier. Sometimes it may occur that the fully open access venue you have chosen is charging authors for publication. For example, the **Directory of Open Access Journals** currently indexes 10189 journals that do not charge authors and only 409 that do. On the other hand, the so called author-pays model is the simplest one for academic publishers and that is why a lot of large, reputable publishers promote it and why it is likely that there will be more and more journals of this kind. The real choice starts when it occurs that the best journal to publish your research in is a so called hybrid journal. It is likely, since a lot of good journals are subscription based but also offer the option to publish articles in open access. This model has all the advantages of gold open access publishing, but it usually involves much higher article processing charges than in the case of fully open access venues. In fact, this option is only possible for authors working for wealthy institutions. If your institution cannot pay the article

processing charge for open access publication in a hybrid journal, or if you have chosen a journal that does not offer a gold open access option, then the last possible solution is green open access. In some cases, it offers almost the same benefits as gold open access, but the main problem is the restrictions imposed on self-archiving by toll access publishers. They are necessary, because when self-archiving gains popularity among authors, paywalled journal content is less attractive to readers. Thus publishers have to protect themselves from cancellations and limit somehow the possibilities of self-archiving.¹⁴

In some cases, only self-archiving of a pre-print version is allowed by a publisher. So, an author can submit to a repository or personal website an article which is different to the one published on the journal website and available for subscribers. This kind of self-archiving is a poor alternative to gold open access. Publishing pre-prints is generally good for academic debate, but when an academic can only access a pre-print version, he or she cannot use the article without knowing what was changed in the final version. Fortunately, 70% of publishers allow authors to self-archive post-print. Usually, self-archiving of post-prints is allowed after an embargo period which may last 6, 12, or 24 months or even longer. Moreover, these publishers impose other restrictions. Some of them limit the option of self-archiving to institutional repositories or authors' websites. This excludes disciplinary repositories, which are bigger, more popular and very often more professional than institutional ones. It is also often forbidden to republish the publisher's pdf version, so self-archived articles usually have different pagination than the original works, which may lead to difficulties in citing them. Publishers' policies toward green open access vary and are changed

from time to time. If you decided to go along the green road it is essential to choose a good repository, which offers good visibility. The more popular the repository is, the easiest it will be to find your work, also with external search engines, like Google or Bing.¹⁴

Funding for Open Access:

Keeping in mind the present OA policies and APCs many of universities and research institutes are gearing up to meet APC of its authors. Some institutions are paying for membership fee to cover all article-processing charges for a year. Some libraries have created funds for gold OA, although these often exclude funding for hybrid journals. 'APC is going to be part of "Library Budget" in some libraries. It has common phenomenon in publishing. **26.8% of academic authors predict that they will have money to cover publication fees in the year 2016. Researchers from the field of Arts, Humanities and Social Sciences seem to be more pessimistic than their STEM colleagues. Also an army of academic authors who are not paid for conducting research see even smaller possibilities of funding for their publication fees.**

As per "De Gruyter Open Author's Survey",¹⁷

- ❖ 26.8% of authors responded positively for having any money to pay publication fees in the year 2016,
- ❖ 42.9% responded negatively claimed that they will not have any money for this goal in 2016 .
- ❖ But 29.9 % says they don't know.

Disciplinary differences have shown a classic pattern, with STEM disciplines seeming to have better access to money than HSS i.e. Arts and

Humanities (23.4%), Medical and Life Science, 29.1%, Science, Mathematics and Engineering (32.2%) and Social Sciences (22%)

Productive authors get more funding : Authors who published more papers than their average disciplinary colleagues in the last 3 years were more optimistic with regard to the availability of publication funds for them (34% predict to have access to these funds vs. 24% of researchers with average or lower publishing output).

- ❖ the frequency of paying Article Processing Charges decreases with career level, while its average amount increases. The state of the APC market also seems to be completely different among various disciplines. Researchers from the global periphery pay APCs as frequently as their colleagues from rich countries, but seem to target cheaper journals.
- ❖ Article processing charges, paid by a research funder, institution hiring an author, or by an author herself/himself as a fee for making an article open access, have become a common thing in Medical and Life Sciences. However, they are still rare in other fields. According to some estimations, APCs were paid for more than half of newly published open access papers, which is probably the result of the spectacular success of several open access mega-journals operating in the field of Life Sciences. These mega-journals developed an APC based model and dominated the OA landscape both in terms of number of works published and influence on debate about the future of the publishing industry. Meanwhile APCs seem to still be extremely rare in the Humanities and Social Sciences. What is more, when researchers in

these fields pay APCs, they pay significantly less than their STEM colleagues.

- ❖ The smallest publication fee paid recently for an open access article was declared to be 28.09 Euros and maximum of 3,000 euro.
- ❖ **The global periphery use cheaper journal-** When researchers from the core countries paid on average 1,100 Euros, the median for those from the peripheries countries is 300 Euros
- ❖ **Disciplinary differences: APC for Social Sciences ranges from EU.28 to Eu.3000. whereas for Humanities** paid fees ranging from 50 to 500 Euros with 150Euro as median. In Science, Mathematics and Engineering minimum of 500 Euros to maximum of 2,500 Euro Medical and Life Sciences and numbers vary from 80 to 2,200 euro. with median of 900 Euros.

Career level: Amount and frequency of APCs vary also according to career level. Frequency of paying APCs decreases with career level, while its average amount increases. who already became academic authors paid from 28.09 to 2,500 Euros, with a median of 250 Euros. academic authors who are Early Career Researchers paid from 50 to 2,500 Euros with 425 Euros being the median.

- ❖ established academic authors was paid, the median is 500 Euros, the maximum value for the whole sample (3,000 Euros),
- ❖ 11.4% of authors from the peripheral countries are ready to treat their own money as a resource that may cover Article Processing Charges, which is true for only 6.1% of those based in the core countries. In the global periphery, academic authors have less access to grant funding that would cover publication fees.

However, due to the substitution of their own money, authors from less wealthy countries are able to pay APCs as often as their richer colleagues.

According to this survey, the biggest group of researchers have funds for publications directly from their employers. 13.1% of all academic authors are able to pay publication fees in 2016 due to the support of an institution that they work for. For 4.2% it is the only source of funding.

- ❖ 11.9% of authors claimed to have access to grant money intended to cover publication costs and for 3.6% it was the only source of money that might cover APCs.
- ❖ 10% have access to grant money for an unspecified goal that might be used to pay publication fee. For 2.2% it was the only source of funding APCs.
- ❖ 8.9% of academic authors declared that they are able to use their own money to cover publication fees in the year 2016, and for 2.2% of them it was the only source available.
- ❖ 5.1% have access to money from their national funding body that can be spent on APCs. Only for 0.33% is it the only source available

The abundance and the shortage

While 42.9% of academic authors declared that they will have no money to be spent on publication costs in the year 2016 and a further 2.2% declared that they will be relying here only on own pockets, 10.4% of their colleagues have access to one external APC funding source. But 11.2% have access to two or more sources of money for publication fees, not including their own pockets.

What is more, among academic authors based in the core countries, 14% have access to 2 or more sources of funding (except from their own pocket), while for those working in the global periphery it is 9.1%. An abundance of funding sources is mostly appearing for researchers working in STEM, and is rare for Humanities and Social Sciences.

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The global periphery pays from their own pocket

- ❖ Authors working in the peripheral countries often have less access to money from grants intended to be spend on publication costs (8.7% vs. 15.7%), and to grant money without a specified goal (8.5% vs 12%).

HSS do not pay APCs because of less grant funding

- ❖ 5.9% of researchers in Arts and Humanities have access to publication grants, while it is as much as 18.7% in Medical and Life Sciences and 16.2% among researchers from the fields of Science, Mathematics and Engineering and 9.1% among those dealing with Social Sciences
- ❖ Authors who publish more papers than their average disciplinary colleagues are more likely to have access to national funding sources, institutional sources and grant money

Conclusion

It is a fact that there is a tremendous change in publishing trends especially in Open Access. The

OA is expected to speed up research progress, productivity and researchers are keen to make their research open access. However, it is difficult to predict whether “Green OA” will take over “Gold OA” or “Gold OA” will take over “Green OA”.

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