



COVER SHEET

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The Rise of Open Access in the Creative, Educational and Science Commons

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Abstract

Management of intellectual property and in particular copyright is one of the most challenging issues in an increasingly digital world. The rise of the Open Access (OA) movement provides a new model for managing intellectual property in educational and research environments. OA aims to promote greater and more efficient access to educational and research materials and has an international profile. This article will overview the basic charter of OA and explain how it proposes to transform academic communication and publishing in an online world. Importantly, this article will also overview the legal issues that surround the move towards OA and the concept of Open Content Licensing (including the Creative Commons Project).

PART 1 WHAT IS OPEN ACCESS?

This paper aims to provide:

- An overview of the rise of the Open Access (OA) movement through the Budapest Open Access Initiative, the Bethesda Statement and the Berlin Declaration;
- Identification of some of the benefits of OA;
- An introduction to Open Content Licensing such as the Creative Commons; and
- An introduction on how OA is being employed in the educational environment such as Open Educational Resources (OER).

The Rise of Open Access

The increasing speed at which the digital world is advancing raises many cultural and legal issues, often pushing the limits of what has previously been the norm. Blogs, wikis and VoIP are now commonplace, as are digital repositories.[1] We employ these things to access knowledge quickly on a worldwide basis in an instant. Society is trying desperately to keep pace with these developments, to keep a reign on what is acceptable, appropriate and legal.

These technological capabilities “massively raise expectations with regard to access to research articles and make it virtually impossible to limit or restrict their dissemination without resorting to tortuous and difficult to police, even draconic, legal constructions. Expectations are raised because, subconsciously perhaps, scholarly information has always been seen as belonging to the worldwide scholarly community, even mankind as a whole. The fact that universal dissemination and access were not possible when one had to rely on print alone was tacitly accepted as a fact of life, an inevitable shortcoming, not in any way as a desirability. The whole purpose of information is to be shared, as the purpose of bread is to be eaten.”[2]

To embrace the new technologies that facilitate access to knowledge, a movement arose, commonly referred to as 'Open Access'. It is associated with Stevan Harnad, initially of the University of Southampton and now of the University of Quebec at Montreal, and is well-documented by Peter Suber of Earlham College. This movement:

1. “proposes that authors electronically publish (or 'archive') pre-prints of their papers, in a manner analogous to Departmental Working Papers series of bygone days;
2. recommends the establishment of ePrints Archives by universities and other research institutions (to provide a manageably small number of persistent, professionally-managed and readily-discoverable locations, rather than tens of thousands of ephemeral, personal web-sites);
3. publishes software that enables such ePrints archives to be managed;
4. recommends use of the Open Archive Initiative metadata standard, in order to support cross-discovery services;
5. approaches journal publishers to sanction author self-archival (already with great success); and
6. communicates with governments, with a view to ensuring that government policy and amendments to copyright law support and not undermine open access to authors' pre-prints”.[3]

Many new forms of OA publishing have arisen including the collaborative online encyclopaedia, Wikipedia, which chronicles the development of OA:

“The beginnings of the scholarly journal were a way of expanding low-cost access to scholarly findings... The modern OA movement springs from the potential unleashed by the electronic medium, and by the world wide web. It is now possible to publish a scholarly article and also make it instantly accessible anywhere in the world where there are computers and internet connections.

The first free scientific online archive is arXiv.org, started in 1991, initially a preprint service for physicists, initiated by Paul Ginsparg. Self-archiving has become the norm in physics, with some sub-areas of physics, such as high-energy physics, having a 100% self-archiving rate. In 1997, the U.S. National Library of Medicine made Medline, the most comprehensive index to medical literature on the planet,

freely available. In 1998, one of the first Open Access journals in medicine, the Journal of Medical Internet Research (JMIR) was created, publishing its first issue in 1999".[4]

Core Principles of OA

During the first two days of December 2001, the Open Society Institute conducted a meeting in Budapest, the capital of Hungary. Those in attendance were the leading proponents of OA for scientific and scholarly journal literature who sought to explore the possibility of working together to further the goals of OA. On 14 February 2002, the Budapest Open Access Initiative (BOAI) was launched in an effort to accelerate progress in OA to peer-reviewed journal literature fostered by self-archiving and a new generation of OA journals[5]. At that time, sixteen people signed the BOAI however, as of 22 February 2006, 3,988 individuals and 339 organizations have added their signatures to the BOAI.[6]

Following the BOAI, a meeting was held on 11 April 2003 to discuss how to proceed as rapidly as possible with the goal of the BOAI in providing OA to primary scientific literature. The Bethesda Statement on Open Access Publishing (Bethesda Statement) was released on 20 June 2003 and stated that the goal of the meeting was:

“to agree on significant, concrete steps that all relevant parties — the organizations that foster and support scientific research, the scientists that generate the research results, the publishers who facilitate the peer-review and distribution of results of the research, and the scientists, librarians and others who depend on access to this knowledge — can take to promote the rapid and efficient transition to open access publishing.”[7]

A working definition of Open Access Publication was drafted in the Bethesda Statement together with statements of the Institutions and Funding Agencies Working Group and the Libraries and Publishers Working Group.[8]

On 20 to 22 October 2003, a meeting was held in Berlin, Germany to further the goal of the BOAI. The Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (Berlin Declaration) which was released on 22 October 2003, defines its goals as the following:

“Our mission of disseminating knowledge is only half complete if the information is not made widely and readily available to society. New possibilities of knowledge dissemination not only through the classical form but also and increasingly through the OA paradigm via the Internet have to be supported. We define OA as a comprehensive source of human knowledge and cultural heritage that has been approved by the scientific community.

In order to realize the vision of a global and accessible representation of knowledge, the future Web has to be sustainable, interactive, and transparent. Content and software tools must be openly accessible and compatible.”[9]

The Berlin Declaration also provided a definition of an Open Access Contribution, mirroring the definitions drafted in the BOAI and Bethesda Statement:

“Establishing open access as a worthwhile procedure ideally requires the active commitment of each and every individual producer of scientific knowledge and holder of cultural heritage. Open access contributions include original scientific research results, raw data and metadata, source materials, digital representations of pictorial and graphical materials and scholarly multimedia material.

Open access contributions must satisfy two conditions:

1. The author(s) and right 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[10]) that is supported and maintained by an academic institution, scholarly society, government agency, or other well established organization that seeks to enable open access, unrestricted distribution, inter operability, and long-term archiving.”

There is no stipulation that the work be made available by the author or copyright owner solely for non-commercial re-use. This provides the opportunity for OA contributions to be released permitting re-users of the work to use it commercially. For example, a poet can release a poem on the Internet satisfying the two OA contribution conditions and expressly permit the poem to be used commercially. Not only do the re-users of the poem have “the right to make small numbers of printed copies for their personal use”[11], they can also publish and sell a book of poetry that includes the poet’s work.

By 15 February 2006, 146 organisations around the world had signed the Berlin Declaration.[12]

“There are three main essentials: free accessibility, further distribution, and proper archiving.

Open access is real open access if:

1. The article is universally and freely accessible, at no cost to the reader, via the Internet or otherwise, without embargo;
2. The author or copyright owner irrevocably grants to any third party, in advance and in perpetuity, the right to use, copy, or disseminate the article, provided that correct citation details are given; and
3. The article is deposited, immediately, in full and in a suitable electronic form, in at least one widely and internationally recognized open access repository committed to open access and long-term preservation for posterity”.[13]

On 30 January 2004, Ministers of the Organisation for Economic Co-operation and Development (OECD) Committee for Scientific and Technological Policy recognised that fostering broader, open access to, and wide use of, research data will enhance the quality and productivity of science systems worldwide. All 34 Ministers adopted, on behalf of 34 countries[14], a Declaration on Access to Research Data from Public Funding. The Ministers declared their commitment to:

“Work towards the establishment of access regimes for digital research data from public funding in accordance with the following objectives and principles:

Openness: balancing the interests of open access to data to increase the quality and efficiency of research and innovation with the need for restriction of access in some instances to protect social, scientific and economic interests.

Transparency: making information on data-producing organisations, documentation on the data they produce and specifications of conditions attached to the use of these data, available and accessible internationally.

Legal conformity: paying due attention, in the design of access regimes for digital research data, to national legal requirements concerning national security, privacy and trade secrets.

Formal responsibility: promoting explicit, formal institutional rules on the responsibilities of the various parties involved in data-related activities pertaining to authorship, producer credits, ownership, usage restrictions, financial arrangements, ethical rules, licensing terms, and liability.

Professionalism: building institutional rules for the management of digital research data based on the relevant professional standards and values embodied in the codes of conduct of the scientific communities involved.

Protection of intellectual property: describing ways to obtain open access under the different legal regimes of copyright or other intellectual property law applicable to databases as well as trade secrets.

Interoperability: paying due attention to the relevant international standard requirements for use in multiple ways, in co-operation with other international organisations.

Quality and security: describing good practices for methods, techniques and instruments employed in the collection, dissemination and accessible archiving of data to enable quality control by peer review and other means of safeguarding authenticity, originality, integrity, security and establishing liability.

Efficiency: promoting further cost effectiveness within the global science system by describing good practices in data management and specialised support services.

Accountability: evaluating the performance of data access regimes to maximise the support for open access among the scientific community and society at large.

Seek transparency in regulations and policies related to information, computer and communications services affecting international flows of data for research, and reducing unnecessary barriers to the international exchange of these data.

Take the necessary steps to strengthen existing instruments and - where appropriate - create within the framework of international and national law, new mechanisms and practices supporting international collaboration in access to digital research data.

Support OECD initiatives to promote the development and harmonisation of approaches by governments adhering to this Declaration aimed at maximising the accessibility of digital research data.

Consider the possible implications for other countries, including developing countries and economies in transition, when dealing with issues of access to digital research data.[15]

As the goals and benefits of OA to knowledge become known, large organisations are supporting the movement. In 2005, the world's two largest funders of medical researchers, the United States National Institutes of Health[16] and the United Kingdom's Wellcome Trust[17], adopted policies with a recommendation and a requirement, respectively, to provide OA to the results of successful grantees. Such support of OA arguably benefits society by enabling access to medical research that can be used to save lives or enhance the quality of life. In the United Kingdom, the Digital Repositories development program[18] “consists of some 25 projects that are exploring the role and operation of repositories. Many of these are concerned with how repositories can help academic researchers both do and share their work more

effectively. Open access is a key driver and demands are growing for the outputs of publicly-funded research to be freely available on the web.”[19]

Benefits of Open Access

There are approximately 24,000 peer-reviewed journals in the world today publishing around 2.5 million scholarly and scientific research articles per year in many different languages.[20] One directory, the Directory of Open Access Journals (DOAJ) had 1,976 free, full text, quality controlled scientific and scholarly journals listed on 19 December 2005.[21] Universities are beginning to answer the call of the Berlin Declaration by establishing digital repositories in which staff and students can self-archive their papers, whether they be articles, research reports or doctoral theses.

One of the vital societal benefits of enabling free access to knowledge in these repositories is that more people than ever before are viewing the papers. Authors are experiencing an increase in the number of citations a work receives once it has been released in the OA environment. Stevan Harnad confirms this phenomenon when he states that “A growing number of studies [are] showing that articles that have been supplemented with such self-archived versions have higher (and sometimes substantially higher) citation impacts than articles that have not been self-archived”[22].

Steve Lawrence investigated the impact of free online availability by analysing citation rates and found an average of 336% (median 158%) more citations to online computer science articles compared with offline articles published in the same venue.[23]

“Free online availability facilitates access in many ways, including provision of online archives; direct connections among scientists or research groups; hassle-free links from e-mail, discussion groups and other services; indexing by web search engines; and the creation of third-party search services. Free online availability of scientific literature offers substantial benefits to science and society. To maximize impact, minimize redundancy and speed scientific progress, authors and publishers should aim to make research easy to access.”[24]

Pat Brown of Stanford University, one of the initiators of the Public Library of Science, has said:

‘Anyone who has an interest in the results of scientific inquiry, or who believes in making the latest advances in medical knowledge available to physicians and patients around the world, can recognise the importance of more equitable access to the scientific literature.’ He then offers a few examples: “When a woman learns she has breast cancer, she deserves to be able to read the results of research on her treatment options that her own tax dollars have funded. A physician in a public clinic in Uganda ought to have the same access to the latest discoveries about AIDS prevention as a professor at Harvard Medical School. And a precocious high school student in Gary, Indiana, who wants to read about the latest discoveries from NIH-sponsored research in cell biology shouldn't have to pay thousands of dollars for journal subscriptions.’

Lack of access to the complete literature also has the effect of impeding advances in knowledge. Take bioinformatics, for example. Without free and easy access to all published papers the full power of computational analysis to reveal hidden information cannot be realized. Some examples of where access to the full literature made it possible to make the analyses that could reveal such hidden and hitherto unrealised links between data have already appeared at the European Molecular Biology Laboratory in Heidelberg. Peer Bork's group was

able to gain untold insights into signalling pathways and biochemical networks, revealing unappreciated links between proteins that can be verified by experimentation.

The benefits of open access for readers may be great; for authors, their funding bodies, their institutions, their professional organisations, and for society at large, the benefits are likely to be even greater. Widespread open access would make it easier to avoid duplication of research effort, and the resulting financial and time waste. Open access would increase the public accountability of science. Open access would make meta-analyses of results more easily possible. Open access de-fragments science literature, because it is making seamless, comprehensive searching possible. Open access would speed up understanding of outstanding scientific questions. Open access closes gaps in the access to knowledge, enabling every researcher to try and see the entire picture. Open access enables the building of databases and knowledge-bases, effectively and efficiently re-using published results in order to make trying to see the entire picture not just a 'mission impossible'. Open access would take science out of its ivory tower isolation by letting non-scientists in. Open access would engender and stimulate wider understanding of, and respect for, science.”[25]

Acknowledging these benefits, the Royal Society for the Encouragement of Arts, Manufactures and Commerce published the Adelphi Charter on Creativity, Innovation and Intellectual Property (Charter) on 13 October 2005[26]. The Charter consists of nine principles and the seventh seeks to facilitate the use of OA to scientific literature. In this way the OA principles are developing momentum into all areas of society and will continue to do so in the years to come.

However, authors might fear they will lose royalties if they release their work under an open content licence. Peter Suber believes that such authors need “to be persuaded either (1) that the benefits of OA exceed the value of their royalties, or (2) that OA will trigger a net increase in sales...there is growing evidence that both conditions are met for most research monographs[27].

“Journals’ gate-keeping function (peer review), a service which controls and certifies research quality, should not be confused with their toll-gating function (subscription, site-license, pay-per-view S/L/P), which pays for an on-paper and/or on-line product, the text...the two are currently still wrapped together inextricably. The result is that the toll-gating for the inessentials (the publisher’s version of the text) is blocking access to, hence the impact of, the refereed research itself. Publishers cannot and will not remedy this on their own. Only authors and their institutions can eliminate all the obsolete and counterproductive access/impact-barriers, virtually overnight, by self-archiving their own refereed research online, now.”[28]

OA journals exert “competitive pressure on all priced journals. However, the downward pressure on journal revenues is occurring regardless ... the opportunity created by the internet for OA to peer-reviewed research literature should be seized.”[29]

Does this mean that the existence of publishers is at risk? Are there any benefits for publishers in supporting OA? There will continue to be a need for authorised versions of journals so publishers will remain important in facilitating the gate-keeping function, as discussed above. The revenue stream for publishers may increase from this role to counter the fall in subscriptions. Authors might even pay the publishers to have their papers peer reviewed and included in the journal. This has been termed the “gold” road to OA.[30] One such “gold” publisher is the Public Library of Science (PLOS) which explains it’s model in the following way:

“To provide open access, the PLoS journals will use a non-traditional business model, in which all of our expenses (managing peer review, providing editorial oversight, and ensuring the highest production standards) will be recovered by imposing a modest charge on the authors or research sponsors for each article they publish. These one-time publication charges will allow us to make all works that appear in our journals freely available to everyone for viewing, full-text searching, and downloading from the moment of publication.

Our goal is not to have these publication charges place an additional financial burden on scientists. Our model treats publication as a fundamental part of the scientific and medical research process, and the costs of publication as a small but essential part of the cost of research.”[31]

However, this is in contrast to the “green” road along which the publishers encourage authors to self-archive:

“Over 80% of journals are already 'green', that is, they give authors a green light to self-archive in some form. About 5% (almost 1,000 journals) are 'gold', that is, they are Open Access journals. However, to recover publication costs no longer covered by subscriptions, many of these Open Access journals charge authors. The riskiness of this untested model makes publishers more willing to go green rather than gold.

An unfortunate tendency has arisen to equate Open Access itself with Open Access journal publishing. But there is more than this one, golden, road to Open Access: there is the faster, surer and more heavily travelled green road. We think that authors may be confusing the *journal-affordability* problem with the access/impact problem. Let us hope that the prospect of increased impact will persuade the majority of authors and their institutions to take to the green road so we can all enjoy its rewards.” [32]

The green and gold roads correspond to the two BOAI Open Access Provision policies, BOAI-1 (self-archiving) and BOAI-2 (open access journal), respectively.[33] A more recent analysis has revealed that “Ninety-two percent of the 8450 journals surveyed to date (including most of the top journals) have given their authors the green light to self-archive: <http://romeo.eprints.org/>.”[34] Publishers will incur less cost in distributing the journals online and might move to publishing printed copies of the journal by request only. The print version of the journals will continue to be important as the digital reproduction of the article might not be in the same format as that used for the journal. Citation of the article will, therefore, be less accurate in identifying the page of the journal on which the quote appeared. Therefore, the print version will provide accuracy in the citation of the work and will sustain the many technological changes that may occur in the future.

Publishers might raise the prominence of the journal name by numbering the paragraphs of the articles so that the URL or journal page numbers from which the article was accessed is not the prime reference. Page numbers for articles on the Internet are difficult to use because, in reality, the article in hypertext is one page and a different number of pages might be printed on different computers. AUSTLII is leading the way in this innovative approach to making access to knowledge more compatible with the existing referencing requirements.[35] If paragraph numbering is adopted, journal articles will no longer need to be released in PDF to enable accurate referencing. In this way re-users of the work need only state the name of the journal in the references together with the paragraph number. The necessity for a published version of the article becomes less important so the cost for publishers will decrease. Projects such as the Integrated Content Environment (ICE) System[36] assist authors to produce their articles in a number of different formats including PDF and html

making it easier for the articles to be self-archived and hence promoting greater access to knowledge.

OA will, as discussed above, increase citations which benefits the journal publishers as well as the researchers. Greater citations increases the likelihood that others will build upon the research results and this is beneficial to all of society.

“OA makes publishers’ articles more visible, discoverable, retrievable and useful. If a journal is OA, then it can use this superior visibility to attract submissions and advertising, not to mention readers and citations. If a subscription-based journal provides OA to some of its content (e.g. selected articles in each issue, all back issues after a certain period, etc.), then it can use its increased visibility to attract all the same benefits plus subscriptions. If a journal permits OA through postprint archiving, then it has an edge in attracting authors over journals that do not permit postprint archiving. Of course subscription-based journals and their publishers have countervailing interests as well and generally oppose OA. But it oversimplifies the situation to think that *all* their interests pull against OA.”[37]

As the benefits of OA become more evident and the business models employed by publishers change, greater support for OA by publishers will invariably strengthen, enhancing free and OA to knowledge for all.

PART 2 OPEN CONTENT LICENSING

As people have sought to promote the principles of OA, and in an effort to protect intellectual property rights, the use of open content licensing has become very important. In preparing readers for his *Open Access Bibliography*, Charles W. Bailey, Jr discusses the move towards self-archiving[38]. Self-archiving includes putting articles in disciplinary archives or in institutional archives and repositories. Self-archiving is a growing trend as a result of “the advent of free scholar-produced journals (which often let scholars retain copyright), an increased awareness of copyright issues as a result of the serials crisis, the vigorous self-archiving advocacy efforts of Stevan Harnad and others, and the rise of the open access movement”[39].

Copyright issues in relation to those rights retained by the author when self-archiving are of concern. Bailey, Jr believes that “A barrier to author granting of rights has been that framing the proper wording of license agreements is a complex process requiring significant legal knowledge. The Creative Commons has greatly facilitated the use of author license agreements by developing a variety of standard agreements that authors can easily select and utilize.”[40] In relation to institutional repositories, Queensland University of Technology leads the OAK Law Project which will develop legal protocols for managing copyright issues in an OA environment and investigate the provision and implementation of a rights expression language for implementing such protocols at a technical level.[41]

In relation to copyright, the Open Society Institute has acknowledged the following:

“The spirit in which copyright was originally conceived was one of protecting both creators and the public. In science, it is in the interest of both to have the widest possible readership. In the traditional, subscription-based publishing model, copyright is used to make articles artificially scarce, so that money can be made selling them, or selling access to them. In the print world that was a necessity – how else could a publisher recoup his investment? Although

charging authors to cover some of the costs was – and is – done (page charges), the income from such charges could only ever cover part of the expenses, as a fixed amount at the input side of the process could never finance a potentially unlimited number of print copies.

This argument is no longer valid in the world we live in today, where the internet makes the electronic dissemination of articles possible without hardly any marginal cost to the publisher. So, finally, copyright can be used for what it is meant to in science, not to make the articles artificially scarce and in the process restrict their distribution, but instead, to ensure that their potential for maximum possible dissemination can be realised. From a trader in copyrights, the publisher becomes a provider of publishing services.

This requires a change of mindset more than anything else. When the publication of an article is paid for by article processing charges, there is no longer any need to use copyright to secure recouping investment. Consequently, to ask authors to transfer copyright is not needed and no longer justified by economic necessity. That doesn't mean that copyright has become irrelevant. But its function now is to guarantee that any restrictions on dissemination are lifted, and authors get the recognition they deserve. Its new focus is more on moral rights than on economic rights.

In practice, authors, as copyright holders, need to assert and agree that their articles are published with OA and made universally and freely available. The legal code for such an agreement has been developed by the Creative Commons, and in particular their 'attribution license' is written specifically for the purpose. This licence is currently being used by OA publishers such as the Public Library of Science[42], BioMed Central[43], and others[44].[45]

As suggested above by Bailey Jr and the Open Society Institute, the Creative Commons has produced licences to facilitate OA to all forms of copyright works. Creative Commons uses “private rights to create public goods: creative works set free for certain uses”[46]. Creative Commons seeks to act, as the free software and open-source movements have, “to offer creators a best-of-both-worlds way to protect their works while encouraging certain uses of them” — to release works with “some rights reserved” rather than “all rights reserved” as is the case in a world where “all rights reserved” is the norm[47].

Creative Commons enables the author/copyright holder to choose the licence that enables the retention of certain rights. These include the following:

1. attribution of the author;
2. commercial or non-commercial use of the work; and
3. whether derivatives of the work can be made or not and if derivatives are allowed, whether the derivative must be released under an identical licence (Creative Commons 2005).

When addressing the need for licences in the provision of pre-prints (articles prior to peer review), Roger Clarke has stated that “a requisite variety of licences is needed in order to reflect the diversity of categories or work and of circumstances [and] [t]his is a similar conclusion to that previously reached by the Australian Educational Sharing Network (AEShareNet, <http://www.aesharenet.com.au/>) in 1998, and by Creative Commons (<http://creativecommons.org/>) in 2001.”[48]

Clarke does not address the issues that arise where more than one person owns copyright in the original work but warns that authors may be required to assign copyright in the work as a condition of publication, in which case, prior release of the work into the OA environment might preclude its publication in a journal, might

require the withdrawal of the pre-print or raise an argument that the post-print is a separate work from the pre-print.[49] In conclusion, Clarke asserts that the Creative Commons Attribution/NonCommercial/No Derivative Rights (By-NC-ND) variant is the most appropriate licence for releasing pre-prints and post-prints (peer reviewed papers) in the OA environment where the author retains copyright in the article.[50] However, difficulties arise when the conference or journal requires assignment of copyright in the work from the author to the publisher.

The RoMEO Project (Rights METadata for Open archiving) was funded by the Joint Information Systems Committee (JISC) from 1 August 2002 to 31 July 2003 to investigate the rights issues surrounding the 'self-archiving' of research in the UK academic community under the Open Archive Initiative Protocol for Metadata Harvesting (OAI PMH).[51] The SHERPA project (Securing a Hybrid Environment for Research Preservation and Access) followed on from the RoMEO project and sought to establish institutional open access e-Print repositories in 20 partner institutions which comply with the OAI PMH using ePrint software.[52]

A colour grading system was developed from the original RoMEO project list to differentiate between four categories of archiving rights adopted by publishers:

White – archiving not formally supported;

Yellow – can archive pre-print (ie pre-refereeing);

Blue – can archive post-print (ie final draft post-refereeing); and

Green – can archive pre-print and post-print.[53]

A list of publishers and their archive policies has been created to assist digital repository managers in complying with publisher requirements.[54]

Upon analysis of the RoMEO/SHERPA colour definitions, Clarke asserts that the Creative Commons Attribution/NonCommercial/No Derivative Rights (By-NC-ND) licence is most appropriate for self-archiving post-prints following copyright assignment to the Blue, Green and Yellow publishers.[55] However, while the Yellow, Blue and Green publishers have allowed for self-archiving, the re-use of the work by a person accessing the repository must comply with copyright law and the conditions required by the publisher. Release of the work from a repository on a Creative Commons licence might be inconsistent with the “all rights reserved” basis upon which the publisher would release the work. Furthermore, unless the author has received a licence to archive the paper from the publisher following assignment of copyright in the article to the publisher, the author has no rights on which to grant a licence to re-users of the self-archived post-print. The agreement assigning copyright to the publisher will address this and repository managers must ensure these rights are communicated to those who access the work in the repository.

By virtue of the Berne Convention and the *Copyright Act 1968* (Cth), copyright vests in the author/creator of a literary, artistic, musical or dramatic work or other subject matter upon its creation in material form. There are a number of exceptions to this including copyright in a work created by an employee will, in most circumstances, vest in the employer. Regardless of this, no registration is required to secure

copyright ownership but in the United States registration is required to enable enforcement of copyright. Presuming copyright remains with the author, the author or authors of the work own copyright which includes a number of exclusive rights including the right to reproduce and communicate the work to the world. If a publisher requires that copyright be assigned to it by the author, the publisher will take a transfer of the economic rights in the work but the author will retain the moral rights (right of attribution and integrity) where they have not been consented away or waived (which is not possible in some countries).

What may emerge is a new era in the world of publishing. We may see more of a move towards a model where copyright in the articles remains with the authors. The predominant course of action might be the granting of non-exclusive licences by the authors to enable publishers to publish the article in print and digital form. Alternatively, authors might assign limited rights to the publishers to enable commercial communication to the world as opposed to non-commercial communication. The right to communicate the article to the world on a non-commercial basis would be retained by authors to enable OA to knowledge by self-archiving in digital repositories or self-publishing on personal websites.

PART 3 WHAT DOES OA MEAN FOR EDUCATION?

As discussed above, Creative Commons, AShareNet and other types of open content licences provide avenues for educational institutions and education communities[56] to share Open Educational Resources (OER). OER includes learning materials, research results, publications and broader materials for educational environments.

The term "Open Educational Resources" was first adopted at the United Nations Education, Science and Cultural Organization's (UNESCO's) 2002 Forum on the Impact of Open Courseware for Higher Education in Developing Countries funded by the William and Flora Hewlett Foundation. Open Educational Resources are digitized materials offered freely and openly for educators, students and self-learners to use and re-use for teaching, learning and research. Open Educational Resources include:

Learning Content: Full courses, courseware, content modules, learning objects, collections and journals.

Tools: Software to support the development, use, re-use and delivery of learning content including searching and organization of content, content and learning management systems, content development tools, and on-line learning communities.

Implementation Resources: Intellectual property licenses to promote open publishing of materials, design principles of best practice, and localization of content. [57]

Massachusetts Institute of Technology (MIT) is one tertiary institution that has provided OER in the form of MIT OpenCourseWare[58]. The development of the Learning Activities Management System (LAMS) which enables teachers to engage in designing, managing and delivering online collaborative learning activities[59] has produced the LAMS Community[60] which seeks to provide OER. The Le@rning Federation (TLF), an initiative of State and Commonwealth governments in Australia and New Zealand, has developed and released an open source project called Basic E-Learning Tool Set (BELTS) which provides teachers with the ability to manage and distribute digital learning objects.[61] Further, to assist educational communities in developing digital learning objects, The Le@rning Federation (TLF) provides, under

the AShareNet Free for Education (FfE) licence, open access to reports from research, trials, feasibility studies and planning activities.[62]

Knowledge management in schools and universities must understand and harness the power of this new dynamic.[63] Educational institutions and education communities will need to understand how to share knowledge legally. To facilitate OA to such knowledge in the educational environment, AShareNet has developed a Free for Education Licence (FfE) that it is requesting the government and others to use in labelling content that can be utilised for educational activities[64].

Creative Commons is looking at developing an OA licence to be used for educational activities and the leader of the cc-education project is David Wiley, Founder of OpenContent[65] and Assistant Professor of Instructional Technology, Utah State University[66]. [67] "Because I'm an instructional technologist, and my primary field of research and inquiry is using technology to better support learning, my own work in open content has always focused on reusable educational media. I couldn't be happier than I am to participate in this manner," said Wiley.[68]

More recently, Wiley said,

"The current community of practice around educational uses of the [Creative Commons] BY-NC-SA license (MIT OCW, USU OCW, Johns Hopkins OCW, etc.) strongly encourages teachers to reuse the OCW materials in their courses...Use by teachers in classrooms, by students, and by people with no institutional affiliation is strongly encouraged. Of course noncommercial doesn't only mean teaching and learning; many types of research are covered by the definition as well." [69]

On a global basis, the OECD held an Expert Meeting on OER in Malmö, Sweden on 6 and 7 February 2006 and published notes on the issues addressed.[70] The meeting was part of the CERI project on OER and was organised jointly by the Swedish Knowledge Foundation. The 21 participants discussed:

1. Intellectual property rights and licenses for open content;
2. Developments and trends in the field of OER;
3. Arguments for institutional participation in OER; and
4. Models for sustainable OER.

There are many issues in each of these areas that are being addressed and OER will continue to evolve in the years ahead.

Conclusion

"OA puts rich and poor on an equal footing for these key resources and eliminates the need for permissions to reproduce and distribute content." [71] OA will continue to evolve, arguably benefiting all parties involved; the authors, the publishers, the public and society. OA to knowledge with the least possible copyright constraints on its reuse will be of immense value to participants in the scientific, educational and creative environments. Such OA is a benefit to society as it promotes the advancement of knowledge, the development of ideas, the catalyst for creativity and the ability to communicate freely with the people of the world. For these reasons, many

organisations, both public and private, are involved in developing digital repositories, facilitating OA to the knowledge and improving the quality of data curation and digital preservation. “Repositories have a key role to play, since they both enable open access, and help universities and colleges manage the intellectual output of their researchers.”[72]

Seamless access to knowledge, facilitated by digital technology, must be matched by a business and legal environment that adequately respects and recognises the proper balance between knowledge, culture and economy, that our existence demands.[73]

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Brian is a well-known intellectual property and information technology lawyer. His latest (co-authored) books are *Cyberlaw: Cases and Materials on the Internet, Digital Intellectual Property and E Commerce* (2002); *Jurisdiction and the Internet* (2004); *Intellectual Property in Principle* (2004). Brian's current projects include work on digital copyright issues across the areas of Open Content Licensing and the Creative Commons, Free and Open Source Software, Fan Based Production of Computer Games, Licensing of Digital Entertainment and Anti-Circumvention Law. Brian is a Project Leader for Creative Commons in Australia and Project Leader of The OAK (Open Access to Knowledge) Law Project. From 1998-2002 Brian was Head of the School of Law and Justice at Southern Cross University in New South Wales, Australia and in January 2002 was appointed as Head of the School of Law at Queensland University of Technology in Brisbane, Australia.

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Scott completed his Articles of Clerkship with Blake Dawson Waldron Lawyers in 2001, after working in the Insurance, Projects, Intellectual Property and Communications and Corporate Advisory practice groups. He then travelled to Silicon Valley, California USA and upon his return, Scott commenced work in the Litigation practice group of McInnes Wilson Lawyers, concentrating on the defence of professional indemnity claims. In 2004, Scott joined the Commercial Litigation practice group of Home Wilkinson Lowry Lawyers which provided broader litigation experience in project management contracting, retailing, construction, manufacturing and franchising. In an effort to progress a career in intellectual property law, Scott commenced work with Colavitti Lillas Lawyers before becoming Project Manager of The OAK (Open Access to Knowledge) Law Project. Scott is presently undertaking his Master of Laws specialising in intellectual property law at The University of Queensland.

Notes

¹ Neil Jacobs believes that technologies such as blogs, wikis and peer-to-peer repositories often come into universities and colleges 'under the radar'. "The PROWE project <<http://www.prowe.ac.uk/>> is asking whether blogs and wikis in particular can be used to support the huge distributed networks of tutors associated with the Open and Leicester Universities. The SPIRE project <<http://spire.conted.ox.ac.uk/cgibin/trac.cgi>> is installing the secure Lionshare <<http://lionshare.its.psu.edu/main/>> peer-to-peer system, to explore its potential in teaching and learning and, in part, to dispel the mistaken notion that peer-to-peer equals Napster equals insecure and probably illegal activity." In Jacobs, N Digital Repositories in UK universities and colleges, *FreePint*, No. 200 16 February 2006, pp. 13-15, at <http://www.freepint.com/issues/160206.htm> accessed 23 February 2006, p. 15.

² Open Society Institute (2005) Open Access Publishing and Scholarly Societies A Guide, www.soros.org/openaccess/scholarly_guide.shtml accessed on 19 December 2005.

³ Clarke, R. (2005a) A proposal for an open content licence for research paper (Pr)ePrint, *First Monday* Vol 10, number 8 (August 2005) http://firstmonday.org/issues/issue10_8/clarke/index.html accessed 22 November 2005.

⁴ Wikipedia at http://en.wikipedia.org/wiki/Open_access accessed 21 January 2006.

⁵ <http://www.soros.org/openaccess/read>.

⁶ <http://www.soros.org/openaccess/view.cfm>.

⁷ <http://www.earlham.edu/~peters/fos/bethesda.htm>.

⁸ <http://www.earlham.edu/~peters/fos/bethesda.htm>. These three items constitute the whole statement and are contained under each respective heading.

⁹ <http://www.zim.mpg.de/openaccess-berlin/berlindeclaration.html>.

¹⁰ <http://www.openarchive.org>.

¹¹ Condition 1 for an open access contribution as defined in the Berlin Declaration, <http://www.zim.mpg.de/openaccess-berlin/berlindeclaration.html>.

¹² <http://www.zim.mpg.de/openaccess-berlin/signatories.html> accessed 18 February 2006: Hans-Jörg Bullinger, President Fraunhofer Society; Karl Max Einhäupl Chairman of the Wissenschaftsrat; Peter Gaetgens President HRK; Peter Gruss President Max Planck Society; Hans-Olaf Henkel President Leibniz Association; Walter Kröll President Helmholtz Association; Ernst-Ludwig Winnacker President German Research Foundation; Bernard Larroustou Director General, Centre National de la Recherche Scientifique (CNRS); Jürgen Mittelstraß President, Academia Europaea; Paolo Galluzzi Director, Istituto e Museo di Storia della Scienza Florence; Friedrich Geisselmann, Head, Deutscher Bibliotheksverband; Yehuda Elkana President and Rector, Central European University Budapest; Jean-Claude Guédon Open Society Institute; Martin Roth Director General, Staatliche Kunstsammlungen Dresden; Christian Bréchet Director General, Institut National de la Santé et de la Recherche Médicale (INSERM); José Miguel Ruano Leon Minister of Education Cultura y Deportes Gobierno de Canarias; Dieter Simon President, Berlin-Brandenburg Academy of Sciences and Humanities; Jens Braarvig Director, Norwegian Institute of Palaeography and Historical Philology; Peter Schirnbacher CEO of the Deutsche Initiative für Netzwerkinformation; Antonio Cantore Director, Consorzio Interuniversitario Lombardo per l'Elaborazione Automatica (CILEA); Georg Wick President of the FWF Austrian Science Fund (FWF Der Wissenschaftsfonds); José Traest Secretary General of the Fund for Scientific Research – Flanders (Fonds voor Wetenschappelijk Onderzoek - Vlaanderen); P. Papagiannakopoulos Director and President of the Board National Hellenic Research Foundation; Eike Jessen President Deutsches Forschungsnetz; Jüri Engelbrecht President Estonian Academy of Sciences, Estonia; Wilhelm Krull Generalsekretär der Volkswagenstiftung; Julia Bolton Holloway President Aureo Anello Associazione Biblioteca e Bottega Fioretta Mazzei e Amici del; Cimitero 'degli Inglesi' Florence, Italy; Lu Yongxiang President of the Chinese Academy of Sciences; Kristen Haugland Research Director University of Bergen, Norway; M.-J. Simoen Secretary General Fonds National de la Recherche Scientifique (FNRS), Belgium; Peter Fabian President European Geosciences Union (EGU), France / Germany; Philippe Kourilsky Directeur General Institut Pasteur, Paris, France; Antonio Fantoni Biblioteca Interateneo Digitale della Sapienza, Università di Roma "La Sapienza", Italy; Rick Johnson SPARC; David Prosser SPARC Europe; M S Valiathan President Indian National Science Academy; Eberhard R. Hilf Director Institute for Science Networking Oldenburg Gmb Han der Carl von Ossietzky University; Robert Aymar Director General CERN; Paula Vita Finzi Università di Pavia; Chen Yiyu President National Science Foundation China (NSFC); Ji Yanjiang Qiji.CN e-Print archive Team University of Science and Technology at Beijing; Ismail Serageldin Director Bibliotheca Alexandrina, Egypt; Marion Guillou

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¹³ Open Society Institute (2005) Open Access Publishing and Scholarly Societies A Guide, www.soros.org/openaccess/scholarly_guide.shtml accessed on 19 December 2005.

¹⁴ The governments of Australia, Austria, Belgium, Canada, China, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Russian Federation, the Slovak Republic, the Republic of South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States:

http://www.oecd.org/document/0,2340,en_2649_34487_25998799_1_1_1_1,00.html.

¹⁵ http://www.oecd.org/document/0,2340,en_2649_34487_25998799_1_1_1_1,00.html.

¹⁶ <http://www.nih.gov>.

¹⁷ http://en.wikipedia.org/wiki/Wellcome_Trust and <http://www.wellcome.ac.uk/>.

¹⁸ <http://digbig.com/4fyve> is building on a previous program called Focus on Access to Institutional Resources (FAIR) at <http://digbig.com/4gfac>.

¹⁹ Jacobs, N. Digital Repositories in UK universities and colleges, *FreePint*, No. 200 16 February 2006, pp. 13-15, at <http://www.freepint.com/issues/160206.htm> accessed 23 February 2006, p. 13.

²⁰ Harnad, S. (2005) On Maximizing Journal Article Access, Usage and Impact. <http://www.haworthpressinc.com/library/StevanHarnad/04212005.asp> accessed 21 December 2005.

²¹ <http://www.doaj.org>.

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²³ Lawrence, S.R. (2001) Free Online Availability Substantially Increases a Papers Impact, *Nature*, 411(6837), p. 521.

²⁴ Lawrence, S.R. (2001) Free Online Availability Substantially Increases a Papers Impact, *Nature*, 411(6837), p. 521.

²⁵ Open Society Institute (2005) Open Access Publishing and Scholarly Societies A Guide, www.soros.org/openaccess/scholarly_guide.shtml accessed on 19 December 2005.

²⁶ <http://www.adelphicharter.org>.

²⁷ Suber P, Open Access Overview 27 October 2005, <http://earlham.edu/~peters/fos/overview.htm> accessed 19 December 2005.

²⁸ Harnad, S. (2001) Research Access, Impact and Assessment <http://cogprints.org/1683/01/thes1.html> accessed 21 December 2005.

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- ³¹ <http://www.plos.org/journals/model.html> accessed 18 February 2006.
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- ³⁴ Harnad, S. (2005a) On Maximizing Journal Article Access, Usage and Impact. <http://www.haworthpressinc.com/library/StevanHarnad/04212005.asp> accessed 21 December 2005.
- ³⁵ <http://www.austlii.edu.au>.
- ³⁶ <http://www.usq.edu.au/dec/staff/ice.htm> accessed 18 February 2006.
- ³⁷ Suber, P. 'Open Access Overview', at <http://www.earlham.edu/~peters/fos/overview.htm>.
- ³⁸ Bailey Jr, C.W. (2005) Open Access Bibliography Liberating Scholarly Literature with E-Prints and Open Access Journals. <http://www.escholarlypub.com/oab/oab.htm> accessed on 19 December 2005.
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- ⁴⁰ Bailey Jr, C.W. (2005) Open Access Bibliography Liberating Scholarly Literature with E-Prints and Open Access Journals. <http://www.escholarlypub.com/oab/oab.htm> accessed on 19 December 2005, p. xvii with endnote <http://creativecommons.org/>.
- ⁴¹ <http://www.oaklaw.qut.edu.au>.
- ⁴² <http://www.plos.org/>.
- ⁴³ <http://www.biomedcentral.com/>.
- ⁴⁴ Directory of OA Journals <http://www.doaj.org>.
- ⁴⁵ Open Society Institute (2005) Open Access Publishing and Scholarly Societies A Guide, www.soros.org/openaccess/scholarly_guide.shtml accessed on 19 December 2005.
- ⁴⁶ Creative Commons (2005) website <http://creativecommons.org> accessed on 3 January 2006.
- ⁴⁷ Creative Commons (2005) website <http://creativecommons.org> accessed on 3 January 2006.
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- ⁵¹ <http://www.lboro.ac.uk/departments/ls/disresearch/romeo/>. The OAI PMH (<http://www.openarchives.org/>) "enables metadata to be exchanged reliably. In terms of digital resources, the standards vary according to the domain, but include: Dublin Core (<http://dublincore.org>) and MARC (<http://www.loc.gov/marc/>) for bibliographical data." in Jacobs, N Digital Repositories in UK universities and colleges, *FreePint*, No. 200 16 February 2006, pp. 13-15, at <http://www.freepint.com/issues/160206.htm> accessed 23 February 2006, p. 13.
- ⁵² <http://www.sherpa.ac.uk/about.html>. SHERPA is part of the JISC FAIR (Focus on Access to Institutional Resources) Programme which supports projects aiming to achieve the "disclosure of institutional assets" with the vision of setting up a "web of resources built by groups with a long term stake in the future of those resources, but made available through service providers to the whole community of learning." (http://www.jisc.ac.uk/index.cfm?name=programme_fair).
- ⁵³ <http://www.sherpa.ac.uk/romeoinfo.html#colours>.
- ⁵⁴ <http://www.sherpa.ac.uk/romeo.php?all=yes>.
- ⁵⁵ Clarke, R. (2005b) A Standard Copyright Licence for PostPrint, <http://www.anu.edu.au/people/Roger.Clarke/EC/PostPrLic.html>, pp. 4 and 5.
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- ⁵⁹ <http://lamsfoundation.org/>.
- ⁶⁰ <http://www.lamscommunity.org>.

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- ⁶² <http://www.thelearningfederation.edu.au/tlf2/showMe.asp?nodeID=3> accessed 3 March 2006.
- ⁶³ Fitzgerald, B. Structuring Knowledge Through Open Access: The Creative Commons Story in C. Kapitzke and B. Bruce (eds.) *New Libraries and Knowledge Spaces: Critical Perspectives on Information Education* (2005) Lawrence Erlbaum and Assoc.
- ⁶⁴ <http://www.aesharenet.com.au>.
- ⁶⁵ <http://opencontent.org/>.
- ⁶⁶ <http://www.usu.edu/>.
- ⁶⁷ <http://creativecommons.org/discuss> accessed and <http://creativecommons.org/discuss#education> 25 February 2006
- ⁶⁸ <http://creativecommons.org/press-releases/entry/3733> accessed 25 February 2006.
- ⁶⁹ <http://lists.ibiblio.org/pipermail/cc-education/2005-April/000245.html> accessed 27 February 2006.
- ⁷⁰ <http://www.oecd.org/dataoecd/12/46/36162143.pdf> accessed 18 February 2006.
- ⁷¹ Suber P. 'Open Access Overview', at <http://www.earlham.edu/~peters/fos/overview.htm>.
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