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Open Access Legislation and Regulation in the United States: Implications for Higher Education

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Abstract

Accessing quality research when not part of an academic institution can be challenging. Dating back to the 1980s, open access (OA) was a response to journal publishers who restricted access to publications by requiring a subscription and limited access to knowledge. Although the OA movement seeks to remove costly barriers to accessing research, especially when funded by state and federal governments, it remains the subject of continuous debates. After providing a brief overview of OA, this article summarizes OA statutory and regulatory developments at the federal and state levels regarding free and open access to research. It compares similarities and differences among enacted and proposed legislation and describes the advantages and disadvantages of these laws. It analyzes the effects of these laws in higher education, especially on university faculty regarding tenure and promotion decisions as well as intellectual property rights to provide recommendations and best practices regarding the future of legislation and regulation in the United States.

Keywords: open access, publicly funded research, legislation, higher education



Introduction

Open access (OA) has been the center of numerous debates for the past three decades, beginning with the creation of free online journals in the late 1980s (Suber, 2009). OA removes cost barriers for reading scholarly and scientific research (Scholarly Publishing and Academic Resources Coalition [SPARC], 2018b; Suber, 2015) and is a growing segment of the scholarly publishing industry (Hoyt & Binfield, 2016). Tennant et al. (2016) argued that OA is more than an academic and economic matter; it is also a moral issue. Access to knowledge “transcends academic affiliation and supports sustainable lifelong learning” (Tennant et al., 2016, p. 15) and is a matter of social justice (Arunachalam, 2017).

In 2018, the US government allocated \$176.8 billion for research (American Association for the Advancement of Science, 2018) and granted about 60% of these dollars to US universities (National Science Board [NSB], 2018). US universities spent \$71.8 billion on research in 2016 using a combination of institutional funds, grants from state and federal governments, and funding from corporations and foundations (NSB, 2018). Traditionally, these researchers published their articles in journals to which readers must subscribe or access through a library (Schockman, 2016). However, journal subscription prices have increased by approximately 6% annually, from an average subscription cost of \$1,252.66 in 2014 to \$1,551.03 in 2018, making it difficult for individuals and libraries to afford the subscriptions (EBSCO, 2018a, 2018b). Thus, users are unable to access articles for which their tax dollars have already paid (Schockman, 2016; Tennant et al., 2016). The OA movement seeks to remove these costly barriers to research, especially government-sponsored research.

This article provides a brief overview of OA and summarizes OA statutory and regulatory developments at the federal and state levels. It compares similarities and differences among enacted and proposed legislation and describes the advantages and disadvantages of these laws. Next, we explore the effects of these laws on higher education, especially regarding university faculty tenure and promotion processes and intellectual property rights. Finally, we discuss recommendations for future legislation and policy development.

Open Access Overview

Suber (2015) defined open access literature as digital, online, and free of most copyright and licensing restrictions. OA archives or repositories and OA journals are two ways of providing access to open research articles. OA has implications for copyright, is funded differently than traditional publishing, and has advantages and disadvantages.

When an author in the United States creates a manuscript, they own specific copyrights as defined by Title 17 of the US Code (Daniel & Pauken, 2015; US

Copyright Office, 2020): the right to make copies; the right to make derivative works; the right to distribute copies; the right to perform literary, musical, dramatic, and choreographic works in public; the right to display literary, musical, dramatic, choreographic, pantomimes, pictorial, graphic, and sculptural works publicly; and the right to digitally perform sound recordings publicly. However, when an author signs a contract with a publisher, they typically transfer all of their copyrights to the publisher, and this often entails an exclusive transfer rather than a nonexclusive license of rights (Bailey, 2014; Tennant et al., 2016). Journal publishers use copyright ownership to restrict access without a subscription, which in turn can limit the spread of knowledge (Bailey, 2014). Authors could choose to retain their copyrights by granting journals nonexclusive rights to publish their work, or they could publish their work on an OA platform using a Creative Commons license (Denicola, 2006; Hoorn & van der Graaf, 2006; Tennant et al., 2016). The Creative Commons Attribution CC BY license enables users to share and adapt the original work and requires users to give credit to the original author (Creative Commons, n.d.). Launched in 2001 and having licensed more than 1.6 billion items, Creative Commons removes barriers to knowledge, which is especially needed during the COVID-19 pandemic (Stihler, 2020).

Like traditional publishers, OA publishers have ongoing costs, but with OA, instead of users paying to read, authors may pay an article processing charge (APC) to publish their research (Butler, 2003; Suarez & McGlynn, 2017; Suber, 2015). APCs range from as little as \$100 to as much as \$5,000 to publish one article (University of Cambridge, 2018), and Tennant et al. (2016) reported that nearly 70% of OA journals do not charge APCs. Vines (2018) proposed replacing the APC model with an article submission fee. OA journals typically cost less to produce than traditional journals because they are published online unlike traditional journals that print and distribute physical journals in addition to providing online access (Nassi-Calò, 2013).

The first fully OA publisher was the Public Library of Science (PLOS, 2019). When the PLoS launched in 2003, it was an experiment showing that open publishing platforms “can work by competing head-on for the best research papers with today’s top scientific and medical journals” (Butler, 2003, p. 554). A nonprofit publisher, the PLoS has created the largest scientific journal and includes article-level metrics. The PLoS seeks to provide access to open data and aims to make peer-review processes more transparent. They have been successful and provide a model that others can emulate (Eisen, 2016). Researchers and readers can find OA journals using the [Directory of Open Access Journals](#) (DOAJ), a privately funded website that indexes high-quality, peer-reviewed OA journals. Some traditional publishers offer a blend of OA and subscription-based access. Wiley, a British publisher, recently



partnered with Germany to publish the works of German researchers on an OA platform and to provide German researchers with read access to all Wiley content published since 1997 (HRK, 2019).

Piwowar et al. (2018) found that readers are likely to have free, if not legal, access to a large proportion of scholarly articles. The authors observed that nearly 30% of the articles that had a crossref digital object identifier (DOI) were available legally online, as were over half of all research articles published in biomedical research, mathematics, and clinical medicine. Piwowar et al. also noted that freely available research articles received “18% more citations than what is expected” (p. 14), while articles published in journals requiring a subscription received 10% fewer citations than expected. However, the shift toward OA is uneven across disciplines (Severin, 2018).

Predatory publishers and journals give OA a bad name (Tennant et al., 2016). They publish articles online with low academic standards and little credibility in exchange for an author fee that is more affordable than reputable pay-for-publication journals (Vakil, 2019). These journals provide fraudulent information on their websites and do not follow traditional peer-review processes (Beall, 2015; Kolata, 2019; Tennant et al., 2016). The US Federal Trade Commission (FTC) recently won a \$50 million fraud lawsuit against Omics International, an Indian publisher and conference organizer (Kolata, 2019). Although the FTC may not be able to collect the judgment, they seek to protect researchers from Omics and similar corporations (Kolata, 2019). Jeffrey Beall (2015, 2016), who maintained a list of predatory journals until 2017, warned authors about predatory publishers taking advantage of researchers by charging substantial fees to publish quickly. These journals often disappear after a few years, providing no record that the published articles ever existed, and faculty members end up with ruined reputations (Beall, 2016). Cabells Predatory Reports uses a long list of criteria to determine whether a journal is authoritative or fraudulent; journals may be fraudulent; Toutloff (2019) reports that journals may be fraudulent if they

- use a fake international standard serial number (ISSN),
- do not have an editorial board or list individuals as editors without their knowledge,
- refer to fees as submission fees rather than publication fees,
- publish articles previously published or that are not scholarly,
- have a title close to an authoritative journal, or
- claim to be, but are not, indexed.

OA benefits academia and society by making it is easier for authors to share work, which often increases the number of citations (Kimbrough & Gasaway, 2015; Right to Research, 2010; SPARC, 2010; Tennant et al., 2016). Students benefit from

OA because they can access scholarly research without being limited to the resources their institution can afford (Right to Research, 2010; SPARC, 2010). Small businesses benefit from having access to research that helps them develop new services and technologies (Right to Research, 2010; SPARC, 2010; Tennant et al., 2016). Doctors and patients anywhere in the world benefit from access to life-saving knowledge (Right to Research, 2010; SPARC, 2010).

OA is attractive for research consumers, but publishers and some academics are lobbying against mandated OA publishing legislation (Butler, 2003; Raff, 2018; Schroter & Tite, 2006). Concerns include the costs of paying to publish, the effect sponsored advertising may have, and the potentially detrimental effect of predatory publishers on researchers' careers (Beall, 2015; Butler, 2003; Raff, 2018; Schroter & Tite, 2006). The Association of American Publishers has lobbied against OA legislation, stating that it threatens the peer-review process (Brown, 2007; Howard, 2007).

US Federal Legislation and Regulation

The US Congress has attempted to pass OA legislation several times without success, including the Federal Research Public Access Act (FRPAA) of 2006 (S.2695), 2009 (H.R.5037, S.1373), and 2012 (H.R.4004, S.2096) and the Fair Access to Science and Technology Research Act (FASTR) of 2013 (H.R.708, S.350), 2015 (H.R.1477, S.779), and 2017 (H.R.3427, S.1701). FRPAA would have required federal agencies to establish and fund online repositories of published research articles that provided "free online public access to such final peer-reviewed manuscripts or published versions as soon as practicable, but no later than six months after publication in peer-reviewed journals" (FRPAA, 2012, H.R.4004, sec. 4.). FASTR replaced FRPAA in subsequent sessions and contained similar provisions. Gugliotta (2012) reported that Congress was not in favor of maintaining the current publishing model or mandating OA.

In February 2013, the Obama administration released a policy recommendation requiring federal agencies that have at least \$100 million in research expenditures to provide free and open access to federally funded research within one year of publication (Executive Office of the President [EOP], February 2013). This executive order expanded the 2008 requirements found in an appropriations bill that required researchers who received grants from the National Institutes of Health (NIH) to make their research freely available on the NIH's PubMed platform within one year of publication (Gugliotta, 2012). Although free access to publicly funded research continues based on an executive order, free access to government data began as an executive order and eventually became federal law. In May 2013, the Obama administration released a memo requiring



federal agencies to ensure that any data they collect or create is usable by other entities through “machine readable and open formats” and is interoperable with other systems (Executive Office of the President, May 2013). The executive order applied to all data, whether public or classified. On January 14, 2019, President Trump signed the Open, Public, Electronic, and Necessary (OPEN) Government Data Act, which codified Obama’s executive order into statutory law. The question remains whether the same transition from executive order to federal statute might occur regarding open access to federally funded research (Subbaraman, 2019).

However, compliance requirements and enforcement vary by agency (SPARC, 2016). The National Oceanic and Atmospheric Administration (NOAA) (US Department of Commerce, NOAA, 2015) policy prohibits researchers from receiving future grants if they do not comply with grant policies, but NOAA’s lack of personnel and automation reduces their ability to enforce compliance. The US Department of Agriculture (2014) may withhold or adjust funding for current grants and may prohibit awarding future grant if researchers do not comply with policies. The US Department of Education (2016) requires grant-funded research to be published in the Education Resources Information Center (ERIC) within 12 months of publication and will check researchers’ compliance with public access before issuing future grants. The US Department of Transportation (2015) requires researchers to obtain an Open Researcher and Contributor ID (ORCID) for use in tracking research compliance. The US Department of Defense (DoD) uses Open Archives Initiative metadata standards to make research articles easy to locate. Inconsistency among agencies may be confusing for researchers who may receive grants from multiple agencies. More unity among federal agencies might make it simpler to enforce compliance.

US State Laws: Illinois and California

In 2015, Illinois and California enacted legislation requiring free and open access to research (Kimbrough & Gasaway, 2015). Although the New York Assembly proposed taxpayer access to publicly funded research legislation in 2013, they did not act on these bills (SPARC, 2013a). No other state has enacted OA laws. SPARC (2013a, 2013b, 2014) and Creative Commons (Vollmer, 2013) only discuss laws from these three states. Table 1 compares proposed federal laws and the 2013 presidential executive order with the laws passed by Illinois and California.

Table 1. Comparison of proposed federal laws, federal executive orders, and state laws governing OA.

Statutes and regulations	Proposed Federal Research Public Access Act (FRPAA)	Proposed Fair Access to Science and Technology Research Act (FASTR)	Executive Office of the President, Office of Science and Technology Policy (EOP, OSTP)	Illinois (P.A. 98-295, 2013)	California (AB 609, 2014; AB 2192, 2018)
Who	Would have required federal agencies that fund \$100+ million research grants annually.	Would have required federal agencies that fund \$100+ million research grants annually.	Directed federal agencies that fund \$100+ million research grants annually.	All state-funded universities.	2014: Researchers receiving grants from the California Department of Public Health. 2018: Researchers receiving grants from any California governmental agency.
What	To develop policies requiring authors' final peer-reviewed manuscripts to be publicly available.	To develop policies requiring authors' final peer-reviewed manuscripts to be publicly available.	To develop a plan supporting increased public access to the results of research funded by the federal government. To provide easy search and access to research, to maintain attribution, and to ensure preservation.	To establish an Open Access to Research Task Force at each public university to develop OA policies and require faculty to submit a final version of scholarly articles.	To encourage researchers to submit research articles funded from the grant in a freely available database and provide a link to the California State Library.
Timing of requirements	Articles must be publicly available within six months of publication.	Articles must be publicly available within 6 to 12 months of publication.	Agency plans are due by August 2013. Articles must be publicly available 12	Universities must establish task force by January 1, 2014, and adopt	No later than 12 months after publication, the research would become freely



			months after publication.	recommendations by January 1, 2015.	available and openly accessible through the California State Library
Supporters	Association of College and Research Libraries	Association of College and Research Libraries, Association of Research Libraries, Alliance for Taxpayer Access, Provosts at 60 US universities	—	Senator Biss	CREDO Action, Measured Voice, Californians Aware, New Media Rights, California Common Cause, Open Knowledge Foundation America, eCitizens.org, Open Science Federation, Electronic Frontier Foundation, PeerJ, Engine Advocacy, PloS, Evri GIS Consulting, Public.Resource.Org, Google, Public Knowledge, Internet Archive, TechNet
Opponents	Association of American Publishers	Association of American Publishers	—	—	—

Note: Adapted from Alliance for Taxpayer Access (2019), Anderson (2013), California Legislative Information (2018), CREDO Action et al. (2013), EOP OSTP (2013), Harington (2017), Illinois Compiled Statutes (2013), Illinois General Assembly (2013, February), SPARC (2013, October), and SPARC (2014).

Illinois's Open Access to Research Articles Act of 2013, like FRPAA and FASTR, required state-funded universities to develop OA policies and required faculty employed at Illinois public universities to submit a final version of their published scholarly articles to their university to make them freely available to the public (Illinois Compiled Statutes, 2013; SPARC, 2013). Senator Biss, who introduced the bill, was a math professor at the University of Chicago before becoming a state senator. He believed OA is "an important social justice issue, human rights issue and fiscal issue for the field of higher education" (Des Garennes, 2019). The original Open Access Act introduced by Senator Biss on February 15, 2013, was amended twice and signed into law on August 9, 2013. It required all Illinois's public institutions of higher education to establish an "Open Access to Research Task Force" to review the issue and to recommend policy directing faculty to submit an electronic version of final manuscripts upon acceptance by scholarly research journals. The purpose of the act was to maximize the social and economic benefits of research to the public.

The Illinois State University (ISU, 2014) *Open Access Task Force Report* recommendations included the following:

- The university should adopt a voluntary OA policy to support the highest level of academic freedom as well as promote public access to research.
- Faculty and other members of the ISU community should be encouraged to deposit completed research, creative activity, and scholarship in open access repositories.
- Accepted author manuscripts (i.e., the final peer-reviewed version of a research publication) should be the preferred version to be made accessible via OA.

The University of Illinois at Urbana-Champaign (UIUC) created a Campus Open Access Policy overseen by the Office of the Provost, including resources and guides for academics looking to publish their research (UIUC, 2015). These policies fulfilled state law, but it is unclear whether they affected the desired changes.

When we compare the legislation of the states of California and Illinois, it shows that the California Taxpayer Access to Publicly Funded Research Act enacted on September 29, 2014, was narrower in scope than the Illinois law and similar to Obama's February 2013 executive order. The California law required research funded by the California Department of Public Health to be publicly available within 12 months of publication (SPARC, 2014; California Legislative Information, 2014). On September 7, 2018, California governor Jerry Brown signed AB 2192 into law (SPARC, 2018; California Legislative Information, 2018). AB 2192 extended the 2020 sunset date of AB 609 indefinitely, improved the original bill by requiring public access to research funded by the California state research agency, and



provided explicit guidance on approved repositories, including the University of California's eScholarship repository and PubMedCentral (SPARC, 2018; California Legislative Information, 2018). According to Harmon (2018), no other state has adopted an OA bill as comprehensive as AB 2192. Critics consider the one-year period to upload papers to public OA repositories too long, especially in fast-paced science fields. Despite the delay, readers benefit from access to more research than they would otherwise. An assessment of adherence to California's OA protocol would offer useful insights.

In response to state law, the University of California (UC) established two policies: the UC Academic Senate Faculty Open Access Policy and the Presidential Open Access Policy (UC, 2015, 2017). Both policies encourage all authors of scholarly journal articles across the UC-system to make their work freely available to the public on eScholarship (UC, 2015, 2017). The UC system recommendations include the following:

- a robust publication management system to automate the discovery of UC-affiliated publications and simplify deposit into eScholarship, UC's OA repository and publishing platform;
- a streamlined workflow for manually depositing articles into eScholarship; and
- a tool to support the generation of the embargo, waiver, and addendum forms at the author's request.

Making the deposit process simple and providing support may increase faculty compliance. In 2019, the UC took another step toward opening access to publicly funded research by not renewing its subscription with Elsevier (UC Office of the President, 2019).

Although both Illinois's and California's laws celebrate public and free access to research, they implemented different approaches. In Illinois, the law required each public higher education institution to form a task force committee to recommend OA policies and procedures. Although the law required universities to adopt policies, it did not address enforcement or penalties. The California law affected only researchers who were recipients of state-agency-funded research grants. Researchers might be more likely to adhere to the California law if their ability to receive future grants depended upon prior compliance. Basken (2016) reported that between 2013 and 2016, only 25% of the articles produced by faculty who received grant funding from the California Department of Public Health were available on the state's accessible repository. Whether compliance will increase with the passage of the 2018 law is yet to be determined. California's public universities could develop an automated process for harvesting research funded by state-agency grants to increase compliance and the percentage of articles freely accessible.

How OA Laws Affect Faculty and Universities

The fast-paced online publishing world has been challenging the viability of the slow-paced world of the traditional publishing industry. OA journals have been a hub of innovation in publishing technologies and have promoted the emergence of academic publishing start-ups and researcher-led projects (Ratcliffe, 2014). Yet, academic departments may be reluctant to embrace OA publishing. The determining rigor and quality standards of OA journals requires academic departments to verify the validity of OA publishers on a case-by-case basis (Alperin, Morales, & McKiernan, 2019; McDonald, Gibson, Yates, & Stevenson, 2016). Compared to the known rigor and quality of established publishers, assessing OA publishers implies an increased amount of work.

Without incentives or penalties, faculty may ignore institutional policies that require or encourage them to deposit their publications in their universities' institutional repositories (Crotty, 2016). For example, Straumsheim (2016) reported that although faculty at the University of Florida (UF) published an average of 8,000 articles annually, they did not deposit their articles in UF's institutional repository to make them freely accessible. Rentier (2015) reported that universities with policies requiring faculty to deposit their published works in the institutional repository achieved less than 30% compliance. To combat low deposit rates at the University of Liège, Rentier, who was rector at the time, established a policy requiring faculty to deposit full-text articles in the repository of the university. Only faculty who complied with the policy could apply for grants or receive promotions; thus, 90% of faculty complied (Rentier, 2015). However, establishing similar policies at US universities may be challenging due to union contracts and academic freedom, which protect faculty "from administrative authority" (Hutchens & Sun, 2015). The American Association of University Professors and the Association of American Colleges and Universities uphold academic freedom in teaching, research, and publication preferences (Hutchens & Sun, 2015; Nelson, 2013).

Harvard University (President and Fellows of Harvard College, 2018) has one of the most comprehensive institutional policies regarding OA. Between 2008 and 2017, the faculty in each of Harvard's colleges granted nonexclusive rights to Harvard to distribute their scholarly articles. Harvard provost Steven Hyman stated, "At Harvard, where so much of our research is of global significance, we have an essential responsibility to distribute the fruits of our scholarship as widely as possible" (President and Fellows of Harvard College, 2018). Readers may freely access the research from Digital Access to Scholarship at Harvard (DASH), a digital repository managed by Harvard's university library.

Many universities have developed OA policies, including 130 US universities that have registered with the Registry of Open Access Repository Mandates and



Policies (ROARMAP, n.d.) and 109 North American universities that have registered with the Coalition of Open Access Policy Institutions (SPARC, 2018). Of the 769 total policies registered with ROARMAP, 72% are institutional policies. Piwowar et al. (2018) could replicate their study of legal access to published articles periodically to measure the impact of these policies and the growth of freely available research. About 45% of commercial publishers enable researchers to comply with institutional, state, and federal policies by allowing them to sign publishing contracts that include nonexclusive distribution copyrights (Kimbrough & Gasaway, 2015). If more universities and funders standardized policies and incentivized and automated compliance, OA might become the preferred method for distributing scholarly works (Crotty, 2015). Academic libraries can be partners in raising awareness about and providing services supporting scholarly communications, copyright, OA, and institutional repositories (Association of College and Research Libraries, 2018).

Promotion and Tenure

Publication pressure on tenure-track faculty is real and often breaks careers in academia. Faculty who do not meet requirements for research and scholarly activity may be denied tenure or may not have their term contract renewed (Venters, 2015). Early career researchers may be aware of the benefits of OA, but the risks are numerous. Though tools exist to guide researchers when choosing where to publish their articles, some researchers end up publishing in journals that have low or no impact factor or in predatory online publications (Butler, 2013). Predatory open-access publishers may trick early career faculty into paying to publish in fraudulent journals because it can be challenging to distinguish between predatory open-access publishers and well-intentioned but inexperienced start-ups (Butler, 2013). Also, confusion occurs when individuals conflate fully OA journals with hybrid journals or believe that OA equates to paying to publish. Article-processing charges can be hefty, although some universities or societies subsidize small OA publishers (Van Noorden, 2013). Some OA publishers, such as Biomed Central (BMC) and PLoS, waive the fee for researchers affiliated with institutions that have purchased an annual membership (Eve, 2012).

According to the results of the 2018 Ithaka Survey, only 40% of faculty respondents chose to publish in OA journals, although over 60% of respondents would be supportive of an entirely open publishing system (Blankstein & Wolff-Eisenberg, 2019). The percentage of respondents in favor of OA reached nearly 80% of faculty aged 34 or younger (Schonfeld & Wolff-Eisenberg, 2019). These younger faculty members are less likely to have earned tenure. A fading but still existing issue is the gap in perception that senior faculty have regarding quality research outlets. Researchers who have not published in an OA journal perceive the journals to “have low prestige and low impact” (Denicola, 2006, p. 360). Senior faculty who

prefer traditional publishers may be apprehensive about OA publishers (Whitaker, 2018), and perspectives about OA vary by discipline (McDonald et al., 2016). Tenured faculty review tenure applications and give a recommendation to the chair of the department whether to move the file forward to the dean's office (Whitaker, 2018). Consequently, faculty who apply for tenure need to be sure about the quality of their papers and the reputation of the journals in which they publish.

Konkiel, Sugimoto, and Williams (2016) pointed out that faculty on the tenure track receive credit for the quantity and quality of their scholarly output. They argued that the number of articles a faculty member publishes is not a valid indicator of quality. Journal impact factor measures how many researchers cite articles published by a specific journal (Clarivate, 1994). The impact factor of a journal measures the overall quality of articles published by the journal, but it does not mean that each article published is of equal quality (Konkiel et al., 2016). Raff (2018) noted that an obsession with journal impact factor is slowing the transition from traditional publishing to OA publishing. In OA, new methods of measuring the contribution of a specific article replace journal impact factor. For example, Altmetric (n.d.) measures research impact at the article level by counting

- how many people are reading a specific article,
- how many people are sharing the article through news outlets and on social media platforms, and
- how many people are saving the citation to the article in citation management systems.

These measures are article-specific and can reveal how a faculty member's research impacts society beyond academia (Konkiel et al., 2016). As the proportion of OA research articles published increases, article-level measures might overtake journal impact factor as the best measure of research quality.

Faculty and administrators at universities in Illinois and California must grapple with state OA laws that potentially affect promotion and tenure policies, academic freedom, and intellectual property laws. State laws govern faculty contracts and the extent to which faculty may establish unions for collective bargaining (Venters, 2015). In Illinois, the OA law affected only faculty working at public universities, while in California the OA law affected faculty receiving grants from state agencies. In both states faculty unions might bargain policies governing research quality and quantity and might not welcome state laws limiting their power to do so. OA is one of several publishing platforms available to researchers. If the online or print journal is a quality source, there is no reason for applicants to see their tenure application denied based on the nature of their publication. Moreover, the Illinois Open Access to Research Articles Act of 2013 does not penalize faculty who do not make their published research freely available. In California, AB 2192

should not affect tenure qualification since the publication requirements are from the state agency funding the research.

The impetus is on universities and funders to guide early career researchers about where to publish and on publishers to provide OA platforms (Ratcliffe, 2014). Researchers may use Cabells Predatory Reports (Toutloff, 2019) coupled with the Directory of Open Access Journals (DOAJ, 2019) to evaluate the quality of OA journals' peer-review processes and to decide where to send a manuscript. Promotion and tenure committees may also use Cabells or DOAJ to assess the quality of the journals in which faculty published.

Intellectual Property

According to Daniel and Pauken (2015), intellectual property laws attempt to balance opposing rights:

- The rights of authors or creators to own and profit from their ideas and creations versus the rights of consumers to use these ideas and creations.
- The rights of faculty and students to own and profit from their ideas and creations versus the rights of the university where they work or study.

Work-for-hire is defined as the work an employee completes “within the scope of his or her employment” (Daniel & Pauken, 2015, p. 488). Specifically, as defined by Title 17 of the US Code Section 101, “work made for hire” is:

1. a work prepared by an employee within the scope of his or her employment, or
2. a work specially ordered or commissioned for use as a contribution to a collective work, as a part of a motion picture or other audiovisual work, as a translation, as a supplementary work, as a compilation, as an instructional text, as a text, as answer material for a test, or as an atlas, if the parties expressly agree in a written instrument signed by them that the work shall be considered a work made for hire. For the purpose of the foregoing sentence, a “supplementary work” is a work prepared for publication as a secondary adjunct to a work by another author for the purpose of introducing, concluding, illustrating, explaining, revising, commenting upon, or assisting in the use of the other work, such as forewords, afterwords, pictorial illustrations, maps, charts, tables, editorial notes, musical arrangements, answer material for tests, bibliographies, appendixes, and indexes, and an “instructional text” is a literary, pictorial, or graphic work prepared for publication and with the purpose of use in systematic instructional activities.

As a result, faculty research and teaching may be considered work-for-hire unless the institution has policies or contracts that indicate otherwise (American

Association of University Professors [AAUP], 2006; Daniel & Pauken, 2015). Intellectual property includes copyrights for authors and creators of original works, patent rights for inventors, and trademark rights (Daniel & Pauken, 2015). Case law exists for all three types of intellectual property, and copyright cases have addressed definitions and formats, fair use, classroom use, library copies, and infringement (Daniel & Pauken, 2015; Rooksby, 2016). Hellyer (2016) recommended amending federal copyright law to create an exception for employees of academic institutions. One case law example regarding OA was the FTC case against Omics International and their fraudulent business practices, where the federal district court judge in Nevada found that Omics International was guilty of making deceptive claims to academics and researchers about the nature of their conferences and publications and hiding very high publication fees (Kolata, 2019).

The relationship between OA and intellectual property rights is complex and politically charged (Anderson, 2013). Priest (2012) reviewed the legal aspects of Harvard's OA policy and discussed key issues such as who owns the articles, whether the research is work-for-hire, and nonexclusive licenses. Priest (2012) asserted that when faculty authors contribute their research to an institutional repository, they retain their copyrights and are granting the university a "nonexclusive license to reproduce and distribute the article . . . even after the author transfers copyright ownership to a publisher" (p. 422). He concluded that US copyright laws were not intended to apply to nonproprietary works; instead, these laws were meant to apply to proprietary works where an entity owns exclusive rights. Priest recommended

- that work-for-hire laws be applied "with sensitivity" (p. 438) to academic researchers,
- that US copyright laws, specifically 17 USC Sec. 205(e), governing nonexclusive licenses be updated to consider uniformity costs, and
- that Creative Common nonexclusive licenses be regulated.

Shavell (2010) proposed that Congress pass a law that would eliminate or exempt scholarly publications from any copyrights. He believed that universities, researchers, and students would support such an exemption. Users would be able to read and distribute scholarly publications freely and would need to cite these works. Shavell offered four characteristics of types of scholarly articles that could be exempted:

- the authors work at an academic institution,
- the audience for the articles is primarily other scholars,
- the content is sophisticated and builds upon prior knowledge, and
- the authors receive few or no royalties.



Kimbrough and Gasaway (2015) and Shavell (2010) outlined numerous benefits of exempting scholarly works from copyright laws:

- university libraries would save money by not having to subscribe to increasingly expensive journals,
- faculty would be able to use scholarly materials in courses without obtaining copyright permission,
- students and faculty would be able to read relevant research without paying fees, and
- researchers would be able to distribute their publications more widely.

However, traditional publishers would lose profits and potentially go out of business (Shavell, 2010). Shavell also noted that scholarly books pose more difficulties than articles because authors typically receive royalties for copies sold.

Recommendations

When funding agencies require research results to be freely available, the number of freely accessible scholarly articles increases (Kimbrough & Gasaway, 2015). From a legislative and policy perspective, several possibilities exist at the state and institutional levels to advance OA publishing initiatives: states could enact legislation establishing publication requirements for state-funded research, states could incentivize OA publishing in higher education funding bills, and research universities could set local policies regarding OA publishing. Each of these options has strengths and weaknesses. Laws and policies do not operate in a vacuum, and as commercial publishing corporations evolve their publishing models, governments and research institutions must adapt accordingly.

State legislatures considering publication requirements for state-funded research should compare the laws passed in California and Illinois and assess the outcomes in both states. The Illinois state law requiring public universities to establish OA policies did not include incentives or penalties for universities or researchers, and thus did not change behaviors or attitudes. Similar laws could potentially conflict with labor and contract laws, intellectual property laws, and commercial laws. Laws that mandate free public access to state-funded research without any method of enforcing them are absurd. States whose agencies offer research grants could introduce legislation like California's laws requiring state-funded research to be publicly available within a specified period following publication. Future agency grants should be contingent on an institution's and a researcher's prior compliance with the agency's OA requirements. Incentives tied to current and future grant funding are powerful, especially when researchers depend upon those grants to operate their research labs or gain credit toward tenure and promotion. Each state funds higher education differently; thus, there is no one-size-fits-all approach to incentivizing OA publishing. A portion of state funding for public

research universities could be allocated based on an institution's OA publishing record. The allocation could be a fixed amount proportionally shared among state-funded universities at the end of the funding year using defined metrics such as the percentage of research articles published within a specific period that are publicly available in a university or statewide institutional repository. Developing an objective metric may be challenging and the rewards may not be worth the effort; incentivizing OA publishing may not be a pressing issue as states brace for tremendous economic impact from the COVID-19 pandemic.

Twenty-nine states use performance-based funding (PBF) metrics to allocate state funds for higher education (Rosinger et al., 2020). Although PBF models focus on student and state outcomes, according to Li (2019), six states included a metric for external monies. Li (2019) did not define what is included in external monies, but it likely includes external grants, contracts, and fundraising revenue. One could argue that institutions with higher research and development expenditures also have a larger number of grants from federal agencies and therefore already have a larger amount of research published in OA platforms. For example, in the state of Michigan, the 2019–2020 state budget allocated \$441,400 (5.6%) of PBF based on research and development expenditures reported in their most recent Integrated Postsecondary Education Data System (IPEDS) report (Zielak & Sefton, 2020). More than half of the research and development allocation was awarded to the University of Michigan (UM) and another quarter was awarded to Michigan State University (MSU), leaving little incentive for the other six research universities. It is likely that UM and MSU researchers publish more research on OA platforms than researchers at the other six research universities. If the remaining twenty-three states include a metric for external monies in their PBF models, that metric might incentivize OA publishing.

OA policies might be most effective at the institutional level where the university and its faculty could negotiate policies addressing local tenure, promotion, and contract issues (AAUP, 2006, 2013). Harvard's policies are a case in point (President and Fellows of Harvard College, 2018). Harvard aggressively encourages faculty to deposit their publications in OA repositories and has a team of OA fellows who proactively assist faculty (Basken, 2016). Given decreasing enrollments and state funding, institutions may not be able to afford personnel who assist with OA initiatives. Universities could establish policies requiring faculty to grant their institutions nonexclusive rights to disseminate their works (AAUP, 2006; Denicola, 2006). However, this solution might threaten academic freedom (AAUP, 2006; Nelson, 2013). Incentivizing faculty to sign nonexclusive contracts with publishers would quickly increase the amount of freely available research (Denicola, 2006; Kimbrough & Gasaway, 2015). However, compliance might be difficult to

achieve. Universities could require research that is funded internally to be published in an OA journal or platform. Universities with strong faculty unions or a majority of disciplines adverse to OA initiatives might face more challenges when adopting OA policies.

The biggest challenges institutions face regarding OA publishing include funding, compliance, and populating institutional repositories. Individual researchers may not be able to afford APCs that average \$1,600 per article without institutional or grant support (Machovec, 2019). Budget pressures on university research offices and libraries also limit their ability to pay APCs. Large research universities, such as the UC system, have negotiated contracts with major publishers that reduce subscription costs, incorporate APC costs, and increase or maintain reading access (Ellis, 2018). However, smaller research universities do not have the negotiating power of large systems and cannot achieve these cost savings on their own. Ensuring that researchers comply with grant requirements to publicly publish their findings surprisingly falls on the institution and the researcher, not the granting agency (Suber, 2019). The National Institutes of Health's Public Access Compliance Monitor (US DHHS, 2013) allows institutions to check their researchers' compliance with the OA mandate. Requiring the researcher's university to enforce compliance shifts the burden from the funding agency to the researcher's institution, and neither can afford to fulfill the mandate. Creating and sustaining institutional repositories is also challenging. To increase faculty participation and heighten the impact of institutional repositories, Holter (2020) recommended universities and libraries to articulate their value, streamline and simplify submission processes, and find ways to connect institutional repositories regionally, if not nationally. The University of Michigan Library's (n.d.) [Deep Blue](#) repository provides a good example of how to articulate the value of archiving one's research. It outlines six benefits of participating and concludes with, "Your work: cited more, safe forever. Deep Blue makes it simple." Larger research institutions may be better poised to promote and support institutional repositories.

Faculty must be aware of university policies, state laws, and granting agency requirements impacting their research. Scholars, administrators, and librarians must continue to monitor OA trends, promote legitimate OA publications and platforms, create sustainable institutional repositories, and ensure compliance. OA laws, regulations, and policies tied to funding may be more effective in tipping the balance of publishing from commercial to open models. Librarians can be essential partners in enabling institutions to comply with external mandates and helping faculty navigate the increasing complexity of scholarly communications.

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