Routledge
Taylor & Francis Group

Riding the Wave of Open Access: Providing Library Research Support for Scholarly Publishing Literacy

Linlin Zhao*

University Library, Deakin University, Burwood, Australia

Researchers are experiencing intense pressures to publish and increase research outputs. Recently many research funders have introduced policies and mandates related to open access, which have contributed to the increasing popularity of open access journals. Dubbed gold open access, open access journals offer researchers another publishing option. However, some publishers with questionable practices and journals of dubious quality have emerged exploiting the 'author pays' open access model and researchers' need to publish. Hence an ability to publish research outputs through the most appropriate outlet for a particular field is crucial for researchers in order to maximise the impact of their research. Notwithstanding the proliferation of open access journals, the literature indicates that some researchers may not have a full understanding of the operations, implications and issues around open access and other publishing issues. This understanding is known as scholarly publishing literacy. With knowledge of scholarly publishing and access to resources and tools, academic libraries and librarians are well-positioned to play an active role in providing support to researchers. This paper argues that scholarly publishing literacy should be treated as an extension of information literacy delivered through a broader research support framework. This paper presents a research librarian's perspective, and draws on literature and the author's practice to illustrate key points. Issues for further investigation are identified.

Keywords: scholarly publishing literacy; open access; information literacy; digital scholarship; research support; academic libraries; author pays; green open access; gold open access

Introduction

An email entitled 'Need your help with my new publication!' catches Sam's attention. As a librarian working in a university library, Sam is responsible for providing research support to the university's research community, from Higher Degree by Research students to researchers at different levels. The email is from Alex; a new lecturer who is currently studying for a PhD. Alex recently received an email from a publisher inviting him to submit a manuscript to an open access journal. The email was well written and the name of the journal resembled some prestigious journals in Alex's research field. An ISSN number was also provided, along with a list of databases in which the journal was indexed. Alex followed the link provided in the email to the publisher's website. Based on its logo and familiar names in the editorial board, he believed the journal was a start-up open access journal associated with a renowned USA university. Alex submitted his latest research paper to the journal. After two weeks, he was informed that his paper was accepted and would be included in its next issue, with some minor editing and an article-processing charge of US$350. Alex was very excited and impressed with the journal's quick processing and relatively low fee. He made the payment and received the published version of his paper a month later. However, he was shocked to see the poor formatting and spelling errors in his name. Alex immediately contacted the publisher through emails; however, no responses were received for months. Alex asked the library for help. With

*Email: l.zhao@deakin.edu.au

due diligence checking, Sam finds a couple of alarming facts about this journal: it is not included in either the Directory of Open Access Journals or Ulrich's Periodicals Directory, the two key directories of peer-reviewed journals; the ISSN number does not exist; none of the databases indexes the journal as it claimed; the publisher's logo is suspiciously similar to the USA university but not identical; one member listed in the editorial board is not aware of the journal; the address provided on its website is from the USA, but the contact number is from China. Thus, both Sam and Alex realise there are some quality issues with the journal. Alex feels embarrassed and asks the library to provide guidelines for further reference.[1]

Unfortunately, along with the exciting opportunities provided by the advent of open access publishing, incidents like the composite scenario above are not uncommon. Some open access publishers with questionable practices and open access journals of dubious quality have emerged exploiting researchers' needs to publish and the 'author pays' open access publishing model, in which pre-publication article processing charges are applied to replace post-publication subscriptions/user fees. To fully understand and take advantage of the current scholarly publishing environment, researchers need to develop sufficient skills in publishing their research outputs through the most appropriate outlet for their field, including identifying suitable publishing options and undertaking due diligence checking. This can be referred to as scholarly publishing literacy, a term introduced by Jeffery Beall in a paper in 2012. This paper argues that scholarly publishing literacy is a dynamic concept and needs to be considered at a broader level both through the lenses of digital scholarship and information literacy. With knowledge of open access, understanding of copyright and licensing, expertise in bibliometrics and applying quality indicators for research quality evaluation, and access to a range of resources and tools, academic librarians are well-positioned to claim a proactive role in supporting scholarly publishing literacy.

This paper is written from a research librarian's perspective, and draws on the literature to illustrate key points. It begins by discussing key issues of the current scholarly publishing environment, including some of the challenges that researchers face, such as the immense pressure to publish and the complex situation created by the rise of open access. It explores the notion of scholarly publishing literacy, and its implications for academic libraries and librarians. After reviewing the current state of library support for scholarly publishing literacy, three key questions are identified for further investigation: (1) the 'what' question: What do we mean by scholarly publishing literacy? (2) the 'how' question: How do libraries and librarians address the issue of scholarly publishing literacy? (3) the 'who' question: Who will be the staff responsible for providing support for scholarly publishing literacy?

The publish or perish syndrome

Since its first mention by Logan Wilson in 1942 (Garfield 1996), the phrase 'publish or perish' has resonated with many researchers in the academic community. According to a 2009 international survey conducted by van Dalen and Henkens (2012), the majority of researchers residing in Anglo-Saxon countries (i.e., USA, UK, Australia and Canada) reportedly suffer from immense pressure to publish. At the individual level, a researcher's scholarly publication and citation counts are often used as key indicators, or even determinants, in measuring their academic skills and productivity. It is common to make decisions on academic employment, promotion or grant applications based on a researcher's publishing track record. At the institutional level, publication counts and citation metrics are strongly tied to evaluating the quality and prestige of academic institutions, for instance, the increasing popularity of various university rankings.

Rankings such as the *Shanghai Jiao Tong Academic Ranking of World Universities* (Centre for World-Class Universities 2014), the *Times Higher Education World University Rankings* (Thomson Reuters 2014) and the *QS World University Rankings* (Quacquarelli Symonds 2014) have captured wide attention not only from academia but also from government departments, funding bodies and the general public (Burns and McCarthy 2010; Macdonald and Kam 2009; Steele, Butler, and Kingsley 2006). These rankings, in many cases, have direct or indirect implications for a university's reputation and research funding.

Since the 2008 global economic downturn and the recent national research funding cuts to the university sector, the Australian research environment has become tougher than ever (Creagh 2012; Robinson 2013). Within the Australian university sector, a significant proportion of research is supported through government funding (Kingsley 2013b). Several measures are implemented by the Australian Federal Government to provide accountability and ensure taxpayers' public money is invested strategically and wisely in research. The annual Higher Education Research Data Collection (HERDC) collects statistics of universities' research output and income. HERDC results are currently used to inform research funding allocations to universities (Australian Government Department of Industry 2014).

In addition, similar to national research evaluation exercises in other countries, the former Labor Government introduced Excellence in Research for Australia (ERA) (Australian Government Australian Research Council 2014a) in 2009. ERA aims to evaluate the quality of research conducted at Australian universities. The Australian Research Council (ARC) is the administering body for ERA on behalf of the Government. According to the ARC website as of 22 May 2013 (http://www.arc.gov.au/era/faq.htm), ERA outcomes will:

> ... inform the performance-based block funding that universities receive from Government to sustain excellence in research. This funding provides all our universities with a direct financial incentive to encourage and support world class research. ERA outcomes directly inform university funding under the Sustainable Research Excellence scheme.

Hence much attention and emphasis have been placed on HERDC data and ERA performance by universities. Apart from the ERA2009 trials, two ERA rounds have been conducted so far – ERA2010 and ERA2012. At the time of writing, a further round of ERA was announced to take place in 2015. In both ERA2010 and ERA2012 national reports, institutional performances have been rated and publicised. Similar to other university rankings, the rankings of Australian universities compiled based on ERA outcomes have sparked much attention within academia and from the general public (Australian Education Network 2013). Since HERDC and ERA results are partially based on the volume and quality of a university's research publications, it is not surprising that Australian universities are exploring means to ensure that their researchers publish as much and as strategically as possible. Various rewards and incentives have been implemented by universities to boost their researchers' publication productivity. A strong relationship between seniority and research publications has been repeatedly reported amongst the Australian universities (Bentley 2012; Hemmings and Kay 2010). Therefore, in order to thrive, or even survive, in this competitive international and national research environment, Australian researchers are under intensifying pressure to publish and increase the research footprint of their institution.

Gold open access publishing

In the last decade, the open access paradigm has begun to reshape the landscape of scholarly publishing. Many government agencies and funding bodies worldwide have

introduced mandates related to open access, such as the National Institutes of Health (US), the National Science Foundation (US), the Research Council UK, the European Commission, the Indian Council of Agricultural Research, the United Nations Educational, Scientific and Cultural Organization (UNESCO), and many more (Australian Open Access Support Group 2014a). In Australia, the two most prominent funding agencies, the Australian Research Council (ARC) (2014b) and the National Health and Medical Research Council (NHMRC) (2014) have both announced their policies on open access. As a result, there is an increasing interest in open access amongst Australian researchers.

Initially defined by the Budapest Open Access Initiative in February 2002, the notion of open access is based on the general philosophy that publicly funded research should be publicly available (Kingsley 2013b). For many years, major activities, for example editorial and review roles, in scholarly journal publishing have been conducted by researchers voluntarily and free of charge. Although publishers provide services such as technical infrastructure and copy editing, it is the researchers who create research and in turn act as reviewers and editors for research papers. Publishers, however, gain copyright of research papers by requiring authors to sign copyright transfer agreements. Once published as journal articles, access to these research papers is generally only possible through journal subscriptions or user fees. Academic libraries usually play a crucial intermediary role in managing journal subscriptions and providing access to researchers at their institutions who may be readers, reviewers, editors and/or authors of these journal articles. Those who cannot afford subscriptions and do not have access through their libraries have essentially been denied access to research, which in most circumstances is supported by public funding. Furthermore, from an economic perspective, the price of journal subscriptions has been increasing almost three times faster than the Consumer Price Index in the last two decades (Kingsley 2013a; UK Department for Business Innovation & Skills 2013). Nowadays, a subscription for a journal can cost as much as US $40,000 per year. To cope with the increasing price of journal subscriptions, libraries have been engaging with the Big Deals. Big Deals are bundled packages of e-journals that publishers offer to libraries at a lower price than subscribing to the journals individually. However Big Deals have failed to meet many libraries' needs of acquiring desired content within their budget, due to the rising price of, and undesired content included in, Big Deals (Bivens-Tatum 2013). Journal subscriptions have become a real financial burden even for well-resourced large libraries like Harvard University Library (Norrie 2012; Roach and Gainer 2013). Hence, it is argued that the domination of subscriber-only models of scholarly publication is unsustainable from both ethical and economic standpoints (Roach and Gainer 2013). Open access is welcomed by many as a social movement and solution to the traditional, unsustainable publishing system.

However, among researchers and practitioners, the scope and definition of open access have been much debated, with different opinions on the economic and social accountabilities of research. There are two broad views on open access: (1) gratis open access, the understanding of open access in strictly economic terms, i.e., open access is free of charge; (2) libre open access, the understanding of open access in both economic and social terms, i.e., open access is free of charge and free to use with minimal restrictions (Suber 2008). This paper borrows one of the most commonly accepted understandings of open access defined by Peter Suber (2013) – research outputs should be 'digital, online, free of charge, and free of most copyright and licensing restrictions'. Within the academic community, the emphasis usually is on providing free online access to scholarly literature such as peer-reviewed journal articles and conference papers.

Two distinct approaches are used to provide open access: green open access and gold open access

Green open access refers to self-depositing, the idea that authors make their research outputs accessible by distributing a free online version to an institutional or subject repository (Roach and Gainer 2013). These repositories are digital archives, which are usually administered by libraries. They store and distribute existing peer-reviewed research outputs to researchers and the public. As Kennan (2011) highlights, depending on the situation, research outputs can be self-deposited at either the pre- or post-review stage. The purpose is to provide access to other researchers without subscriptions to the journals, to the public, and to increase visibility of the work through search engines such as Google and Google Scholar. Unlike journals, repositories typically are not responsible for reviewing articles. The goal is not to replace publishers and provide all the functions of a journal. The goal for green open access is to disseminate research papers, which will have been reviewed via traditional journals or other means. Green open access thus operates in conjunction with traditional scholarly publishing.

Gold open access, on the other hand, refers to journals most of which manage, peer-review and publish articles and make those articles publicly available online to readers. Such journals are sometimes differentiated by their degree of openness, and the timing within which articles are made open, including: (a) open access journals offering full and immediate access to articles; (b) hybrid journals allowing some articles to be free access within an otherwise subscription-based journal; and (c) delayed open access journals, where articles are made open access after a nominated period of time. When published in an open access journal, with or without an article processing fee, authors may or may not retain the copyright of their work but readers are provided free access and, in some cases, re-use rights (i.e., libre open access). Due to the removal of subscriptions or user fees, some open access journals employ an author pays system, where pre-publication article processing charges are applied after articles are reviewed and accepted. Depending on the situation, article processing charges usually are paid by the authors, their institutions, or funders through subsidies, memberships or grants (Morrison 2009; Roach and Gainer 2013; Suber 2013). In comparison to the disseminating focus of green open access, gold open access journals generally incorporate all aspects of the journal publishing process 'identical to traditional scholarly journal publishing, providing necessary control over research quality' (Xia 2010, 615).

Generally speaking, green open access is well supported in Australia, mostly through university institutional repositories. An international body of literature (c.f.; Bailey 2005; Nicolas et al. 2012; Van Westrienen and Lynch 2005), including Australian contributions (c.f. Australian Open Access Support Group 2014b; Kennan 2007; Kingsley 2013b) has investigated the development of institutional repositories and their impact on green open access. However, while green open access has been flourishing recently, so too has gold open access. According to the Directory of Open Access Journals (DOAJ), the total number of open access journals has increased from 37 in 2002 to 9804 as of 1 January 2014 (www.doaj.org).

In contrast to the self-depositing nature of green open access which is mostly explored within the academic community, gold open access has been increasingly adopted by commercial, learned society and other academic publishers as a business model. Open access journals offer researchers an alternative means of publishing their research output with a possibility of larger readership and higher visibility than subscription journals. Due to the success of the Public Library of Science (PLOS) for sciences and BioMed

Central (BMC) for health and medicine, open access journals are drawing more attention and are gaining credibility among researchers in many fields. Commercial publishers (established and newcomers) see open access as a source of additional revenue and have joined in the market exploring and establishing open access journals (Solomon and Björk 2012).

Questionable open access journal publishing practices

While open access publishing creates opportunities a number of issues and problems have also arise (Butler 2013).

In the conventional scholarly publishing model, a 'stable' triangle has been established among key players through years of practice. As Kennan (2011) outlines, there is a symbiotic relationship between researchers and publishers. In scholarly publishing, publishers provide infrastructure, marketing, copy editing and publish research outputs. Researchers play multiple roles in scholarship – they act as authors, reviewers, editors and/or readers at various stages. Vardi (2012) further addresses the crucial intermediary role that libraries play in providing access through post-publication subscriptions. Although researchers are the creators and/or users of scholarship, publishers often gain copyright of research outputs through requiring authors to sign copyright transfer agreements. Libraries then become the 'real' customers of publishers by paying subscription fees. In fact, to achieve the dissemination of scholarship, symbiotic relationships exist among researchers, publishers and libraries. For many years, this has been the norm of scholarly publishing, with the triangle consisting of researchers (to write, edit, review and read), publishers (to publish) and libraries (to subscribe and provide access).

However, the small percentage of open access publishing options which employ the author pays model has the potential to fundamentally change the relationships among researchers, publishers and libraries. By essentially removing the post-publication subscriptions, libraries as customers/subscribers are removed from the 'triangle'. Subsequently the traditional intermediary role that libraries play between researchers and publishers disappears. By applying the pre-publication article processing charges, individual researchers as authors become the direct purchasers of their own scholarship. To publishers, researchers instead of libraries now become their customers. Since different market and financial foci have emerged, different marketing techniques are required. Thus, instead of marketing to libraries for subscription fees, in paid gold open access publishing, publishers gain financial benefits by attracting researchers to publish their manuscripts with them (Solomon and Björk 2012). In reality, this results in a new scholarly publishing system consisting of only two parties, both of whom are keen to publish for different reasons (Vardi 2012).

Consequently, with the increasing prevalence of open access, it is not surprising that some publishers with questionable practices have emerged, exploiting the author pays open access business model and researchers' eagerness to publish. In order to attract authors, these open access publishers promise a speedy publishing process and high acceptance rate, sometimes at the expense of quality. Some open access publishers are engaged in such questionable practices, and operate in a similar way to vanity publishers by offering publications solely based on author payments without a proper peer-review process and other quality control mechanisms in place. These questionable publishing practices are becoming more visible and damaging the open access movement and scholarly publishing as a whole. Some researchers, rather than seeing the publishers with questionable practices as aberrations, make incorrect assumptions that these practices

apply to all open access journal publishers. In some extreme cases, publishing decisions by these questionable publishers are made solely based on the goal of generating revenue rather than promoting scholarship (Beall 2012; Butler 2013; Vardi 2012). Techniques are employed by this type of publishers to make their journals appear more promising than they really are. For instance, they often attract manuscript submissions by sending unsolicited emails or falsifying facts about their credentials (Stratford 2012).

In a longitudinal study of researchers' attitudes and behaviours toward open access journals, Xia (2010) identifies a steady increase in the number of researchers participating in open access journal publishing, associated with the increase of their awareness of the new forms of scholarly communication. As Xia points out, however, many researchers are still unfamiliar with open access disseminating and publishing. Despite the increasing awareness of open access, researchers may not all have a deep understanding of the operations and issues of open access publishing (Xia 2010). This conclusion reinforces what the composite scenario at the start of this paper sought to illustrate – that some researchers, particularly research students and early career researchers can be unintentionally trapped by this emergent type of publishing scam due to the lack of sufficient knowledge and skills. Therefore, it is vital that researchers are aware of the issues associated with open access publishing. There is an urgent need for the development of knowledge and skills to distinguish the appropriate publishing options from questionable ones offered by numerous open access publishers (Poltronieri et al. 2013).

Scholarly publishing literacy

Open access has profoundly challenged not only the landscape of scholarly communication but also researchers' publishing behaviour. The social values for which the open access philosophy fundamentally stands cannot be underestimated. By simply dismissing open access journals, researchers could potentially limit their publishing options and readership. However, the unorthodox and, in some instances, unethical practices of some publishers are complicating the already complex scholarly publishing environment. To fully understand and take advantage of the current environment, researchers need to develop sufficient skills in relation to publishing their research outputs through the most appropriate outlet in their field, including identifying suitable publishing options and undertaking due diligence checking.

Jeffrey Beall coined the term 'scholarly publishing literacy' in 2012 to cover the knowledge and skills required. He describes it as 'the ability to recognise and avoid publishing scams and to differentiate counterfeit journals from authentic ones' (Beall 2012, 4). However, this paper argues that scholarly publishing literacy is a dynamic concept that needs to be considered at a broader level, through the lenses of digital scholarship and information literacy. Through a Venn diagram, Figure 1 illustrates the relationships among three concepts: information literacy, digital scholarship and scholarly publishing literacy. According to Rumsey (2011, 4), digital scholarship, as an emerging concept, refers to a range of scholarly activities assisted by digital technologies, such as reading, researching, writing and publishing. Digital scholarship consists of several key dimensions including 'digital authoring, digital publishing, digital curation and preservation, and digital use and reuse of scholarship', which are in boldface represented by the right-hand side circle in the diagram. The left-hand side circle represents the other crucial lens to view the concept of scholarly publishing literacy – information literacy. This paper borrows Shapiro and Hughes' (1996) seven dimensions of information literacy, i.e., tool literacy, resource literacy, social-structural literacy, research literacy, publishing
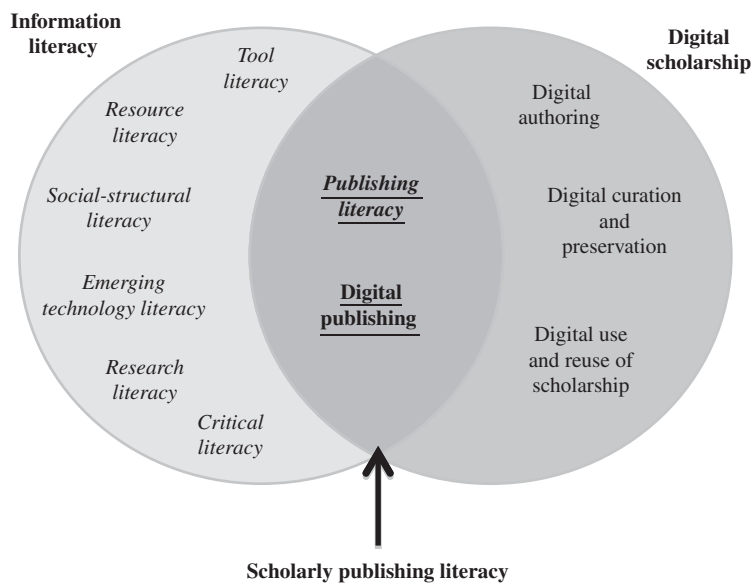
Figure 1.   Scholarly publishing literacy (at the intersection of digital scholarship and information literacy). Note: Figure 1 was developed based on Shapiro and Hughes' (1996) understanding of information literacy and Rumsey's (2011) definition of digital scholarship.

literacy, emerging technology literacy and critical literacy, which are shown in italics in the diagram. As illustrated in Figure 1, scholarly publishing literacy occurs where the dimensions of digital scholarship and information literacy overlap. It is closely related to the 'digital publishing' aspect of digital scholarship and the 'publishing literacy' dimension of information literacy. Scholarly publishing literacy represents the part of digital scholarship that can be enabled by information literacy. It is a realm in which academic libraries and librarians have a significant role to play. This paper argues that sustainable support will need to be delivered through a broader research support framework, in collaboration with other key players in the current scholarly publishing environment.

Digital scholarship frequently centres on the development of scholarly outputs and the digital environment which supports them (Vinopal and McCormick 2013). In the current academic community, there is a growing prevalence of open access journals. This is partially due to the UK government's responses to the recommendations made by the (much anticipated and debated) Finch Report (Finch Group 2012). Along with other online publishing options, open access publishing is becoming one of the key models in digital publishing. Hence, a sound understanding of open access publishing is essential for developing digital scholarship. In other words, it is crucial for researchers to move beyond superficial awareness of open access. To advance their scholarship, they need to develop a deep understanding of the operations and issues developing around open access publishing, including funders' policies, licensing and copyright, and criteria for due diligence checking on the quality of open access journals.

Information literacy, on the other hand, is a core notion in the field of library and information science. In practice, the understanding of information literacy has been evolving since the 1990s. The American Library Association (2000, 2) defines information literacy as a set of abilities requiring individuals to 'recognize when information is needed

and have the ability to locate, evaluate and use effectively the needed information.' Its scope has been elaborated and extended from skills-based formulation of information to encompass aspects of evaluation and communication of information (Bawden 2008). In their paper *Information Literacy as a Liberal Art*, Shapiro and Hughes (1996) outline seven dimensions of information literacy which are identified as: (1) tool literacy, the competence in using hardware and software tools; (2) resource literacy, the understanding of forms and access to information resources; (3) social-structural literacy, the understanding of the production and social significance of information; (4) research literacy, the use of IT tools for research and scholarship; (5) publishing literacy, the ability to communicate and publish information; (6) emerging technology literacy, the understanding of new developments in IT; and (7) critical literacy, the ability to evaluate the benefit of new technologies. Among the seven dimensions, the aspect of publishing literacy emphasises the set of skills that allows researchers to create, format and publish research outputs in both textual and multimedia forms. Its applications in the current academic environment can be seen as the knowledge and skills required for identifying and publishing their research in the most appropriate outlet, including the assessment of open access publishing options.

Scholarly publishing literacy in an open access environment entails a range of knowledge and skills, including:

- Subject expertise in relevant research fields and knowledge of their publishing trends
- An understanding of the journals in their discipline or field, how these journals are ranked, what types of research they publish, where particular subfields fit, and so on
- Awareness of different roads to open access and their implications
- Familiarity with the operations of open access journals
- Understanding of funders' policies related to open access
- Knowledge of licences and copyright (including Creative Commons) related to open access
- Ability to manage one's own rights as an author
- Knowledge of key indicators of quality open access journals
- Ability to apply such quality indicators as criteria for due diligence checking
- Skills in using digital media to create and communicate research in a digital environment

To put it more precisely, sufficient scholarly publishing literacy prepares and equips researchers for the current dynamic scholarly publishing environment. Unfortunately, two studies on researchers' knowledge of open access journals (SCONOL 2013; Xia 2010) have revealed that the levels of scholarly publishing literacy within the academic community are mixed and some researchers have a limited understanding. While researchers may be aware of open access as a new form of scholarly publishing and be willing to explore this option, many do not possess full understanding of the operations, implications and issues surrounding open access publishing. Many researchers struggle to distinguish the most appropriate publishing outlet for their research from all the 'noise' attending open access publishing.

Scholarly publishing literacy can be seen as an extension of information literacy with a specific emphasis on assisting digital scholarship. Support for scholarly publishing literacy is what academic libraries and librarians can and do offer to meet researchers' current and emergent needs. However, as scholarly publishing is only one facet of contemporary digital scholarship (See Figure 1), effective and sustainable support cannot be isolated

from the full research life cycle. Therefore, a broader research support framework is required where scholarly publishing literacy support is delivered as an integrated element. Universities and libraries have been rethinking and investigating sustainable research support frameworks to better support researchers in this digital age (Auckland 2012). Examples include the various activities around digital literacies funded by Jisc (formerly JISC – the Joint Information Systems Committee) since 2011, including a project further developing SCONOL's (Society of College, National and University Libraries) Seven Pillars framework of information literacy for research (Jisc 2012; SCONOL 2011).

Library research support for scholarly publishing literacy: opportunities and issues

With the rise of open access publishing as a new model in scholarly publishing, there is a pressing need among researchers to develop sufficient scholarly publishing literacy to thrive in the current environment. Academic libraries and librarians are well-positioned to play a key role in supporting researchers on scholarly publishing literacy.

Academic libraries are known for their strong tradition of supporting research within their parent institutions. Providing information literacy and research support are essential parts of a university library's core business. Traditionally, library support has revolved around information discovery, collection development, and some elements of information management (Corrall, Kennan, and Afzal 2013). However, the advent of digital technologies and emergence of global scholarly communities have shifted scholarship profoundly. These changes naturally have significant impact on researchers' information needs and behaviours. In order to remain responsive and vital to their parent institutions, academic libraries have responded to these changes by evaluating and revamping their research support services, and overall rethinking of the way they engage with researchers and research processes (Richardson et al. 2012). In its report, entitled *Re-Skilling For Research,* Research Libraries UK (RLUK) reveals the results from its project investigating researchers' information needs in the current and future research environment (Auckland 2012; Brewerton 2012). In all countries investigated, i.e., the United Kingdom, Australia, New Zealand and Ireland, it is evident that academic libraries are extending their focus from building collections (digital and print) and revitalising the physical environment to developing responsive services and support for researchers. Academic libraries engage in supporting research from scholarly publishing and disseminating research, data management and curation, to bibliometrics (Auckland 2012; Brewerton 2012; Corrall, Kennan, and Afzal 2013; Richard, Koufogiannakis, and Ryan 2009). In Australia, most academic libraries recognise the rapidly changing research environment and pressing needs of researchers. Hence, traditional services have been enhanced and new services are being introduced in the attempt to meet researchers' needs. For instance, according to the survey conducted by the Queensland University Libraries Office of Cooperation (QULOC) in 2012, although at different levels, providing support for scholarly publishing was emphasised in all 13 participating academic libraries' research support services (Richardson et al. 2012). It is safe to say that academic libraries have been playing, and are continuing to play, a key role in supporting scholarly publishing.

As for academic librarians, with a solid grounding in organisation and dissemination of information, they have long engaged in liaising with and providing researchers support regarding scholarly publishing from information discovery to tracking research impact and developing publishing strategies (Richard, Koufogiannakis, and Ryan 2009). In addition, librarians have been advocating for, and have been actively involved in, the development of open access, particularly in the management and promotion of

institutional repositories (Kennan 2011; Kingsley 2013b). Finally, with knowledge of open access, understanding of copyright and licensing, expertise in bibliometrics and applying quality indicators for research quality evaluation, and access to a range of resources and tools, academic librarians are well situated to claim a proactive role in supporting scholarly publishing literacy in the following areas:

- Raising awareness of open access developments, for example the different roads to open access, operations of open access repositories, and hybrid and fully open access journals
- Assisting researchers with accessing tools and resources to enable them to understand funders and publishers' policies related to open access, for example databases such as SHERPA/RoMEO, SHERPA/JULIET
- Supporting the management of authors' rights, for example information on copyright and licensing, including Creative Commons
- Administering and promoting the use of institutional repositories, for example supporting the depositing of research outputs
- Using bibliometrics tools and other journal quality indicators for quality and impact evaluation, due diligence checking on open access journals

Open access publishing has created not only challenges but also great opportunities for academic libraries and librarians to reinvent their role in supporting research and scholarly communication. Most libraries and librarians have recognised such opportunities and responded to them by increasing support services for research and scholarly publishing.

Notwithstanding the active engagement and current good practices of university libraries and librarians in supporting scholarly publishing, a range of issues need to be further addressed. These issues are discussed below, in relation to the 'what', the 'how' and the 'who' of scholarly publishing literacy.

To begin with, there is the 'what' question: What do we mean by scholarly publishing literacy? There is a lack of professional discourse, and consequently a lack of common understanding among librarians regarding what scholarly publishing literacy entails. Although literature indicates that most academic libraries and librarians are actively involved in supporting scholarly publishing, the types, levels and format of support vary significantly from institution to institution (Auckland 2012; Brewerton 2012; Richardson et al. 2012). Many academic libraries have taken a leading role in supporting open access and scholarly communication. However, instead of supporting researchers to develop scholarly publishing literacy, the priority is often on promoting the open access agenda and advocacy for institutional repositories. In terms of formal information literacy training for researchers, the current focus is still on literature searching and bibliography management. Some libraries provide occasional workshops on generic publishing strategies. Specific support for scholarly publishing is usually provided in the form of one-on-one support based on individual requests/queries (Richardson et al. 2012). As mentioned earlier, researchers have a pressing need to develop sufficient scholarly publishing literacy to fully engage in, and take advantage of, the current scholarly publishing environment. With ad hoc support, there is the risk of missing important deadlines and failing to meet researchers' needs effectively. Therefore, it is critical for academic librarians to engage immediately in a professional discourse and form a common understanding of library research support for scholarly publishing literacy.

With regard to the 'how' question: How do libraries and librarians address the issue of scholarly publishing literacy? First of all, addressing any issues about publishing

behaviours with researchers can be a complex matter. It requires not only sound knowledge but also delicate tactics from librarians. The role that librarians play in research varies and is still hotly debated. Evidently, librarians and researchers have different views on the expertise and contribution that librarians can add to research and scholarly publishing (Corrall, Kennan, and Afzal 2013; MacColl and Jubb 2011; RIN 2007). Researchers have long been engaged with the conventional publishing model, but that model is changing and this paper questions that all researchers have had the time to keep up with those changes. There is a widespread perception that it is researchers who are expert in publishing, not librarians. However, because researchers are so 'close' or used to the exercise of publishing, they often have learned or developed a set of practices utilising their own networks and existing knowledge on publishing. These habits or existing views can act as barriers for researchers to revisit their attitudes towards the changing scholarly publishing landscape, including open access (Brewerton 2012; Kennan 2011). For some researchers, open access publishing is the 'unknown unknowns' issue (i.e., the things we don't know that we don't know), which requires delicate tactics to address. Second, because librarians have been involved in or closely follow the development of open access, many have invested heavily in the philosophy for which open access stands. Librarians are sometimes subject to criticisms, even lawsuits, for their enthusiastic advocacy or opposition concerning open access publishing (Beall 2013; New 2013). Therefore, it is crucial that librarians, instead of jumping in as advocates or opponents of open access publishing, focus on providing well-researched information and generating critical thinking on open access publishing and scholarly publishing literacy. Last but not least, there is a necessity to develop a broader library research support framework that incorporates and supports scholarly publishing literacy. As argued earlier, scholarly publishing literacy needs to be considered through the lenses of digital scholarship and information literacy to be fully understood. This paper argues that it should be treated as an extension of information literacy and integrated with libraries' core practices. In addition, many academic libraries are exploring the notion of digital literacy, which extends the library's traditional role in supporting information literacy to a broader level, encompassing the aspect of scholarly publishing as part of the research life cycle (SCONOL 2011).

Finally, there is the 'who' question: Who will be the university staff responsible for providing support for scholarly publishing literacy? Among academic libraries, due to the variety of the support they provide to their researchers, the structure, roles and responsibilities of library research support services differ greatly from one library to another (Auckland 2012; Brewerton 2012; Hansson and Johannesson 2013). To take Queensland academic libraries as an example, library structures for research support services range from individual faculty librarians supporting researchers to library representation on university research committees. The scope and focus of research support also vary from information discovery to research impact assessment. Assorted titles are given to research support services (Richardson et al. 2012). A similar situation is encountered in other states (e.g., Victorian academic libraries). The positions providing research support include research (support/services) librarians, liaison/subject librarians, scholarly communication officers, data management coordinators, copyright and repository officers, and more. Specialist research support positions are often created in response to an individual university's immediate needs. Overall, there is ambiguity and inconsistency among academic libraries regarding the structure, role and core responsibility which may indicate a lack of common understanding and framework of library research support. This may be responsible for the lack of constructive professional

discourse on supporting scholarly publishing literacy and the sense of insecurity among academic librarians when researchers approach them with scholarly publishing queries (Hansson and Johannesson 2013).

All three questions discussed above represent the issues that academic libraries face today in terms of library research support for scholarly publishing literacy. Further studies are planned to be undertaken to investigate these issues.

Conclusion

In the current international and national research environment, researchers are under immense pressure to publish productively and strategically. Accompanying the increasing prevalence of open access, the issue of questionable open access publishing practices has emerged. Both opportunities and challenges are posed to not only researchers, but also academic libraries and librarians. To ride on the wave of changes in scholarly communication such open access publishing (and not get dumped), researchers need to develop sufficient skills to identify and select the most appropriate publishing outlet in their particular fields and research and make informed and strategic publishing decisions. Such skills, dubbed scholarly publishing literacy, can be seen as an extension of information literacy with a specific emphasis on supporting the digital publishing aspect of digital scholarship. From a research librarian's perspective, supporting researchers with scholarly publishing literacy is no less significant than literature search, bibliographic citation management or any other long-established library research support services offered to students and researchers. In addition to the current good practices among university libraries, a range of issues need to be further addressed. These include establishing a common understanding of scholarly publishing and scholarly publishing literacy among academic librarians, developing not only expertise but also tactics when addressing scholarly publishing literacy with researchers, and initiating ongoing professional discourse and creating consistency regarding research support roles and services among university libraries.

Acknowledgements

Note

1. This Composite scenario was created based on cases witnessed by, or heard of, by the author through communications with researchers and other librarians.

Notes on contributor

Linlin Zhao is a Research Librarian at Deakin University Library. She liaises with, and provides customised research support to, the University's researchers and research students specializing in literature searching, bibliography management, publishing strategies, bibliometrics, data curation, copyright and licensing. Prior to her current role, Linlin had over ten years teaching experience in a range of educational settings. Linlin holds a Master of Education (2005) and a Graduate Diploma in Information and Knowledge Management (2011) from Monash University. She was the VALA student award recipient for 2011 (Monash University).

References

American Library Association. 2000. *Information Literacy Competency Standards for Higher Education*. Chicago: Association of College and Research Libraries.

Auckland, M. 2012. *Re-Skilling for Research: An Investigation Into the Role and Skills of Subject and Liaison Librarians Required to Effectively Support the Evolving Information Needs of Researchers*. Accessed September 29, 2013. http://www.rluk.ac.uk/files/RLUK Re-skilling.pdf

Australian Education Network. 2013. "Australian University Rankings 2013." Accessed September 29, 2013. http://www.australianuniversities.com.au/rankings/

Australian Government Australian Research Council. 2014a. "Excellence in Research for Australia (ERA)." Accessed January 8. http://www.arc.gov.au/era/

Australian Government Australian Research Council. 2014b. "ARC Open Access Policy (Version 2013.1)." Accessed January 8. http://www.arc.gov.au/applicants/open_access.htm

Australian Government Department of Industry. 2014. "Higher Education Research Data Collection (HERDC)." Accessed January 8. http://www.innovation.gov.au/RESEARCH/RESEARCH BLOCKGRANTS/Pages/HigherEducationResearchDataCollection.aspx

Australian Government National Health and Medical Research Council. 2014. "Dissemination of Research Findings." Accessed January 8. http://www.nhmrc.gov.au/grants/policy/dissemination-research-findings

Australian Open Access Support Group. 2014a. "Statements on OA in Australia & the world." Accessed January 8. http://aoasg.org.au/statements-on-oa-in-australia-the-world/

Australian Open Access Support Group. 2014b. "Australian research into open access." Accessed January 9. http://aoasg.org.au/resources/australian-research-into-open-access/

Bailey, Charles W. Jr. "Open Access Bibliography: Liberating Scholarly Literature with E-Prints and Open Access Journals." Accessed January 8, 2014. http://digital-scholarship.org/oab/oab.htm

Bawden, David. 2008. "Origins and concepts of digital literacy." In *Digital Literacies: Concepts, Policies and Practices*, edited by Colin Lankshear, and Michele Knobel, 17–32. New York: Peter Lang Publishing.

Beall, Jeffrey. 2012. "Predatory Publishers and Opportunities for Scholarly Societies." Paper presented at the *American Educational Resarch Association meeting*. Washington, DC.

Beall, J. 2013. "Predatory publishing is just one of the consequences of gold open access." *Learned Publishing* 26 (2): 79–83.

Bentley, Peter. 2012. "Gender differences and factors affecting publication productivity among Australian university academics." *Journal of Sociology* 48 (1): 85–103. doi: 10.1177/1440783311411958.

Bivens-Tatum, Wayne. 2013. "The Big Deal's Damage." *Library Journal*, Accessed January 2, 2014. http://lj.libraryjournal.com/2013/05/opinion/peer-to-peer-review/the-big-deals-damage-peer-to-peer-review/#_

Brewerton, A. 2012. "Re-skilling for research: Investigating the needs of researchers and how library staff can best support them." *New Review of Academic Librarianship* 18 (1): 96–110.

Burns, Barbara, and Dianne S. McCarthy. 2010. "Working Together to Ease the Pressure to Publish in Higher Education." *Academic Leadership (15337812)* 8 (4): 5–5.

Butler, Declan. 2013. "Investigating journals: The dark side of publishing." *Nature* 495 (7442): 433–435.

Centre for World-Class Universities. 2014. "2013 Academic Ranking of World Universities." Shanghai Jiao Tong University. Accessed January 8. http://www.shanghairanking.com/

Corrall, Sheila, M. A. Anne Kennan, and Waseem Afzal. 2013. "Bibliometrics and Research Data Management Services: Emerging Trends in Library Support for Research." *Library Trends* 61 (3): 636–674. doi: 10.1353/lib.2013.0005.

Creagh, Sunandaa. 2012. "Mid-year budget slashes \$499m from research support." *The Conversation*. Accessed September 30, 2013. http://theconversation.com/mid-year-budget-slashes-499m-from-research-support-10248

Finch Group. 2012. *Accessibility, sustainability, excellence: how to expand access to research publicastions - Report of the Working Group on Expanding Access to Published Research Findings*. Accessed January 9, 2013. http://www.researchinfonet.org/publish/finch/

Garfield, Eugene. 1996. "What is the primordial reference for the phrase 'publish or perish'?" *The Scientist* 10 (12): 11.

Hansson, J., and K. Johannesson. 2013. "Librarians' Views of Academic Library Support for Scholarly Publishing: An Every-day Perspective." Journal of Academic Librarianship. 39 (3): 232–240. doi: 10.1016/jacalib201302002.

Hemmings, Brian, and Russell Kay. 2010. "Journal ratings and the publications of Australian academics." *Issues in Educational Research* 20 (3): 234–243.

Jisc. 2012. *Developing Digital Literacies Programme*. Accessed September 29, 2013. http://www.jisc.ac.uk/whatwedo/programmes/elearning/developingdigitalliteracies/Developingdigitalliteraciesprog.aspx

Kennan, M. A. 2007. "Academic authors, scholarly publishing, and open access in Australia." *Learned Publishing* 20 (2): 138–146.

Kennan, M. A. 2011. "Learning to share: Mandates and open access." *Library Management* 32 (4/5): 302–318, http://dx.doi.org/10.1108/01435121111132301

Kingsley, Danny. 2013a. "BIS Report part two - Information & observations." *Australian Open Access Support Group*. Accessed January 2, 2014. http://aoasg.org.au/2013/09/19/bis-report-part-two-information-observations/

Kingsley, Danny. 2013b. "Build It and They Will Come? Support for Open Access in Australia." *Scholarly and Research Communication* 4 (1): 1–16. Accessed September 30, 2013. http://www.src-online.ca/index.php/src/article/view/39

MacColl, John, and Michael Jubb. 2011. *Supporting Research: Environments, Administration and Libraries*. OCLC Research.

Macdonald, S., and J. Kam. 2009. "Publishing in top journals–A never-ending fad?" *Scandinavian Journal of Management* 25 (2): 221–224.

Morrison, Healther. 2009. *Scholarly Communication for Librarians*, edited by Ruth Rikowski. Oxford: Chandos Publishing.

New, Jake. 2013. "Librarians Rally Behind Blogger Sued by Publisher Over Critical Comments." *The Chronicle*. Accessed September 28, 2013. http://chronicle.com/article/Librarians-Rally-Behind/137329/

Nicholas, David, Ian Rowlands, Anthony Watkinson, David Brown, and H. R. Jamali. 2012. "Digital repositories ten years on: what do scientific researchers think of them and how do they use them?" *Learned Publishing* 25 (3): 195–206. doi: 10.1087/20120306.

Norrie, Justin. 2012. "Harvard: journal subscription fees are prohibitive." *The Conversation*. Accessed December 28, 2013. http://theconversation.com/harvard-journal-subscription-fees-are-prohibitive-6659

Poltronieri, E., E. Bravo, T. Camerini, M. Ferri, R. Rizzo, R. Solimini, and G. Cognetti. 2013. "Where on earth to publish? A sample survey comparing traditional and open access publishing in the oncological field." *Journal of Experimental and Clinical Cancer Research* 32 (1): 4–7. doi:10.1186/1756-9966-32-4.

Quacquarelli Symonds. 2014. "QS World University Rankings 2013/14." Accessed January 8. http://www.topuniversities.com/university-rankings

Richard, Jennifer, Denise Koufogiannakis, and Pam Ryan. 2009. "Librarians and Libraries Supporting Open Access Publishing." *Canadian Journal of Higher Education* 39 (3): 33–48.

Richardson, J., T. Nolan-Brown, P. Loria, and S. Bradbury. 2012. "Library research support in Queensland: A survey." *Australian Academic and Research Libraries* 43 (4): 258–277.

RIN. 2007. Researchers' use of academic libraries and their services: A report commissioned by the Research Information Network and the Consortium of Research Libraries. Accessed December 28, 2013. http://www.rin.ac.uk/our-work/using-and-accessing-information-resources/researchers-use-academic-libraries-and-their-serv

Roach, A. K., and Jesse Gainer. 2013. "On Open Access to Research: The Green, the Gold, and the Public Good." *Journal of Adolescent & Adult Literacy* 56 (7): 530–534.

Robinson, Rob. 2013. "Research funding cuts; and planets not for sale-Physics." *Australian Institute of Physics*. Accessed September 28, 2013. http://www.aip.org.au/info/?q=article/research-funding-cuts-and-planets-not-sale-%E2%80%93-physics-may-2013

Rumsey, Abby Smith. 2011. *Scholarly Communication Institute 9: New-Model Scholarly Communication: Road Map for Change*. Charlottesville, VA: University of Virginia Library.

SCONOL. 2011. "The SCONUL Seven Pillars of Information Literacy - a research lens." Accessed September 29, 2013. http://www.sconul.ac.uk/tags/7-pillars

SCONOL. 2013. "Briefing on mandatory open access policies." Accessed September 29, 2013. http://www.sconul.ac.uk/page/briefing-on-mandatory-open-access-policies

Shapiro, J. Jeremy, and Shelley K. Hughes. 1996. "Information literacy as a liberal art." *Educom Review* 31 (2): 31.

Solomon, D. J., and Bo-Christer Björk. 2012. "A study of open access journals using article processing charges." *Journal of the American Society for Information Science and Technology* 63 (8): 1485–1495. http://dx.doi.org/10.1002/asi.22673

Steele, Colin, Linda Butler, and Danny Kingsley. 2006. "The publishing imperative: the pervasive influence of publication metrics." *Learned Publishing* 19 (4): 277–290. doi: 10.1087/095315106778690751.

Stratford, Michael. 2012. "Predatory' Online Journals Lure Scholars Who Are Eager to Publish." *Chronicle of Higher Education* 58 (27): A1–A8.

Suber, Peter. 2008. "Gratis and libre open access." *SPARC Open Access Newsletter*. Accessed September 30, 2013. http://dash.harvard.edu/handle/1/4322580

Suber, P. 2013. "Open Access Overview." Last modified August 12, 2013. Accessed September 28, 2013. http://legacy.earlham.edu/~peters/fos/overview.htm

Thomson Reuters. 2014. "Times Higher Education World University Rankings 2012–2013." Accessed January 8. http://www.timeshighereducation.co.uk/world-university-rankings/2012-13/world-ranking

UK Department for Business Innovation & Skills. 2013. "Open Access: Fifth Report of Session 2013–14." Accessed December 31. http://openaccess.eprints.org/index.php?/archives/1040-.html

van Dalen, H. P., and Kène Henkens. 2012. "Intended and unintended consequences of a publish-or-perish culture: A worldwide survey." *Journal of the American Society for Information Science & Technology* 63 (7): 1282–1293. doi: 10.1002/asi.22636.

Van Westrienen, G., and A. C. 2005. *Lynch. Academic institutional repositories. D-lib Magazine* 11 (9): 1082–9873.

Vardi, M. Y. 2012. "Predatory Scholarly Publishing." *Communications of the ACM* 55 (7): 5–5. doi: 10.1145/2209249.2209250.

Vinopal, J., and M. McCormick. 2013. "Supporting Digital Scholarship in Research Libraries: Scalability and Sustainability." *Journal of Library Administration* 53 (1): 27–42.

Xia, J. 2010. "A longitudinal study of scholars' attitudes and behaviors toward open-access journal publishing." *Journal of the American Society for Information Science and Technology* 61 (3): 615–624.