Chapter 3
Supporting Digital Information Literacy in the Age of Open Access:
Considerations for Online Course Design

Sarah Felber

University of Maryland Global Campus, USA

Pascal Roubides

University of Maryland Global Campus, USA

ABSTRACT

In this chapter, the authors aim to inform the audience about the issues pertaining to access to educational resources, with a focus on open access; how to access such sources; ways of integrating principles of information literacy into the entire educational experience; and the potential of open access sources in providing much needed, affordable information literacy to all knowledge seekers, especially in academic endeavors. The issue of information literacy and open access is defined and explored, with a bias toward practical implementation and impact in the academic setting, culminating in hands-on recommendations for academic professionals.

INTRODUCTION

Advances in technology have brought about a plethora of benefits in many fields of human endeavor, including in education and learning. Following the trend to infuse more technology in educational settings, educational research has shifted its focus from previously dominant philosophies (behaviorism and cognitivism) to more encompassing ideology (constructivism and connectivism) that promotes the use of technology in creating widely accessible and socially inclusive ubiquitous learning experiences. Based on such changes in the perceptions of how learning takes place, and how content necessary for learning can or should be accessed, different pathways for designing and delivering information have emerged.

With the advent of online platforms specifically created for managing and sharing knowledge and information in the new era, the expected increase in using connected networks for delivering and accessing information has been ongoing for almost two decades. Along with that new paradigm, shifts in the way content is designed and delivered as well as theories supporting these ideas have been constant. Moving rapidly from e-learning to m-learning to ubiquitous learning, both content and access to it seem to have become, in some ways, a hindrance to achieving information literacy in an otherwise digitally connected world.

Regardless of any technologies or their benefits to learning, creating content and enabling prospective learners' access to it has and shall always remain a necessity. Content for the most part has been the mainstay of large commercial publishing companies, and costs of educational and scholarly materials have been on the rise for several decades. Education costs in the United States, for instance, have had a multi-fold increase against the rate of inflation since the early 1980s (Roubides, 2018). New approaches in the development and dissemination of educational and scholarly content have been the goal of new movements, such as the open educational resources (OER) and open access scholarship movements, which contribute to a ubiquitous learning environment by allowing more people access to content without limitations in time and space.

Promotion of and interest in open content, whether in the form of open access scholarship, which is usually funded by public institutions, hence taxpayer money, or in the form of OER, which can be used to develop formal or informal, academic and non-academic learning experiences, have been growing in recent years. While teaching and learning issues surrounding OER have been garnering increased attention (see, e.g. Colvard, Watson, & Park, 2018; Lawrence & Lester, 2018; Winitsky-Stephens & Pickavance, 2018), the spotlight being shined on open access of scholarship (henceforth, *open access*) has often focused on economic viability (see, e.g. Frankland & Ray, 2017; Jack, 2017) and on the perspectives of the producers of such scholarship (see, e.g. Rowley, Johnson, Sbaffi, Frass, & Devine, 2017; Watson, 2018) with little attention given to the impact on learners as consumers of information products.

This chapter will discuss considerations for online course designers who seek to assist learners in meeting the digital information literacy demands created by open access. Online course designers in this context may include anyone who works alone or as part of an online course design team, from instructional designers to subject matter experts or instructors. The chapter includes trends in open access publishing of which online course designers should be aware; discusses of the role of libraries in helping learners obtain open access materials; and proposes the use of the Association of College & Research Libraries' Framework for Information Literacy for Higher Education as a lens for understanding what concepts are important to learners when working with open access materials. The chapter culminates in a summary of recommendations for course designers.

DIGITAL INFORMATION LITERACY AND OPEN ACCESS: AN OVERVIEW

Generally speaking, information literacy may be one of the most pressing issues of modern societies in the quest to nurture an informed and educated populace. The rapid expansion of the Internet's reach and coverage has been a boon for the availability of information—but also, unfortunately, for the availability of misinformation. Though educators have long recognized the importance of information literacy, public attention on this issue in the United States reached fever pitch during and after the 2016 presidential election, when accusations of "fake news" took the spotlight.

Since the introduction of the concept of information literacy half a century ago, instruction in this area has become increasingly important at all levels of the educational spectrum. Defined as the ability to locate, evaluate, and use appropriate information for a given purpose, information literacy may be expressly taught in academic writing courses as well as in other subject areas, as learners are guided to evaluate sources for authority, reliability, and relevance. In formal post-secondary learning in particular, part of this instruction is often focused on articles found in academic journals, sources to which learners may have had little to no prior exposure, but that are held up as a higher standard of being able to provide credible, in-depth information.

As consumers of information increasingly find that information—including scholarly sources—in electronic form, the term *digital literacy* has often been used when discussing the skills and abilities needed to navigate information created, stored, and accessed digitally. Given competing views of the relationship between information literacy and digital literacy (Cordell, 2013; Jarson, 2015), in this chapter, the term *digital information literacy* is used to refer to information literacy skills for a digitally connected world.

Facilitated by the affordances of digital technologies, the open access movement has arisen largely in response to the concern voiced by many in academia about handing over control of their intellectual work to for-profit enterprises (Maternowsky, 2009) and the view of knowledge as a public good (Verschraegen & Schiltz, 2007). The cost of such sources of information and knowledge from commercial publishers has been growing at a rate far exceeding the general rate of inflation, and despite early expectations, digitization has not eased the financial burden (Wenzler, 2017). A recent survey of the costs of academic journals showed that journals in many disciplines had average annual journal subscription prices of over $2000 (Bosch & Henderson, 2016). At these prices, libraries are forced to limit their collections, and even a single subscription is out of reach for many individual knowledge seekers.

The public funding of scholarly work further strengthens arguments for open access (Kimbraugh & Gasaway, 2016). In many cases, the public must buy from commercial publishers the same research that its own tax contributions have funded through grants and salaries at public institutions. As concern for the cost and fairness of access grows, so does interest in publishing scholarly work through open-access venues. Increasingly, funding agencies require that research output they fund be published in open access venues.

The term *open access* refers to the ability of the public to freely access and use materials. The influential Budapest Open Access Initiative (2002) defines open access as

free availability on the public internet, permitting any users to read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. (para. 3)

Their definition alludes to the affordances of internet technology to make materials accessible, and it requires the granting of permission for a broad range of uses, thereby distinguishing open access from a model that simply makes material available on public library shelves. Though the free nature of open access materials generally receives the most attention, an interesting aspect of the definition is that it relies on users' ability to reuse open access materials, an issue that will be revisited later in this chapter.

It is important to note, as well, that various types of materials can be open. Though the term *open access* on its own is generally reserved for research output, like journal articles and monographs, OERs are also becoming more popular and important in the instructional design and delivery of academic courses, especially in the online environment. These resources include textbooks, lesson plans, media, software, and even full academic courses. Also of interest is the growth of serious academic dialogue on blogs and social networks. Once viewed as being of little worth for academics and research, these venues are now entering the academic and scholarly conversation, amid the climate of online openness. The work of distance education researcher Tony Bates provides a nice example of both OERs and scholarly conversation via blogging. During the process of writing his open textbook, *Teaching in a Digital Age*, Bates (2015) posted chapter drafts on his blog (http://www.tonybates.ca/), generating public conversation among the very scholars whose work his book covered, as well as other blog visitors. Though this chapter focuses primarily on scholarly publication, similar questions can be raised about awareness, discovery, and appropriate use of OERs, blogs, and the various other open materials that are bursting onto the scene.

The proliferation of open-access scholarly materials is clearly a step in the right direction for making high-quality sources of information available to and usable by all, for ubiquitous learning experiences, but it also places increased demands on learners for digital information literacy. Open access means that knowledge seekers have more places to look for sources and additional issues to consider when evaluating sources. Learners must be guided in the identification and evaluation of sources, as selecting appropriate sources will be crucial both within and beyond the virtual classroom. Yet learning professionals may, themselves, be in the process of navigating the rapidly changing landscapes of open access and digital information literacy. Accordingly, the next section describes trends in open access publishing of which online course designers should be aware.

SCHOLARLY SOURCES GOING OPEN

At the most fundamental level, online course designers who wish to help learners make use of scholarly sources must know where to find them. Open access is bringing changes to the nature of this task, making scholarly sources more ubiquitous; this section describes these changes.

The 21st century has seen online overtake print as the primary way to access scholarly sources (Marks & Janke, 2012; Prabha, 2007). The digitization of resources has many advantages, among them the ability of users to access resources at any time and any place, and of multiple users to access a resource simultaneously. But digitization may also present a barrier to access, in that print materials on library shelves tend to be publicly available, whereas digital materials accessed through library databases tend to be password protected, to protect the financial interests of publishers. Accessing scholarly journals without the support of a library is also not a viable option for most; despite early speculation that digitization would reduce costs, that result has not been obtained (Marks & Janke, 2012). Digitization without openness, therefore, is limited in its ability to provide content to anyone, anywhere, at any time.

Traditional information literacy instruction may, in fact, reinforce the idea that scholarly content is not fully available to all. This instruction may rightly stress the importance of scholarly journal articles based on the qualifications of their authors, the degree of reliability supported by the peer review process, their depth of information, and their ability to bring learners into the scholarly conversation of a field. Part of this instruction often includes a sharp distinction between scholarly articles sourced through a library database, and websites or items found on the "free web." Items on the free web, learners are taught, have to be more carefully examined to determine their degree of authority, reliability, and coverage. In essence, the message is that the "best" sources are not likely to be free.

There has been pushback against this tendency for instructors to emphasize categorization of sources by where and how they are published, even independent of the open access movement. Wiebe (2012) expresses frustration as a librarian working with students who are given assignments with requirements for certain types of sources in certain numbers (e.g. at least two scholarly journal articles, no more than one website, mix of print and online sources). Wiebe argues that this "checklist" approach stifles the critical thinking required to assess sources based on their individual merits and appropriateness for a particular assignment and topic.

The open access movement, while making scholarship more universally available, also makes learners' task of identifying appropriate scholarly sources more challenging by changing much of what used to be true about where to find scholarly work. To be sure, many articles are still published in traditional commercial journals (also called toll-access journals) and accessed through library databases or, for a fee, on journal websites. Increasingly however, scholars, unhappy with ceding their intellectual property rights to publishers, are turning to other models and publishing in other venues. Scholarly sources can be found in more places than ever before.

Self-Archive, Green, Gold, Platinum

One option for making scholarly work open access is to publish in a toll-access journal, but self-archive the work, making it available to the public for free. This method, called green open access, requires that the copyright agreement with the journal publisher allow for self-archiving. Authors may self-archive in a variety of ways. These can include depositing works in institutional repositories, created by institutions to house the work of their academic communities, or in disciplinary repositories, created by scholars or organizations within a discipline for the same purpose. Authors may also choose to place their work on personal websites or social networking sites like academia.edu or ResearchGate.

A second alternative to toll-access journals is gold-access publishing. In the gold-access model, journals publish works that are freely accessible to the public. The cost of publishing in gold open access journals may be covered by article processing fees charged to the author, who can sometimes pass on expenses to their employing or grant-funding institutions (Solomon & Björk, 2012). Some journals publish only open-access articles, while others take a hybrid approach, giving authors the choice of toll access publishing or open access publishing for a fee.

Platinum open access is now sometimes being recognized as a different publishing model from gold open access. In this view, the term "gold open access" refers only to journals with author processing charges for open access, while "platinum open access" is used for journals that are completely open access without author processing charges (Beall, 2012). Funding for platinum open access journals may come from a sponsoring foundation or agency.

Peer Review

A key feature signaling reliability of scholarly work is peer review, making it important to understand the role of peer review in open access publishing. Typically, institutional and disciplinary repositories have no peer review requirements; work archived there may include pre-prints or post-prints of journal articles that have undergone the peer review process, or they may be unreviewed (although new models in open peer review are emerging—see Pandelis et al., 2017). The same goes, of course, for articles posted on personal websites and social networking sites. Open access journals typically incorporate peer review, but the character of the peer review process can vary widely (Wicherts, 2016); readers unfamiliar with a particular journal should be prepared to investigate its publishing standards.

Of particular concern are the so-called "pay-to-publish" journals. Though many open access journals charge article processing fees to cover publishing expenses, the term "pay-to-publish" is generally reserved for journals with predatory practices. These journals have low standards of quality, making publishing decisions based on receipt of a fee. They may have the appearance of a peer review process, but this process is either non-existent or not of the rigor that one would expect from a well-respected journal (Harzing, & Adler, 2016). It can be difficult to identify a pay-to-publish or predatory journal, but some authors, including Harzing and Adler (2016) and Shamseer, et al. (2017) have put forth criteria for consideration.

Awareness

Those involved in the course design process certainly cannot help guide learners in an understanding of open access unless they are aware of it themselves. A number of studies have found limited awareness of open access publishing on the part of college and university faculty, though there is variation from one location or discipline to another, and overall awareness seems to be increasing. In a 2007 University of California survey, almost two thirds of faculty respondents reported that they were unaware of, or had little knowledge about, open access journals (University of California, 2007). Several years later, in a study of business faculty, Hahn and Wyatt (2014) found that nearly 50% were unaware of open access journals in their fields. The type of institution can play a role as well. Kocken and Wical (2013) report on their survey of faculty at a small liberal arts university, in which over 50% were unaware of open access journals in their fields, and in fact, over 20% did not have even a basic understanding of what open access was. More encouragingly, in a study of Texas A&M University faculty across disciplines, Yang and Li (2015) found that 88% of faculty were aware of an open access journal in their field. Xia's (2010) meta-analysis determined that, overall, faculty awareness of open access has been increasing since the mid-1990s and was expected to continue increasing.

Instructional designers and librarians involved in course design may wish to explore open access resources with faculty and subject matter experts, as the availability of open access resources and awareness level of team members cannot be taken for granted.

Course designers' awareness is the first step in helping learners build information literacy as open access grows. In addition, online libraries play a very important role in helping learners work with the variety of sources that are available. The role of libraries is the subject of the next section.

THE ROLE OF LIBRARIES WHEN SCHOLARLY SOURCES GO OPEN

Online course designers should consider what role their institutional library might play in supporting learners' use of open access materials and development of digital information literacy. Given that a major role of libraries in the toll-access model is to arrange for the purchase of materials and supply them to users, one might ask whether the open access movement could, at some point, contribute to the obsolescence of libraries. At this point, that appears unlikely. Open access, in fact, presents new and interesting challenges in information management, and online libraries especially have a strong role to play in helping online instructors and learners identify and obtain appropriate resources. These components involved in bringing to users the materials they need have been called discovery, "the process of finding things on a topic," and fulfillment, "the process of acquiring things that have been discovered" (Fons, 2016). Martin (2010) calls libraries' efforts to help with the discovery and fulfillment of open access materials "a value-added service for patrons." Though perhaps the aforementioned "patrons" (library users) could get to these materials on their own, libraries can make the process faster and easier, while also providing education on working with open access sources.

There are various discovery methods that individuals try on their own when looking for information on a given topic. For many learners, the most common tool—and maybe even the only tool—used is the Google search engine (Connaway, White, Lanclos, & Le Cornu, 2013; Marks & Janke, 2012). When open access materials are discovered in this way, the discovery process can sometimes lead seamlessly to fulfillment, without the intervention of a library. But evaluation and selection of sources remain an important part of what the user must accomplish, and libraries have a role to play here.

Although Google is often an effective discovery tool, appearance of a source in Google search results depends upon a variety of factors. Google helps this process along through its indexation of scholarly material in Google Scholar, and through guidance for improving the likelihood that open access materials will appear in search results (Google Scholar, n.d.), but if open access databases are not in compliance with the guidelines, it may be more difficult for users to find open access materials via Google search. Libraries can provide another avenue for discovering these items by identifying good sources of open access materials and including them among the resources learners can find through the online library portal. There are multiple ways that this can occur. Many of the databases to which libraries subscribe, such as ScienceDirect, index some journals that have moved to an open access model. Libraries can also link to open access collections like PubMed Central. In addition, libraries can elect to facilitate search of open access databases through aggregators like EBSCO Discovery Service, which allow interested readers or researchers to search across multiple databases at once. Overall, assisting in discovery of open access materials is a challenge for libraries, which employ a variety of strategies. In the future, more consistent use of metadata on open access materials could help libraries with this task (Bonn, 2015; Bulock, Hosburgh, & Mann, 2015).

Discovery and fulfillment of open access resources is often one integrated process, but this is not always the case. Sometimes users discover citation information only, and still need to figure out how to access the resource. With open access materials being found in so many different locations, including journal websites, institutional and disciplinary repositories, personal websites, and social networking sites, fulfillment can be a challenge. Though all readers can access these materials (given access to the internet), not all have the ability or inclination to locate them.

Libraries' use of link resolvers has been one way to address the problem of fulfillment. Link resolvers are tools that take as input certain information about a source and use that information to match a target URL, which may change over time (Younghusband, 2005). Libraries can include databases of open access materials among those targeted by their link resolvers, thereby easing the task of fulfillment for their users.

One especially notable use of link resolvers is with Google Scholar, which combines the ease of a Google search with a focus on scholarly sources. By using a link resolver integrated with Google Scholar, libraries can help interested readers or researchers to quickly retrieve sources found through Google scholar, whether open access or non-open library holdings.

Libraries also assist with fulfillment by offering interlibrary loan (ILL) services. Through ILL, libraries obtain and deliver materials that are not in their own holdings. Libraries have been observing a contraction in ILL requests in recent years, a change due, in part, to the growth of open access (McGrath, 2015). However, so far ILL remains relevant and is even used in connection with open access. McGrath (2014) responds to the idea that the expansion of open access will lead to the death of ILL, listing a number or reasons that ILL will survive. One reason is that green open access publishing often involves an embargo period, a waiting period between publication and the author's ability to self-archive. If the journal in question is not in the library's holdings, then ILL requests to access articles during the embargo period can be made. Citing Bennett (2012), McGrath observes that libraries may even choose not to subscribe to certain green open access journals, instead preferring to rely on ILL during the embargo period, after which those interested can be referred to the self-archived copy of an article. Another reason McGrath gives for the use of ILL with open access materials is that users may have difficulty finding what they are looking for. Baich (2015) echoes this point, arguing that users are willing to forego the speed of locating open access materials themselves for the ease and convenience of making ILL requests. She found that borrowing requests for open access materials at a large public university increased every year from 2010 to 2013.

While learners may consult libraries for assistance, they can also be expected to do much of their searching on their own. It is especially important that they develop the ability to do so in preparation for lifelong learning experiences that may occur without institutional support. Course designers may find value in using the Framework for Information Literacy for Higher Education as a lens for examining the digital information literacy concepts that will be important for learners to master and take with them beyond their formal education.

OPEN ACCESS THROUGH THE LENS OF THE ACRL FRAMEWORK

In 2015, the Association of College & Research Libraries (ACRL) introduced its Framework for Information Literacy for Higher Education, replacing its previous guidance from the year 2000. The new framework focuses on integrating principles of information literacy into the entire educational experience, with the learner's critical thinking and inquiry as prominent aspects of the framework.

For course designers seeking to develop learners' digital information literacy, the framework can provide a guide to the concepts that will be important for learners in working with open access materials. They can thus help learners prepare to develop the related dispositions and engage in the related practices

in lifelong ubiquitous learning experiences. The framework is presented as six frames, each including a core concept along with related knowledge practices and dispositions, with four having clear relevance to working with open access materials.

Authority is Constructed and Contextual

This frame discusses the importance of understanding what leads to the recognition of authority within a given domain. Connections can be found between open access and several of the knowledge practices in this frame:

- Learners should "use research tools and indicators of authority to determine the credibility of sources, understanding the elements that might temper this credibility" (ACRL, 2015, p. 4). When searching a library database, it is often possible for a learner to limit search results to scholarly journal articles. Open access materials, however, are often located and accessed outside of library databases, requiring other means to determine authority and credibility.
- Learners should "recognize that authoritative content may be packaged formally or informally and may include sources of all media types" (ACRL, 2015, p. 4). This practice suggests a questioning of the very system by which academia traditionally measures the value of scholarly work. Open access represents just one way in which authors can step outside the conventional expectations of scholarship. Learners may be encouraged to consider whether and how the dominant publishing model lends value to scholarly material. (For related discussion, see Beilin, 2015.)
- Learners should "understand the increasingly social nature of the information ecosystem where authorities actively connect with one another and sources develop over time" (ACRL, 2015, p. 4). The climate of openness has encouraged ongoing and public idea exchange and knowledge construction among scholars, for example as in blogs, as previously discussed. Learners should recognize that conversations among experts may be encountered on the open web, and recognize the relationship between these conversations and peer-reviewed, published work.

The issue of developing sources over time leads directly to the next core concept of the framework.

Information Creation as a Process

This second frame relates to the understanding that sources are created through varying processes, and that some processes may be better aligned with particular information needs than others. Two knowledge practices stand out as particularly relevant to open access:

- Learners should "articulate the traditional and emerging processes of information creation and dissemination in a particular discipline" (ACRL, 2015, p. 5). Open access is a driving force in new processes for creating and disseminating information.
- Learners should "recognize the implications of information formats that contain static or dynamic information" (ACRL, 2015, p. 5). Whereas traditionally published articles are static, some types of open access materials are dynamic in their content or availability. For example, authors may post papers online before publication, remove them during the peer review process, and later put up post-prints in an open access format.

Information Has Value

The connection here to open access is that it is precisely because of the value of information that access to it is important. It can be difficult to discern the value of various information sources when there is so much, and such varied, freely available information. Several of the knowledge practices in this frame have clear connections with open access:

- Learners should "understand that intellectual property is a legal and social construct that varies by culture" (ACRL, 2015, p. 6). Publishing practices are central to the question of who controls access to and use of information resources.
- Learners should "articulate the purpose and distinguishing characteristics of copyright, fair use, open access, and the public domain" (ACRL, 2015, p. 6). This is the one direct mention of open access in the framework. The ACRL recognizes that open access is a significant part of the information landscape and that learners should be aware of its existence and features.
- Learners should "recognize issues of access or lack of access to information sources" (ACRL, 2015, p. 6). When attending a school that has a library with access to full text databases and interlibrary loan services, learners have privileged access to scholarly information. By recognizing this, they can learn the value and importance of open access.

Searching as Strategic Exploration

The idea here is that learners must develop the skills to find the information they need – using a process of discovery to find sources on a topic and to explore beyond their initial ideas on a topic. This last portion of the ACRL framework breaks the discovery process into component skills, and connections are evident between several of these skills and open access:

- Learners should "match information needs and search strategies to appropriate search tools" (ACRL, 2015, p. 9). As we've seen, open access has the effect of broadening the range of search tools for scholarly materials. While library databases have long been recognized as a preferred tool for this purpose, the increase in open access has brought with it increased usefulness for alternate strategies, including use of Google Scholar and other search engines.
- Learners should "understand how information systems (i.e., collections of recorded information) are organized in order to access relevant information" (ACRL, 2015, p. 9). Lower-level learners can first be introduced to the idea of articles published in journals and indexed in databases, as well as open access articles collected in various online repositories. As learners move into more advanced studies, they become familiar with the particular journals, databases, and repositories crucial to their fields of study.
- Learners should "use different types of searching language (e.g., controlled vocabulary, keywords, natural language) appropriately" (ACRL, 2015, p. 9). Learners are most likely accustomed to using something akin to natural language search when using Google, and they are taught specialized search techniques, such as keywords and Boolean operators, when searching library databases. To maximize their success in locating open access sources via Google Scholar and other open search tools, they may need to apply many of the same specialized search techniques used with library databases.

So far, the focus has been on how learners locate, evaluate, and understand information, but learners are also users and emerging creators of information. Thus, questions of copyright and reuse are important, and these are issues that are deeply intertwined with open access. All widely used definitions of open access, including that of the Budapest Open Access Initiative (2002), specify that a strict definition of open access requires materials not only to be freely accessible, but also to be freely available for copying and reuse. Many authors license their open access materials with Creative Commons or other licenses that guarantee reuse, but the presence or absence of reuse restrictions is not always so clear. Some authors may release their work without specifying whether reuse restrictions apply, and some publishers claiming to offer open access do, in fact, place restrictions on reuse (Hrynaszkiewicz & Cockerill, 2012). Though it may be difficult to guide learners through this issue, exploring the ambiguities of reuse together with learners is one way of bringing them into the fold of current scholarly conversation.

SUMMARY OF RECOMMENDATIONS FOR COURSE DESIGNERS

This section summarizes recommendations for the design of online course designers that support digital information literacy with consideration for open access.

Join Forces With the Library

Course designers should maintain a relationship with their institution's library and understand the library's approach to helping users work with open access materials. An institutional library offers crucial support, not only for learners, but for course designers as well. Librarians are typically more than willing to work with course designers on their own understanding of resources and on developing ways to work with learners. Course designers can use this list of questions as a starting point for developing and maintaining a productive relationship with the library:

- Is there a library liaison for my department, and if so, who is it?
- In what ways does the library work with learners to promote (digital) information literacy? Is there a library course for learners? Does my institution use embedded librarians? Are there online tutorials to help learners find and evaluate sources?
- In what ways does the library work with course designers and instructors to promote (digital) information literacy? Are there workshops available?
- How does the library support users in finding open access materials? Are open access databases searchable through the online library portal?

Stay Informed

As discussed above, awareness of open access, though increasing, remains variable. It is important for course designers to cultivate their own awareness of issues surrounding open access, both general and discipline-specific.

Course designers and other academic personnel can cultivate their own awareness of open access by following higher education media sources like *Inside Higher Ed* (https://www.insidehighered.com) and *The Chronicle of Higher Education* (http://www.chronicle.com), each of which publishes frequent news and commentary about open access and other pertinent issues. They can also participate in workshops and webinars offered by their institutions' libraries or by outside organizations.

In addition to maintaining general knowledge about open access, course designers can also build the knowledge and awareness they share with learners by keeping abreast of publishing trends and attitudes toward open access in the disciplines for which they design courses. The role and perception of open access can vary widely from one discipline to another; understanding the climate for open access in one's discipline is part of expertise in the discipline's knowledge practices. The examples below briefly illustrate some of the diversity that is found in the open access landscapes of various disciplines:

Chemistry

Many science fields have been leaders in open access, but chemistry has somewhat lagged behind other fields like biology and physics in this regard (Wilson & Humphrey, 2017). Chemistry publications come with some of the highest subscription costs (Bosch & Henderson, 2016), making open access particularly important. In addition, agencies funding research may require open access. For example, the National Institutes of Health (NIH) Public Access Policy of 2008 specifies open access requirements for federally funded research (Pence & Losoff, 2011), and the Bill & Melinda Gates Foundation has strict open access requirements for its funded research (Bill & Melinda Gates Foundation, 2017). Recent years have seen several chemistry journals move to open access models; while some of these show promise as well-respected publications, reputation and impact factor of open access journals in comparison to traditional toll access journals remains a concern (Wilson & Humphrey, 2017).

Linguistics

The field of linguistics has experienced a forceful move into open access publishing during the 21st century. Grassroots efforts by linguists have strongly supported open access publishing, and prominent journals and organizations have taken corresponding action. The professional organization Linguistic Society of America (LSA) has made changes to its publishing practices, introducing a new platinum open access journal and meeting green open access standards for its other publications (LSA, 2013). In another notable move, the editorial board of the journal *Lingua* resigned en masse after a disagreement with the publisher, Elsevier, about open access policies (Wexler, 2015). This is an interesting situation because Elsevier was running *Lingua* as a hybrid open access journal with article processing fees (APCs) charged to authors. Linguists are less likely to have access to funding that covers APCs than authors in the hard sciences, making Elsevier's open access option out of reach for many. After their resignation, the former editorial board of Lingua went on to found a new platinum open access journal, *Glossa*. The commitment of these editors to open access has led to the exploration of alternative funding mechanisms so that high-quality research can be freely disseminated and used without cost to authors.

Business

As noted earlier, Hahn and Wyatt reported in 2014 that nearly 50% of business faculty were unaware of open access journals in their disciplines. Of those who were aware of open access journals, many did not want to publish in those venues, citing their lack of prestige (Hahn & Wyatt, 2014). This situation highlights one of the major issues in open access that every discipline has to address to some degree: The value of open access publishing is dependent upon the willingness of scholars to participate in an open access system, while scholars' willingness depends upon the perceived value of open access publishing. It is not surprising, then, that movement towards open access can sometimes be slow and difficult, as it depends on a shift of the ethos of a field.

Encourage Critical Thinking About Sources

The new information landscape demands a redoubling of efforts to guide learners in evaluating sources found both with and without the assistance of library tools.

Georgas (2015) found that, when asked to find any source on a topic, undergraduates are more likely to come up with a high-quality scholarly source using a library search tool than using Google. However, with more specific direction to find a scholarly article, there is a smaller gap in the quality of what they find using the two search tools (Georgas, 2015). Learners should therefore be supported in searching for and evaluating sources on the open web, with emphasis on the type of source that is most appropriate for the task at hand.

This kind of guidance has to go beyond surface characteristics of sources like publication types and domain names. For example, we have seen that blogs, though they have sometimes been dismissed wholesale as unreliable sources, are now emerging as a relevant part of scholarly conversation. It is now even possible to find blog posts being referenced in peer-reviewed scholarly literature. (For instance, see Prinsloo and Slade (2014), who refer to a post from Audrey Watters's blog "Hack Education.") At the same time, what appears to be a legitimate journal article could be published by a predatory journal without an effective peer review process. Teaching learners ways to critically evaluate all of their sources is more important now than ever.

Learners may have been taught at some point that certain domain names indicate reliable sources. They may believe, for example, that .edu, .gov, and .org indicate good sources and .com indicates a poor source. This is another area where learners can be prompted to deepen their critical thinking about sources, considering the authorship of sources, regardless of their internet domains, and the biases and other limitations that may influence sources.

There are many online sources that course designers can use to develop creative lessons on evaluating Internet-based sources. One of these, which is suitable for instruction at lower educational levels but that could also be used at the college/university level, is "The Pacific Northwest Tree Octopus" (http://zapatopi.net/treeoctopus), a site about a completely fictitious endangered species, complete with a Frequently Asked Questions page and links to media and information about other (non-fictitious) animals of interest. More generally, designers can seek out online sources that tie in with the subject matter of their course being developed and create lessons that help learners critically evaluate and contrast various sources on a topic.

CONCLUSION

Open access, while broadening the availability of scholarly sources, also increases the complexity of digital information literacy.

In a toll access model, scholarly sources are most commonly accessed through academic libraries, and for learners early in their academic careers, discovering the resources available through a school library can be a revelation. Through library instruction and use, learners develop the ability to home in on high-quality academic sources more easily, compared to an internet search, which is often their initially preferred method of finding sources.

With the introduction and growth of open access, library services and instruction continue to be important since, as discussed, libraries have various ways of directing users to open access sources. However, learning to evaluate information and sources, whether they are accessed with or without the use of library tools, is even more fundamental to every learner's overall development as an information consumer functioning in increasingly ubiquitous learning environments.

The increase in open access means that more high-quality scholarly materials are available online to the public. With that availability comes the need to recognize scholarly information and to understand when it is useful. This is just one part of the puzzle of digital information literacy, which requires that individuals develop a well-rounded understanding of the various types of information they may encounter online. Reinforcement of digital information literacy lessons across disciplines will help learners to prepare for higher level academic work that they might choose to pursue and to practice their information literacy skills in a variety of contexts, with the goal of transferring those skills to other areas of their lives.

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KEY TERMS AND DEFINITIONS

ACRL Framework: Document adopted in 2016 by the Association of College and Research Libraries. Contains six "frames," each composed of an essential information literacy concept and associated practices and dispositions.

Course Designer: Anyone involved, individually as part of a team, in planning the aims, organization, and approaches of a course. For the purposes of this chapter, also includes course development activities such as selecting course materials and creating lessons and assessments.

Digital Information Literacy: The ability to locate, evaluate, and use information that has been created, stored, or accessed digitally.

Discovery: The process of finding resources on a given topic. May be separate from fulfillment.

Fulfillment: The retrieval or acquisition of discovered resources.

Open Access: The quality of being digitally available for free use, storage, and reuse. Often applied to scholarly works freely accessed online, but not fully available for reuse or adaptation.

Repository: An online location for storing and disseminating content. Repositories are often disciplinary or institutional.

Scholarly Sources: Materials, typically peer reviewed, written by experts for an academic audience.