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Digital Trends and the Global Library Community

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ABSTRACT

This year's theme of International Open Access Week was Open for Collaboration, and centered on the political and legal gains open access communities have made worldwide. Scholarly Publishing and Academic Resources Coalition has been the major organizer of Open Access week since its beginnings in 2007. The world-wide participation of so many different communities in this event, which was celebrated on every continent except Antarctica, shows that the issue of open access, which a few years ago was mainly a concern of the U.S. academic community, now has international backing and is shaping how scientific research will be disseminated in the future.

KEYWORDS

Open Access Week; SPARC; scholarly publishing; scientific journal publishing

Celebrating open access (OA) week

In October, researchers, health care workers, government officials, librarians, university employees, educators, and students—those communities that have the most at stake in the OA movement—celebrated International OA Week with events that took place on each continent except for Antarctica. This year's theme was Open for Collaboration, and centered on the political and legal gains OA communities have made worldwide. Events included seminars, speeches, workshops, editions, blog postings, tweet chats, and video recordings, many of which are documented at or linked from the Scholarly Publishing and Academic Resources Coalition (SPARC) site <http://www.openaccessweek.org/>. SPARC has been the major organizer of OA week since its beginnings in 2007.

OA means different things to different people, depending on whether they are a provider or a consumer of information (see the sidebars for individual reports from around the world).

To governmental agencies, OA is about the stewardship of public monies and ensured access to grant-funded national scientific research. To academic libraries, OA is about unfettered access to information for their users. To scholars, OA means both a greater

exposure of their work through their institutions' repositories and a challenge to the traditional forms of tenure and promotion valued by their community. To scientific journal publishers, OA refers to the intellectual property rights of their authors.

It is the last community—scientific publishing—that has the most to lose financially from OA Movement. Many publishers offer some form of OA, which is usually reflected in the contracts offered to their authors. These contracts (in contrast to traditional contracts in which the author generally either cedes copyright on partial copyright to the publisher) are of two types: “Gold” in which scholars or their university pay a fee for a work to be published and the authors then “own” distribution rights and “green” in which the authors may publish a pre-print, post-print, or a copy of the published article in an institutional repository at the publisher's discretion. Sherpa Romeo provides an extensive list of publisher copyright policies and self-archiving <http://www.sherpa.ac.uk/romeo/index.php?la=en&flDnum=&mode=simple>.

Just as there are different kinds of contracts, there are different business models of scholarly publishing, as seen through the policies of commercial ventures, like Elsevier and Springer, non-profit institutions

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The “Digital Trends and the Global Library Community” column examines technological advances internal and external to libraries. The focus is on how technology is changing the way services are provided to users, the methodologies used in the provision of those services, and the resulting scope of responsibilities of libraries and parent institutions. Interested authors are invited to submit proposals and articles to the column editor at marta.deyrup@shu.edu. Please include “IILR Submission” in the subject line of the e-mail.

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and advocacy organizations like the Public Library of Science (PLOS) or United Nations Educational, Scientific and Cultural Organization (UNESCO), pre-print servers and institutional repositories, like that hosted by Purdue University. Even though the business model may be different all these publishers are experimenting with, if they are not already committed to, some form of OA. The non-profit Directory of Open Access Journals (DOAJ) <https://doaj.org/> provides a list of and links to over 10,000 of these world-wide OA peer-reviewed publications.

Historical precedents

The founding of the OA movement is generally attributed to Paul Ginsparg, a professor of physics at Cornell, Steven Harnard, a professor in cognitive science at the Polytechnic Institute, and Harold Var- mus, the director of the National Institutes of Health (NIH), who created the first e-print server, arXiv.org, in 1991. This institutional repository allowed physicists to circumvent traditional publishing models by sharing online drafts of their current research. ArXiv.org now contains over 1,000,000 pre-prints in physics, mathematics, computer science, quantitative biology, and quantitative finance and statistics and is considered to be the prototype of an OA repository (arXiv.org).

As these three men were beginning their online experiment, commercial publishing was becoming increasingly fragmented. Advances in computer technology had eliminated the necessity for the massive infrastructure that previously had been needed, such as printing presses, and printers, the skilled workers who ran them. These positions were gradually phased out through contract negotiations among unions, publishers, and newspapers and most of these business and jobs no longer exist. Computer technology also disrupted distribution methods, since large warehouses were no longer needed to store materials that now could be saved on a hard drive. As a result, the publishing industry as a whole began to shrink. The 1990s and early 2000s saw the acquisition of small societal journals and publishing houses by international publishing conglomerates, one of the most important being the merger of Harcourt Brace and Elsevier. (A similar situation is occurring today with the mergers of Springer and Macmillan in 2015, of Ebrary and Proquest in 2011 and H. W. Wilson in 2013 and EBSCO).

By the early 2000s, largely because of the monopolistic practices of these journal publishers, the cost of

scientific information in the United States (http://www.arl.org/focus-areas/statistics-assessment/statistical-trends#.VmlV4-G9_wA) was rising at a faster rate than health care, leading to what is commonly referred to as the crisis in scholarly communication. Academic libraries that had once budgeted for both Science Technology Engineering Math (STEM) and humanities literature were forced to dedicate the majority of their funds to scientific journal purchases. As the possibilities for hosting large online repositories, like the Internet Archives, the Google Book Project, and Hathitrust grew, it became more and more obvious that non-traditional publishing (i.e., publishing that entirely circumvented commercial publishers) was a viable alternative.

In the early 2000s members of U.S. and European academic, library, and publishing communities met several time to try to map out a future for scholarly publishing. This resulted in a series of “manifestos,” which include the Tempe Principles for Emerging Systems of Scholarly Publishing https://www.physics.ohio-state.edu/~wilkins/osu_and_ohio/Past_stuff/tempe.html (2000); the Budapest Open Archive Initiative (2002); <http://www.budapestopenaccessinitiative.org/read>, and the Bethesda Statement on OA publishing <http://legacy.earlham.edu/~peters/fos/bethesda.htm> (2003).

Arguably the most important of these manifestos is the Berlin Declaration on OA to Knowledge in the Sciences and Humanities <http://openaccess.mpg.de/Berlin-Declaration> (2003), which established the conceptual framework for OA scholarly publishing and which is reproduced below:

1. OA contributions must satisfy two conditions: The author(s) and rights holder(s) of such contributions grant(s) to all users a free, irrevocable, worldwide, right of access to, and a license 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 (community standards, will continue to provide the mechanism for enforcement of proper attribution and responsible use of the published work, as they do now), as well as the right to make small numbers of printed copies for their personal use.
2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in an appropriate standard electronic format is deposited (and

thus published) in at least one online repository using suitable technical standards (such as the Open Archive definitions) that is supported and maintained by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable OA, unrestricted distribution, interoperability, and long-term archiving.

Global activity

The world-wide participation of so many different communities in OA Week shows that the issue of OA, which a few years ago was mainly a concern of the U.S. academic community, now has international backing and is shaping how research—and in particular scientific research—will be disseminated in the future. Philanthropic, governmental, and educational institutions such as the Wellcome Research Foundation (UK), the Chinese Academy of Sciences and the Australian government now mandate that publicly funded research be made freely available on the Internet.

These developments most benefit poor nations, whose access to international scientific research is often limited by their ability to subscribe to costly English language journals. However, it also levels the playing field in wealthier countries, where information resources are often concentrated in the hands of a few elite institutions. There are now almost 2.1 billion Internet users in the world, with China having the majority (641,601,070). Not surprisingly, the United States, Canada, and Germany, France and the United Kingdom have the highest percentage of citizens who have access to the Internet (<http://www.internetlivestats.com/internet-users/>). The United States also has the largest concentration of digital repositories and electronic journals.

Because each country has a different history of scholarly publication, the approach adopted by each toward OA has been different. In Latin America, for example, print publications are still an important part of scholarly discourse and the publishing industry as a whole is dependent on foreign investment. As a result, OA is mainly a concern of universities and research institutions rather than an integral part of commercial publishing. In the Arab States, growth in OA publishing has been limited in part by the fact that online scientific databases in the Arabic language have been slow to develop. In Africa, a major driver of OA has

been UNESCO. In the United States and Europe the greatest catalyst in pushing OA as an agenda has been legislation. In Asia, the China has committed itself to OA principles, first by signing the Berlin Declaration in 2003, and subsequently in 2015 with the announcement by the National Science Foundation of China and the Chinese Academy of Science that researchers would now be required to deposit their published work, funded by public monies, into online repositories (<http://www.nature.com/news/chinese-agencies-announce-open-access-policies-1.15255>). In Europe, OA initiatives have been most aggressively pursued by the United Kingdom. However, in 2013, group of eight (G8) nations agreed as a body to implement the Open Data Charter in order to coordinate and open up data resources for research and industry and to improve governmental accountability (http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=4&ved=0ahUKEwidjeOgjMzJAhUEWh4KHSF_BgsQF-ggxMAM&url=http%3A%2F%2Fec.europa.eu%2Finformation_society%2Fnewsroom%2Fcf%2Fdae%2Fdocument.cfm%3Faction%3Ddisplay%26doc_id%3D3489&usq=AFQjCNEOlutVQlrm_5IRpHwHON-HL3bnw&sig2=5WTyY6pKo-idJ7HB_J3J2g).

European Union (EU) projects include Digital Repository Infrastructure Vision for European Research (DRIVER II). Driver II will establish an electronic infrastructure that connects institutional repositories throughout the EU.

To get a sense of OA policies that have been adopted or mandated at research and academic institutions see the Registry of Open Access Repository Mandates and Policies (ROARMAP) which includes links to institutional OA policies from the United States, Europe Canada, and Mexico (see <http://roarmap.eprints.org/>).

Report from Africa contributed by Jacob K. Kariuki and Tina Mullins

Health care providers all over the world have the unique obligation to provide high quality care based on the best available evidence. Needless to say, their success in providing the expected high quality care depends to a great extent on their ability to access current knowledge and emerging evidence from research.

While many health workers in developed countries enjoy almost unlimited access to all aspects of current

evidence, courtesy of their institutions' premium subscriptions, the situation is drastically different in developing countries. Technological challenges and scarcity of resources play a major role in limiting access to journals and databases that publish current evidence and recommended best practices in medicine. Many hospitals and training institutions have few, and often outdated computers which are shared by dozens of staff and students. As a result, computer time is golden and every minute online is too precious. In some instances tight schedules are made to regulate the maximum duration that one can spend online.

Worse still, many institutions in developing countries cannot afford subscriptions to scholarly journals and databases. As a result, health care providers and students in these institutions face a lot of obstacles in their quest for the precious evidence base for practice. More often than not, their tedious online searches yield restricted results where only the abstract is freely available. Such unfortunate closure to the painstaking online searches disheartens many, making them reluctant to seek the best available evidence for practice.

In a bid to break the access barriers, a dedicated team at the University of Massachusetts Boston devised a Libguide that eases access to scholarly articles and databases. The OA for Africa Libguide (<http://umb.libguides.com/c.php?g=351208>) offers a succinct orientation on how to optimize online searching, and provides links to OA journals and databases. Additionally, the incorporated OAA One Stop search engine filters search results to weed off ads and commercialized articles. The search engine also prioritizes results that are not only scholarly but also free in full text html and/or pdf. All its features can be accessed through any Internet-enabled mobile phone. The site also offers guidance to librarians on how they can obtain free subscription to premium databases such as UpToDate using their philanthropic offers to institutions in resource constrained countries.

If Lincoln had 6 hours to cut down a tree, he said he would spend 4 hours sharpening the axe. OA for Africa is an exemplar of a small initiative aiming to "sharpen" health workers in developing countries. The feedback from users so far has been encouraging. Last year, the site registered over 3,000 views, with about 60% of the viewers accessing the site from Kenya, where the site has received publicity due to the partnership between UMass Boston and local institutions.

Report from the United States, contributed by Heather Joseph

Every year, the Federal Government funds tens of billions of dollars in basic and applied research. The expectation is that that new ideas and discoveries resulting from that research will advance science, stimulate innovation, grow the economy, and improve the lives and welfare of the public. Once the results of this taxpayer-funded research are written up, the manuscripts are submitted for publication to a scholarly journal, which has become the primary medium for reporting the results of new research.

But many of these journals are prohibitively expensive, and are often out-of-reach for the average taxpayer. There are 15 entire academic disciplines for which the average journal costs more than \$1,000 per year, and even individual articles often cost upward of \$30 each—too expensive for most to afford, especially when it can take many multiples of articles to find what you need. But it doesn't have to be this way.

A bipartisan bill is currently being debated in Congress. The Fair Access to Science and Technology Research (FASTR) Act of 2015 (<https://www.congress.gov/bill/114th-congress/senate-bill/779>) consistent, permanent public access policies for articles reporting on their funded research, requiring that they be made freely accessible and fully reusable by anyone no later than 6 months after publication in a peer-reviewed journal.

The National Institutes of Health (<http://public.access.nih.gov/>) has had a similar, successful policy in place for many years. PubMed Central, the database into which its funded articles are placed, sees more than a million unique users every day. These users are diverse—they are students and teachers, health care professionals, researchers, business owners, interested members of the public—and they download more than two million papers daily, demonstrating the deep demand throughout the general public for this information.

In February 2013, the White House Office of Science and Technology Policy (OSTP) issued a directive (https://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf) that requires the results of taxpayer-funded research—both articles and data—be made freely available to the general public. However, the OSTP Directive is not

a permanent law, and can be easily overturned by a subsequent administration.

FASTR will ensure that faster access to cutting edge research is the law of the land, rather than just the preference of an administration. It will prevent taxpayers from having to pay twice to support research—once through government grants and then again to obtain access to the results through subscription payments. It will promote greater economic activity and economic growth. And it will stimulate follow-up on research, moving it more quickly toward applied research and commercialization into new products and services. By speeding commercialization greater openness accelerates job creation.

If Congress is serious about advancing science and creating jobs, it should pass FASTR to ensure that there is timely OA to the taxpayer funded research that will form the basis for greater innovation and discovery and help keep the county competitive.

Report from Hong Kong, contributed by Brian Minihan

Changes are afoot in the scholarly communication environment in China and Hong Kong, but have yet to yield visible results on a large scale. Top-down initiatives, in the form of funding agency mandates, emerged in both mainland China and Hong Kong recently. Last year there were announcements that some mainland China funding agencies in the sciences would require researchers to deposit works in a green OA repository (China Academy of Sciences, National Natural Science Foundation of China, 2015). These announcements have not been followed with any sort of available policy documentation. Hong Kong's primary research funding body added a clause to its grant application that principal investigators agree to make their research available at their institutional repository 6 months after the latest embargo date (Research Grants Council of Hong Kong, 2015). The author's university, in Hong Kong, has initiated a small grant for collaborative OA digital humanities (Hong Kong Baptist University Library, 2015). At face value, these developments indicate a direction toward mainstreaming of green OA in China and Hong Kong.

However, academic publishing in China and Hong Kong is still largely a traditional model. Two recent surveys found only a fraction of mainland Chinese journals in a primary academic journal database and

index were OA (Hu, Huang, & Zhou, 2012; Zhang & Ding, 2015). The necessity to register a journal with the General Administration of Press and Publication may explain why so few digital-native journals (and more likely to be OA) have emerged in mainland China (Hu et al., 2012, p. 91). A large number of academic publishers' exact policies in Hong Kong and China are unknown; they are not archived in the Sherpa Romeo database of publisher copyright policies. Gold OA has been more successful as grant awardees in mainland China are permitted to use funding to pay article process charges. Springer and Elsevier have both acquired numerous Chinese academic journals in the gold OA model.

For now, green OA repositories remain inconsistently populated. The centralized China Academic Institutional Repository features 40 university repositories with a wide range of article population and accessibility (<http://ir.calis.edu.cn/>). In Hong Kong, green OA success stories, to date, have been through the effort of libraries to gather pre- or post-print archives, while offering directly beneficial information to researchers, such as article-level view count graphics (University of Hong Kong and Lingnan University), Web of Science and Scopus citations (University of Hong Kong and HK University of Science & Technology) and mass Open Researcher and Contributor ID (ORCID) registration drives (Baptist University). The next year should reveal whether the policy mandates by the research funding bodies, both in China and Hong Kong, bear fruit in terms of archiving publications and populating existing repositories.

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