Open Access and Development: journals and beyond

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IDS Knowledge Services

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OPEN ACCESS AND DEVELOPMENT:

Journals and beyond

"(we are like)…dwarfs on the shoulders of giants, so that we can see more than they, and things at a greater distance, not by virtue of any sharpness of sight on our part, or any physical distinction, but because we are carried high and raised up by their giant size."

- Attributed to Bernard of Chartres by John of Salisbury in 1159 and later famously uttered by 17th Century scientist Isaac Newton.

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Executive Summary

This following report sets out to explore what Open Access means, how it has evolved as a philosophical and practical tool for scholarly communication, and how these publishing modes are currently being used to redress some of the imbalances, which currently exist within the traditional models of scholarly communication. It then goes on to examine the current and potential uses of open access in the context of the developing world; questions if, within these contexts, a different open access-based approach is required, and makes recommendations for this.

Traditional scholarly publishing models are no longer applicable in a networked world. While researchers can share information easily and informally using digital tools, journal articles, databases and archives published using traditional models restrict access in various ways. The costs of subscriptions to the journals published by traditional publishers are prohibitively high, putting them well above the means of many institutions, particularly those in the developing world.

At the same time, the citation models (which have evolved in conjunction with the market-driven growth in scholarly publishing) force researchers to fight for page-space in handful of core journals – leading to the development of a culture of "publish or perish". These journals are not only expensive to access, but they have a narrow mandate, and tend to publish work only from a small selection of global research. This has led to a situation where research from the developing world has been overlooked, creating a "scientific silence" which misrepresents the reality – an invisible college of networked researchers producing high-level research that impacts directly on improving people's lives and contributes to national development.

Open access models not only remove the price barrier, thus making knowledge (which is often produced using public funding) available freely, but it also allows researchers from this silent college to upload, share, collaborate and build upon their research more freely.

Global funders and governments alike have begun to recognise the value of building research infrastructures using open access models, which allow for the freer flow of information – this has been recognised as a global public good. At policy levels, they have begun to build open access models into their funding and policy-building practices. These are all valuable actions, and the global scholarly community will feel their impact. However, some of the context-specific

requirements of the developing world are more complex, and require that governments and funders consider the unique needs of each country when creating these policy frameworks. Unless that happens, the decisions and value-evaluations made by the developed global North will continue to be imposed upon the developing world in an unequal and unsustainable way.

1. Introduction

Scholarly journals have been the primary means of sharing knowledge for academics and researchers since the mid 1600s, when Henry Oldenberg published the first issue of the English-language periodical *Philosophical Transactions of The Royal Society of London*. Oldenberg undertook this endeavour with several objectives in mind, including the intention of leveraging technology (in this case, print and new models of distribution which, interestingly were emerging as a result of the early experiments in copyright and intellectual property) to disseminate the latest scientific discoveries[1]. However, it was not until the latter half of the 20th century that large-scale commercial publishers began to realise the potential economic value to be found in scholarly publishing, as a result of changes in higher education post-World War II. By recognising that scientific knowledge was expanding as a commercial sector, and predicting the growth of the knowledge economy, commercial publishers quickly began to supplant the learned societies and small publishers, which had previously prevailed in the scholarly publishing landscape. These publishers, in turn, have evolved and been consolidated into global corporations who dominate the production and publication of research[2].

As a result of this large-scale commoditisation of knowledge, scholarly communication has come to be governed by the market-oriented values adopted by the publishers (and in many cases, by university presses as well, which are often pressurised by their institutions to become 'profit-making'.) A significant symptoms of this commercial system, which relies on quantitative metrics as the measure by which the status and quality of scholars are evaluated is that the citation index, a system initially designed to help librarians manage the boom in the volume of scholarly publications being produced, has become the universal yardstick by which the value of a researcher's output is measured. (Guédon, 2001 & Gray 2009). However, this standard is deeply flawed – it is controlled by one commercial company, Thomson Reuters, and is subject to pressures of the commercial world. A secondary, but no less important consequence of this is the fact that the current system is dominated by publishers based in the global North, and their publication output is almost exclusively made up of research from institutions in the North, meaning research in the developing world is marginalised and often overlooked. This phenomenon is one of the core focus areas of this report, and while this process will be explored and critiqued, this paper also hopes to make several points about how Open Access in general may

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[1] Guedon, 2001, introduction
[2] Gray and Willmers, 2009

offer some respite and opportunities for researchers in the developing world to take a more central place in the dissemination of essential research.

The evolution of scholarly publication into a for-profit enterprise has a myriad of damaging implications not only for the processes of scholarly publication, but for the practices of researchers and academics themselves. The culture of publish-or-perish is the most obvious of these consequences – by basing evaluations and measuring "value" by way of bibliometrics, researchers and academics are incentivised to publish frequently and in the highest profile journals; a system, which makes scholarship vulnerable to competitive and anti-scholarly practices. This output-focussed approach has led to a growing "publication bias"—the tendency to publish only confirmatory evidence for research, in an effort to secure results deemed worth of publication. By making publication output a condition for consideration for tenure, and in many cases incentivising with cash bonuses, researchers are pressurised to produce results fast and several critiques have shown that this leads directly to increased incidences of corner-cutting in the research, and in extreme cases, academic fraud[3]. As van Dalen and Henkens put it "…the content of publications seems to be taking a backseat in academia as the message to aspiring researchers has evolved into the publication rule that it no longer matters what you write, but only how often, where and with whom you write." (2012).

At the same time, the cost of subscriptions to these journals was also subject to profit taking, and the now-familiar scenario of subscriptions becoming too expensive for even the most prestigious institutions arose. In some cases, the increases were disproportionate to consumer price indexes, as David Schulenburg, then-Provost of the University of Kansas, pointed out in 1998. Between 1986 and 1996, the consumer price index in the USA increased 44 percent, while over the same period, the cost of monographs increased by 62 percent. Health care costs increased by 84 percent while the cost of scholarly journals increased by 148 percent and the cost of subscriptions to certain online databases grew even more rapidly, in the most notorious case by over 350 percent in a single year. "Our budget would have to increase 70 percent if we were to buy the same proportion of serials and monographs as we did in1986. Due to inflation in price and in publications available, we would need an acquisitions budget . . . 2.5 times that of our existing acquisition budget."[4] This phenomenon was not limited to North America either. In Australia, JW Houghton reports, "between 1986 and 1998, the number of journal subscriptions in Australian university libraries declined by 37%, but expenditure on them increased by 63% and the unit cost

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[3] Van Dalen and Henkens
[4] Policy Perspectives, 1998

of journals increased by a staggering 474%".[5] This has not changed in the intervening years - according to the Library Journal, the 2011 Periodicals Price Survey, found the average cost for an annual subscription to a journal ranges from US$4,044 in Chemistry discipline to US$1,103 in Agriculture. Scientific publishing houses also offer a 'Big Deal' package that provides access to multiple journals: Elton Bryson Stephens Company's (EBSCO) Big Deal package, Academic Search Primer, provides non-US universities with access to 2,001 journals for US$ 2,667,333 million (at an average of US$ 1,333 per journal). These costing models are unaffordable not only for most universities in developing countries, but even for Harvard, as the Faculty Advisory Council to the library recently stated publicly that subscriptions to the major journal packages are neither tenable nor sustainable.[6]

There two trends – the staggering growth in costs and the increased pressure to publish the right kinds of research in the right kinds of journals has had a hugely chilling effect on the growth of and access to research in developing world. Historically, developing countries were defined by the scholarly publishing system as 'peripheral' and 'local' and they were driven further towards the margins of the global knowledge system (Gray and Willmers). When the Information Sciences Institute deliberated the presence of publications from 'Third World' countries in the index in 1982, the decision was to evaluate their 'contribution to world science', rather than including work on matters of national or regional significance (Guédon 2007). By doing this, the definition of what could be classified as 'world science' by a handful of editors and publishers of journals based in the global North arbitrated "world class" scholarship. It also reduced the possibilities for researchers to disseminate regional-focussed research, which has resulted in an assumption that there is inactivity in these parts of the world, even though, in many cases, it is in these areas of regional interest that researchers from the developing world can make a meaningful contribution.
In these circumstances, marginalised researchers have little scope for having their research represented in international institutional subscribers, and scholars from the developing world have limited chances of having their articles published in the indexed journals (Gray and Willmers). While this picture is bleak, it is only compounded by the fact that the rise in the cost of journal prices is felt even more keenly in the developing world, where unfavourable exchange rates and a general lack of resources mean that it would be unlikely that researchers would be able to access the journals even if they were represented in their pages[7].

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[5] Houghton 2001
[6] http://isites.harvard.edu/icb/icb.do?keyword=k77982&tabgroupid=icb.tabgroup143448
[7] Gevers and Mati 2006

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Into this rather bleak picture however, the possibilities provided by new technologies and the new models that have evolved as a result of these technologies, provide a welcome potential for redressing the imbalances. Developments in ICT, and developments in copyright, content licensing and IP mean that new possibilities for knowledge access and communication have emerged. Open access and the models for scholarly communication that have emerged from this foundation are just one of the developments which allow researchers to share information and exchange ideas instantly, but they need to be seen within the contexts of the global movement towards an opening up and freeing of information, both in terms of a lack of financial barriers to access, and a freedom of access itself.

This report, funded by the Mobilising Knowledge for Development (MK4D) programme, based at the UK Institute of Development Studies, focuses on the problems and challenges associated with proprietary journals and its effect on the production, distribution and sharing of research information coming from natural and social scientists and development practitioners. This report presents a study of general OA trends at the international level based on cases from Brazil, India and South Africa. It also provides a set of recommendations for advancing information-sharing and communication practices.

2. Methodology

This report seeks to achieve three goals:

1. Provide an understanding of the general status and models of Open Access publishing

2. Explore the links between OA and development

3. Make recommendations for taking forward OA advocacy in developing countries.

The methodology for this study included:

i.   Desk research and interviews with key players
ii. Country case studies on India, South Africa and Brazil
iii. Online engagement / email consultations.

Desk Research

Desk research was undertaken to review the global literature on open access, including open access policies being implemented by governments and research institutions, and support provided by development agencies. This contributed in particular to analysis of the status of open access movements and in helping to identify opportunities and challenges. Desk research on the global status of open access movements was undertaken by Murali Shanmugavelan, Doctoral student in Critical Media Studies at the School of Oriental and African Studies, and Professor Leslie Chan, Senior Lecturer, Department of Social Sciences at the University of Toronto, Scarborough.

Country Case Studies

India, South Africa and Brazil were chosen as country case studies. These leading emerging economies, which are increasingly investing in research and knowledge production, have embraced and engaged with open access in various forms. Further, as a country-bloc, referred to as IBSA,[8] these three countries work together on various policy issues that provide an opportunity to advocate at the international level. At the same time, these countries are regional powers, which can be used to mobilise advocacy networks in their respective regions. These countries are also members of a grouping of powerful emerging economies called BRICS (referring to Brazil, Russia, India, China and South Africa) The members of this grouping are all developing or newly industrialised countries distinguished by their large, fast-growing economies and significant

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[8] Established in June 2003, India-Brazil-South Africa (IBSA) is a coordinating mechanism amongst three emerging countries, three multiethnic and multicultural democracies, which are determined to contribute to the construction of a new international architecture, to bring their voice together on global issues and to deepen their ties in various areas. Source: http://www.ibsa-trilateral.org/

influence on regional and global affairs. As of 2012, the five BRICS countries represent almost 3 billion people, with a combined nominal GDP of US$13.7 trillion, and an estimated US$4 trillion in combined foreign reserves. [9]

The case studies were designed to analyse the relevance of the open access movement in the developing country context and its relation to development. It is important to note that while each country in the report has engaged with open access in different ways, there have already been some regional collaborations between all three which leverage the flexibility facilitated by open access and the Internet to share and exchange information.

Brazil has spearheaded the creation of the Scientific Electronic Library Online (SciELO[10]). This electronic virtual library platform delivers scientific journals from several Latin American countries. SciELO envisages, 'the development of a common methodology for the preparation, storage, dissemination and evaluation of scientific literature in electronic format'[11]. There are over 900 titles available though SciELO and it is able to keep costs low as a result of using a shared platform (Packer, 2007). The SciELO consortium benefits from government subsidies and in many countries are operated through the national Academies of Science. It has been successful in establishing the profile of Latin American scholarship and claims to have the third-highest global citation rating in Google Scholar (Packer 2006). In 2008, the Scholarly Publishing initiative of the Academy of Science of South Africa, supported by the Department of Science and Technology, undertook an investigation to discover the optimum route to create a national platform to host national open access journals. It was decided to trial a collaboration with SciELO to create a SciELO platform for South Africa. This will lead to the creation of a national platform for scholarly journals, selected through a process of peer review by the National Scholarly Editors' Forum. These journals will use the meta-tagging system developed by SciELO to track regional and national citation levels and could, at a later stage, be extended to other African countries, and lead to a major South-South collaboration in research publishing, with locally relevant citation systems. (Gray and Willmers) In mid-2012, Thompson Reuters announced that they would partner with SciELO to host the database on Web of Knowledge[12]. This partnership will bring greater visibility and improved access to research from emerging economies in Latin America, the Caribbean, and South Africa. By integrating SciELO into the Web of Knowledge, researchers will be able to access relevant regional content alongside international literature.

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[9] http://www.brics.utoronto.ca/about.html
[10] http://www.scielo.org/
[11] ibid
[12] http://thomsonreuters.com/content/press_room/science/696739

These collaborations are exciting not only because they offer a glimpse of the possibilities created by open access, but also because they expose the potential for a complete re-visioning of scholarly publishing methods and models in ways which are developing world-appropriate. Replicating open access models in the developing world in the hope that this will bridge the gaps left by decades of silence in the scholarly literature is not enough – the initiatives have to be driven and managed by the developing countries themselves so that they are able to meet the various unique needs of their contexts. It is one of the key objectives of this report to highlight, via the case studies, what these contexts look like, interrogate the solutions being posited and make recommendations for further actions.

Rights-Based Approaches in Open Access – an Indian Case Study

In 2010, India became one of 135 countries in the world to make education a fundamental right when it passed the Right to Education Act (RTE).1 The objective of this case study is to establish the link between this constitutional right and open access to educational and research materials.

This case study was carried out by the Centre for Internet and Society, Bangalore. The team included Professor Subbiah Arunachalam, Madhan Muthu, Tom Dane, Sunil Abraham and Pranesh Rakesh.

Southern Perspectives on Open Access – a South African Case Study

This case study focuses on how OA movements, by looking beyond peer-reviewed journal publishing models, have moved forward to be relevant and useful in developing countries.

The case study was carried out by Dorothy Evelyn Gray, Honorary Research Associate in the Centre for Educational technology, University of Cape Town, together with associates.

An Open Access Experience – the Brazilian Case Study

Brazil's OA experience is particularly different from other developing countries. The case study documents efforts by national government and libraries to work together to advance the OA movement.

The Brazil case study was contributed by Helio Kuramoto, senior technologist at the Brazilian Institute of Information Science and Technology (IBICT).

3. Key Concepts

Before this report attempts to make statements about how open access can and should be used in the developing world, it is important to ensure that some of the key concepts discussed in the rest of the report are clearly and cohesively laid out, for the sake of clarity. In the following section a clear definition of open access will be outlined, the different models will be highlighted, and the core of the section will focus on journals, as this is the central theme of the report. Some of the most abiding misunderstandings about open access journals will be addressed and clarified, and finally, it will attempt to paint a picture of the current open access landscape, and identify some of the key players, including publishers and funders.

Open Access Explained

Open Access is a concept that has suffered somewhat from general misunderstandings of what it is, and how it is implemented. While this section will endeavour to outline a basic definition of Open Access, and then go on to examine how it emerged, the different models of open access publication that have emerged, their benefits and some of the emerging business models that have grown up around open access methodologies, it is important to note at the start that there is a crucial philosophical concept at the heart of the open access movement. The notion that knowledge is a "public good" which can be leveraged by decentralised and democratic communication methods, which in turn leads to increased equity and social justice is a very important feature of open access. This idea, articulated best by Yochai Benkler in his book, *The Wealth of Networks*, places Open Access firmly within a broader social movement that has been growing steadily in the last few decades, and encompasses the free culture movement, open source software, alternative copyright/copyleft and the access to knowledge movement. All of these component groupings share many common views (and encompass more topic-specific features) but all are dedicated to leveraging the democratic nature of the Internet and other media to distribute and modify free and freely available content.

In his book, *The Access Principle*, John Willinsky argues "Open access … takes advantage of automated processes, open source software, and existing technical infrastructure in the university. And its spirit of openness is not strictly an academic notion. Open access journals, e-print archives, and institutional repositories are part of a larger movement to create an open and public space online that would carry forward the continuing life and legacy of print culture." (2006). It is Willinsky's assertion that the current debates around subscription prices, rights and electronic archives are a recent distraction, and that libraries have always stood as arguments for increasing

access to knowledge, from the fabled collection at Alexandria to the early public libraries of nineteenth-century America. As such, he argues, open access is in fact, a position that has an important historical precedent, and argues that online open access publishing by scholarly journals can be seen as a public good.

While these grounding arguments help frame open access conceptually, a concrete definition of open access is still necessary, particularly because it is important to make the critical distinction between open access and open access publishing, which are not, in fact, the same thing, although they are often (and mistakenly) used synonymously. Open access refers to the general principle, articulated very well in a briefing paper to the European Science Foundation: "Open access to scientific articles means online access without access-charge to readers or libraries. Committing to open access means dispensing with the financial, technical, and legal barriers that are designed to limit access to scientific research articles to paying customers It means that, for the sake of accelerating research and sharing knowledge, publishers, institutions and independent initiatives will need to recoup their costs from other sources." (ESF 2003: 3) Open access publishing is one mechanism of using the open access principle to create pathways to accessing material, and which will be explored in the section of this chapter that deals with open access publishing models.

Open access models

While most of the significant events that have taken place in the development of the thinking and modelling around open access have taken place post-millennium, it is worth noting that the free sharing of resources and knowledge has taken place between academics for many years, and the use of electronic media to facilitate this is not a new process either. Email communication and the sharing of preprint editions of articles and manuscripts has taken place for at least two decades. The ArXiv electronic archive of self-archived preprints was founded in 1991. However, it can be argued that this is due, in part at least, to the fact that the subject areas covered by ArXiv include those like mathematics and physics, which have a strong tradition of collaboration and self-archiving. In the mainstream the development of models of open access has been a more recent development. What is significant is how accepted these models have become in just over ten years.

Open Archives

Open archives are, essentially, a digital communal space in which researchers are able to share outputs, post early-phase research for comment and critique, and provide and take advantage of

access to research developments. These discipline-based archives grew out of the need for researchers to have timely and comprehensive access to research findings, and represented a new model for sharing and disseminating their research. The Open Access Directory[13] lists over 100 of these repositories, ranging across disciplines and including humanities, social sciences, scientific, technical and medical subjects.

One of the critiques often levelled at open archives is the lack of formal oversight or peer review required for inclusion, since many of these collections rely on self-archiving, unlike formal scholarly publications. However, research conducted by the Association of Research Libraries found in 2008 that almost all of the archives operated some form of peer review or editorial oversight as a means of maintaining quality, and that the digital nature of the materials meant that these collections were able to operate on relatively small budgets and serve both very large and smaller, niche audiences. However, not all employ a range of support strategies in the search for financial sustainability. (Maron and Smith 2008). As Paul Ginsparg, the founder of arXiv points out the model of collaborative knowledge-sharing, and the system of using community review for quality assurance, uses the potential of the internet more effectively than the replication of formal journal publication in electronic form. Reputation, he argues, is established within the community rather than through the imprimatur of a journal (Ginsparg 1996).

Open Access Repositories

In this model, sometimes referred to as they "green route", authors self-archive full text versions of their research papers as either preprints (the version of the article submitted to the journal before peer review and editing) or post-prints (the article revised after peer reviewing, but usually not the edited and typeset version published by the journal, and sometimes embargoed for a period of time). (Gray & Willmers) This is a particularly useful way of making material available which will also be published in commercial journals and therefore otherwise inaccessible. This system allows authors to publish in high-prestige journals as well as making their work universally available. Most repositories are based either at higher education institutions or are curated by funding bodies. These collections have the added benefit of being able to host many different kinds of materials, not just journal articles, and make allowances for "grey literature" – new outputs which may not be easily located via journals or other traditional publication methods.

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[13] http://www.doaj.org/

Repositories have the potential to be powerful tools for building research capacity and visibility in the developing world because the material they contain is often locally relevant and thus more useful within local development contexts.[14]

Increasingly, large funding agencies and national research councils are requesting or mandating the deposit of publications arising from the research that they fund in these types of repositories. These organisations include the UK House of Commons Science and Technology Committee, the National Institutes of Health in the USA, the European Community, the Wellcome Trust, the Australian Research Information Infrastructure Committee, the Australian Government Productivity Commission, Research Councils UK, CODATA and the International Council for Science (Gevers and Mati 2006).

Open Access Journals

Open access journals offer a free and open way to read, download, copy, distribute and print articles and other material. (Gray and Willmers, 2009). Often referred to as the "gold route", open access journals provide immediate access to all the articles via the journal publisher's site or another interface. Since the early adopters of the gold route, such as PLoS and BioMed Central began to experiment with publishing and business models in the early 2000s, over 7000 journals have come to be listed in the Directory of Open Access Journals.[15] Over the last decade, the models of open access have also evolved to include various "degrees" of open access; hybrid models which include some research articles openly; delayed journals which delay access to some of the content and make it freely available after a set time period and self-archiving journals, which allow researchers to archive their outputs themselves have all emerged with differing degrees of success.

Several sustainability models have emerged as well. Some journals are subsidised by institutions, societies or agencies, while others require payment on behalf of the author. Many researchers finance their contributions through publications budgets built into research grants, and increasingly national and international agencies who fund research through public funds, (such as the Wellcome Trust in the UK and the National Science Foundation and National Institute of Health in the USA) and are making publication of results in open access journals a mandatory feature of the funding process. It is important to point out though that not all of these models are appropriate to all contexts. In the developing world, where funding levels in higher education tend

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[14] Chan, Kirsop and Arunachalam, 2005. http://www.scidev.net/en/features/open-access-archiving-the-fast-track-to-building-r.html
[15] www.doaj.org (accessed March 2012)

to be relatively low, the "author pays" model would put publishing in open access journals beyond the means of many researchers.

Many critiques have been levelled at the gold route, and they range from arguments around sustainability to questions around the integrity of the material published in open access journals. While the growth of the number of open access journals and the wide range of subjects they address is, in itself, a powerful argument for the value of the model, it is important to address some of these critiques, partly because we are looking at the developing world context which does create unique scenarios, and in part because resistance to open access is still a major reason why many researchers do not publish their outputs openly. Many of these arguments are dealt with in great detail and with clarity by BioMed Central on their site.[16] However, it is important for this report to look at three of the broad areas of critique and evaluate the arguments both in favour of and against open access journal publishing. These three positions can be roughly divided into arguments about quality of material, about global access and about diverting funds from research to pay for open access publishing.

Quality Arguments

The first general position from which many opponents argue against open access is concerned with the quality of the material published in open access journals. They point out that in an upfront payment model, the peer review process can be corrupted because open access publishers have an incentive to publish dubious material in order to receive revenue – anyone who can pay, can be published. Copyright, this argument holds, is necessary to protect the integrity of the scientific articles[17]. The overall answer to these arguments is simply that open access journals are under exactly the same obligation as other journals to maintain the scientific integrity of the work they publish in order to maintain their reputations. It would, in theory, be possible for an open access publisher to turn a blind eye to poorly reviewed content in return for upfront fees, but this is not a viable long-term strategy – open access journals depend on their reputations to maintain readers and authors. If anything, it would be more risky for an open access publisher to do this – the wider the access to their content, the sooner readers would notice mistakes and poor-quality content, and it would rapidly lose readers and authors, who would rather submit to journals with a reputation for publishing quality material. If anything, open access journals are better placed to avoid the temptation of publishing sub-par material – as Peter Suber points out: "Just as [open access] journals with a large number of excellent submissions are free to publish

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[16] http://www.biomedcentral.com/about/advocacy12
[17] Ibid

long issues, those with a small number are free to publish short issues. They are under no pressure to accept weak submissions just to fill an allotted space or to give subscribers their money's worth. There is no allotted space and there are no subscribers. In this sense, they are better insulated than conventional journals against pressures to lower their standard."[18] Of course, some abuse is inevitable, and over recent years it has become apparent that there are a number of journals now being established that are not of good quality or can be considered 'predatory' Typically, these publishers spam professional email lists, broadly soliciting article submissions for the clear purpose of gaining additional income. Operating essentially as vanity presses, these publishers tend to have a low article acceptance threshold, with a false-front or non-existent peer review process. Unlike professional publishing operations, these predatory publishers add little value to scholarship, pay little attention to digital preservation, and operate using fly-by-night, unsustainable business models. These 'abusive' journals are now tracked in the Beal Directory[19] – a demonstration of how the openness of the web, while providing the freedom which can lead to unethical practices also provides the facilities for discovery. Put another way, it is the self-correcting nature of the open access model which protects it from this possibility and ensures continued quality of content.

Access Arguments

Arguments around access tend to point out that researchers in the developing and developed world already have access to all the journal articles that they might need, and that printed content is more readily accessible, because not all researchers are digitally connected. Initiatives like HINARI[20] and AGORA[21] are often cited as examples of how researchers in the developing world have access to journal articles.

There are several responses that have emerged out of the experiences of the last few years to counteract these arguments. Firstly, it is important to look at the statistics when evaluating the levels of access granted by these UN-endorsed schemes. 28 publishers participate in HINARI, making journals available for free to some of the poorest countries (defined as having a per capita annual income of less than $1000); and at a deep discount for some slightly less disadvantaged countries (per capita annual income between $1000 and $3000)[22]. However, the list of which

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[18] http://www.earlham.edu/~peters/fos/newsletter/03-02-04.htm#objreply

[19] http://metadata.posterous.com/?tag=predatoryopenaccessjournals

[20] Programme set up by WHO together with major publishers, enables developing countries to gain access to biomedical and health literature consisting of more than 8,500 journals and 7000 e-books (in 30 different languages).

[21] The AGORA program, set up by the Food and Agriculture Organization of the UN (FAO) together with major publishers, enables developing countries to gain access to digital library collections in the fields of food, agriculture, environmental science and related social sciences.

[22] http://www.biomedcentral.com/about/advocacy12#poorcountries

countries qualify does not include countries like Brazil, South Africa and China, even though they qualify for discounts according to World Bank criteria. This is because these countries have significant research programs, and publishers are reluctant to miss out on the substantial income that can be generated by selling subscriptions to them. The flaws in programmes like HINARI will be explored in more detail in the later sections of this report.

Many publishers also argue that researchers in the developed world have sufficient access to materials either via interlibrary loans or printed material. However, this argument does not take into consideration the fact that in many countries research takes place in several different areas, such as higher education as well as the public sectors, and access to the journals that publish this material is not universal. Likewise, the use of paper-based journals is rapidly decreasing, and as digital publishing offerings become richer, paper will no longer be able to provide the rich forms of content available in the digital medium. The widening of the digital divide is a serious worry for those involved in digital publishing and particularly for advocates of open access, and this particular issue, and it's pertinence to the developing world context will be explored in more detail in later sections.

Funding Arguments

Many critics of open access argue that, in traditional publishing, profits made by publishers were needed to fund innovation in digital publishing, and that moving to an open access model would reduce the amount of funding available for research as funds are channelled into paying for publication. They also argue that the switch to an open access model for some of the large journals would be hugely expensive for the authors, who might have to pay large amounts in the "author pays" model. While it is true that innovation does need to be funded, the general patterns that have emerged in the online space over the last two decades have shown that it is open platforms with active communities that tend to spur innovation. The open standards of the Internet allow almost anyone to create sites and innovate services well beyond what proprietary services had been able to produce. In terms of the actual research, a study conducted by the Wellcome Trust in 2004 has shown that there is no reason why the cost of open access publishing should exceed the cost of the current system, since the fundamental process is the same. They also found that open access publishers are continually innovating new ways of using web technology to reduce costs and concluded that open access can save researchers and funders up to as much as 30%[23].

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[23] Houghton, J., Rasmussen, B. and Sheehan, S, et al.

With these basic premises and arguments for and against open access outlined in this section, the following sections will focus on the changing paradigm of open access in the context of developing countries and allow for a closer interrogation of the specific challenges and potential possibilities arising from open access for real innovation in the way scholarly content is produced and shared, which will redress the current imbalances.

4. Case Studies

INDIA

OPEN ACCESS AND RIGHT TO EDUCATION

In 2010 India became one of 135 countries in the world to make education a fundamental right when it passed the Right to Education Act (RTE). On announcing the new law, the Indian Prime Minister declared: "We are committed to ensuring that all children, irrespective of gender and social category, have access to education. An education that enables them to acquire the skills, knowledge, values and attitudes necessary to become responsible and active citizens of India."

This constitutional guarantee imposes a certain legal obligation on public funded institutions, such as the Indian Institute of Technologies and central and state universities (which are often not always enthusiastic about OA). This new arrangement also provides an opportunity for political activism by citizens.

Previously, if one student in India attending the Indian Institute of Science could access material from the best journals in the world but ten of her/his peers at a smaller college were not able to, this was considered to be an institutional issue. However with the Right to Education this effectively becomes a national issue.

In India there is a special opportunity for Open Access to make a significant contribution to the delivery of education due to the large number of potential students compared to the number of university places available to serve them. The Gross Enrolment Ratio for tertiary education stands at 11 percent, compared to 23 percent for the global average and more than 55 percent in developed countries generally. That is, comparatively fewer young people have access to tertiary education and scholarly literature in India than in other countries. With Open Access, in principle a student would not be prevented from accessing educational material due to their income, location, physical abilities, learning preferences, or working hours. As Abdul Gani writes, Open Access makes "higher education equally accessible through the web to all who can make use of it".

In India, there are 279 university-level institutions and more than 13,150 affiliated colleges. While many of the university level institutions have the resources required to establish OA repositories, all of them face difficulty in affording journal subscription fees. It has been reported that the research contribution of the regional colleges is very small, and they could benefit significantly from access to external research.

An example is the National Institute of Technology, Rourkela (NITR), which in 2003 had access to less than fifty academic journals and produced around 28 academic papers a year. Once the NITR joined the INDEST consortium it gained access to more than 1500 online journals and production of academic papers rose to over 180.

The average cost of an annual subscription to a single journal by an Indian institution is around USD 1,302. For online archives like JSTOR and Muse, there are different price models based on the size, type and location of the institution, yet a large research university could expect to pay around USD 50,000 for a year of access. However, US $50,000 means more in India than it does in America. That is, while a straight exchange would equate this to around Rs. 2.5 million, this amount goes much farther, and can be used to buy more goods and services in India than in the US. A 2011 estimate of India's Purchasing Power Parity put the correction factor at 2.9, meaning that in India one can buy the same goods and service for US $100 that would require in US $290 in America. By this same calculation, a subscription cost of US $50,000 for an Indian library would feel roughly the same as $US 145,000 for a library in the US. Open Access is a means to address this problem, particularly in small and under-funded rural colleges, which vastly outnumber the more prestigious and resource equipped universities.

Open Access can benefit not only tertiary students, but it also offers indirect benefits for secondary and primary education, and the Indian educational system as a whole. It creates the opportunity to communicate new knowledge to primary and secondary schools sector. In particular, access to recent research on child development, psychology, and pedagogy could potentially improve the quality of primary and secondary education.

It is clear therefore that there is an important opportunity in India for the OA movement to link itself more strongly with education.. India now has a constitutional right to education, and Open Access can be seen as an important means to achieving this goal. The Open Access movement could work with Right to Education groups and other organizations to promote Open Access..

The OA movement in India should also include a greater focus on the social sciences and humanities. This would create a stronger movement outside the natural sciences and could lead to broader support for Open Access generally.

SOUTH AFRICA

KNOWLEDGE FOR ALL

The values enshrined in the open access movement in South Africa are reflected, to a good extent, in the history of the anti-apartheid struggle, from the 1955 Freedom Charter with its affirmation of learning and access to books as essential aspects of a democratic society to the 1996 Constitution, which has clear provisions for access to information and education. The students' uprising of 1976 brought educational issues to the heart of the liberation movement.

Apartheid censorship provoked the underground distribution of anti-apartheid literature, while a photocopying culture developed in an oppressive educational system isolated by the academic boycott. In the universities, the more radical research groupings developed a culture of open distribution of their findings, which in a digital age has come to mean placing research reports online to be freely downloaded.

Against this background, the South African case study reviews the complexity of the current national policy context for open access and then uses two innovative case studies to demonstrate expansive practice in the use of open access. These case studies illustrate a view of OA that extends beyond the common focus on journal articles. Instead, a more integrated vision of openness emerges that can incorporate a wider range of research outputs as well as Open Educational Resources (OER) and community-focused publications arising out of research programmes.

The government policy direction in relation to OA and access to knowledge in a democratic South Africa has been uneven, with commitment to a principled support for openness and democratic rights coexisting alongside reliance on a brand of knowledge economy thinking, that views IP enforcement and the creation of patents as the best route to economic growth. The complexity of this policy environment is exacerbated by the division of responsibility for research in higher education between two ministries, the Department of Science and Technology (DST) and the Department of Higher Education and Training (DHET), each with their own admixture of open and proprietary scholarly communication policy initiatives.

A major focus of the DST has been the articulation of innovation policy, which has been largely patent-driven, but it has also supported a major intervention for an open access journal publishing programme for South African journals, through the Academy of Science of South Africa (ASSAf).

The DST provides funding to support the open access publication of national scholarly journals on the SciELO South Africa platform, hosted on the SciELO OA regional scholarly publication platform in Brazil, an important South-South OA collaboration. The inclusion of SCiELO in the Thompson Reuters Web of Knowledge will ensure, as the number of journals on the platform expands, considerably more international recognition for South African journals - a positive outcome from South-South collaboration in SciELO. The DST is also supporting policy development for access to publicly funded data.

DHET is responsible for the administration of a publication policy that provides substantial subsidies to universities against the publication of journal articles in 'accredited' journals published in a government-selected local list and in international indexes such as the ISI. At the same time, however, DHET, through the Academy of Science, is supporting the implementation of a forward-looking policy for the recognition of scholarly book publication that recommends OA for South African scholarly books.
In the Green Paper for Post-School Education and training, published in 2012, the Department of Higher Education proposed government support for open education resources and for the development of open textbooks.

In the universities, this has led to a contradictory pull between the strong drive for international recognition and financial rewards earned for publication of articles in prestigious international journals and university policies and programmes that respond to national demands that publicly funded research should make a contribution to the public good and to meeting the development goals of the country and the region.

Also in the universities, an increasing number of OA institutional repositories are providing access to local research outputs: 23 are listed in the Open Doar Directory[24]. The University of Pretoria was the first university library in Africa to institute an institutional repository, UPSpace, profiling a wide range of research outputs, with some 15,000 items now online. The University of Stellenbosch has also been very successful in establishing a repository with over 17,000 publications online and a successful OA journal publishing programme under way.

South Africa has also been a front-runner in open access scholarly book publication. In 2001 the Human Sciences Research Council (HSRC), in the throes of a radical post-apartheid restructuring, adopted a dual stream open access and print publishing model for its research reports and

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[24] http://www.opendoar.org/

scholarly book publications. This became the HSRC Press, a leading global example of OA social science publishing. This was an unusual intervention in that the focus was not journals but scholarly books and social science research reports. The strategic thinking was that the goal of the Council was to disseminate the knowledge, produced from its publicly-funded research, arguing that the institutional gains from such an exercise resided not in the revenue from the sale of books, but the added profile and prestige accruing to the organization as well as the demonstration that such publication provided of the effectiveness of its research programmes. However, the vulnerability of strategies that lack explicit government support has been demonstrated in later developments at the HSRC, where the senior administration of the research council now appears to be demanding profitability from the HSRC Press.

This initiative was extraordinarily successful, becoming the largest scholarly press in the country, with publications that were downloaded in just about every country in the world, and a reputation that made it a first stop for policy-makers, researchers and journalists.

The most substantial and consolidated open access activity in South Africa has taken place in the higher education sector. This is appropriate, given the need for a powerful research base and effective research communication to help resolve critical national challenges, such as HIV AIDS, food sustainability, poverty alleviation and urban and rural planning.

South African researchers get less recognition for a strong record in OA publishing of a different kind, beyond journals, encompassing research outputs targeted at development and policy impact in addressing these national challenges. These are produced by a number of university research units and research NGOs. As just one example, the PLAAS research institute at the University of the Western Cape, focused on poverty, land and agrarian studies, posts online a wide range of books, working papers, policy briefs and research reports, licensed under Creative Commons licences and aimed at supporting the national and regional impact of PLAAS research as a broker of better livelihoods and agrarian growth.

OA publishing initiatives are also taking research outside of the universities, 'translating' research knowledge for community use, sometimes supported by small specialist digital publishing specialists. As one example, Electric Book Works – an eBook publisher - provides publishing services and business model design for a series of community health training manuals, part of a decentralized training programme in the fields of perinatal care, HIV, TB and maternal and child health, targeted at poor rural communities. . In this model, OA content is available online, printed

books are for sale and course certification offered for a fee. These training manuals are developed by the Perinatal Education Programme, managed through a Trust set up by a former University of Cape Town professor, who now consults to UNICEF and the WHO. The programme reaches health care workers beyond the formal college system and has provided learning opportunities for 60,000 doctors and nurses since 1992, in South Africa, other African countries and beyond.

It may be true that publishing an article in a journal might serve to enhance global recognition and prestige, but has a limited impact beyond academic audiences (DFID 2009). However, what a number of more informal South African OA initiatives demonstrate is the ability to make research findings available and accessible to policy makers, practitioners and community organisations for the 'translation' of this research to achieve practical impact. What is missing, however, is a comprehensive strategy for the production and curation of development-focused research outputs, beyond journals and recognition of the value of this kind of OA research translation in government policy and university reward systems.

BRAZIL

POLICY BARRIERS TO OPEN ACCESS

Brazil has been a leader in OA journals compared to other developing countries. Today, the Scientific Electronic Library Online (SCiELO) provides open access to 979 peer-reviewed journals from Brazil and other Latin American countries. Red de Revistas Científicas de América Latina y el Caribe (originally, the Network of Scientific Journals of Latin America and the Caribbean, Spain and Portugal, Redalyc) currently provides OA to 758 peer-reviewed journals. Brazil has also developed a national electronic library consortium, Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Coordination of Improvement of Higher Education, CAPES), which now provides journal access to universities and research institutions.

This case study outlines OA in the context of Brazil and focuses on policy inconsistencies between the Ministry of Science, Technology and Innovation and Ministry of Education, which have the potential to hinder the OA movement.

In 2009, Brazil's investment in public-funded Research and Development (R&D) was US$21.6 billion. Its major areas (ranks in brackets) of R&D were Agriculture (1), Higher Education (6), Research (11) and Health (12). These public-funded sectors are vital to national development and therefore, research information should be kept in public domain. However, the government does not have a policy on research information sharing and dissemination. Therefore, journal publication continues to happen in the 'traditional way' with restrictive access. On the other hand, publicly-funded universities and research institutions spend more than US$60 million on journal subscriptions.

Key Actors

In Brazil, the Ministry of Science, Technology and Innovation (MCTI) is dedicated to all science, technology and innovation matters. There is also a Ministry of Education (ME), which is responsible for all education related to issues from foundation (primary) schools to universities.

Apart from these two structures, there are some research units responsible for strategic knowledge development areas. In general, these research units have different administrative status; some of them are foundations, such as the Brazilian Agricultural Research Corporation (Embrapa) and the Oswaldo Cruz Foundation (Fiocruz). Others are directly administered under the MCTI: there are 19 others research units and two main funding agencies – National Council for

Scientific and Technological Development (CNPq) and Financiadora de Estudos e Projetos (Research and Projects Financing, FINEP) – under MCTI.

CNPq and FINEP provide funding to programmes at universities and research units. Among research units under MCTI two, particularly, play an important role in the science and technology landscape: the Brazilian Institute of Information on Science and Technology (IBICT) and the National Education and Research Network (RNP).

IBICT's mission is to promote the expertise, resources development and information infrastructure in science and technology, as well as integrating scientific knowledge and technology in Brazil. RNP is responsible for the networking infrastructures for public universities and research units and provides these institutions with free access to the Internet. In fact, RNP provides the backbone to Brazil's national public higher education and research units.

The Ministry of Education (ME) has Secretaries to manage the education at all levels. Its main institution is CAPES which coordinates and provides support to post-graduate programs in all universities. It is a foundation under ME and its budget comes from the Ministry of Planning.

Journal Access

Until 2000, researchers in Brazil accessed scholarly information from their University libraries and the subscription budget for all journals was provided by the Brazilian government through CAPES and ME. Since 2001, CAPES has been providing access to scholarly information through an online platform, the Scholarly Serials Portal (SSP).

Today SSP is accessible by researchers and students from 311 institutions with a cost of about US$64 million per year. It provides access to about 25,000 journals. SSP reaches the majority of Brazilian public universities and research centres.

IBICT and its efforts to improve OA

IBICT has actively promoted the OA movement and implemented OA initiatives since 2003. IBICT believes that OA plays an important and strategic role for disseminating scientific information, and if implemented it could then eventually lead to national scholarly-information policy. IBICT operates with the assumption that if self-archiving (Green OA) is adopted at the national level, then the main effect will be the creation of a systematic procedure for registering and disseminating all Brazilian research outputs to all its universities and institutions. This procedure

will provide an important mechanism for sharing scholarly information and, consequently, it will boost the visibility, use and impact of research outputs.

Today, there are 46 Brazilian institutional repositories registered at OpenDOAR, but only 39 were set up by the IBICT project. To expand this distribution, IBICT has organised many events and training sessions to explain and sensitise Brazilian universities to the importance of OA and RIs. This project will finish at the end of 2012.

There are two main initiatives within OA scholarly publishing. First is the SCIELO online initiative which was launched in 1998. It has developed a centralised management methodology to promote high quality journals and then provide open access to them. This model is centralised and funded by government resources and is not self-sustainable.

The second initiative is IBICT's Open Journal System (OJS) in Portuguese. This project, financed by FINEP, aims to help Universities and research centres develop and implant their own Institutional Repository (IR). The budget was established to distribute 80 technological kits (a kit consists of a server with pre-installed software like DSpace and OJS) to these institutions and develop a portal to integrate them. This model is decentralised, which lowers costs. All journals are installed on each institution's servers, and many universities have already built their own portals .

CAPES vs. IBICT

Both CAPES and IBICT believe in the importance of disseminating research information to Brazilian universities and institutions but each institution has adopted a different route to implementation.

Essentially CAPES does not favour OA, even though its mission is concerned with information-sharing. As CAPES' portal currently hosts a vast series of commercially published journals, there is a concern that OA could weaken CAPES' very existence.

One might argue then that a major obstacle to OA in Brazil is that all federal universities' access to scholarly journals are maintained by CAPES. However, universities do have certain autonomy to develop their own OJS projects if they want.

In July 2011 Senator Rodrigo Rollemberg presented a bill aimed at establishing a national OA mandate for public universities and research centres, as well as supporting the building of institutional repositories. This bill would also establish a High Level Committee to establish a

National Policy for Scholarly Information based on OA strategies. Many OA advocates are anxious for this bill to become law, in order to move the OA movement in Brazil onto the next level.

5. Analysis of the Key Issues

This chapter is organised into two broad sections. First there is an examination of the general trends and major milestones relating to open access in recent years and their impact on the national and international actors engaging with open access. This is followed by an examination of the responses from the publishing industry. This section will make some allusions to emerging key issues relevant to the open access movement with emphasis on the developing country context, and these will be explored in much more detail in section 7.

General Trends – Responses from Global Agencies and Governments

In terms of the growth of open access the last ten years could be described as something of something of a tsunami. Since 2010, the growth of interest in and acceptance of open access as a viable, valuable model has been even more accelerated. The first six months of 2012 alone have seen four major announcements from international agencies in support of open access, and several government policy shifts in the UK and elsewhere which show a growing acceptance of the fact the open access is good for both research and researchers, and an important way of ensuring that knowledge which is created through public funding is made publicly available. Many of these initiatives will be detailed in the coming section, and the effects of these policies and statements will be examined closely. But it is important to remember that for the sake of this report, they need to be considered in terms of the potential effect they may have on the development of scholarly communication emerging from - and taking place within - the developing world. Not all of these policies were crafted with the developing world as the primary focus, and in some cases they may even have unintended, negative effects, which need to be examined and understood if any recommendations for future policy improvements can be made.

The proliferation of the number of journals and repositories which operate under open access and hybrid models have shown that open access principles are no longer fringe ideas and choosing open access models for publication are not marginal activities taking place on the periphery of scholarly communication. This was confirmed by several events that took place towards the end of 2011 and during the first months of 2012 – a period that has come to be described by many observers as an "academic spring", following close on the heels of the revolutionary movements taking place in both the Arab world and the international protests grouped under the umbrella of the "Occupy" movement. It is true that the first few months of 2012 have provided several exciting and far-reaching announcements, but they also need to be seen within the context of a decade of

growth in open access and an increasing mainstreaming of the process. They also reflect the changing nature of the means of communication among scholars and researchers, who are increasingly using online tools such as blogs and other social media to share ideas and opinions.

In early January 2012, Timothy Gowers, a mathematician at Cambridge University published a blog post[25] in which he objected to the cost and business practices of Elsevier (one of the largest commercial academic publishers in the world) and their support for measures such as SOPA, PIPA and the (now abandoned) Research Works Act, all of which aim to impose price and permission barriers on the exchange of information. In this post, he stated his decision to no longer publish, referee or do editorial work for any of the journals published by Elsevier. This statement was quickly shared and the boycott spread. At the time of writing, over 11000 researchers from Humanities, Earth and Natural Sciences, Mathematics, Economics, Social Sciences and Medicine have joined the boycott[26]. This figure does need to be considered in terms of the global community of reviewers and researchers. It is significant as a reflection of the growing dissatisfaction among researchers with the attitudes and practices of the academic publishers. It is also a telling indicator of the shift in perspective among researchers towards an acceptance of the principals of openness and the concept of knowledge as a global public good which should be shared as widely as possible.

Following close on the heels of this grassroots response to the publishing industry, several major international agencies made public statements embracing open access. First, UNESCO released a set of Open Access Policy Guidelines to promote open access in member states. In the statement, UNESCO outlined a firm commitment to actively promote open access as policy:
"Building capacities in Member States for Open Access is a necessary but not sufficient condition for promotion of OA. Creating an enabling policy environment in Member States for OA is therefore a priority. The new publication will serve the needs of OA policy development at the government, institutional and funding agency level.
The overall objective of the Policy Guidelines is to promote Open Access in Member States by facilitating understanding of all relevant issues related to Open Access. Specifically, it is expected that the document shall:

iv.   enable Member State institutions to review their position on access to scientific information in the light of the Policy Guidelines;

v.   assist in the choice of appropriate OA policy in the specific contexts of Member States; and

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[25] http://gowers.wordpress.com/2012/01/21/elsevier-my-part-in-its-downfall/
[26] http://thecostofknowledge.com/

vi.   facilitate adoption of OA policy in research funding bodies and institutions by integrating relevant issues in the national research systems."[27]

These comprehensive guidelines are explicitly intended to guide the development of open access policy for research by national governments, which is what makes them such a potentially powerful tool. In terms of the scope of this report, they are important because they could, in principle, be used to guide the process of developing open access policy in the developing world, if, of course, the policymaking process is properly articulated and implemented. This aspect will be explored further in Section 7.

International agencies such as DfID and IDRC also generate a significant amount of research, which is often extremely locally relevant to policy development and has direct implications for the lives of people in the countries and communities being examined. IDRC launched an Open Access Repository in 2007 and DFID is launching its own Open Access policy on 1st November 2012. And in April 2012, shortly after the UNESCO announcement, the World Bank announced its latest open access initiative – an Open Access Repository for many of its publications. The Open Knowledge Repository[28] contains a range of World Bank publications and research outputs including monographs, chapters in monographs, journal articles and pre-publication reports. A significant characteristic of this repository is that peer review or review by project coordinators is required for all publications that are deposited. Not only does this initiative indicate a willingness on the part of the World Bank to make a significant amount of content available, but the licence used by the repository – an unrestrictive Creative Commons Attributions licence will allow material to be copied, adapted and distributed, even for commercial purposes. This is an extremely significant feature in the context of the developing world, for not only does it make information freely available to developing world researchers who may not otherwise have access to it, but it also helps to surface regional research which might otherwise be missed by the global research communities.

Later that same month, the Wellcome Trust announced the launch of eLife, an open access 'mega-journal', designed to compete directly with top-tier publications such as *Nature* and *Science*.[29] The Wellcome was an early adopter of open access - requiring research outputs from the projects it funds to be deposited in PubMed Central, but this announcement reflects a strengthening of these

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[27] http://www.unesco.org/new/en/communication-and-information/resources/news-and-in-focus-articles/all-news/news/open_access_to_scientific_information_policy_guidelines_for_open_access_released/
[28] https://openknowledge.worldbank.org/
[29] http://www.guardian.co.uk/science/2012/apr/09/wellcome-trust-academic-spring?CMP=twt_gu

requirements and the Trust's commitment to open access to scholarly publication. The launch of eLife also reflects a growing commitment within the UK to the principles of open access and an understanding of the potential innovation that can be born out of free access and knowledge transfer facilitated by open access.

In 2012, the UK government made several high-profile announcements in support of open access[30] and access to knowledge. Jimmy Wales, the founder of Wikipedia was drafted to advise[31] government on opening up policymaking and assist the Department for Business, Innovation and Skills and the UK Research Councils to develop new ways to store and distribute research data and articles.

In September 2012, Research Councils UK (RCUK) announced a new Open Access policy which will apply to all qualifying publications being submitted for publication from 1 April 2013 and which states that peer reviewed research papers which result from research that is wholly or partially funded by the Research Councils must be published in journals which are compliant with Research Council policy on Open Access, and must include details of the funding that supported the research, together with a statement on how the underlying research materials such as data, samples or models can be accessed[32]. In order to offer a suitable gold option, a journal must provide immediate (unembargoed) access to the version of record from its own web site, and must allow immediate deposit of the version of record in an open access repository. The journal may (but is not required to) levy an Article Processing Charge (APC). In order to offer a suitable green option, a journal must allow deposit of the peer-reviewed manuscript (with or without subsequent copy editing and formatting) in an open access repository not operated by the publisher. It must allow non-commercial reuse, and may require an embargo of up to six months from the date of publication for articles in the natural sciences and up to 12 months in the social sciences and humanities. The journal must not charge a fee for this option. The RCUK will give block grants to universities to pay APCs on behalf of faculty who publish RCUK-funded research in journals which offer a suitable gold option and charge an APC. Universities will create publication funds for redistributing these block grants, and use their own criteria to decide which APCs to pay and which not to pay[33].

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[30] http://www.guardian.co.uk/commentisfree/2012/may/01/open-free-access-academic-research
[31] http://www.guardian.co.uk/technology/2012/may/01/wikipedia-research-jimmy-wales-online
[32] http://www.rcuk.ac.uk/media/news/2012news/Pages/120716.aspx
[33] Peter Suber, http://www.earlham.edu/~peters/fos/newsletter/09-02-12.htm

This policy is based, in part, on recommendations made by the UK Working Group on Expanding Access to Published Research Findings, informally called the Finch Group, after its convenor, Janet Finch. The group's report[34] makes several significant recommendations, all of which are made with the overall understanding that open access journals should be "the main vehicle" for publishing new research. The report recommends open access repositories only for theses and dissertations, grey literature, data, and preservation and states an explicit and emphatic preference for gold over green routes.

The UK government and research agencies are not alone in making open access the preferential model for scholarly publication and government communications. Between May and July 2012, the UN Human Rights Council, the Global Research Council, five Danish research agencies, Australia's National Health and Medical Research Council (NHMRC), the Deutsche Forschungsgemeinschaft (Germany's largest public funder) the European Research Council and the European Commission all issued a major strategy papers or announcements in favour of open access.

These agencies and governments are also not alone in their recognition of the value of open access. Since the repository and journal models emerged, various agencies and governments have embraced them to certain degrees[35]. However, several features make these events particularly noteworthy. In terms of the developing world context, the policy-focus of the UNESCO announcement and the UK government's commitment represent an incentive and motivation for a mirroring process throughout the developing world, which, as Eve Gray puts it "…involves active participation by organisations, stakeholders, institutions and individual academics so that the policymaking process is really geared to the strategic goals that have been articulated for [local] research efforts.[36]"

Responses from the publishing industry

The initial response to open access from the publishing industry was, as one might imagine, less than enthusiastic. Many of the large multinational publishers initially criticised the models as being counterproductive, bad for science and potentially dangerous, as they risked subverting the peer-

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[34] The full report can be found at: http://www.researchinfonet.org/wp-content/uploads/2012/06/Finch-Group-report-FINAL-VERSION.pdf

[35] For a comprehensive list of developments year-by-year, Peter Suber's excellent SPARC newsletters have become the gold-standard: http://www.earlham.edu/~peters/fos/newsletter/archive.htm

[36] http://www.gray-area.co.za/2012/04/13/academic-spring/

review process. The last decade of experimentation and growth of open access have, by and large, proven these arguments to be unfounded[37].

In later years, with the rise of digitisation, several publishers offered large, online Big Deal or journal bundling packages. According to this model, publishers bundled many journals (often based on research disciplines) as a single package and sold them as one subscription to institutions. Initially, many publishers and libraries saw these Big Deals as the solution to the problem caused by the growing number of scholarly journals. In reality, however, these deals did little to solve the cost dilemma for many institutions in the developing world. The bundles often included journals that they neither required nor wanted, but were obliged to take. They also did little to solve the more critical problem: the marginalisation of developing world research and researchers. – The bundles contained journals selected by the publishers, using their own criteria, and little or no back-and-forth exchange of knowledge took place as a result.

Finally, as discussed in the introduction, various regional and subject-specific initiatives were released by these publishers, in many cases in partnership with global organisations such as various United Nations agencies. These initiatives, such as HINARI, AGORA and Research4Life are problematic not only for the commercial drivers, which underlie their models of access (as described in the introduction) but also because of the models of dependency that they establish. As Chan, Kirsop and Arunachalam describe:

> "Coming as these programs do with the blessings of the UN agencies and powerful commercial publishers, it has been hard to wean research communities off dependency systems and onto true open access (OA) resources. These resources include the growing number of OA journals and institutional repositories worldwide that are now accessible free of cost to anyone with Internet access. The growing volume of OA resources provides a far greater degree of freedom for researchers to exchange and collaborate, for knowledge to be translated into useable forms by frontline health workers, and for emerging technologies such as text mining and semantic tagging for faster knowledge discovery to be used. It must be underscored that such usages and redistribution are not permitted by donated content included in the Research4Life programs, even though users are free to read such content. Further, while the "free access" programs purport to be providing essential articles to researchers in poor nations (excluding countries

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[37] http://www.biomedcentral.com/about/advocacy12

such as India where the publishers have an existing market), access is not country-wide, but is only available if the researchers work in the registered institutions." (2011)

What this quote highlights is that open access does not just offer benefits in terms of more equitable financial models for researchers in developing countries, but also it offers a more equitable model of the exchange of knowledge as a public good. This point is perhaps one of the most important to remember when discussing open access in the context of the developing world, as the next chapter will show.

6. Challenges and Recommendations

Open access has enjoyed a great deal of acceptance and growth over the last decade. However, while we know that the models work in the immediate and short term, and can be seen not only as viable alternatives, but, in many cases, as better than the models that preceded them, some of the longer term consequences and effects are still emerging. And while it is impossible to do a scan and predict the implications of open access for all of the developing world, the points raised by the case studies do show some consequences specific and unique to those countries. These, seen in conjunction with some of the emerging trends and patterns do make the point that in the developing world new opportunities and possibilities are created by open access, and, at the same time certain pitfalls need to be noted and avoided.

Perpetuation of Publish & Perish

The introductory section of this report showed the risks posed to all scholarly communications, discourse and practices by the publish-or-perish system. In the developing world the detriments are potentially much deeper and more damaging, as researchers are incentivised to publish in overseas-based journals, which are unavailable in many developing world contexts. This research 'brain-drain' risks widening the gap between research and policy[38]. At the same time, it also puts localised research at risks - as researchers tend to do the types of research that are more likely to be published in core journals, they are less likely to undertake research that has a more local focus and application because their work is either considered to be only of local or regional interest or does not meet the quality standards required by the major commercial indexes[39]. These kinds of research, however, may be far more relevant than research from the richer countries, and may also be more applicable in other countries with similar socio-economic situations.[40] This potential for the loss of specialised, context-appropriate research is one of the key areas where an adoption of open access at a higher education policy level can have a potential to reverse the trend. In order for this to happen though, national research policies have to consider the communication aspect of scholarly activity and invest not only in the principles of open access, but also in developing the technical infrastructure and skills to support this.

There is another aspect to the publish-or-perish phenomenon, which needs to be borne in mind when considering the potential of open access to mitigate it: while open access can relieve some of the financial burdens, it does not necessarily solve the problem of citation scores. In fact, a key

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[38] Van Dalen & Henkens
[39] Chan, Kirsop and Arunachalan
[40] Ibid

irony of the development of open access in the global North is that it is increasingly being appropriated by the mainstream to justify publish-or-perish. Many researchers see publishing using open access as a way of increasing individual citations, and several journals have chosen to prominently publish their impact factors,[41] which does little to decrease the marginalisation of research from the developing world. If researchers and academics from these countries really want to take full advantage of the power of open access to make their research visible globally and challenge the status quo, they need to take advantage of the power of networks and social media in order to bypass the traditional system of publishing and evaluation of the perceived "quality" of research[42]. This means creating new kinds of impact metrics, particularly those which demonstrate the impact of research on development. In this context, the growth of open access journals in the developing world offers some very real opportunities for measuring and recording alternative impact. However, policymakers and funders need to be educated on this issue – not only in terms of open access, but in the light of the open source, open education and free culture movements as well, which when seen in a broader context, make a convincing argument for convergence in effort and collaboration.

Building Sustainable Funding Models

In many open access models, the cost of publication is borne by the author. To date, one of the most common ways of managing the cost is to build it into the research funding, or for donors and funders to cover it. While these models are being tested at the moment, for many researchers in developing countries it still means that publication of local research, even in local open access journals, it still arbitrated by external bodies. In the long term, this can be overcome by the development of a more locally-focussed global knowledge commons, which encourages leverage of the networked world we live in. It is well understood that phenomena such as disease and climate change are global and do not recognise borders, much less currencies. The exchange of knowledge across borders and the building of a global knowledge commons is increasingly important for solving problems that we all face. The funding of a global knowledge commons is a fraught and complex issue, but open access provides one mechanism for making the funding of the tools for exchanging information simpler and more equitable.

In many countries, and indeed in many international agencies, the power wielded by the commercial scholarly publishing lobby is still great. Publishers can convince governments and

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[41] http://www.biomedcentral.com/about/faq/impactfactor#jif
[42] Chan, Kirsop, Arunachalan

agencies that their subscription donations are a viable alternative, and in many developing countries, they exploit the lack of coherent research development frameworks to further their market-driven purposes. Historically many universities in the developing world, emerging out of undemocratic systems, needed to rebuild their research systems after the depredations of World Bank and IMF structural adjustment programmes. The focus in this recovery period tended to be on the need to rebuild prestige and so the policy focus and reward systems for researchers gave preference to publication in the big international commercial journals, with their high-impact ratings[43]. However, many institutions in the developing world are increasingly attempting to leverage the potential for the development of scholarly publications that can contribute to their strategies for research contribution to national and local development imperatives. Open access offers an opportunity to make a significant difference at a policy level, which encourages dialogue among developing country research organisations, allowing them to reframe the focus of global open access policy initiatives, contributing to the debate rather than just playing follow-on.

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[43] http://www.gray-area.co.za/2012/04/13/academic-spring/

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