

Open access in South Africa: A case study and reflections

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In this paper, we locate open access in the South African higher education research context where it is, distinctively, not shaped by the policy frameworks that are profoundly changing research dissemination behaviour in other parts of the world. We define open access and account for its rise by two quite different routes. We then present a case study of journal publishing at one South African university to identify existing journal publishing practices in terms of open access. This case provides the springboard for considering the implications – both positive and negative – of global open access trends for South African – and other – research and researchers. We argue that academics' engagement with open access and scholarly communication debates is in their interests as global networked researchers whose virtual identities and online scholarship are now a critical aspect of their professional engagement.

Introduction

Many South African researchers are unfortunately encountering open access for the first time in negative terms: through expensive article-processing charges (APCs), through the inaccurate definition of gold open access as 'author-pays' and through the discourse of regulatory compliance which is such anathema to the ethos of academic freedom and academic rigour which all scholars hold dear. Not surprisingly, researchers' responses range from downright negative to extremely sceptical, and there is a general lack of clarity regarding either the value proposition or the practical effects.

We provide a case study of journal research publishing from one South African university, showing where and how publishing has taken place over a 6-year period, particularly in terms of whether and how open-access publishing occurs. The case provides an opportunity to reflect on the realities, opportunities and challenges for South African research and researchers.

What is open access?

Open access as a concept has been in existence for over a decade, officially defined for the first time in the Budapest Declaration of 2001.¹ While differences in definition do exist, usually because of specific foci or interests, Peter Suber's is generally regarded as definitive: 'Open access (OA) literature is digital, online, free of charge, and free of most copyright and licensing restrictions'.² There are numerous misconceptions about what open access means, the most common being that copyright is lost or given away. The opposite is in fact true in most cases, as true open-access publishing is based on legally open licences, a form of copyright permission in which the author(s) retains copyright and specifies permitted uses; in this way a publisher can still publish the work without owning the copyright. The most widely used licences are Creative Commons licences, all of which require author attribution.³ Open licences are, in fact, more aligned with academic freedom and agency than traditional copyright agreements because authors keep their copyright and determine licences for use on their own terms; under conventional agreements researchers invariably sign away their copyright to publishers.

There are two types of open access: gold and green. Gold open access means publishing in an open-access journal so that the article is freely and openly available from the time of publication (as indeed is the entire journal), and green open access means making a version of the published article (often a pre-print or post-print) available through a repository, sometimes after an embargo period.

Reasons for open access

Open access as an issue came into existence for two main reasons: the expense of subscriptions to bundled journal databases (known as 'the serials crisis'),⁴ and, simultaneously, a movement arguing for publicly funded research to be made available freely to the public who had paid for it (premised on the existence of the Internet making this possible in ways previously impossible). These two reasons are aligned with different philosophical approaches: one economic and the other democratic.

As access to journals has moved from print to online, there has been a move from accessing individual titles to accessing bundles, whether or not all the individual titles included in that bundle are wanted. Over the past decades, prices have skyrocketed, with average spending on journals rising by 302% from 1986 to 2004.⁵ Individual titles are extremely expensive, as seen in Table 1.⁵

Researchers have been largely protected from this crisis because they have no direct involvement in journal purchasing, which is undertaken through institutional libraries. They therefore have no immediate reason to exert pressure on publishers to lower prices or to adopt business practices that are more favourable to researchers and the public.

The economic model accepts the concept of knowledge as a commodity; here the primary interest of commercial publishers is to their shareholders rather than to the research community, and in this they are successful. Despite the purported disruption to the industry, the main academic publishers' operating margins rose to a 39% profit margin in 2013.⁶ However, all academic journal publishers are not the same in terms of ownership or intent, and

this is reflected in their prices: for-profit journals are priced 10–15 times higher than not-for-profit publisher titles.⁷

Table 1: The average 2013 price[†] (per title) for online journals in the Web of Science index

Discipline	Average price per title (USD)
Chemistry	3906
Physics	3500
Astronomy	2308
Biology	2163
Engineering	1942
Botany	1885
Zoology	1884
Health science	1661
Geology	1513
Maths and computer science	1366
Technology	1318
Food science	1284
General science	1202
Agriculture	1120
Geography	965
Social sciences	818
Education	778
Psychology	774
Military and naval sciences	751
Business and economics	746
Sociology	721
Political science	620
Anthropology	589
Recreation	581
Law	555
Library science	493
General works	472
Arts and architecture	455
History	433
Philosophy and religion	426
Language and literature	361
Music	278

Table adapted from Bosch and Henderson⁵ (source: LJ Periodicals Price Survey 2013).
[†]Prices represent print + free online, online only and the first tier of tiered pricing.

A parallel argument for open access is founded on the democratic principles of knowledge creation and dissemination, supported by new

technologies, and generally premised on the concept of knowledge as a commons. This is exemplified in the Budapest Declaration¹:

An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the internet. The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds.

Whichever the approach, questions are being asked about the role of publishers in a digital age, especially in academic publishing where scholars provide unpaid-for services through the undertaking of the research itself, the peer-review process and often the editing of the research outputs too; the Cost of Knowledge movement⁸ is one example of researchers engaging forcefully with commercial publishers on these issues. Many publishers have responded by changing their focus from content to services, and many universities already provide publishing services for journals and even books. In short, there is a growing consensus, shared by a diverse group of stakeholders, that the traditional scholarly communication system is 'broken' and not in sync with the changing practices of researchers in a digitally mediated age. That open access will form part of a scholarly communication system in transition is not in dispute – the questions are 'how?' and 'in whose interests?'

The value proposition

The value of open access sometimes gets lost in bureaucratic squabbling and regulatory nitpicking, but generally there is little dispute about its merit. Open access is beneficial for research universities (their rankings and impact measures improve); for funders whose missions of creating and sharing knowledge are realised; for the research process which sees efficiencies, immediacy and transparency; and for the development imperatives of universities and societies at large for which the scholarly resources of universities are made available to all.⁹

Open access is essential for visibility and has proven valuable for citations: in a meta-study of 35 studies surveyed, 27 showed a citations advantage (the percentage increase ranged from 45% to as high as 600%).¹⁰ For those from less developed countries, the effect is more profound: the influence of free access on citations has been shown to be twice as large for the poorer countries in the developing world compared to richer countries, as measured by per capita gross national income.¹¹

Open access is now a mainstream issue in the global north, and plays a central role in Latin America. What of South Africa?

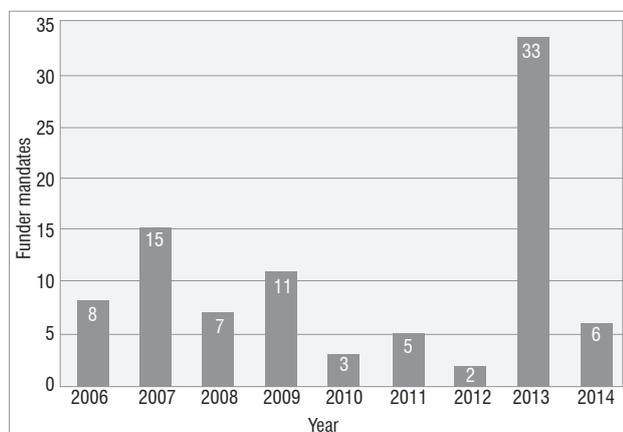
The current global policy environment

These issues might have remained of general interest in ways that did not affect local researchers but for the dramatic change in the funder policy environment during 2013 which saw a major shift to open-access publishing as a condition of grant funding. The Registry of Open Access Repositories Mandatory Archiving Policies (ROARMAP)¹² lists 90 funders who had such a mandate at the time of writing: these include research councils, government agencies (many US departments, for example) as well as the entire European Commission (Figure 1).

These mandates have given rise to consternation, debate, some jubilation, some anxiety and a great deal of confusion. The academic fear is largely that researchers are being told where to publish, which in reality they are not: an analysis of funder open access policies around the world showed that only in one case was publishing in an open-access journal a requirement; in all other cases, depositing in a repository was an option (the Finch report in the UK has since also shifted to a green/gold choice).¹³ Wallander and colleagues¹³ analysed 48 mandatory

funder policies and found that 33 required green (repository based) open access; 14 required either green or gold, and only one preferred gold (i.e. open-access journals) – but only ‘where available’.

These trends in our local context are usefully explored through the case of one South African university, shaped by researchers’ nexus in both national and international networks.



Adapted from ROAR Funder Mandate Graph (May 2014)

Figure 1: The number of funder mandates for open-access publishing per year recorded in the Registry of Open Access Repositories Mandatory Archiving Policies (ROARMAP).¹²

The South African context

South African researchers face challenges in terms of funding: the average research and development (R&D) intensity (R&D as a percentage of GDP) for Organisation for Economic Co-operation and Development (OECD) countries was 2.4% in 2009, while few developing countries had reached 1%.¹⁴ All researchers have problems accessing research¹⁵; in the African and South African context, the limited availability of research is a serious problem,¹⁶ one even worse for researchers not affiliated to universities and research institutions. The cost of access is already so high, and the situation is exacerbated by worsening exchange rates: it would be dramatically worsened by the proposed VAT on digital media which would see university libraries’ purchasing power reduced by a further 40%.¹⁷

Researchers also face challenges in terms of the dissemination and visibility of their research: a study reported in 2013¹⁸ showed the almost entire invisibility via a Google search of South African research in an area where it is known that much research has been undertaken. The visibility issue is ironically about to become much worse when the funder policies requiring open access in the global north are implemented, and what is found online (by researchers who expect everything to be found online¹⁹) is research from the global north and not local, southern research. Geopolitical knowledge inequality, already an acknowledged problem^{20,21}, is about to be exacerbated through poor online access and limited discoverability as well as through new bottlenecks to participation^{9,22}. Online visibility is not a form of vanity, it is now an essential requirement for participation in knowledge creation networks.

At the time of writing, South African research funders either in or outside of government structures – including the National Research Foundation (NRF), the Department of Science and Technology (DST) and the Department of Higher Education and Training (DHET) – had not taken a definitive stand on open access and no such similar open-access publishing requirement is exerted on South African funded research. Universities therefore make strategic decisions at the institutional level, shaped partly by global research funding contracts and individual institutional missions. A handful of South African universities have adopted open access policies, including the University of Cape Town whose policy sets the scholarly dissemination default to open, encourages all scholarship to be made available, and requires journal articles, theses and dissertations to be deposited,²³ while the University

of Pretoria and Stellenbosch University have led the way in developing open repository infrastructure and content. A notable exception to this general lack of engagement to date is the Academy of Science of South Africa’s SciELO SA open-access publishing platform²⁴ funded by DST and endorsed by DHET. Through this platform, 40 South African accredited journals were openly accessible at the time of writing, with many more under evaluation for inclusion on the platform. Journals on the SciELO platform are also indexed by the Web of Science. The increase in visibility for these journals has been dramatic in several cases. One such journal reports increased readership since going open access: ‘To compare... an average issue in say 2007 with an issue now: we would print 200 copies and send perhaps 100 to subscribers and journal affiliates and sell perhaps 50 out of hand: a total circulation of 150. Now our issues collectively get about 10 000 article hits a year.’ (Bank A 2014, written communication from journal editor, April 24).

Open access is making a difference to journal editors in South Africa, but what about academics? Are South African researchers publishing in open-access journals?

A case study: Journal publishing at the University of Cape Town

An analysis was undertaken of the top 20 journals in which the University of Cape Town’s (UCT) research output was published. This analysis is of particular interest given that half of UCT’s journal output was in these 20 journals.

The focus of the analysis was on the form of publishing and the open-access status of the top journals in which UCT publishes. Information about the open-access status of journals was obtained from the Directory of Open Access Journals²⁵ on 17 May 2013. All costs were converted to South African rands (ZAR) using the Google exchange rate calculator²⁶ on 11 June 2013 (rates: GBP1 = ZAR15.71; USD1 = ZAR10.04; EUR1 = ZAR13.36). Costs per issue were calculated by dividing the annual subscription cost by the number of issues per year. The analysis is based on Mouton’s²⁷ ‘UCT Research Performance Assessment’ which covers the years 2006 to 2011. While this is an institution-wide report it is skewed towards the sciences; the output of the humanities is not entirely reflected as a majority is published as books and monographs, and disciplines (such as Computer Science) which favour conference proceedings are also not well represented. It is of note that the sciences and health sciences make up 60–70% of the total output of the sample.

The top 20 journals

We examined the top 20 journals in which UCT research was published between 2006 and 2011²⁷ and analysed the types of journals in which the work was published (open access, subscription or hybrid, at the time of analysis in 2013) and the publishers of these journals. The costs – in terms of subscription fees or APCs – are provided where it was possible to ascertain them (the costs provided are those at the time of analysis in 2013). Table 2 summarises this information.

Figure 2 shows the types of journals in the top 20 by category.

Figure 3 shows the number of articles published in the top 20 journals (equivalent to half of the total output) according to type (note that the number of full papers for each journal was obtained from Mouton’s²⁷ report ‘UCT Research Performance Assessment’ presented at the UCT Research Indaba of 08 May 2013).

Accredited lists

All of the top 20 journals appear on accredited lists: 19 are indexed in Web of Science and 1 is indexed in the International Bibliography of the Social Sciences (IBSS) (as of 2013). A total of 8 journals are on the DHET-accredited list (some of which are also on the Web of Science), and 4 journals are available through the open-access platform SciELO SA – *South African Medical Journal*, *South African Journal of Science*, *South African Journal of Surgery* and *Water SA*.

Table 2: Top 20 journals: case study summary table

Journal	Publisher	Number of full papers (relative proportion)	Listed on the DOAJ as open access? (Creative Commons licence)	Not open access/no open access options	Hybrid?	Article processing charges for open-access articles	Subscription costs and number of issues (per year) (*supplied by UCT libraries)
1. <i>South African Medical Journal</i>	Health and Medical Publishing Group and the Medical Association of South Africa	293 (10.28%)	Yes (CC-BY-NC)			None	ZAR1044 (print) 12 issues ZAR1495* (print + online) 4 issues
2. <i>African Journal of Marine Science</i>	MISC and Taylor & Francis	120 (4.21%)			Yes	ZAR10 000	
3. <i>PLoS One</i>	PLOS	104 (3.65%)	Yes (CC-BY)			USD1350	n/a
4. <i>Monthly Notices of the Royal Astronomical Society</i>	Oxford Journals	91 (3.19%)			Yes	GBP1 450 USD2550 EUR2175	GBP5213 (print + online) GBP4656 (online) GBP4745 (print) 12 issues
5. <i>Minerals Engineering</i>	Elsevier	82 (2.88%)			Yes	USD2500	USD2145 (print) USD1429.87 (online – 5 users) 15 issues ZAR1000 (print) 6 issues
6. <i>South African Journal of Science</i>	Academy of Science of South Africa	76 (2.67%)	Yes (CC-BY)			? (not indicated on site)	
7. <i>AIDS</i>	Lippincott Williams & Wilkins	64 (2.25%)			Yes	USD3000	USD3155 (not stated what this includes) 18 issues ZAR1135 (print + online) ZAR995 (online) 3 issues
8. <i>Ostrich</i>	MISC and Taylor & Francis	57 (2.00%)			Yes	ZAR10 000	
9. <i>British Journal of Sports Medicine</i>	BMJ Publishing Group	55 (1.93%)			Yes	GBP1950	(institutional price not on site) 18 issues
10. <i>Physical Review D</i>	American Physical Society	54 (1.90%)			Yes	USD1700	USD7695 (online) USD10505 (print + online) for large research institutions 24 issues
11. <i>South African Law Journal</i>	JUTA	50 (1.76%)		Yes		n/a	ZAR939 4 issues
12. <i>International Journal of Tuberculosis and Lung Disease</i>	International Union Against Tuberculosis and Lung Disease	50 (1.76%)		Yes		n/a	EUR5000 (print + online) 300 – 700 end users 12 issues
13. <i>Lancet</i>	Elsevier	49 (1.72%)			Yes	USD5000	EUR1604* (print) USD1629* (online) 52 issues
14. <i>South African Journal of Surgery</i>	Association of Surgeons of South Africa, Health and Medical Publishing Group and the Medical Association of South Africa	47 (1.65%)	Yes (CC-BY-NC)			None	n/a 4 issues
15. <i>JADS – Journal of Acquired Immune Deficiency Syndromes</i>	Lippincott Williams & Wilkins	46 (1.61%)			Yes	USD3000	USD2588 (print + online + iPad) 15 issues Not stated 4 issues
16. <i>South African Journal of Psychology</i>	Psychological Society of South Africa	46 (1.61%)		Yes		n/a	
17. <i>Marine Ecology – Progress Series</i>	Inter-Research	44 (1.54%)			Yes	(1) Free access: EUR500 (1–8 pages), EUR1000 (> 14) (2) Open access under CC-BY licence: EUR900 (1–8), EUR1200 (9–14), EUR1400 (> 14)	EUR5714* 25 volumes
18. <i>Journal of Infectious Diseases</i>	Oxford Journals	44 (1.54%)		Yes		n/a	GBP2153 (print + online) GBP1721 (online) – for 1000-9999 end users 24 issues
19. <i>CMS Spectrums</i>	Cambridge University Press	42 (1.47%)		Yes		n/a	Not stated 12 issues
20. <i>Water SA</i>	Water Research Commission	41 (1.44%)	(free online)	Yes (free online)		n/a	Not stated 4 issues

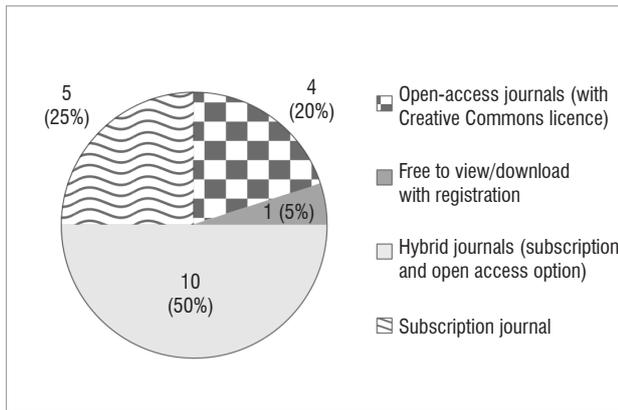


Figure 2: Number (%) in each category of the top 20 journals in which authors from the University of Cape Town publish.

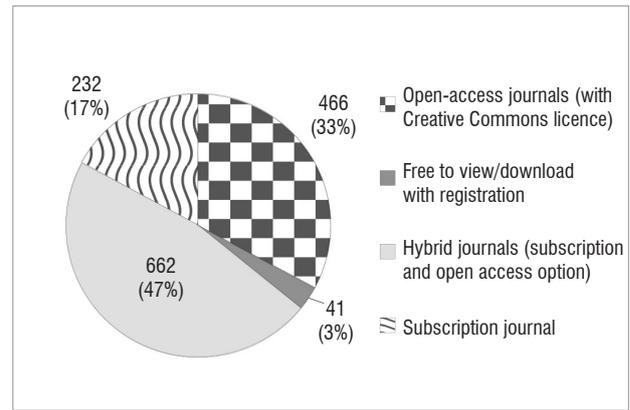


Figure 3: Number of articles published in the top 20 journals in which authors from the University of Cape Town publish (by category).

Free online and open access

Of the 20 journals, 5 are freely available online: *South African Medical Journal*, *PLoS One*, *South African Journal of Science*, *South African Journal of Surgery* and *Water SA*. The publications by UCT authors in these five journals make up 19.69% of the total relative proportion of all UCT articles published. Four of these five journals are available through SciELO SA, four are formally open-access journals (i.e. freely available online and openly licensed under Creative Commons licences) – 18.25% of the total relative proportion of UCT articles are published in these journals – and one is freely available online with registration (1.44% of the total relative proportion of UCT articles are published in this journal).

Of the open-access journals, two are available under Creative Commons Attribution (CC-BY) licences – which means anyone can ‘distribute, remix, tweak, and build upon’ the work provided that the original author is credited.³ Others can profit from the work, as there is no restriction on commercial use. The other two are available under the Creative Commons Attribution Non-Commercial (CC-BY-NC) licence – which means anyone can ‘distribute, remix, tweak, and build upon’ the work provided the original author is credited and the work is not used commercially.³

There are no costs for publishing in three of these four open-access journals, and, interestingly, all three journals are local. UCT authors published 416 full papers (i.e. 14.6% of the total) in these three no-costs-for-publishing journals.

The remaining open-access journal has an APC. *PLoS One* charges an APC of ZAR13 800.65 per article. With 104 full papers published in *PLoS One*, the total possible cost (disregarding fee reductions, fee waivers, etc.) is ZAR1 435 267.60. It would require an interrogation of each of these articles to find out what the actual costs were for these 104 papers, given that UCT authors do apply for waivers and reductions, and also that APCs may be paid by co-authors from countries for which there are block grants for APCs.

The publishers of these open-access journals are: Health and Medical Publishing Group and the Medical Association of South Africa (co-publishers) (*South African Medical Journal*); PLOS (*PLoS One*); Academy of Science of South Africa (*South African Journal of Science*); Association of Surgeons of South Africa, Health and Medical Publishing Group and the Medical Association of South Africa (co-publishers) (*South African Journal of Surgery*) and the Water Research Commission (*Water SA*). It is of note that these open-access journals are largely published by associations rather than for-profit publishing companies.

Hybrid journals

There are 10 journals (i.e. half) which are available via subscription with an option to make a specific article openly accessible – that is, hybrid journals. These journals are *African Journal of Marine Science*, *Monthly Notices of the Royal Astronomical Society*, *Minerals Engineering*, *AIDS*, *Ostrich*, *British Journal of Sports Medicine*, *Physical Review D*, *Lancet*,

JAIDS and *Marine Ecology – Progress Series*, and are published by NISC and Taylor and Francis (co-publishers), Oxford Journals, Elsevier, Lippincott Williams & Wilkins, BMJ Publishing Group, American Physical Society and Inter-Research (Table 2).

The subscription costs *per issue* (where it was possible to ascertain) for these journals range from approximately ZAR373 to ZAR6919 (for print + online); ZAR418 to ZAR6298 (for print only); ZAR320 to ZAR6180 (for online only); ZAR1763 (for print + online + iPad) and ZAR1791 to ZAR3100 (not stated what this cost includes). Therefore, an overall cost range per issue is ZAR320 to ZAR6919. In addition to subscription costs, all of these hybrid journals also charge APCs, ranging from ZAR10 000 to ZAR51 113 per article, for open-access articles.

The publications by UCT authors in these 10 journals make up 23.23% of the total relative proportion of UCT articles published.

It is these journals which can be described as ‘double dipping’, as they benefit from both subscriptions and APCs.

Subscription access

Five of the journals are available via subscription only with no open-access option. These journals are *South African Law Journal*, *International Journal of Tuberculosis and Lung Disease*, *South African Journal of Psychology*, *Journal of Infectious Diseases* and *CNS Spectrums*. These journals are published by a mixture of publisher types: JUTA, International Union against Tuberculosis and Lung Disease, Psychological Society of South Africa, Oxford Journals and Cambridge University Press.

The subscription costs (where it was possible to ascertain) for these journals range from ZAR234 (for print only) to ZAR5652 (print and online for 300–700 end users) per issue. Three of the journals do not provide a subscription cost on their website and the costs were also not available through the UCT library. The publications by UCT authors in these five journals make up 8.14% of the total relative proportion of UCT articles published.

Observations

The case study of publishing at UCT provokes several interesting points including the extent of existing publishing in open-access journals, the limited requirement for APCs, the nature of hybrid journals and the possibilities for green route open access in the South African context.

Open-access journals

The finding that nearly a quarter of the top 20 journals are open-access journals is of note given that the South African policy environment does not require or encourage open access. Articles in these open-access journals account for a third of those published in the top 20 journals. It is

perhaps unsurprising that these are all science-aligned journals as open-access publishing has been more predominant in the sciences to date.²⁸

It may come as a surprise that of these open, freely available journals, only one – *PLoS One* – charges an APC. This finding means that of the open-access articles published ($n=466$), only 23% (104) required APCs. The misconception that open access equals ‘author pays’ is possibly caused by the muddying of the waters of the hybrid journals which offer APCs in addition to subscriptions, as seen in 10 of the 20 journals in this case study.

However, ‘pure’ open-access journals have a number of funding models, including membership fees, sponsorship and subscriptions (for print copies). The different options, as well as how they are utilised by different-sized publishers, are shown in Figure 4, adapted from Dallmeier-Tiessen et al.²⁹

The fully funded APC model is considered advantageous because it makes publishing costs more transparent to researchers and engages them with the realities of research dissemination. In a recent (2014) study,³⁰ it was noted that ‘there is evidence from a variety of sources that APC price is a consideration for many researchers and is helping moderate APC prices’. This is a good thing for the system as a whole, especially in the South African situation, in which, for open access APCs to be effective, it is essential that institutions see cost savings through funds not spent on subscriptions, especially given that there are no APC funds forthcoming from the government, as elsewhere.

Some South African universities (e.g. Stellenbosch³¹) have provided their own in-house APC funds to support open-access publishing. Whether these funds are specifically for open-access journals or can be used for hybrid journals is relevant, as it determines whether or not the institution is paying the publisher twice – once to write and publish and once to access and read. In addition, publishers like PLOS have a fee waiver policy for those who cannot afford the full, very expensive costs of APCs.³² PLOS, as well as other publishers, also have a system of waivers based on a country’s economic status, with reduced APCs for those below a specific per capita GDP: South Africa does not benefit from these blanket waivers although individual researchers can request waivers.

While legitimate and reputable open-access journals such as *PLoS One* have been in existence for several years, the policy shift to open access has seen an explosion in vanity publishers and ‘predatory’ journals which assure scholars of publication at a cost, regardless of peer review or quality. These publishers and journals have given all open-access journals a bad reputation. Of course, the criteria of quality – in the form of reputable editorial boards and rigorous peer-review processes – pertain to both open-access and propriety journals. Indeed, there are many

poor quality proprietary journals, and scams occur in both – the recent case of computer-generated ‘gibberish’ research papers being removed from the archives of reputable and well-known commercial publishers after the papers were shown to be fakes is just one example.³³ The increasingly open research domain enabled by the online environment is one possible piece in the real rise in the number of retractions in high-impact journals in recent years.³⁴ South African researchers could reap the benefits of the additional checks that choosing open and digital publishing options enables.

Hybrid journals

Hybrid journals require particular attention, because they are a lose-lose situation for universities in that they pay twice (and perhaps a win-win for those publishers who are comfortable with being paid twice). The finding that 50% ($n=10$) of the top 20 journals in which UCT research is published, containing 47% ($n=662$) of the articles considered in this case study, are hybrid journals should be of particular concern to UCT, as well as to other South African universities. In some cases, research funders provide funds for APCs, an example being the Wellcome Trust whose recent data shows dramatically the extent to which double charging is taking place. A report of a 1-year period (October 2012 to September 2013) showed that academics spent GBP3.88 million to publish articles in journals with immediate online access – of which GBP3.17 million (82% of costs, 74% of papers) was for publications that universities would then be charged for again. Only GBP0.70 million of the charity’s GBP3.88 million was used for publishing in a ‘pure open-access’ journal. Specifically, the Wellcome Trust paid nearly GBP1 million to Elsevier, and over GBP500 000 to Wiley-Blackwell to make articles freely available on point of publication, in journals that a university library would also be trying to find money to pay subscription fees.³⁵

The dysfunctional nature of the hybrid journal market has been recently described in some detail by Björk and Solomon³⁰ who express concern about the transparency of the process of subscription reductions when aligned with APCs, especially in light of the fact that

reductions in the list prices of individual titles are almost meaningless since the bulk of the publishers’ subscription revenue comes from multi-year bundled contracts or ‘big deals’, the details of which often are hidden behind non-disclosure agreements.^{30(p.39)}

They also raise as concerns the mechanisms for reducing subscription costs for individual universities or consortia in direct proportion to the hybrid APCs paid by them. They point out that such agreements may be difficult both to negotiate and implement. In short, efforts to keep

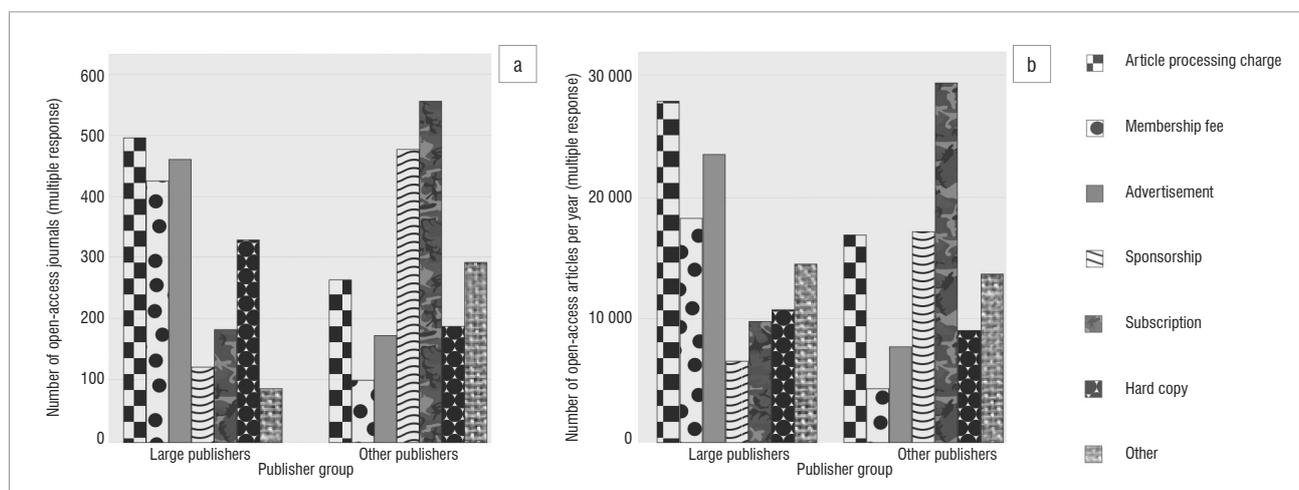


Figure 4: The number of (a) journals and (b) articles as a function of the income source of publishers, for large publishers and other publishers. ‘Large’ publishers are defined as those that publish more than 50 journals or more than 1000 articles per year.²⁹

commercial publishers in the scholarly cycle and good intentions to enable open access are being derailed by complicated and bureaucratic processes with unanticipated consequences which may well undermine the good they set out to achieve.

One might be tempted to suggest that, in light of the complexities of the implementation in other countries, South African researchers are well enough served by closed, paywall proprietary journals. However, these journals are becoming unaffordable even for elite institutions, and the research that is published in them is effectively lost to all without financial and technical access. Through this traditional route, research uptake is thwarted and research investment wasted – a situation that South Africa can ill-afford.

Paywall and hybrid journals – the repository route

An examination of the 20 journals in the UCT case study shows that most ($n=18$) allow for versions to be deposited in institutional or disciplinary repositories (as ascertained by searching on Sherpa Romeo), although embargo periods may apply. Of these 18 journals, 14 allow for pre-print archiving (3 of the open-access/free online journals, 9 of the hybrid journals and 2 of the subscription journals), 11 allow for post-print archiving with no restrictions (4 of the open-access/free online journals, 5 of the hybrid journals and 2 of the subscription journals) and 6 allow for publisher's version to be archived (4 of the open-access/free online journals, 2 of the hybrid journals and none of the subscription journals). Another study³⁶ which looked at an extremely large sample (1.1 million articles) across a variety of publishers found that the majority of articles was legally eligible for repository deposit. Approximately half of the articles could be shared at the time of publication either as the accepted manuscript or as the publisher's version and this number increased to 80.4% after 1 year from publication.

Under pressure from academics globally, publishers have agreed that a version of a journal article can be deposited legally in authors' institutional repositories or on their own websites. These kinds of institutional mandates came to a peak a few years ago in the global north, and many publishers automate linkages to institutional scholarly communication structures, sometimes after a specified embargo period.

This route in South Africa would make a real difference to the availability of local research online.

In recent years, there has been increased attention paid to such mandates in South Africa and elsewhere in Africa (for example, several Kenyan universities now have open access mandates⁹), as universities have become more attuned to the necessity of guarding and taking responsibility for the presentation and dissemination of their own resources. Universities with robust scholarly communication infrastructures and expertise can and should play a significant role in preserving and disseminating the journal scholarship of their universities through their own efforts and expertise.

The role of repositories in online visibility is proven in numerous studies with its value particularly emphasised in developing country contexts. In the South African situation, that same study (mentioned earlier) which found such limited visibility of South African research online found that one article appeared on Google and Google Scholar top 10 results. This article was accessible only through a subscription of USD593 for 12 issues or by online access to the single article for 24 h at a cost of USD31.50, but it had been legally deposited into a university repository from where it had been downloaded 2356 times at the time of writing. Ironically, the journal in which the article was published subsequently offered an open-access publishing option, at a cost to the author of USD3000.¹⁸

Together with such mandates has been increased attention to the building of scholarly communication infrastructures to support not only the deposit of journal articles but the full gamut of scholarly communication and research dissemination activities enabled in a digitally mediated age of scholarly social media and online participation. It is beyond the scope of this piece to discuss the intricacies of infrastructure and repositories; suffice to say that they provide a valuable mechanism for South African researchers wishing to improve their online visibility, share their scholarly output online, extend their research networks and make their work available to all with Internet access.

Concluding discussion

There is no question that open access is now firmly part of the global knowledge creation and dissemination landscape. It is the present

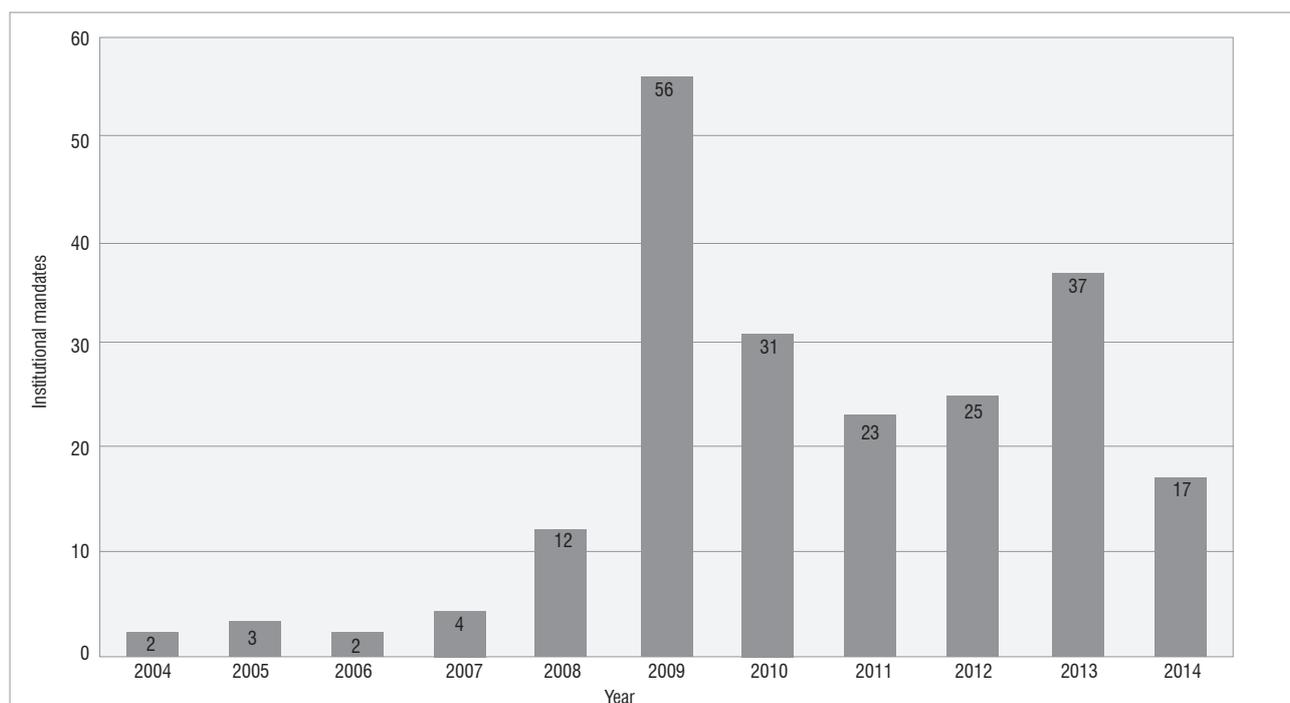


Figure 5: The number of institutional mandates on open-access publishing per year recorded in the Registry of Open Access Repositories Mandatory Archiving Policies (ROARMAP)¹².

muddled and muddled transition which makes the terrain hard to read, especially as stakes are claimed and interests fought over. South African scholars need to understand the shape of the shifting landscape and engage with the debates to ensure that their own interests are being addressed. A worst case scenario for South African researchers would be a lose-lose situation in terms of both access and participation. It would be debilitating for local researchers for access to northern research to become straightforward, but opportunities for participation by southern researchers to be reduced. Access to southern research is likely to be even further reduced as local researchers' publishing options might be restricted by financial gatekeeping at the outset. While sweeping changes in the global north will see more northern research freely available to all online, the danger for locals is twofold: firstly, that they may be limited in their opportunities to publish (especially by expensive APCs) and, secondly, that their own research drowns in the worsening invisibility of the online discoverability sphere.

The transition does not have clear sign posts; indeed, many believe that the present moment is a turning point for open access with a tug of war between a publisher-driven future and a researcher-driven future. South African researchers especially have a vested interest in understanding and engaging with the issues.

What does this mean for South African scholars? Academics need to cast a sharp eye on the choices they are offered and differentiate between types of journals (whether fully open access or hybrid) and between open access options. Doing so is premised on a realisation that taking control of research dissemination is increasingly in academic interests. Historically, research ended when an output was published; now the publication is dynamic and at the centre of a virtuous cycle of participation, online representation and the co-production of knowledge in a borderless world.

Central to full participation and engagement is copyright. There is less reason than ever before for academics to give away their copyright, when legal alternatives exist which give publishers the right to publish while academics keep the copyright on their own work and specify their own conditions. Even publishers are quietly coming to realise this; it is no coincidence that so many are changing their business models to provide research-related services and tools in new areas such as text mining, referencing and research collaboration.

A strategy that exists immediately for academics is to deposit their work in institutional and disciplinary repositories as well as properly curated websites. The expertise and costs associated with professionally preserved content are borne by informational professionals with the necessary proficiencies. Assuring that scholarly content is online and visible is not only essential for personal scholarly presence, it is also a part of ensuring equity of representation and realigning lopsided geopolitical knowledge resources online. Representation matters – because what is found online increasingly shapes what is known and what can be known. Knowledge which can be found online becomes that which is considered legitimate, normalising it and giving it power.

How the current tensions and debates in scholarly communication play out is of import to academics who should get involved in open access negotiations at the policy level: the outcomes really matter to researchers. Engagement between academics and government departments (such as DHET and DST) around open access policies and funding in the South African research environment is a key requirement going forward. The lack of a national open access policy in South Africa hinders the development, growth and availability of local research, which is in stark contrast to the strong national legislative leadership shown by countries in Latin America such as Mexico, Peru and Argentina, which have all passed national open access policies in the last 18 months, with Brazil's in the offing. National government also needs to step in at the resource and system levels. While the SciELO SA initiative is laudatory, it must be only the first step in developing and supporting new business models for scholarly publishing in the public interest. In the same vein, regulations and allocations for research dissemination (including APCs) also need urgent state attention.

Collaboration between researchers and universities in negotiations with publishers to change terms of agreement will also strengthen the interests of academia. Negotiations with stakeholder groups would of necessity include publishers and most especially should acknowledge the importance of publishing skills which are critical no matter where they are located. But fine-tuning is needed to differentiate between publishers: they are not the same and their *raison d'être* differs, profoundly determining their behaviour. Difficult questions can and must be asked, and the terms of agreement renegotiated. All this must happen while simultaneously ensuring that the highest quality academic standards are maintained and that fraudulent opportunists are firmly nipped in the bud.

As the entire global ecosystem changes, academics need to participate in global conversations about the changing nature of research dissemination in order to ensure that voices from developing countries are inserted and heard. Northern-focused gazes rarely serve the needs of research and social development in the global south; decisions may not be feasible or may privilege those with more access and with the tools to facilitate visibility and participation. While hybrid economies and ecologies can and do exist (the open source community is a fine example), academics need to intercede to ensure that commercial interests serve academic interests first and foremost, and not the other way around.

Within universities, academics need to lobby for changes in performance assessment and promotion mechanisms in order to widen the types of knowledge production acknowledged by the rewards system. Academics now can benefit from new formats and exploit the read-write affordances of new technologies, and participatory, open or collaborative academic roles and outputs are now possible; but academic evaluation systems have been slow to acknowledge and reward them.

As Poydner put it so well, what is so exhilarating about a research-driven model is that it is future focused, and so has the potential to produce forms of scholarly communication more suited to the networked environment³⁷; it holds out the promise of a new 21st century scholarly communication system, not a retrofitted 20th century system. We would add that, for the opportunities to be realised, it is essential that they are determined through a genuinely global conversation to create scholarship shaped by academic rigour and quality, disciplinary frameworks and research imperatives, not determined by geographical borders, technical and other inequalities or commercial gains.

In short, we argue that despite the muddled representations of open access discourses in the South African research terrain, researchers should firmly engage with the specificities of open-access publishing through both journals and repository deposit. Engaging with open access is an important way of taking control of the fruits of academic labour – essential for individual scholars and the universities whose mandates of knowledge creation and dissemination they serve as well as the broader community which needs access to the latest research to grow, benefit from and participate in a global body of knowledge.

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Authors' contributions

Both authors contributed equally to the manuscript.

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