Chapter Four
Embracing Change, Empowering Scholarship

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Abstract

Open access (OA) has entered the mainstream. We now have more than a decade of experience from which to assess advancement in the OA ecosystem and the work ahead of us to realise the goal of unrestricted internet access to new scholarship. This chapter focuses on the role of academic libraries and librarians in facilitating and advancing an understanding of OA among faculty and researchers, key partners in accomplishing this transition. It will use the University of Kansas Libraries as a case study to highlight the changes, the challenges and opportunities to support researchers in the open access system.

Keywords: open access; academic libraries; librarians; institutional repositories; University of Kansas; KU ScholarWorks

Introduction

Long before the term 'open access' was coined, libraries faced a growing crisis in scholarly publishing known as the serials crisis, shorthand for the rise in costs for academic journals and the inability of libraries to bring these costs under control (Young 2009). Shulenburger (1998: 1) led the drive to 'move with dispatch to resolve the scholarly communication crisis.' He introduced the idea of a National Electronic Article Repository (NEAR) to ensure 'the ultimate right of the academy to inexpensive and open access to the scholarly communication it generates' (Shulenburger 1998: 6).

A few years later a small group of scholars saw the power of technology to transform a tradition for a public good. They launched a worldwide campaign for OA to all new peer-reviewed research and were the first to articulate a public definition of 'open access' as 'free availability on the public internet, permitting any users to read, download, copy, distribute, print, search or link to the full text of these articles, crawl them for indexing, pass them as data to software or use them for any other lawful purpose…' as stated by the Budapest Open Access Initiative (BOAI 2002: 1).That vision has attained global momentum: what appeared aspirational more than a decade appears to be achievable.

The move towards OA is a profound change for the whole infrastructure of scholarly communication, and is bound to have impacts on the library as it does on other parts of the process. There has been a lot of discussion around the impact of OA on researchers and publishers but less about what the shift means for libraries and librarians. More than a decade after the definition of open access was introduced a robust infrastructure of digital repositories, new open licenses and a growing body of institutional, national and international policies have been established. Scholars, at first hesitant, are now increasingly embracing OA distribution of their work. Within this higher education paradigm libraries have played a key role in advancing OA. This chapter will focus on libraries in the United States (US).

Institutional open access policies and libraries

In 2008 Harvard University's Humanities and Arts faculty led the way to adopt an OA policy, followed by the Massachusetts Institute of Technology (MIT) faculty with a campus-wide policy (Harvard University OA policy 2008; MIT OA policy 2008). These two institutions were instrumental in laying the foundation for OA policies and their implementation at institutions of higher education in the US.

The University of Kansas, the first public institution in North America to embrace OA, adopted a faculty-led, campus-wide policy modeled on Harvard's in 2009 and 2010 (University of Kansas OA policy). Harvard's policy has been widely adopted as a model for open access policies and resolutions at institutions of higher education. DuraSpace (DSpace), an open source repository developed by MIT Libraries and Hewlett Packard, was looked at as a model for digital repositories.

The majority of these institutional policies focus on faculty members granting to the university permission to make their scholarly peer-reviewed journal articles publicly available in the institutional repository (IR). In 2011, twenty two institutions, mostly librarians, founded the Coalition of Open Access Policy Institutions (COAPI 2011) to share information and experiences and to illuminate opportunities for moving faculty-led open access policies forward at member institutions, advocating for open access both nationally and internationally. The growth in institutional OA policies since 2011 has contributed to the growth of COAPI participants to more than 60 in 2015. The group maintains a listserv and conducts informal meetings while attending other national conferences. The growth of OA policies is not restricted to academic institutions. The Registry of Open Access Repository Mandates and Policies (ROARMAP), a searchable international registry, charts the growth of open access mandates and policies adopted by universities, research institutions and research funders that

require or request their researchers to provide OA to their peer-reviewed research article output by depositing it in an OA repository (ROARMAP 2015).

The work of moving an institutional OA policy forward is not easy. Two distinct phases are evident: first, an effort to gain consensus on the theoretical and philosophical underpinnings for the OA movement and second, determining the pragmatic requirements of practicing OA. (Emmett, Stratton, Peterson, Church-Duran & Haricombe 2011) document the process used at the University of Kansas to highlight the complexities of passing an institutional policy.

Libraries are natural partners in the process: they have first-hand experience of the impact of the serials crisis and understand the need for reform in scholarly publishing. Harris (2012) asserts that librarians already have many skills that should help in OA. Through their work in coalition building, outreach and education, copyright and licensing, and digital journals they have the skills and experience to support OA scholarly communication (SC). Emmett et al. (2011: 8) assert that 'as an active open access partner libraries will not only help universities demonstrate the depth of their own faculty's scholarship, but they will also provide the widest possible audience and increase its potential impact nationally and globally'.

Leveraging skillsets

Libraries have been actively involved in advancing their institutional OA policy from the beginning. If faculty are expected to participate in open access it is critical that they feel supported. Rosenblum (2010) identifies several ways in which front-line librarians can assist to sustain OA practices and policies, including assistance with rights and permissions, maintaining websites, copyright workshop and resources. Passing an institutional policy does not necessarily translate into compliance; rather, it marks the beginning of perpetual and consistent outreach and education among faculty who are key partners in advancing the goal of open access to provide unfettered, free, online access to their peer-reviewed journal articles. A unique and key strength of academic libraries is their relationship with all the departments through library liaison. Kenney (2014: 3) notes 'the past decade has witnessed the development and evolution of the library liaison model as full-time collection development and reference positions gave way to combined and expanded portfolios characterised by greater outreach to faculty and students'. Jaguszewski and Williams (2013) believe an 'engaged liaison' shifts the focus away from the work of librarians to the life-cycle of the research, teaching and learning process.

That shift was formally introduced into the profession at The University of Minnesota, an early adopter of the Librarian Position Description Framework to usher in an engagement-centered model for librarianship that was tied specifically to position descriptions (Williams 2009).

Many institutions have used this framework to add new activities to support these new roles, including scholarly communication, such as Cornell, Duke, University of Washington, Penn State, Virginia Tech, and Stanford (Kenney 2014: 4).

How libraries support the research agenda of their parent institutions has changed as a result of forces like changing scholarly communication practices, technological developments and reduced purchasing power. These drivers of change have implications for the professionals who work in them and require different and new knowledge skills that, in turn, create a demand for new positions, workflows, education and training (Tenopir, Birch & Allard 2012). Kenney (2014: 5) warns that 'as demands and expectations rise, it is clear that no one liaison can do it all'. Libraries have turned to creative staffing models, leveraging subject expertise and functional expertise to work in tandem to respond to these demands, a strategy not without its challenges.

Despite these challenges, libraries have assumed a leadership role in supporting research in

the open networked environment. This engaged scholarship has led to meaningful partnerships and support in new areas including copyright assistance, contract negotiation, repository management, digital publishing, author processing fees, and the life-cycle management of data.

Institutional repositories and libraries

Since 2002 when DSpace and other IR software began to be available, research libraries and their parent institutions have invested in IRs to collect and provide access to diverse locally produced digital material (Bailey et al. 2006).

OA policies and IRs go hand in glove; IRs are a key infrastructure component to support OA policies. They have become established components of many academic libraries, representing 83.7% of the world's repositories according to the Confederation of Open Access Repositories (COAR 2015: 5). The vast majority of OA policies request or require authors to deposit articles in an IR to provide visibility and OA to research outputs, with a focus on the journal literature.

Passing an OA policy does not itself result in an increase in article deposits to IRs (Zhang, Boock & Wirth 2015). Deposits into IRs rely on a host of new services that require traditional library skills, expertise and active engagement with faculty to recruit content, check publishers' policies, insure compliance and deposit the articles (Madsen & Oleen 2013: 3). Bankier and Perciali (2008) believe that supporting services that remove barriers to participation can help ameliorate the difficulty of soliciting faculty content. Madsen and Oleen (2013) highlight a survey of IR managers by Hanlon and Ramirez (2011) who found that the majority followed a mediated deposit process with librarians and library staff holding the role of copyright clearance. Promoting the IR is equally important; you may build it but faculty will not necessarily deposit their articles. Reference librarians, library liaisons and subject librarians are well positioned to take on the roles of marketing IR services and explaining the features and advantages to increase faculty participation (Rockman 2005). IRs have come into sharp focus recently due to the high volume of funding agencies responding to the White House's Office of Science and Technology Policy's (OSTP) directive for 'increased public access to ... peer-reviewed publications and digital data'. As the principal producers of the resources that are to be made publicly available, the White House directive provided a compelling reason to integrate higher education's investments into a system of cross-functional digital repositories. In response, in 2013, the Association of Research Libraries (ARL), the Association of American Universities (AAU), and the Association of Public and Land-grant Universities (APLU) established the Shared Access Research Ecosystem (SHARE) to help ensure the preservation of, access to, and reuse of research outputs. Their primary goal is to help maximise the benefits of research to science and society (*ARL News* 2014).

Libraries supporting public access policies

The enactment of the US National Institutes of Health (NIH) Public Access Policy in 2008 required researchers to release to the public their manuscripts supported by NIH. Implemented as a request in 2005 and following years of discussion and opposition to the NIH's public access policy, the request became a legal mandate in 2008 requiring NIH funded researchers and scientists to release their papers within 12 months of publication. Suber (2008: 1) asserts that 'measured by the ferocity and opposition overcome and the volume of literature liberated, this is the largest victory so far in the open access movement'.

Libraries were swift to embrace the opportunity to take a leadership role in developing services to support their research communities which were required to comply. Typical services identified in an ARL survey included consultations, presentations, compliance guides, training, and policy overviews and the drafting of language and advocacy for policies in support of public access (Sarli, Dubinsky, Engeszer & Lewis 2009). In providing these services libraries leveraged the expertise of units on campus. In doing

so, they developed new alliances with units outside the library to support public access including the Office of Research, General Counsel and the Office of Sponsored Projects. Within this new paradigm of OA higher education libraries demonstrated their ability to embrace change and to leverage resources and expertise to respond quickly and efficiently to future mandates. They became the leaders in the effort to address the complexity of research in the 21st century (Antell, Foote, Turner & Shults 2013).

Several funding agencies around the world have joined the international push to provide OA to publicly funded research. In the US the world fundamentally changed for the research community when the White House's OSTP in 2013 directed that 'within six months each federal research funding agency with R&D [research and development] budgets of $100 million or more' develop a plan to support increased public access to the results of research funded by the federal government including peer-reviewed publications and digital data (OSTP memo 2013). The mandates extend the requirement beyond access to articles to the underlying data.

Libraries and data management mandates

The majority of the institutional OA policies focus on peer reviewed articles but it is clear that the funding agencies' mandates focus on data with implications for libraries. These mandates have reached a tipping point in recent months as agencies began to respond to the OSTP directive which will affect researchers at every research institution. Data management, once viewed as peripheral to the core of librarianship, is now becoming mainstream.

Libraries understand their role in advancing research in order for researchers to focus on their work. They have long assisted researchers in broad data support services including locating data sources, geospatial analysis, acquisition of datasets, copyright and patent advising. Many libraries launched research data management (RDM) services to support faculty with data management plans for the National Science Foundation (NSF). Universities that have begun to address research data management actively have found that they need a multidisciplinary team that includes the information technology units, libraries and the research office to pool their skills. A snapshot of the range of services for research data management support include consulting, data management plans, copyright services, data curation, archiving and preservation, digital publishing and copyright assistance (Fearon, Gunia, Lake, Pralle & Sallans 2013; Brown, Bruce & Kernohan 2015).

While these services do align with a diverse skill set across the library an ARL survey listed specific essential skillsets to support RDM services. These include application of metadata standards, digital preservation, data ownership, technical skills in data acquisition, analysis and visualisation (Fearon et al. 2013). Tenopir, Sandusky, Allard and Birch (2013: 76) believe that academic research librarians are the most appropriately equipped to provide research data services such as data management planning, digital curation (selection, preservation, maintenance, and archiving), and metadata and creation and conversion. Neal (2005) thinks the need for new skillsets may perpetuate the trend in academic libraries of populating professional ranks with staff with alternative or non-traditional academic backgrounds.

Data management is not a new concept to researchers; however, the number of funding agencies' mandates requiring formal data management is new. As the need for research data management grows, many libraries are considering adding data services to support the research mission of their institution. While many research libraries have begun to respond to this emerging demand by adopting new roles, services and organisational structures, libraries are still in the early stages of development and implementation of research data management services. Antell, Foote, Turner and Shults (2014: 557) found mixed themes of uncertainty and optimism in their

study of science librarians' participation in data management. They found '…uncertainty about the roles of librarians and libraries, and other campus entities; uncertainty about the skills that will be required; but also optimism about applying "traditional" librarian skills to this emerging field of academic librarianship'. The lack of institutional data management policies and clear institutional directives to support new research services is partly to blame. Despite this environment libraries are offering services ahead of evidence on which models are most effective. Witt (2012: 186) asserts that 'data management will have matured when "data reference" becomes just "reference" and data is no longer treated as more special than any other collection'.

OA publishing and libraries

The evolutionary development of OA in libraries owes its traction to the 'serials crisis' in the 1990s. Young (2009: 6) described this movement as 'an attempt to remove barriers of price and permission, which enables numerous additional benefits'. OA requires libraries to be active participants in creating scholarly materials and in recruiting the content of their institution's scholarship. In Walters's study (2012) on the future role of publishing services in university libraries participants saw collaborating with multiple libraries and other stakeholder organisations to establish publishing cooperatives as essential. Several libraries have responded to this opportunity by combining the traditional strengths of publishers and librarians to provide an array of services to their faculty, including Purdue University Libraries' Publishing Division and the University of Michigan Library's Michigan Publishing. Others are shaping their own responses to provide the means to scholars 'to launch a new generation of journals committed to open access, and to help existing journals that elect to make the transition to open access…' (BOAI 2002: 1).

The evolution of OA publishing models has budgetary implications for libraries as they explore ways to support faculty who embrace OA publishing. Increasingly authors face processing charges ranging from US$200 to $5000. Poynder (2015: 1) writes:

> BOAI did not specify that OA journals should levy an article processing charge (APC), but while OA advocates point out that most OA F do not charge a fee, the reality (unless something changes) is that the pay-to-play model is set to dominate OA publishing. One of the main promises of the OA movement was that open access would solve the affordability problem that has held universities in its iron fist for several decades now – the so-called 'serials crisis'. Pay-to-publish gold OA may seem like a good solution, but if it proves as expensive as (or more expensive than) subscription publishing, how will the research community afford it?

With the number of articles being published in OA journals charging APCs growing, and an increase in the number of institutional policies mandating their employees to make their works available in OA repositories, faculty will continue to face this dilemma (Fruin & Rascoe 2014).

The Compact for Open-Access Publishing Equity (COPE) is a programme by universities to support equity in business models used for scholarly publishing. Several programmes exist to reduce barriers to OA publishing for authors needing to choose the venue for their work that best suits their needs. These include the Directory of Open Access Journals (DOAJ), PeerJ, and eLife. However, the landscape is complex with concerns about predatory journals, and there are ongoing efforts on the part of some publishers to undermine the investment libraries have made in repositories over the last decade to ensure that the academic community is asserting control over its own intellectual property (Joseph 2015).

Faculty perceptions

The new roles and services imply significant investments by libraries to advance the goal of OA but has it been transformational? Kroll and Forsman (2010: 18) assert that 'researchers have

no perception of the huge internal transformation most libraries have undergone in the conversion to digital access'. Affirming this perception is Ithaka S+R's Faculty Survey (Housewright 2012) that shows faculty's highest level of need for the library is that of acquisition agent. Faculty still tend to value established scholarly dissemination methods and journals with impact factors and there is less widespread agreement about the value of support services offered by libraries that are intended to maximise access and impact. A shift in this perception will not happen overnight unless we embrace our role to lead our universities into the 21st century. Zhang, Director of the National Science Library of the Chinese Academy of Science, warns of the sense of urgency for libraries to do something or be left behind (2012: 2).

Embracing change, empowering scholarship

The literature review reflects the significant investments academic libraries have made in infrastructure, resources and partnerships to advance OA. While libraries have responded to the call through transformed workflows, services, organisational structures and retooling current employees, they need to do more to transform themselves from a knowledge service provider within the university to be a pre-eminent and active partner within a rich and diverse learning and research ecosystem. Simply put, libraries need to shift from being collections-centric organisations to become more engagement-centric.

Kenney (2014) writes, 'Perhaps no other library has embraced this shift more fully than the National Science Library of the Chinese Academy of Sciences'. Zhang, its director, has defined a resource strategy reframing the needs and roles for libraries. Kenney (2014: 4) quotes Zhang describing his vision of a transformed research library in an OA world:

> And a knowledge analysis and experiment laboratory is to rise from the clouds of digital content to support tracking, detecting, analyzing, and discovering trends, structures, and abnormalities in science, technology and innovation, so to help and stimulate R&D decision-making and research road-exploration. The library will no longer be bounded by resources and systems but diffusing into users' knowledge processes in a digital, network, and computational way.

In Zhang's model, the relationship between the users, the librarians, and the library will be transformed. Librarians and services will be disentangled from THE library or its processes, with librarians becoming knowledge workers working together with researchers and within their research processes. The challenge, he says, 'is to recontext the library, to capitalize on the complexity and to shape the future, not just for themselves but for research and learning' (Zhang 2012: 2). A case study of the University of Kansas Libraries further highlights the changes, the challenges and opportunities to support researchers in an OA system.

Case study: University of Kansas (KU) Libraries

This case study will highlight the process and the investments made to support OA that culminated in the faculty-led campus-wide OA policy and the libraries role in implementing the policy.

KU has enjoyed a rich institutional history of supporting OA. The University was a founding partner of BioOne, an early signatory of the high energy physics OA initiative, Sponsoring Consortium for Open Access Publishing in Particle Physics (SCOAP), and also a campus partner in developing support for NIH open access compliance (Ludwig 2010). From the beginning the libraries played a key role in advancing OA on campus.

Achieving consensus

Deeply rooted in the serials crisis of the 1990s, the KU's chief academic officer, David Shulenburger, led the movement among stakeholders in higher education to reshape the scholarly publishing system. Following OA policies at Harvard and MIT in 2008, KU adopted a faculty-led, campus-wide OA policy in 2009 and in 2010, became

the first public university to pass an institutional policy requiring faculty to make their journal articles available through an OA repository (University of Kansas OA Policy 2010). KU's OA policy was the culmination of a decade long campaign to build consensus on a set of principles that could guide the transformation of the scholarly publishing system. The process took two full academic years and significant investments of time on the part of many faculty, including library faculty in leadership roles in the faculty senate: 'Achieving reasonable levels of consensus across such a diverse faculty required diplomacy, patience, forethought, and careful crafting of presentations and messages to faculty' (Emmett & Peterson 2010: 7). Ludwig (2010) agrees, noting three key elements that led to the successful adoption of a faculty-initiated campus-wide OA policy: significant institutional support for OA built over more than a decade; leadership by faculty for faculty in developing a policy and accompanying implementation strategy; and deep engagement of faculty across disciplines in discussions about the implications of open access scholarship over time.

Institutional repository

The institutional repository, KU ScholarWorks, was a key investment made in 2003 and launched in 2005 to coincide with KU's resolution to encourage self-archiving by its faculty. The libraries were involved in its development and planning and sought faculty input regularly. Following an assessment of IR deployment in the United States, Lynch and Lippincott (2005: 1) asserted that 'institutional repositories are now clearly and broadly being recognized as essential infrastructure for scholarship in the digital world'. Although KU had been widely recognised as a leader in reforming scholarly publishing, faculty authors were not necessarily among those who recognised IRs as 'essential infrastructure.' An assessment of KU's implementation strategies revealed a disconnect between faculty behaviour and the University's investment in an IR to assist faculty to retain control of their intellectual rights. This finding was consistent with those in the literature review about faculty's attitudes and OA. Recognising its role as a catalyst to advance OA, the libraries adjusted the submission process and introduced a suite of services that transformed the IR from a self-archiving model to a mediated service model that began to generate a higher volume of articles and high visibility in KU ScholarWorks.

KU's decade long strategies provide valuable lessons for others who are pursuing institutional OA policies. These lessons include the critical importance of: meaningful engagement with faculty to understand their concerns and needs; implementing barrier-free submission or mediated services to assist faculty who support OA; using multiple approaches to engage faculty; including and consulting all stakeholders; assessing services regularly, and being prepared to provide continuous outreach and education. Mercer and Emmet (2005: 1) stated 'KU ScholarWorks will fill its role as an institutional repository when its contents are representative of the vast research output from the many disciplines at KU'. The content representing KU's scholarship is diverse including KU's electronic theses and dissertations, graduate student project submissions and small sets of data, among others.

KU's IR reflects what Goodyear and Fyffe (2006: 3) define as 'making visible – to the campus and to its leadership – the breadth, depth, and value of the scholarly papers, research data, and other assets held in campus information systems and, by extension, demonstrates the scholarly importance of properly managing those systems and assets'.

Open access publishing

KU Libraries provide a variety of support services for OA publishing as enumerated in the literature review. They continue to invest in initiatives to open access to scholarship globally and to its own published work, for example, Journals@KU (2015) supports the KU community in the publication of scholarly journals online by providing two platforms, and KU ScholarWorks

and Open Journals System make journals visible and assure their preservation, but also support the editorial management workflow, article submission, multiple rounds of peer-review and indexing. In 2012 KU established a central fund, the One University Open Access Fund, to support faculty, staff and students on the main and medical campuses who choose to publish in OA journals that require author fees for accepted manuscripts. Unlike most campuses where libraries provide all or some of the funding support for APCs, KU's fund is supported centrally by the provosts on each campus and the vice chancellor for research and graduate studies. The libraries, in consultation with faculty developed the criteria for funding and evaluate requests for APCs in a monthly competitive review process. The libraries provide special services to digitize older theses and dissertations (even handwritten ones!) that have resulted in generous cash donations to the library.

Education and outreach

Education and outreach are ongoing through existing organisational structures, services and programmes. Celebrating OA week through hosting visiting speakers, workshops, and special projects are among the most visible activities to raise awareness around OA on campus. KU Libraries host an annual session specifically for graduate students to introduce them and engage them in conversations about OA. It also supports the international OpenCon, a conference for students and early career professionals on OA, open education and open data, by sponsoring a graduate student to attend the conference.

Professional development opportunities are provided for librarians and staff to assist and participate in outreach and education. In 2013, a statement of expectations to advance open access was included in librarians' position descriptions as a strategy to begin to mainstream their roles in advancing OA.

An OA advisory board of faculty and deans assists with policy development and assessment while appointed OA liaison staff in several disciplines across campus serve as key contacts between the libraries and their departments. These structures are beneficial in 'testing' the waters, for example, the value of altmetrics in tenure and promotion decisions. Highlighting the top ten downloads in the IR every month helped to showcase the broad reach and impact of KU's scholarship.

Conclusion

Open access has gained significant momentum. Since it entered the mainstream in 2002, more than a decade ago, libraries have emerged as leaders to reshape the scholarly communication landscape in response to the serials crisis. This new role has deeply impacted infrastructure, new services, staffing skills, workflows, funding and outreach to promote OA among faculty. Progress is palpable.

IRs and workflows have become mainstream, the number of institutional OA policies have increased beyond single campuses to university systems and state-wide policies, research institutions and funding agencies are mandating access and re-use and publishers have begun to modify their behaviour or create new models to provide options for open access to published materials, albeit at a cost. The open agenda has broadened to include open data, open science and open educational resources in which libraries are well positioned to contribute distinctive expertise. Despite the evolution in the open access ecosystem libraries have remained key stakeholders in this changing landscape.

Zhang, Liu, Li, Zeng and Ku (2012) reframe the needs and roles for libraries in an OA world by looking at three different but closely related perspectives: what is needed for and enabled by OA from OA research and learning institutes; what is needed for and enabled by OA for scholarly communications, and what would be the libraries' roles and services contributing to the transformation. In doing so, Zhang et al. (2012) have identified opportunities for libraries to embrace the changes to empower scholarship and to advance

their work in a growing OA world. The case study detailing the KU's strategies provides valuable lessons for others who are pursuing institutional OA policies.

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