

Making Higher Education Pay for the Wall (of Knowledge):

How Privatizing Knowledge Inhibits Higher Education's Knowledge Creation & Dissemination

Mission

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Introduction

Each newly-produced piece of knowledge fits into a network of knowledge, linked through the tradition of citations. Academia's two-fold mission to create knowledge (research) and disseminate it (teach) assumes access to this network of present and past knowledge. Its assumed access is evident in that while tenure and promotion processes are often based upon publishing research, there exists no real language or stipulations addressing the limitations of accessing established knowledge (Chait, 2009). No tenure guidelines state something along the lines of "the limitations of access to knowledge will be considered in a faculty member's ability to produce meaningful scholarship."

By emphasizing the importance of publishing while assuming access, faculty and faculty-promotion structures externalized the considerations and costs of accessing the knowledge network to elsewhere; namely, academic libraries. For the last two centuries, an institution's academic library was the access point to the network of knowledge. Until the 1990s, most libraries' ability to aid faculty in finding relevant research had been confined to that which can be physically acquired and stored on the library's premises or what could be temporarily acquired through library networks and consortiums (Borgman, 2010; Crawford, W., & Gorman, M., 1995). Since the rise of the Internet in the 1990s, academic libraries shifted from knowledge-owners to knowledge gatekeepers as the analogue network of knowledge became almost-entirely digitized and moved into enclosed digital networks run by publishers and databases.

The digitization of knowledge should have been a great boon to academic libraries since digital storage dropped in cost by as much as 50% every two years while digital storage capacity

on computers grew exponentially over the last thirty years (Weinberger, 2014). Increasingly cheap and almost-limitless storage space would mean that each academic library could become a proverbial Library of Alexandria. Instead, knowledge digitalization has represented a drastic increase in costs. Between the 1997-1998 and 2011-2012 academic years, the average institutional expenditure for physical books and journals dropped from \$1,363,447 to \$776,070—a 43% decrease in spending—while the average expenditure for digital books and journals exploded from \$153,531 to \$1,617,241—a 1053% increase in costs--over the same period (National Center for Education Statistics, 2015). The Association of Research Libraries (ARL), which focuses specifically on libraries at research institutions, reports ongoing resource expenditures and library materials (the two categories that represent knowledge acquisition in the digital form) have risen in total 521% and 352% respectively between 1986 and 2015 (ARL Statistical Trends).

The absence of potential cost-savings for academic libraries and higher education originate in five converging forces. First, changes in copyright laws in the late 20th century impacted the ways in which knowledge, and particularly digital knowledge could be used by institutions and scholars (Sun & Baez, 2010). Second, in looking to maximize profits from such legal changes, academic publishers, particularly journal publishers, switched from an ownership model to an access model (Poynder, 2011). Third, for-profit publishers became the majority entities in academic publishing over the last twenty years, artificially inflating prices which could be used to acquire more journals (Larivière, et al, 2015). Fourth, the knowledge network constantly expands because of higher education's mission to create knowledge; this challenge predates knowledge digitization (Byrd, 1990). Fifth, for much of the 20th and 21st century,

scholars in most disciplines including higher education disengaged from the discussion around the repercussions for producing knowledge in a capitalist regime and knowledge economy.

The Five Force Explained

The first challenge consisted of legal changes throughout the 20th century, namely the Copyright Act of 1976, Digital Millennium Copyright Act (1996) and the Copyright Term Extension Act (1998). These laws lengthened the duration of ownership by publishers, (Sun & Baez, 2010) restricted how knowledge in digital form could be used (Band, 1998) and changed the fair use exception for scholars to a fair use defense (Baldwin, 2014).

The second challenge resulted from publishers capitalizing on these legal changes. Publishers switched their business model from selling products (journals and books) to an access model where institutions pay annually to access knowledge, often in the form of bundles (Poynder, 2011). Bundles consisted of a collected set of journals or ebooks that institutions would purchase at a supposedly lower rate than if they paid for individual subscriptions (though often including journals the institution may not actually want). Publishers offered more access to institutions but that access was more costly and temporary, unless continually renewed.

Not entirely unrelatedly, the third challenge arose as for-profit publishers began to squeeze maximum profit and acquire other journals. Soon, for-profit companies also became the majority of publishers within academic publishing (Larivière, et al, 2015). Though expenses were being lowered and publishers did not pay for the scholars to write or peer review the scholarship, for-profit publishers increased the costs of subscription rates by three-fold compared to nonprofit academic publishers (Dewatripont et al, 2007) as well as inflated prices of journals that were more frequently cited.

The fourth challenge related to the increasing cost of knowledge which represents a constant issue for higher education that existed before the digitalization of knowledge (Byrd, 1990). Knowledge digitization only amplifies the problem since it often reduces the time associated with physical print and allows for a quicker publishing environment (Weinberger, 2014).

The final challenge comes from within academia. A blindspot, intentional or otherwise, evolved among scholars to keep from questioning or challenging the problems of publishing. Because scholars were not directly footing the bill, conversations about the cost of knowledge have rarely arisen in the discourse of individual disciplines or the discipline of higher education (Willinsky, 2011). The two areas where the discussion has been significant since the 1990s is the two overlapping disciplines of scholarly communication and information science. But despite the many disciplines that critique capitalism and its corrosive tendencies, the question and implications of producing knowledge in a knowledge economy often seems absent. Even within higher education, the threats and challenges posed by academic capitalism, have yet to really consider the interwoven needs to create and access knowledge within an academic capitalist regime (Slaughter and Rhoades, 2004).

Knowledge Access Costs and Stratification

This knowledge system evokes part of Slaughter and Rhoades' (2004) academic capitalist regime. They present knowledge as "a raw material to be converted to products, processes, or service" and note that producers of knowledge (i.e. higher education) are inextricably linked in a global economy (p. 15). They argue that academia's autonomy as it relates to this global knowledge economy and the state is "fictive" and "less possible." (p. 15). In this regime,

institutions support and expect scholars to produce important knowledge in order to raise the institutions' esteem (and potential investment by the state or other global economic entities). However, scholars in pursuit of tenure and promotion freely give their scholarship to the publishers that their own institutions must buy back on the competitive market; more than fictive autonomy, this situation connotes an enslaved knowledge regime.

This publishing regime contributes to the further stratification of higher education since institutions with less money will inevitably have smaller budgets for libraries and therefore, less access to knowledge. A comprehensive survey of academic libraries in the US (McKendrick, 2011) found nearly 80% of academic libraries were navigating fiscal limitations by either reductions in staff training and subscriptions. Among the over 3,700 academic libraries in the U.S., about 1,100 institutions have total library budgets surpassing \$1 million. However, more than half, some 2000 academic libraries, operate on a budget under \$500,000 (ALA Library Fact Sheet 4, 2015). This disparity of budgets means that the increasing cost of access will impact those lower-tiered institutions more substantially since they lack the buying influence that comes with a larger budget nor the wiggle room to adjust to increased costs.

A good example of budget disparity among academic libraries can be found at three different institutions: Linn-Benton Community College, University of Massachusetts's Boston campus, and Harvard University. The 2014-2015 total budget for Linn-Benton was just above \$555,000 to run their library, which included journal subscriptions (NCES, 2014). In 2017, the University of Massachusetts had a total budget of \$2.8 million (down \$700,000 from the previous year) (Dixon, 2017). By contrast, the 2012 budget for Harvard for just journal subscriptions was \$3.5 million with total expenditures at just over \$177 million (Sample, 2012;

Spending by University Research Libraries, 2012-13, 2014). The ability to access knowledge and therefore contribute to the discipline are quite different at each institution and illustrate a stratification of knowledge access.

Research Problem

Higher education requires scholars to produce research but has largely ignored the signing away of ownership to academic publishers who make higher education pay repeated access costs. Thus, higher education pays to produce knowledge and pays again to access it. While knowledge continues to expand, academic library budgets face cuts or increases under 5% while access costs often rises annually above 5% (Bosch & Stephen, 2017; EBSCO, 2017). Since new research cannot be produced without looking at previous research, higher education and individual disciplines failure to consider the implications of publishing in a knowledge economy and publishers' monopolizing of knowledge through copyright acquisitions and access practices leaves institutions and disciplines beholden to publishers' whims and can result in institutions losing access to previously-accessible research, jeopardizing scholarship and its associative prestige. Such increasing restraints on knowledge access compromises institutional and disciplinary missions to produce and disseminate knowledge.

Given the centrality of knowledge in the mission of nearly every higher education institution, an increasing stranglehold on access will inevitably challenge each institution's ability to fulfill its mission. Therefore, this literature review will explore how the realms of institutions, academic libraries, and scholarly disciplines reconcile an ever-expanding knowledge base with an increasingly costly and privatized knowledge system that inhibits higher education from fulfilling their ability to produce and disseminate knowledge.

Loss of Access, Lawsuits, and Piracy: Where the Problem Currently Stands

The problem of knowledge access has not been substantively addressed within higher education with the exception of scholarly communications and information science disciplines. Yet, it is a problem that has ramifications for nearly all scholars and institutions that employ them. Currently, higher education is beginning to see the impact of knowledge access.

The shift to knowledge access and the increasing costs means that libraries hold a less permanent and stable knowledge base. They may have more access to knowledge than ever before but that lasts only as long as their institutions are willing to support the ever-increasing costs of bundles (Poydner, 2011). Already, institutions big and small have been deliberating giving up certain bundles as library budgets shrink while bundle costs continue to rise (Sample, 2012). In 2012, Director of Libraries and College Archives at the State University of New York at Potsdam, Jenica Rogers explained on her blog the decision process to leave the bundle offered by American Chemical Society due to costs (Rogers, 2012). That same year, the Harvard Library, with one of, if not the highest budget for library databases (at the time, \$3.5 million), sent a memo to its faculty warning about the impact of journal increases and beseeching faculty to publish their work in open-access venues. The memo explained that the current increasing prices would further compromise collections that were being impacted by the cost hikes (Sample, 2012).

The new power wielded by publishers have increased the need for librarians or institutional representatives to be better versed in copyright and fair use law as publishers are making it clear that they will be legally aggressive in when it comes to information sharing they believe compromises their ownership (Charbonneau & Priehs, 2014). One of the most prominent

and recent examples consisted of Georgia State University being sued by a handful of publishers for violations of copyright material used as part of electronic reserves within the institute's secured internal network (Jaycox, 2011). However, one most tragic case included Aaron Schwartz, a student at MIT who attempted to share millions of articles from the database, JSTOR. Eventually, Schwartz was charged with federal felonies as a result of JSTOR's legal pursuit and committed suicide before trial (Bombardieri, 2014).

Finally, there is the curious case of scholar piracy, exemplified best with Sci-Hub. This online database illegally collects research from publishers and databases to make research (over 64 million articles as of 2017) available to everyone across the world (Sci-Hub, 2017). Between September 2015 and February 2016, there were over 28 million downloads from the site, which included over seven hundred thousand downloads from within the United States (Rosenwald, 2016). Since its servers exist outside the United States, publishers have been unable to shut down the site but are becoming increasingly aggressive in its tactics to limit its use (Waddell, 2016). Millions of academic articles are being pirated because individuals are not able to access or afford the knowledge the higher education produces. When knowledge creators become knowledge pirates, the cracks in the current academic publishing regime are visible and the model becomes untenable.

Guiding questions

Given the problem of knowledge access in the the age of digitization and privatization of knowledge, the following questions will guide this literature review and provide the different areas of exploration for research:

- How has the scholarly communications and library science scholarship conceptualized the legal and technical changes of knowledge in the late 20th and early 21st century and the changes' impact on higher education's relationship to knowledge creation and access?
- How do academic libraries adjust to the impact of the changes to knowledge creation and access while still maintaining reasonable access for the institutions they serve?
- How are disciplines and institutions reconciling broader access to scholarship despite or beyond the restraints that academic publishing maintains in the digital era?

Question 1: Changes in Knowledge Access

The changes from knowledge ownership to knowledge access are best explored within the scholarship of library science and scholarly communication. This first question explores the transition to knowledge access through three areas: the legal context that encouraged publishers to shift to an access model, the predictions within scholarly communications and information science scholarship about where knowledge digitization is going, and how academic libraries and scholar communications experienced the shift to knowledge digitization and increasingly the knowledge access paradigm. For the first part of this section, the works by Sun and Baez (2009), Hirtle et al (2009), and Baldwin (2014) among others address the changing legal context of the 1990s in conjunction with its impact on scholarly communication because of both capitalism and globalization. For the second part of this section, the literature will focus on how information science and scholarly communications scholarship attempt to predict the forthcoming changes and impact of knowledge digitization with particular attention to resistance to publisher cost-increases (Bergstrom, 2001), restructuring of the entire scholarly communications structure (Webster, 2000), and a shift away from commercial publishers within academic publishing

(Newtwich, 2001). In the final part of this section, the research highlights how scholars have conceptualized the change to digitalized knowledge for libraries. For instance, some scholars have seen the change as altering the academic library mission for how librarians work differently with faculty and students (Anderson, 2011; Borrego & Ollé, 2010; Fisher, 2008; Ross & Sennyey, 2008), while others studying academic libraries identify new practices that affect librarians' and scholars' view towards research and how the two groups work together (Borgman, 2007; Rowlands, 2007).

Question 2: Emerging Practices

The first research area focused on how the shift to knowledge access happened and how scholars made sense of it. This area of literature more directly considers how the changes augmented the practices of academic libraries with particular attention to the fiscal challenges brought about by increased access-costs and the rise of for-profit academic publishers, how cost increases have changed and augmented library services, and best practices institutions and their libraries used in order to maintain the maximum amount of access to knowledge. The first section initially discusses briefly how scholarly communications evolved into the current academic publishing model (Regazzi, 2015), before exploring the economics of academic publishing and its imbalance power dynamic with academia (Bergstrom et al 2001, 2004, 2004a, 2010; McCabe et al, 2004, 2004a, 2004b, 2006, 2007) and how this imbalance impacted the costs and pricing strategies for publishers while also increasingly shifting towards for-profit publishers (Larivière et al, 2015). The second section discusses information science scholarship that explores the impact of cost increases and how academic libraries adjust through a mixture of cost-cutting in other areas (McCaslin, 2010) and extracting more work from staff as less staff are

often cut while access is kept (Leuzinger, 2013). The final section in this area explores emerging practices for libraries such as more long-term planning as libraries enter into long-term access contracts with publishers (Robinson, 2017), how librarians can use data analytics from knowledge digitization to help determine the best use of money (Baker, 2008), and leveraging user statistics to advocate to funders for more financial support (Bucknell, 2008).

Question 3: Alternative Paths

The final area of this literature review examines how some scholars, professional association, disciplines, and institutions are remediating their relationship and responsibilities to create knowledge within the current exploitative publishing regime. The first section explores the rise of institutional or consortium repositories for scholars to place copies of their work for institutions to access, their importance, and their usage (Lynch, 2003; Lynch & Gibbons, 2004; Lynch & Lippincott 2005; Crow, 2002). The second section initially addresses the rise of the Open Movement, a movement that uses alternative licensing (known as Creative Commons licenses) to make research more freely available than traditionally published. From there, this section investigates the scholarship that examines the ways in which open publishers, open databases, and funding-mandates for open-access outcomes are challenging and changing traditional publisher practices as well as the literature on their limitations (Spezi et al, 2016; Suber, 2009; Suber, 2012; Wilinsky, 2001, 2002, 2004, 2005, 2005a, 2005b, 2006, 2006a, 2006b, 2007, 2008). While librarians, scholarly communication scholars, and other scholars have been engaged in the discussion of open research, many other disciplines are less aware or unaware of the growing restrictions on knowledge access. Therefore, this section will explore what other

pockets of academia are initiating conversations about open research and why (Berbusse, 2013; Bacevic & Muellerleile, 2017; Suber, 2009).

Significance

The conversation of knowledge access is happening but is largely absent in the field of higher education. Though scholarship does exist on understanding knowledge creation as part of higher education's contributions, these conversations focus on the support of faculty, the types of research, and the value of such research (Kezar & Burkhardt, 2015; Rhoten & Calhoun, 2011; Stanton, 2012; O'Meara, 2015). Despite knowledge being higher education's most tangible good, higher education scholarship does not question its role in publishing in a knowledge economy that privatizes knowledge. An awareness and reconsideration of its role in the knowledge economy might change how higher education engages with publishing and understanding its knowledge creation as a public good (i.e. accessible to all).

As knowledge becomes increasingly costly and institutions face other financial challenges, they will need to consider the price associated with perpetuating the current knowledge regime. This literature review will contextualize just how the challenge of knowledge access has impacted higher education as a whole. Not only does this research have implications for librarians, it also may help administrators consider the priorities of the institution and how the cost of knowledge in the current publishing market may augment or limit the full execution of those priorities.

The relevance to scholars is equally important as inaccessible knowledge raises questions about their ability to produce knowledge and their roles in perpetuating this knowledge regime. Costly knowledge limits that which scholars can potentially find, use, or personally afford for

research at lower-tiered institutions and therefore, limits scholars' abilities to contribute to their disciplines. In turn, this limits their personal and institutional prestige, which limits the opportunities for funding or promotion for the individual or the institution.

Students, too, have less access to the cutting-edge research of their disciplines in lower-tier institutions, making it harder for them to be as versed in their disciplines. Such limitations may impact their potential to move from undergraduate to graduate programs and eventually in professional realms where research proficiency and depth are necessary and evaluated professional skills (for careers in academia, laboratories, think-tanks, etc.).

However, the implications go much further than that; society is impacted by the artificially-high cost of knowledge. With much of the research of the 20th and early 21st century secured behind paywalls, access to that knowledge comes not at a singular price, but an exponentially repeated price, that individual institutions, companies, and the taxpayer pay again and again. Given that two-thirds of U.S. higher education research is funded with taxpayers' dollars, the finished product (the article or book) is usually put behind the paywall (University Science & Engineering R&D Funding by Source, 1990-2013). Thus, individual colleges, companies, and organizations pay billions of dollars (Ware & Mabe, 2015) annually for the same knowledge that they have already paid to produce. If higher education can find a way to resolve this profiteering of knowledge, then hospitals, law firms, biomedical companies, independent scholars, and everyone who seeks out knowledge may also reap significant financial savings and intellectual opportunities.

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