
Peer-Reviewed Article

The role of online databases in academic libraries

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Note: The author of this article is a member of the Journal of Online Education editorial staff. Because the author was not involved in facilitating the double-blind peer review process, the Journal believes that any conflict of interest has been nullified.

Abstract: An overview of the role online databases play in academic libraries. The value of online databases in all academic institutions is affirmed and emphasized as a necessity for online institutions. A wide variety of databases is encouraged, including multidisciplinary databases, subject databases, open access databases, and institutional repositories. Databases should provide materials in different formats, including articles, books, reference materials, and other formats that fit students' research needs. Funding issues may make it difficult to provide access to electronic resources and alternative acquisition models may be necessary.

Keywords: library databases, online learning, library resources



Journal of Online Higher Education

ISSN: 2575-1204

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Introduction

Academic libraries play a critical role in the development of higher education students. While many facets of the academic library are undeniably important—information literacy initiatives, infrastructure, library staff, etc.—how its collections support the needs of the institution should be a key factor in evaluating the library’s effectiveness, given the “positive relationship between student use of library resources and academic success as measured through GPAs” (Allison, 2015).

In most modern libraries, collections include both physical and digital materials, with a stronger emphasis on the latter. This can be seen as far back as 1999, when researchers noted that “users more often prefer electronic resources to print, and have become accustomed to information being accessible on demand, whether by E-mail, Internet or fax” (Carr & Wolfe, 1999, p. 2). The emphasis on ensuring that resources are available digitally has only become more pronounced, with Breeding (2016) noting that “academic libraries have seen an almost complete transformation of their collections from mostly print to largely electronic in the last 2 decades” (p. 9).

This is not to say that print collections have become superfluous—except in situations when the library is physically inaccessible to students, a significant number of patrons will continue to check out the print resources available to them—but it should be clear that because so many students rely on electronic resources, it is imperative that the academic library’s digital collections have the breadth and depth to support the learning requirements of its student population. This is especially the case for online campuses, which generally lack the flexibility to make resources available in non-electronic formats and thus are wholly reliant on what they can provide digitally.

Online resources became ubiquitous in academic libraries in large part because of the early efforts to create infrastructure to support electronic resources. In 1999, Crossref began working on a project that enabled collaborative reference linking and established Digital Object Identifiers (DOIs) as a standard of academic publishing (Pentz, 2016). In 2001, it was estimated that 6% of academic journals were available online (Carlson, 2001); by 2005, it was estimated to be as high as 91% (Ninety percent of journals, 2006), and today it is likely much higher. Because so much of the work to retroactively digitize and assign metadata to print works has

already been done (and publishers today take into account the fact that their products will be available in electronic formats during the publication process), it is relatively simple for the library to provide digital materials to its patrons in large quantities.

Types of Online Databases

Library patrons today are often accustomed to having a single search box on the library homepage where they can input their query and search all the library's holdings simultaneously. This process—often called “federated search”—will search all of the library's resources without requiring the user to know which database they need. Even though patrons may no longer be required to go to each individual database directly, the selection of databases that the library is able to provide will drastically affect their research experience. Broadly speaking, academic libraries will usually provide four categories of databases: multidisciplinary databases, subject databases, open access databases, and unique digital collections.

Multidisciplinary Database

One of the most commonly used types of digital collections—not only in academic libraries, but also in school and public libraries—is the multidisciplinary database. This category of database does not aim for specialization, but rather acts as a collection that, theoretically, will have something for all areas of inquiry. For an electronic resources librarian, subscribing to multidisciplinary databases like EBSCO's Academic Search databases, JSTOR, or Gale Academic OneFile is a tremendous time-saver because these resources can quickly establish a baseline level of coverage without having to adopt thousands of titles individually. A multidisciplinary database, however, is not a panacea for the academic library's every need and it alone will seldom contain the depth necessary to keep up with the full research demands of the institution's population.

An academic library should strive to have multiple databases that focus on the same discipline. The need for a diversity of databases is supported by research by Hood and Wilson (2001), who found that (1) accessing the top database alone only provided around 1/5 of the scholarly literature of a given field, (2) to reach of the level of 80% access would generally require 5-10 databases, and (3) a progressively higher number of databases was needed to increase the percentage of coverage (p. 1251). Hood and Wilson also note that “coverage is very topic dependent,” so these figures may vary, but overall, any topic with higher interdisciplinarity

requires more databases to reach adequate coverage, while more insular subjects can suffice with fewer databases (p. 1253).

Subject Database

Subject databases have a narrower scope than multidisciplinary databases, containing only resources that are relevant to the discipline. A subject database may be perceived to have higher quality resources than a multidisciplinary database, due to vendors having a vested interest in putting the more prestigious journals of the field in the more exclusive package. The notion that prestige is correlated with quality, however, is misleading, as there is evidence that highly prestigious journals are not significantly more reliable than other journals in the field (Brembs, 2018). The more valuable asset of the subject database is in how it increases the number of publications available for that subject.

As a general rule, the coverage of a particular topic will be higher in a subject database than what a multidisciplinary database will cover for the same subject. This makes intuitive sense—as there would not be much point in acquiring a subject database otherwise—but it is also supported by the findings of a study by Nisonger (2008), who found that database Library Literature & Information Science Full Text was superior to Academic Search Premier in the number of library and information science journals it contained, even with the latter being “known to have significant library and information science content” (p. 8). Assuming that this trend holds true across all disciplines, academic libraries should primarily rely upon subject databases for covering any topics that are particularly important for their population to research, thus allowing the multidisciplinary database’s role to be more about reaffirming the subject databases and helping to address inquiries that are outside anticipated avenues of research.

Open Access Databases

Open access databases also play an important role in providing students access to additional content. Much like the subscription multidisciplinary database, an open access database is a tool that allows the library to provide access to a wide variety of content that does not require excessive labor on the librarian’s part to curate. The added benefit here is that, unlike a subscription database, the monetary cost for providing students with open access databases is essentially zero. Open access databases, however, feature certain biases that may be less pronounced in subscription databases. Open access as a field is weighed heavily towards fields

in which open access publishing is widely accepted. This means that fields that were early adopters (such as physics, astronomy, or information technology) or that place a strong emphasis on sharing information (such as the medical sciences) will have more free resources to work with, whereas fields where open access is not the norm (such as chemistry or engineering) will have to continue relying more on paid resources (Severin, Egger, Eve, & Hürlimann, 2020). Additionally, open access databases often also have little to no curation, which makes them more susceptible to including less reputable sources. One study of student bibliographies found five cited journals that were on Beall's List of Predatory Journals; none of these five journals were indexed in the subscription-based Academic Search Premier or Web of Science, but all of them were findable using the freely available Google Scholar (Schira & Hurst, 2019, p. 11). This is not to say that predatory journals cannot find their way into reputable databases (they can, as seen in the research by Nguyen et al. (2020)), nor does this mean that open access databases are inherently unreliable, but librarians should make sure that students are aware of potential pitfalls in the databases that are made available to them.

Unique Digital Collections

Libraries also regularly house unique materials, which the ACRL notes includes digital collections (ACRL Board of Directors, 2018, p. Performance Indicators 5.3). Academic libraries supporting graduate-level programs will usually include the electronic dissertations and theses of its graduate students in an institutional repository. Other scholarly resources created by the institution, such as "article pre-prints and manuscripts, technical reports, conference proceedings, data sets, and software," may also be included in institutional repositories (Association of College and Research Libraries, 2020). Since unique academic library collections are not part of a package developed by a third party, it is incumbent on the library to ensure that digital materials are preserved in the long term. Arnepalli and Rao (2020) identify several strategies for digital preservation, including periodically copying the materials from one medium to another, relocating data to different software or hardware, ensuring materials can accommodate updates in technology, and supporting materials that are preserved in software to be compatible with other software (p. 6).

Types of Electronic Resources

It is also important that databases have differences in the kind of resources they contain. In a study by Lantz et al. (2016), the top three source types that students used in their annotated bibliography assignment were journal articles (39% of sources cited), books (37% of sources cited), and reference sources (18.5% of sources cited) (p. 259). Each of these source types should be readily accessible in an online academic library's digital collections.

Journal Articles

Journals (also called serials) are regularly published publications that combine several articles into a volume or issue. Journal holdings at most libraries have gone digital to the point that many students at ground campuses are unaware of the existence of print periodicals in their library (assuming that it even has them), having only ever accessed their digital counterparts. Electronic journal articles have the advantage of being extremely convenient: they can be read in a single sitting, their full text can be viewed in a browser or downloaded as a PDF file, and they can be quickly evaluated based on whether they are peer reviewed or not. In nearly all respects, journal articles are well-suited for the online learning environment.

Books

Books (also called monographs) are the quintessential feature of the library and are used by almost everyone, from new students to tenured faculty and from the career professional to the casual consumer. Despite the widespread use of books—and maybe, to some extent, because of it—the transition from print books to eBooks in academic libraries has been neither quick nor smooth. A ProQuest (2016) analysis of academic library book purchasing trends showed that despite 89% of academic libraries now offering eBooks, in 54% of libraries eBooks only accounted for 20% or less of the overall monograph budget (p. 8).

Books fill so many niches that it can be difficult to have a consistent infrastructure to support them. It is not uncommon for eBooks to lack of uniformity in the technology used to access and read the book, have problems with digital rights management and licensing, or have significant differences between the library market and consumer market (Plum & Franklin, 2015). Wiersma and Tovstiadi (2017) are particularly critical of the barriers to discovery that eBooks are much more likely to face, noting that the metadata provided by third-party eBook vendors is often substandard and may lack support for full text searching, even though “most

users expect to have the ability to search the full text of an e-book” (p. 630). While librarians could theoretically make corrections to eBook metadata to improve findability, Wiersma and Tovstiadi observe that this degree of quality control is usually impracticable “due to the high volume of e-books purchased by academic libraries” (p. 639). Despite these challenges, however, eBook databases are undoubtedly valuable and, though they may see less use than print books in some cases (Plum & Franklin, 2015), eBooks are clearly in demand for a significant portion of the student population and thus should be actively sought after. As the eBook industry moves forward, academic libraries should be mindful of any difficulties that their students may encounter while accessing library eBooks and do whatever they can to improve the eBook experience for their patrons.

Reference Sources

Reference sources historically were mainstays of the library; now that many are already freely available online, this is less often the case. Students today are more inclined to check places like Wikipedia, Dictionary.com, or Google Maps instead of visiting the library for an encyclopedia, dictionary, or atlas. This is not inherently a bad thing—even if some professors prohibit citing these sorts of sources, reference websites can still be valuable for early phases of the research process, as they can help establish a baseline understanding of a new topic and may lead to a rabbit hole for further research. Though many reference websites are available outside the library, academic libraries can still seek ways to incorporate reference materials into their online collections. East (2010) notes that the best place for reference materials today is not in print, but rather online, and further explains that “being online is not enough: they must be easily findable and ideally cross-searchable so that we can leverage the variety of content and viewpoint in our entire electronic encyclopedia collection” (p. 168). Academic libraries can include the online versions of general and subject-specific encyclopedias, dictionaries, thesauruses, handbooks and manuals, almanacs, atlases, timelines, bibliographies, directories, compilations, and other reference materials in their collections and have these materials be discoverable through the library search interface. Libraries can also subscribe to reference databases designed to guide students through the research process that often contain quick tips for research, visualizations of how keywords are related, background articles explaining key concepts, links to relevant sources in the library’s collections, and other tools for teaching

information literacy. Reference materials, though they may not be in as much demand as they once were, still have an important role to play towards the enrichment of student knowledge, and thus should be made available in ways that students will see their value and come to rely upon them.

Other Source Types

Beyond the trifecta of articles, books, and reference materials, libraries will regularly adopt online databases containing other types of sources. There are many databases in a variety of subjects that enable students to view images, listen to sound recordings, stream video, examine archival materials, or export datasets. There are also certain situations where a very particular type of database is necessary because it has a specific type of resource that will not be found elsewhere. For example, a medical student looking for interactions between medications should access a drug interactions database. A business student who needs company records, however, is better served by a market research database containing company profiles and economic data. Furthermore, a law student investigating legal precedent would seek out related court cases in a law database containing case reports. While subject databases can get these students to the general area of inquiry, if the database focuses on the wrong type of resource, it will be much more difficult for the student to obtain the information they are actually looking for. It is thus vital that the library understands what types of sources their students will need to perform their research and provide these source types to them.

Acquiring Electronic Resources

Funding

The determining factor for whether libraries can adopt an online database is usually whether or not they have enough money to do so. Funding in academic libraries will usually be provided by the parent institution, though other potential sources include “research grants, special projects, gifts and endowments, and fees for service” (American Library Association, 2015). Libraries also frequently join consortia to share resources and spread the cost burden between the libraries that can pay and those that cannot. Regardless of the source of library funding, however, the financial support for any database subscriptions needs to be consistently present from year to year and be able to accommodate changes in database pricing.

Getting that consistent funding has often been a difficult task for libraries. In a survey conducted in 2015, ProQuest found that 29% of academic library resource budgets had decreased, with the primary reason being due to budget cuts (ProQuest, 2016, p. 4). For libraries that had an increase in their resources budget, the most frequent reason for it doing so was that the price of the resources they subscribed to had increased, not because they acquired new resources. Many libraries faced with higher serials pricing have also resorted to decreasing their monograph budget to have enough to pay for it. Academic libraries looking to acquire new databases must work to get buy-in from their institution and other invested parties to ensure that the library can keep up with the growing demand for quality resources. Libraries will also need to monitor database usage—both in raw numbers and anecdotally—to best understand how their population actually uses the library’s resources and use this information to bolster the argument for when the library needs to continue providing a particular database or when they can let it go.

Alternative Acquisition Models

In addition to database subscriptions, many vendors provide other means for the library to acquire electronic resources. For example, if the library uses an online service like Get It Now or The Academic Collection to supplement its interlibrary loan, students can also get easy access to individual articles from journals that the library does not subscribe to. A ProQuest blog post about eBook acquisition identifies the following models that could be used besides database subscription: perpetual access (can be for individual or bundled titles), demand driven acquisition (DDA) (only purchasing eBooks used by patrons), short term loan (STL) (eBooks are loaned for a short time for a fraction of the price), and Access-to-Own (ATO) (loan spending on a title will contribute to the library owning it) (ProQuest, 2016). In 70% of libraries, more than one of these models are used to acquire eBooks and will choose what method will best suit the needs of the library’s population and budget.

Conclusion

Electronic databases and the resources they contain are of prime importance to almost any academic library, whether the campus is on-ground or online. Databases are diverse in nature and academic libraries should embrace this diversity to find the best assortment of databases to fit all of their institution’s needs. Though many electronic resources are freely available, open-access databases will usually not be sufficient on their own and academic

libraries should not rely wholly upon them. Though academic libraries will invariably be restricted by what is available in their budget, they may be able to utilize different acquisition models to obtain the resources they need for their students and researchers to succeed.

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