College & Research Libraries

CRL

May 2026 • Volume 87 • Number 3

Association of College and Research Libraries

COLLEGE & RESEARCH LIBRARIES

May 2026

VOLUME 87

NUMBER 3

ISSN 0010-0870

Articles

Reviews

Publish or Perish? A Content Analysis of Scholarship Criteria in R1 Academic Libraries' Promotion and Tenure Documentation

Teresa Schultz, Emily E. Boss, and Elena Azadbakht*

This study sought to understand how R1 libraries define scholarship and creative activities and how they address quality of scholarship through a content analysis of promotion and tenure documentation. Peer review is the most common indicator of quality mentioned in the documents, followed by the geographical reach of scholarship and originality of the research. Other common scholarship criteria included the need to demonstrate sustained scholarship activity, while discussions of open access research were rare. Academic libraries that offer promotion and tenure should evaluate their documentation to ensure they provide clarity to candidates and are up to date.

Introduction

Although tenure for academic librarians has existed for some time, one component—scholarship—tends to strike more fear into the hearts of librarians than any other. Various studies report that anywhere from 40% to 60% of U.S. academic libraries offer tenure to their faculty members (Duffy & Webb, 2017; Walters, 2016). Although scholarship has not always been part of tenure, recent studies have reported rates anywhere from 85% to 100% for libraries covered by the studies (Ackerman et al., 2018; Damasco & Hodges, 2012; Sassen & Wahl, 2017; Smith & DeVinney, 1984; Walters, 2016). This demonstrates that scholarship is now a common area for any tenure-seeking librarian to address. The Association of College & Research Libraries (ACRL) indicated the important role that scholarship plays in advancing faculty status for librarians, stating, "The function of the librarian as participant in the processes of teaching, research, and service is the essential criterion of faculty status" (ACRL Board of Directors, 2012, p. 2).

Yet, other studies continue to show that librarians struggle with scholarship. While this can be partly due to lack of training, confusion about what is expected can also play a role. The researchers behind this project, who work at an R1 institution and have all gone or are

*Teresa Schultz is Scholarly Communications & Social Sciences Librarian at University of Nevada, Reno, email: teresas@unr.edu; Emily E. Boss is Head of Metadata, Cataloging, and One-Time Acquisitions at University of Nevada, Reno, email: eboss@unr.edu; Elena Azadbakht is Health Sciences & Evidence Synthesis Librarian at University of Nevada, Reno, email: eazadbakht@unr.edu.

going through the tenure process, were inspired by their own experiences and questions about what counts as scholarship, particularly in terms of what the documentation actually says. This study sought to better understand documentation regarding the promotion and tenure (P&T) process by conducting a content analysis of P&T documents, primarily bylaws, gathered from R1 university libraries that provide tenure or similar procedures.

Literature Review

The literature review will first look at how library and information science scholarship has been evaluated, what has counted, and some problems with the evaluation criteria. It will then summarize what is known about the documentation of P&T for libraries, with a focus on the language used.

Evaluating Scholarship

How librarians are evaluated on their scholarship has often been fuzzy and changing. Typically, evaluation has focused on the format of disseminated scholarship, with journal articles, books, and book chapters being seen as highly valuable; conference presentations are also commonly mentioned, if given slightly less weight (Leysen & Black, 1998; Sassen & Wahl, 2017). Artistic works, exhibits, and blogs are sometimes seen as legitimate forms of scholarship, but less so (Hendricks, 2010; Novara & Novara, 2017; Sassen & Wahl, 2017). Even within a university system, standards and rules can vary among institutions (Hecker & Smith, 2012).

Peer review is often seen as the primary criteria for rating these and other formats (Ackerman et al., 2018; Best & Kneip, 2010; Bradigan & Mularski, 1996; Sassen & Wahl, 2017; Wirth et al., 2010). Hendricks (2010) found that one of the reasons blogs were not as highly valued as other publication forms was their lack of peer review.

Other criteria that studies identify include the number of authors of a publication, whether a publication has a national or international audience, publishing in library science-focused outlets, the research metrics of a journal, reviews, and awards (Best & Kneip, 2010; Bradigan & Mularski, 1996; Leysen & Black, 1998). Nixon (2017) argued for a tiered rating of journals, saying such a system would assist reviewers in better determining the appropriateness of a journal, especially when they were not familiar with them. Although this article prioritized peer review as the most important criteria, it also suggested criteria such as lists of top journals as identified by library administrators in studies from 1985 and 2005, low journal acceptance rates, and high journal-level metrics.

Evidence also exists that some libraries (although not necessarily a majority) specify how many publications a library faculty member should have when they go up for tenure, ranging from one to five (Ackerman et al., 2018; Shropshire et al., 2015). Others do not use a specific number but instead use "less easily defined qualities such as 'progress,' 'consistency,' or 'competence' in scholarship" (Ackerman et al., 2018, p. 555).

But many have critiqued the ways in which academia tries to evaluate scholarship, noting an over reliance on quantitative metrics. A case study at Oregon State University noted how they had relied on a journal's peer review status, as well as metrics such as Journal Impact Factor (JIF) and the Eigenfactor, but these "'standard metrics' called upon to evaluate the quality of library publications fall short, except for the use of peer review" (Wirth et al., 2010, p. 516). The San Francisco Declaration on Research Assessment (DORA) attempts to take these concerns into account in its principles, stating that evaluators should avoid putting too

much weight into journal-level metrics like JIF, and instead focus on assessing the content of a scholarly publication (Declaration on Research Assessment, n.d.). The declaration also asserts that institutions should "be explicit about the criteria used to reach hiring, tenure, and promotion decisions" (n.d., para. 11).

Promotion and Tenure Documentation

ACRL has stated the importance of documentation for promotion and tenure criteria and that this documentation should be developed and approved by library faculty (ACRL Board of Directors, 2012). At the same time, ACRL noted that these documents will likely vary among institutions. One survey of academic librarians found that 80% reported having documentation specific to their library, with the same amount reporting faculty handbooks played a role as well (Connell, 2018).

Bolin argues that the language in promotion and tenure documents is important as "documents encode values and tradition and perpetuate institutional memory" (Bolin, 2014, p. 214). The study found that the documents are broad in covering the entire tenure process but also vague. In analyzing the language of these documents, Bolin found that they demonstrate librarians are expected to direct their scholarship toward advancing the field of librarianship while also showing how librarians have embraced research as part of their work.

However, other studies have pointed out how the lack of P&T documentation or vague language can cause stressful confusion for librarians seeking tenure. One study found that P&T documents often fail to define specific phrases and terms, and do not specify what is needed to obtain tenure or how various criteria are weighted, with the authors saying that they are often "highly subjective" (Lo et al., 2022, p. 85). This can be especially stressful for librarians of color, as broad language can leave interpretation open to racial discrimination (Damasco & Hodges, 2012). The authors argued that P&T documentation is essential for librarians at the start of their tenure clock to ensure they can properly plan their time. They surveyed tenure-track and recently tenured librarians of color and found that most (80%) had been provided with P&T documentation when they were hired. However, about a third did not believe their library policies clearly defined standards of performance, the process of earning tenure, or the evaluation criteria. Another study found that librarians who reported clearly understanding tenure requirements at their institution also reported less job stress than those who did not (Cameron et al., 2021).

One case study at Boise State University details the library's process of attempting to better clarify their evaluation rules and procedures. Meregaglia et al. noted that

> There had been a growing dissatisfaction among tenure-track and tenured library faculty regarding the confusion and lack of information that was available to guide the annual evaluation process. Faculty noted that the absence of written guidelines created confusion and perceived unfair variation in how annual evaluations were conducted. (2021, p. 1)

Despite the desire for better documentation, though, the authors said library faculty could not agree on how much weight peer review should carry, leading the library to sidestep the question of scholarship for a later time.

While some research has sought to better understand how library leaders and specific libraries have addressed how scholarship is evaluated and how librarians themselves understand their institutions' criteria, there's a dearth of literature that analyzes what the documentation itself says. This study sought to help fill this gap by answering the following research questions:

- How do R1 academic libraries define scholarship and creative activities, and what counts?
- How do R1 academic libraries address quality of scholarship, including peer review and use of metrics?

Methodology

The researchers worked from a predeveloped list of R1 academic libraries with tenure from a recently published article (Lo et al., 2022). To find each institution's promotion and tenure documentation for the libraries, the researchers searched Google for the institution name plus words that would aid in finding the relevant documentation, such as "guidelines," "tenure," and "bylaws" (e.g., site: www.clemson.edu OR site: library.clemson.edu) (tenure OR librarian) (guidelines OR criteria OR document OR policy OR policies). If documentation was found for main and branch libraries, only the main library documentation was pulled. If no library-specific documentation was found, the main institution's documentation was used, but only if it specifically referenced librarians. When documentation could not be found, the researchers contacted libraries directly, targeting contacts in the library's administration office or contacts the researchers knew professionally. The researchers located documentation for 47 of 51 institutions (see Appendix 1) using this method in December 2023 and January 2024, although they might have missed documentation, especially informal documentation that might not be publicly accessible. Some documentation was also more than 10 years old or undated, so it's possible newer documentation exists that was not found using the stated methodology.[1]

Five institutions' documentation was chosen at random for all researchers to review to inductively create an initial codebook informed by the research questions. The initial codebook identified types of scholarship mentioned (e.g., books, journal articles, etc.), quality indicators used (e.g., rubrics, metrics, etc.), and other common elements related to the understanding of what counts as scholarship. The initial codebook was then used by all three researchers on three additional institutions' documentation. The researchers met to discuss the test coding and resolved coding discrepancies, added, merged, or refined codes, and adjusted code definitions (see Appendix 2). The 47 documents were equally divided to have two researchers code each document.[2]

During initial coding, the researchers discovered that some institutions in the study sample referred to continuing appointment instead of tenure in their documentation. The researchers met to discuss these institutions and decided that if continuing appointment was defined similarly to the American Association of University Professor's (AAUP) definition of tenure, that is, "indefinite appointment" (2006, para. 1), then those institutions were valuable

---

[1]*Schultz, T., Boss, E., & Azadbakht, E. (2026). Supplementary material to 'Publish or perish? A content analysis of scholarship criteria in R1 academic libraries' promotion and tenure documentation.' Zenodo. https://doi.org/10.5281/zenodo.18686283*

[2]*Schultz, T., Boss, E., & Azadbakht, E. (2026). https://doi.org/10.5281/zenodo.18686283*

to include in the study even if they did not require research specifically as they follow a similar trajectory and outcomes. The researchers then reviewed the remaining 95 R1 institutions to identify those without tenure, but with continuing appointment, using the same Google search strategy; they then reviewed their documentation for the terms of continuing appointment contracts. During this review of remaining R1 institutions, it was discovered that the previously predeveloped list missed some tenure-granting institutions. The researchers identified 12 additional institutions that met the study parameters. Out of 56 R1 institutions that the researchers confirmed offered tenure for librarians, the study was able to find documents for 48 of them (86%), and of the 13 institutions that met this study's parameters for continuing appointment, the study was able to find documents for 11 of them (85%) for a total of 59 documents. One institution that offers tenure also offers continuing appointment.

While each whole document was reviewed, emphasis was placed on the scholarship and creative activities sections of each due to the study design. A total of eight of the institutions have not specifically required research and scholarship to obtain tenure (one institution) or continuing appointment (seven institutions). Some of these institutions combined scholarship/creative activity and service under an umbrella category such as "professional development." In those cases, the whole section was coded to remain consistent. Criteria for full professorship was not included because not all documents had it, and it is not generally applicable to obtaining tenure/continuing appointment. Each document was reviewed by two researchers to resolve coding discrepancies.

Limitations

Researchers were unable to confirm whether 19 R1 universities provided tenure or continuing appointment for their libraries, so the study population might be missing some organizations. Researchers first relied on publicly available P&T documents and stopped if they were able to find them for an institution, not contacting anyone at the library to see if there were additional or more current documents. This means this project could have missed additional documentation that was not publicly available. Also, analyzing documentation provides one view of how an institution or library defines and evaluates scholarship; however, that does not mean that is how an institution defines and evaluates scholarship in practice.

Results

Quality Indicators

One of the main goals of this project was to assess how, specifically, P&T documentation addressed issues of quality, or how did they define or provide direction for assessing quality of scholarship? From this, several themes emerged.

Peer review is the most common marker of quality across the documents, appearing in 48 (81%) of them. The term peer review is usually used in reference to journal articles but also sometimes to conference presentations and book chapters. One outlier is Baylor University, which allows for peer-reviewed "software, data, or other nonprint media" in tenure and promotion applications. Several institutions ask librarians to explicitly identify which of their publications have been peer reviewed.[3]

---

[3]*Page numbers or section numbering was inconsistent or not present due to the variety of formats used for P&T documents so the researchers have chosen to not include them.*

While some institutions require peer-reviewed publications, most simply indicate that peer-reviewed products ranked higher or counted more in tenure and promotion decisions than non-peer-reviewed products. According to the University of New Hampshire's document, for example, "[p]eer-reviewed scholarship in all cases outweighs non-peer-reviewed scholarship." Several of the institutions with less stringent research expectations listed peer-reviewed publications as more of a nice-to-have. "Peer-reviewing of the publications provides additional evidence of quality, but its absence does not invalidate the value of the work," says Baylor University.

Another component was the geographical distribution or reach of a librarian's scholarship. Just over half (30) of the libraries mentioned geography in some way. Generally, these referenced the dissemination venue (e.g., journal, conference) but could also refer to the candidate's own reputation (i.e., they had established, or were working on establishing, a national reputation) or the university's reputation. A large majority of these mentions indicated a desire for national recognition or reputation. More than half also indicated a desire for the international level, although all but one of these mentions indicated a national level was acceptable. Slightly less than half included the regional and state levels, and some included the local level. While most of these mentions of smaller areas also included national or international reputation and recognition, eight of the mentions did specify only the regional or small geographical level was required. Three mentions included all geographical levels, essentially rendering geography moot as an indicator of quality. Five mentions said geography mattered but did not indicate at what level.

Half (28) of the institutions included originality as another marker of quality in these documents. In the context of scholarship, originality often refers to how unique or groundbreaking a librarian's research is. More specifically, original research fills a gap in the literature, signifies an entirely new line of inquiry, or showcases the use of new approaches or new interpretations. The University of Nevada, Las Vegas' bylaws, for instance, asks evaluators to consider if a librarian's research "is completely new and uncharted territory? Such as a new theoretical approach to a topic, an innovative use of research methodology, the first practical implementation of a theoretical concept, or development of a new technical application." Likewise, the University of Colorado, Denver's bylaws state that a "faculty member's scholarship must provide compelling promise of continued creativity with respect to generating new observations, new concepts, and new interpretations related to the individual's scholarly endeavors."

An equal number of the institutions also include quantity of scholarship outputs in some way. Of these, 13 set a specific number of research outputs. A minimum requirement for three scholarly items was most mentioned (six institutions), followed by five and four items (four institutions each), and one and two items (two institutions each). In a few instances, a university's documentation provided contradicting numbers, for example, one document noted that two substantial writings (i.e., a book chapter or journal article) were required but then noted a minimum of five journal articles elsewhere. Some institutions gave a range, usually three to five. Some of these specified the type of work produced, which could be a journal article or a "major work." Another 15 institutions mentioned that quantity mattered or would be considered but did not give an indication as to how many works were desired or required. Often this was done by just including "quantity" in a list of items to be considered; however, some institutions used other language, such as "multiple publications" (University of Arizona)

and "a regular pattern of scholarly activity" (Kent State University). Eight of these institutions noted either the quantity did not matter or mattered less, such as Clemson University's document that stated, "the quality of this research program will not be determined by the quantity of outputs."

There were 22 (37%) institutions that mentioned the publication venue. Most of these focused on the prestige or reputation of the journal, the audience or circulation of the journal, and/or the scope of the journal. Language related to prestige varied and included phrases such as "prestige of venue," "respected academic journals," "standing of the outlet," "reputable," "influential or pioneering," "major journal in the discipline," "authority," "a venue indicating superlatively high regard from peers." For the audience of the journal, some documentation instructed librarians to provide information about a journal's circulation but did not indicate what was acceptable. Other mentions noted the need for a librarian to disseminate their research to an appropriate audience, and one institution did note that the audience would vary based on the needs of the research. Mentions of a journal's scope were generally vague, such as Oregon State University, which noted the need to communicate research to "external audiences in appropriate outlets." Less common themes regarding the publication venue were the reputation of the publisher (as opposed to the journal), statements of no preference in terms of the publication venue, the impact factor of a journal, and how selective the journal is.

In terms of metrics, 17 (29%) institutions noted citations as a quality measure of research. Most indicated citation counts were paramount to demonstrate a measure of quality; however, two specifically mentioned that the citations need be "favorable" or "positive." Two institutions also noted that citations should accompany awards, perhaps indicating that only the highest recognition of scholarship or engagement should be cited. One institution noted that citations would be used to demonstrate the "degree of dissemination" of the work.

Only 12 (20%) institutions mentioned other metrics of research quality, such as, "descriptions of stories in the media, pageview statistics, h-index, or alternative metrics" (Oregon State), "evidence of influence on the work of others" (Ohio State), download statistics, journal or conference acceptance rates, and even mentions on social media or the news.

The least common indicator—used by just 10 institutions—references the impact of a librarian's research output as a criterion in a general, unqualified way. Most often, impact as a marker of quality often appears alongside a request for other metrics, such as the number of articles a librarian has published in peer reviewed journals, citation counts, or download statistics. The University of Colorado, Denver, for instance, asks librarians to provide "formal or informal measures of impact, such as publisher download statistics for electronic versions of published articles." Some documents ask for qualitative evidence of impact, such as an argument for how a librarian's work has contributed to the field or effected various audiences (e.g., the university, the state, or the profession). For example, Oregon State has evaluators consider "how the [librarian's research] findings have impacted the conversation in the candidate's field."

Overall, two institutions—Temple University and the University of Cincinnati—had no descriptions of how quality would be evaluated. Another two, the University of Hawai'i and the University of Washington, had only one specific criterion listed, while five institutions had two criteria, three had three criteria, and five had four criteria listed. It should be noted that of the above institutions, seven do not specifically require some kind of research or scholarship, but eleven do.

Type of Scholarship

The study also analyzed what types of specific research outputs were mentioned in the documents. Although the researchers anticipated finding references to the most common forms of scholarship within the field of librarianship—namely, journal articles, book chapters, and conference presentations—54 of the documents included examples of scholarship not covered by another of this study's codes. The most-mentioned scholarly products are as follows:

- Conference materials: 51 institutions; included papers, posters, or presentations given at conferences.
- Journal articles: 45 institutions.
- Grants: 43 institutions. Main differences included what stage of the grant counted for research credit; 14 institutions note that both funded and unfunded grants count for research credit, while 9 institutions specified that only awarded grants counted.
- Reviews: 39 institutions; 15 of these mentions were of book reviews specifically.
- Creative works: 30 institutions; included art, films, compositions, performances, choreography, recitals, graphic design, and even audiocassettes.
- Books: 28 institutions.
- Book chapters: 27 institutions.
- Awards and honors: 25 institutions; eight specified the award should be related to research; two specified librarianship or service.
- Exhibits: 23 institutions; four institutions included language about virtual exhibits as well as physical.
- Code: 23 institutions; included databases, software development, technology development, computer programs, hardware, etc. In a few cases, this needed to be shared through peer review.
- Serving as journal editor: 22 institutions; a few had qualifiers, such as how it helped expand the applicant's impact.
- Bibliographies or indexes: 20 institutions.
- Web content, including blogs: 20 institutions.
- Course materials: 19 institutions; included broad language, such as curricula, and more specific, such as textbooks.

Scholarly types listed by fewer than a quarter of the R1 institutions included graduate degrees other than an MLIS; white papers or reports; reference work entries; digital projects (including digital humanities projects); consulting work; abstracts; standards; entrepreneurship (including patents); data; lectures and speeches; translations; non-journal editorial work; essays; and participating in mentor relationships. A small number of institutions also specifically listed works that do not count as scholarship, which included in-house reports, preprints, work created as part of a librarian's main duties (such as research guides), conference reports/minutes, and moderating a conference panel.

Additional Scholarly Indicators

The researchers also looked for other factors that provided details about what scholarship counted and how it would be evaluated.

Among these, 40 (68%) institutions included the concept of professional scholarship growth in some form or another. For the purposes of this study, the researchers defined professional scholarship growth as developing, fostering, and sustaining a research agenda

or distinct line of inquiry during the pre-tenure years (with an understanding that this may take many different forms or need to change over time). The University of Utah, for instance, asks that "[a] librarian's research/creative activity should reflect a coherent agenda in at least one topic area." Likewise, Oregon State University's document states that "[a]ll the pieces of [a librarian's] scholarly output should form a cohesive picture of the faculty member as a librarian and a researcher." Many of the institutions also state that librarians should show evidence of "maturity" when it comes to their research. That is, they are not only consistently producing scholarship but also strengthening their research skills and developing expertise in their chosen area of inquiry. The University of New Hampshire, for example, stipulates that "[a] candidate's activities should show a steady progression or developing focus in expertise and selectivity of dissemination throughout the period before their application for promotion and/or tenure." The researchers also used the professional growth code in cases where evaluators are asked to assess a librarian's potential for sustained research beyond the awarding of tenure and promotion. For instance, Ohio State University's library bylaws state:

> It is therefore essential to evaluate and judge the probability that faculty, once tenured, will continue to develop professionally and contribute to University Libraries' academic vision, mission, and values at a high level for the duration of their time at the university.

Interdisciplinary research is addressed by 37 (63%) of the institutions. In all these instances, interdisciplinary research is painted in a positive light; librarians are generally encouraged to engage in research that is interdisciplinary in nature. Many documents contained caveats, however. Most often, they stipulated that a librarian's entire body of work cannot lie completely outside of the field of library and information science (LIS). For example, Montana State University's bylaws state that, "[w]hile Library faculty are encouraged to pursue their interests in research and creative activities wherever they lie, their publication record is expected to include contributions to the field of Library and information science." Some of the institutions likewise specify that research outside the field of librarianship is allowed or encouraged only if it falls within one of the subjects a librarian supports as part of their primary assignment or has some, even tenuous, connection to their day-to-day responsibilities. At the University of Memphis, for instance, "[s]cholarship and creative activities in non-librarianship fields may be included if they are germane to the faculty member's professional duties, but they should not outweigh those in librarianship."

Just over half (30 institutions) included language in their documentation about the weight research plays in P&T decisions in comparison to other job concentrations. Broadly, 15 institutions indicate that an excellent rating in research is encouraged or required for P&T. For contrast, eight of those 15 instances indicated some combination of research excellence with primary assignment excellence, usually a required excellence in both or in one or the other. Further, an unrelated nine institutions said all aspects were to be excellent or well-balanced to make tenure, promotion, or continuing appointment. Only six were silent on research's rating significance in the decision, using language such as, "Each candidate must present evidence of effectiveness in all of the professional domains in which he or she performs" (Utah State University), or "a faculty member is expected to have demonstrated excellence in the areas of expertise applicable to the candidate's appointed position" (Ohio State University).

Twenty-five institutions referred to the university's mission or values when discussing research. In many instances, producing scholarship of high quality and boosting the institution's wider reputation is part of these universities' missions, and this applies to all faculty, including librarians. Land-grant universities' P&T documents suggest that faculty research should benefit the state and its people in some, even indirect, way. The University of Arkansas, for example, notes that the research its faculty produces should be "all in service to Arkansas." A few documents mention the university's mission and values in the context of definitions of what "counts" as scholarship. Virginia Tech University, for example, states that "[c]reative works that can be tied to the missions of the University Libraries or the university through context provided by the candidate in the dossier" are acceptable scholarly products.

Twenty (34%) institutions addressed collaboration in research. Most indicated the collaborative nature of librarianship and the ways in which research extends the collaborations that are so ingrained in the profession. Two institutions even described it the same way, saying, "Much of the advancement of librarianship depends on formal cooperative efforts" (University of Colorado Denver, University of Kansas). This value of collaboration often accompanied mentions of entities, colleges, or groups that were external to the libraries; however, Kansas State University says that for tenure/promotion, "it is essential that faculty members demonstrate the ability to work cooperatively and collaboratively with other Libraries personnel" showing that even internal collaboration was beneficial. Of the 20 mentions of collaboration, 11 stipulate that collaborative and independent scholarship are weighted equally. Only two institutions mention the need to demonstrate independent scholarship apart from collaborative efforts. Finally, one institution mentions collaboration with students specifically, while two make a point that any collaborative effort should include an explanation to an individual's role in the scholarship.

There were 19 (32%) institutions that expressed an expectation for individuals to explain their role in scholarship in formal documentation for tenure/promotion. The length of explanation varied widely from "not to exceed one page" (Montana State University) to "one to two sentence[s]" (Baylor University). Similarly, whether the explanation was to be narrative or quantitative was hard to parse from the language used, with phrases such as "estimate of the extent" (University of Hawai'i) and "degree of responsibility" (University of Illinois). Two institutions stipulated that the role should only be explained for works in progress or grant applications.

A less common element was whether and how open access (OA) research is handled, with 11 (19%) institutions including it in some way. These institutions generally noted that open access work was accepted and often encouraged. For example, the University of Buffalo, states that "publishing in open access venues is also encouraged and valued but not required for tenure or promotion at any rank." A few institutions gave a reason for supporting OA. For example, the University of Nevada, Las Vegas, states that OA allows "wider dissemination and potential impact." The University of New Hampshire notes that OA would be evaluated similarly to paywalled research, and Virginia Tech University states that they rated OA scholarship more highly.

Another minor area that emerged was the use of a rubric, with nine institutions using some type of a rubric. Most rubrics divided scholarship into two or three ranked groups and provided instructions about producing so many works from each group. For example, one library had a group for "major works" and another for "minor works." Peer review and the

geographical area (i.e., national versus regional/state) were often indicators used to separate items. One institution used just one list of works that was ranked in order of preference and credit given.

Likewise, only eight universities defined their various ranking levels (e.g., excellent, satisfactory) in some way. Sometimes the institution defined only one level, such as what it took to reach exemplary. Some definitions provided only one or two details, such as Auburn University, which stated "exemplary research/creative work and/or awards demonstrate progress towards a national reputation," while others went into much greater detail. Sustained work showed up in multiple definitions for excellent, as did achieving national recognition. Some definitions included specific types of research products, such as presenting at major conferences.

Other Scholarship Language

Finally, the researchers coded and analyzed other language related to research but that did not fit any of the definitions of existing codes, and which were often found in only one or two institutions' documents. Some language was ultimately neutral, such as one institution that provides a range for what percentage of someone's role is assigned to research. However, most of these statements fell under one of two broad categories: prescriptive or permissive/supportive.

Examples of prescriptive language center on placing limits on what is allowed or adding rules (e.g., noting that works in progress do not count toward tenure and promotion); requiring research to connect to general duties; requiring solo authorship; calling for proof of either citing articles or that an article has been accepted; further criteria for each department in a library; the need for research to be conducted ethically; and that tenure candidates should consider spending their own money to attend conferences.

Permissive/supportive statements include those that specifically encourage flexibility or call for support for librarians seeking tenure. Some of the more common language found in this theme include statements about providing support to the tenure-seeking candidate, such as a mentorship system, rules requiring tenure documentation be shown to new employees, and a statement supporting the need for a healthy work/life balance. Another subtheme revolved around support of equity, diversity, and inclusion (EDI). For example, one institution specifically asks candidates to note whether they've incorporated EDI into a research project. One-off examples of permissive language include a call to be open to new forms of research; recognition that research can change based on a job change or that managers might not be able to perform as much research; a note that librarians going up at the same time will not be judged against each other; and encouragement to research what people are interested in.

Discussion

In their P&T formal documents, R1 academic libraries address quality of scholarship, including peer review and use of metrics, in both expected and unexpected ways. The researchers acknowledge that unstated expectations are prevalent in academia, so this study's analysis might not tell the whole story (Cate et al., 2022). Nevertheless, peer review is the most common marker of research quality used by the libraries in the study sample. However, it is not a universal requirement, even among R1 institutions, and its dominance raises potential questions about how these institutions view emerging types of scholarship and publication

venues. For example, what does the preference for peer-reviewed journal articles mean for preprints and overlay journals? Open access appears far less frequently in the documents, which elicits concerns because many still reference quality indicators that privilege paywalled journals (i.e., the publication venue). However, the low number is similar to the findings of a study of institutional P&T documents, which found that most of the small number of documents that did mention OA did so negatively (Alperin et al., 2019). Quantity (i.e., number of articles published pre-tenure) as an evaluative criterion is common as well and helps entrench the "publish or perish" view many faculty (including librarians) have of the entire P&T process. Yet, surprisingly, few documents explicitly mention research metrics. Considering the well-established problems with prevailing measures, like the Journal Impact Factor and the Eigenfactor, perhaps this absence is for the best (Declaration on Research Assessment, n.d.). Of course, these omissions do not necessarily mean that a certain number of publications and "good" metrics aren't an unwritten expectation, as noted. Overall, the researchers were concerned about the small but real number of institutions that had few, if any, evaluative criteria included in their documentation. More criteria do not necessarily equal better criteria, but a lack of criteria could leave new librarians struggling with understanding how their research will be judged.

In terms of how R1 academic libraries define scholarship—as well as which research output types count—journal articles do appear in most of the documents; however, they were not the most mentioned scholarly product. Instead, conference materials dominate. Considering that librarianship is a practice-based field, this makes some sense. The fact that grants and reviews of various kinds also appear in many of the documents further indicates that librarians' research supports their day-to-day work. However, vague language abounds, and many of the documents merely list examples of research without much explanation. For example, "web material" as a type of scholarship appears in dozens of the documents but is almost never explicitly defined. Does all web content count toward tenure or promotion, or does the context and venue matter? Some descriptions of scholarship types are confusingly vague and so broad that they theoretically could refer to several different creations. Additionally, the institutions' scholarly product lists seem outdated. For instance, bibliographies appear throughout the study sample, even though, the researchers argue, librarians have been publishing formal bibliographies with much less frequency than other forms of scholarship (Jabeen et al., 2015, p. 445). And, while many of the documents are long, they devote as much or more space to logistics as they do to substantive concerns, like criteria and definitions. Others use grandiose or jargon-laden language, which the researchers felt obscured meaning even further. For example, one institution proclaims that "[a]ccepting weakness in any aspect of performance in making a tenure decision is tantamount to deliberately diminishing the department's ability to perform and to progress academically." Taken together, these characteristics might make it harder for newer librarians to make sense of the documents or external reviewers asked to evaluate candidates in accordance with the documentation.

Likewise, urging faculty to conduct research aligned with the institution's mission or values is an interesting, and potentially problematic, finding. Depending on the nature of the mission or values in question, this requirement could hamper academic freedom. However, the documents that link research to the university's or library's mission or values use especially vague language to do so. Moreover, none of the documents' research quality indicators address this. Therefore, the researchers suspect that most of these institutions do not actually

evaluate their librarians' research according to how closely it aligns with stated missions or values. In contrast, support for interdisciplinary research is much more explicitly stated in the documents, with institutions using positive language to describe it. Librarians conducting scholarship of this kind remains uncontroversial at R1s, so long as it somehow relates to the librarian's work or to the overall field of library and information science. Given the supportive and service-oriented nature of librarianship, this encouragement of interdisciplinary research is heartening.

The researchers hope libraries use this study's findings to reevaluate their own documentation. However, they realize libraries are not always fully in control of how their bylaws are written and that they might want to be less prescriptive in some respects to allow for unique research agendas and emerging forms of scholarship. Nevertheless, here are a few points to consider:

- Determine whether a library uses any quality indicators that appear in bylaws or other documentation to evaluate applications. If not, update them so that they align with practice. Or, if changing bylaws regularly is too onerous, consider creating a less formal guide for all librarians that outlines local expectations in greater detail, or with more nuance, than the bylaws would allow. Such documentation would need to be regularly maintained to ensure it complies with any bylaws.
- If documentation is short on (or missing) evaluative criteria, consider adding it.
- Use clear, precise language to define any concepts and standards that are relied upon for decision making. Don't assume those new to the field or to an institution understand what is meant by research metrics, "well-regarded" publication venues, or what kind of web content counts as scholarship.
- Encouraging open access publications and interdisciplinary research is a good idea, given the current scholarly publishing landscape, and is in keeping with best practices.
- Use positive, supportive language to highlight the qualities an institution wants to see in P&T applications.

Conclusion

This study aimed to better understand how R1 academic libraries define and rank scholarship expectations for promotion and tenure. Overall, peer review and conference materials were the most heavily mentioned when discussing quality and type of scholarship. While similarities existed in the structure and elements of the documents—including lists of scholarship outputs and procedural matters—details on how candidates' scholarship would be evaluated were slim. Additionally, documents seemed to be outdated, overly formal, and hard to understand, leading the researchers to question both how these institutions were applying the criteria in practice and if candidates at these institutions really understood how they were being evaluated. Achieving tenure or continuing appointment is a significant accomplishment for any librarian, clarifying the scholarship quality required would benefit candidates as well as evaluators.

Scholarship expectations were the focus of this study; however, other elements of the process could be evaluated in further research, such as full professor criteria, criteria specific to land-grant institutions, or a deeper dive into how open access scholarship is treated. Additional research could also utilize interviews or focus groups to obtain personal accounts of how scholarship criteria in formal documentation is being applied or understood.

Author Contributions

All authors contributed equally throughout all steps of this research project.

Data Availability Statement

Because of copyright concerns, the actual documentation analyzed in this study will not be shared. However, the appendices, which contain the list of the study population and the codebook, including definitions for each code, can be found at https://doi.org/10.5281/zenodo.18686283.

References

Ackerman, E., Hunter, J., & Wilkinson, Z. T. (2018). The availability and effectiveness of research supports for early career academic librarians. *The Journal of Academic Librarianship*, *44*(5), 553–568. https://doi.org/10.1016/j.acalib.2018.06.001

ACRL Board of Directors. (2012). Joint statement on faculty status of college and university librarians. *College & Research Libraries News*, *73*(11), 669–670. https://doi.org/10.5860/crln.73.11.8869

Alperin, J. P., Muñoz Nieves, C., Schimanski, L. A., Fischman, G. E., Niles, M. T., & McKiernan, E. C. (2019). How significant are the public dimensions of faculty work in review, promotion and tenure documents? *eLife*, *8*, e42254. https://doi.org/10.7554/eLife.42254

American Association of University Professors. (2006, June 30). *Tenure*. AAUP. https://www.aaup.org/issues/tenure

Best, R. D., & Kneip, J. (2010). Library school programs and the successful training of academic librarians to meet promotion and tenure requirements in the academy. *College & Research Libraries*, *71*(2). https://doi.org/10.5860/0710097

Bolin, M. K. (2014). The language of academic librarianship: The discourse of promotion and tenure. In *Advances in library administration and organization* (Vol. 32, pp. 213–264). Emerald Group Publishing. https://doi.org/10.1108/S0732-067120140000032004

Bradigan, P. S., & Mularski, C. A. (1996). Evaluation of academic librarians' publications for tenure and initial promotion. *The Journal of Academic Librarianship*, *22*(5), 360–365. https://doi.org/10.1016/S0099-1333(96)90085-3

Cameron, L., Pierce, S., & Conroy, J. (2021). Occupational stress measures of tenure-track librarians. *Journal of Librarianship and Information Science*, *53*(4), 551–558. https://doi.org/10.1177/0961000620967736

Cate, L., Ward, L. W. M., & Ford, K. S. (2022). Strategic ambiguity: How pre-tenure faculty negotiate the hidden rules of academia. *Innovative Higher Education*, *47*(5), 795–812. https://doi.org/10.1007/s10755-022-09604-x

Connell, R. S. (2018). Promotion & tenure procedures: A study of U.S. academic libraries. *Library Leadership & Management*, *32*(4), Article 4. https://doi.org/10.5860/llm.v32i4.7296

Damasco, I. T., & Hodges, D. (2012). Tenure and promotion experiences of academic librarians of color. *College & Research Libraries*, *73*(3). https://doi.org/10.5860/crl-244

Declaration on Research Assessment. (n.d.). San Francisco declaration on research assessment. *DORA*. Retrieved March 22, 2024, from https://sfdora.org/read/

Duffy, M. A., & Webb, P. L. (2017). Do southeastern public universities adhere to the ACRL tenure and promotion standards? *Journal of Library Administration*, *57*(3), 327–345. https://doi.org/10.1080/01930826.2016.1269536

Hecker, P., & Smith, L. (2012). Tenure and promotion: Criteria and procedures used by University of Louisiana System Libraries. *Codex: The Journal of the Louisiana Chapter of the ACRL*, *2*(2), 17-45. https://journal.acrlla.org/index.php/codex/article/view/71

Hendricks, A. (2010). Bloggership, or is publishing a blog scholarship? A survey of academic librarians. *Library Hi Tech*, *28*(3), 470–477. https://doi.org/10.1108/07378831011076701

Leysen, J. M., & Black, W. K. (1998). Peer review in Carnegie research libraries. *College & Research Libraries*, *59*(6), 512–522. https://doi.org/10.5860/crl.59.6.511

Lo, L. S., Coleman, J., & Pankl, L. (2022). Exploring collegiality as an evaluation factor in librarian promotion and tenure documents. *Journal of Library Administration*, *62*(1), 85–100. https://doi.org/10.1080/01930826.2021.2006987

Meregaglia, A., Keyes, K., Vecchione, A., Armstrong, M., & Ruppel, M. (2021). Creating an annual evaluation framework for library faculty. *The Journal of Academic Librarianship*, *47*(5), 102426. https://doi.org/10.1016/j.acalib.2021.102426

Nixon, J. M. (2017). Core journals in library and information science: Developing a methodology for ranking LIS journals. *College & Research Libraries*, *75*(1). https://doi.org/10.5860/crl12-387

Novara, E. A., & Novara, V. J. (2017). Exhibits as scholarship: Strategies for acceptance, documentation, and evaluation in academic libraries. *American Archivist*, *80*(2), 355–372. https://doi.org/10.17723/0360-9081-80.2.355

Sassen, C., & Wahl, D. (2017). Fostering research and publication in academic libraries. *College & Research Libraries*, *75*(4). https://doi.org/10.5860/crl.75.4.458

Shropshire, S., Semenza, J. L., & Kearns, K. (2015). Promotion and tenure: Carnegie reclassification triggers a revision. *Library Management*, *36*(4/5), 340–350. https://doi.org/10.1108/LM-09-2014-0113

Smith, K. F., & DeVinney, G. (1984). Peer review for academic librarians. *Journal of Academic Librarianship*, *10*(2), 87.

Walters, W. H. (2016). Faculty status of librarians at U.S. research universities. *The Journal of Academic Librarianship*, *42*(2), 161–171. https://doi.org/10.1016/j.acalib.2015.11.002

Wirth, A. A., Kelly, M., & Webster, J. (2010). Assessing library scholarship: Experience at a land grant university. *College & Research Libraries*, *71*(6), 510–524. https://doi.org/10.5860/crl-51r1

Not Just Monetary: Arts and Humanities Scholars' Perspectives on the Costs of Open Access Publishing

Lindsey S. Skaggs, Rachel Elizabeth Scott, and Colby Cilento*

Bibliometric and survey-based studies have documented different open access (OA) publishing practices among scholars across academic disciplines. This article reports on interviews conducted with arts and humanities scholars from the United States, and it explores how OA intersects with their research and publication practices. Beyond the considerable financial costs of OA publishing, findings demonstrate that arts and humanities scholars contend with opportunity, reputational, equity, and time costs as they consider and engage with OA publishing. The authors discuss the implications of these costs for librarians who facilitate the dissemination, discovery, and preservation of arts and humanities scholarship.

Introduction

The literature shows that arts and humanities scholars do not publish their work open access (OA) as frequently as their colleagues in the sciences (Severin et al., 2020). A variety of factors contribute to their relative lack of engagement with OA publishing, including differences in research funding, the format of research outputs, and the availability and prestige of OA publishing venues. Despite research demonstrating that arts and humanities scholars are not dissimilar in their OA preferences (Scott & Dubnjakovic, 2025), their practices, opportunities, and resources remain quite different from those conducting research in the sciences.

This study focuses on the costs of OA publishing—material, opportunity, reputational, equity, time, and otherwise—to explore arts and humanities scholars' perceptions of OA publishing within their disciplines and institutions, as well as the intersection of these perceptions with personal practices. Although interview participants were selected based on self-reported OA engagement, none had paid out-of-pocket to publish their work OA, and most would be opposed to doing so. Not only is OA publishing not a priority, but several participants also conveyed a lack of awareness of the varieties of OA, their financial costs, and licensing considerations.

Lindsey S. Skaggs is Assistant Professor and Scholarly Communication Librarian at Illinois State University; email: lsskagg@ilstu.edu; Rachel Elizabeth Scott is Professor and Head of Acquisitions and Cataloging Services at the University of Illinois; email: rescott@illinois.edu; Colby Cilento is Copyright Librarian at Illinois State University; email: cjcilen@ilstu.edu.

The authors investigate three research questions to consider participants' perceptions of the costs involved in OA publishing and how these intersect with personal, disciplinary, and institutional values:

- RQ1. How does open access factor into the publication and dissemination of arts and humanities research?
- RQ2. How are open access venues perceived in arts and humanities disciplines, and what considerations contribute to these perceptions?
- RQ3. What do arts and humanities scholars identify as the costs of open access publishing?

Participants' responses uncovered the nuanced positions arts and humanities scholars find themselves in as they disseminate their work and advance professionally. In amplifying these positions, the authors—all of whom work as academic librarians—hope to shed light on opportunities for librarians to assist arts and humanities scholars in preserving and sharing their work.

Literature Review

There is a vast literature on OA publishing, with much of it focusing on articles rather than monographic or other formats. Prior studies gathering scholars' general perceptions of OA publishing have largely found ambivalent attitudes across the disciplines (Rowley et al., 2017; Tenopir et al., 2017; Togia & Korobili, 2014). While STEM faculty are generally more aware of OA publishing due to grant funding requirements and have adopted OA at higher rates (Olejniczak & Wilson, 2020; Severin et al., 2020), uncertainty about OA publishing practices and principles persists. Bryant and Thomas (2024) make an important distinction between awareness and understanding; while authors are often aware of OA, they do not understand the nuances between publishing models or how to intentionally make their work open.

Considering that arts and humanities researchers are less likely to believe OA publishing expands their readership to new audiences (Dalton et al., 2020), are less frequently subject to OA mandates (Severin et al., 2020) and receive less grant funding for article processing charges (APCs) (Tenopir et al., 2017), they generally lack incentive to better understand the OA publishing landscape in their disciplines. Scholars in the arts face the added complication of navigating image permissions in a system designed primarily for text-based contributions (Thomlin, 2011). The proliferation of predatory journals further disincentivizes OA publishing, reinforcing the narrative that OA publications are of lesser quality even when the evidence suggests otherwise (Gaines, 2015; Richardson et al., 2019; Tenopir et al., 2017). For some scholars, paying to publish OA—if they can source funding—risks association with vanity publishing; therefore, they view traditional gated publishing and established venues as the only valid route to tenure and promotion (Harley et al., 2007; Narayan, 2018; Scott & Shelley, 2022).

For scholars across disciplines, the literature shows that OA and copyright policy play a minor role in venue selection, with fit, quality, and time-to-publication carrying significantly more importance (Gaines, 2015; Solomon & Bjork, 2012; Swan & Brown, 2004). Once a venue is selected, however, OA is often viewed as a bonus (Nicholas et al., 2019; Scott & Shelley, 2022). Many arts and humanities scholars support the ethos behind OA publishing even if they do not prioritize OA venues (Eve, 2014; Nicholas et al., 2019). As more gated journals transition to hybrid OA and offer fee-based publishing options, they provide a lower-effort path to OA publication by preserving author choice and providing options based on author

funding. The question then becomes whether scholars or their institutions are willing or able to pay these fees.

APC funding is a barrier for arts and humanities scholars (Quigley, 2021; Severin et al., 2020), though recent studies suggest funding opportunities are growing. In a 2020 study, Cantrell and Swanson surveyed faculty with at least one OA publication in the social sciences, arts, and humanities; of the ten who had paid an APC, all ten reported having received funding through their department, college, school, library, or sponsored research funds. In Bryant and Thomas's 2024 study, participants predominately in the humanities, social sciences, and public health disciplines reported mixed levels and sources of financial support, ranging from none to full APC coverage. Often, using funding for APCs requires a tradeoff. In *Exploring the Hidden Impacts of Open Access Financing Mechanisms* (2022), the American Association for the Advancement of Science reports that "over three-quarters of researchers (n = 115, 77.7%) reported foregoing purchases of materials, equipment, or tools to pay APCs, and nearly three-fifths (n = 86, 58.1%) reported not attending workshops or conferences relevant to their work" (p. 1)—a substitution that disproportionately impacts women.

Historically, arts and humanities scholars have had low self-depositing rates; Gargouri et al. (2012) recorded average rates of 9% and 14% for articles published in the arts and humanities, respectively, between 2005–2010, compared to a 21% average for all disciplines, and a high of 43% for math. Arts and humanities scholars are more familiar with institutional repositories (IRs) than disciplinary repositories (Creaser et al., 2010), though academic social networks (ASN) continue to show considerable growth. In a 2017 study, Borrego found that only 11.1% of the articles published by researchers at Spanish universities in 2014 were deposited in IRs, while 54.8% had been uploaded to ResearchGate. Scott (2019) compared the deposit practices of musicologists and the subject librarians who serve them; unsurprisingly, librarians deposit in institutional repositories at higher rates than musicologists, whose work was more commonly in ASN. When sharing to ASN, researchers across disciplines lack clarity on whether this practice is considered OA (Bryant & Thomas, 2024).

The present study adds to this literature by providing more depth and nuance regarding arts and humanities scholars' motivations and practices surrounding OA publishing and self-deposit, as well as the costs associated with them. Previous studies examining OA publishing behaviors and attitudes have largely collected information using surveys (Cantrell & Swanson, 2020; Dalton et al., 2020; Gaines, 2015; Nayaran et al., 2018; Richardson et al., 2019; Rowley et al., 2017; Solomon & Bjork, 2011; Swan & Brown, 2004; Tenopir et al., 2017). Although some studies have leveraged focus groups, group discussions, and interviews to explore OA motivations and obstacles in a variety of disciplines (Greussing et al., 2020; Kirschner et al., 2024), there is nonetheless space for a deeper reflection that privileges the experiences and motivations of arts and humanities researchers in their own words.

TABLE 1
Self-Reported Participant Disciplines

Art History (5)
Art (1)
Communication (2)
Critical Media Theory (1)
Design (1)
English (1)
Literature and Languages (1)
History (4)
Journalism and Mass Communication (1)
Musicology (1)
Philosophy (1)
Rhetoric (1)
Theatre Studies (1)

Methods

TABLE 2 Participant Academic Position/Rank
Not on the tenure track (2)
Pursuing tenure (6)
Tenured (10)
Retired (1)
Emeritus (2)

TABLE 3 Participant Institution Type
Baccalaureate (1)
Master's (3)
Doctoral/Professional (2)
Doctoral: High research activity (6)
Doctoral: Very high research activity (9)

The authors conducted twenty-one in-depth, semi-structured interviews with arts and humanities scholars based in the United States who identified as having published at least one article OA. For the purpose of this study, the authors defined OA publications as those freely available directly from the publisher. In addition, participants were asked about self-deposit practices. One of the authors had previously co-conducted a survey of arts and humanities scholars on their experiences with and perceptions of OA publishing (Shelley et al., 2023). That survey was distributed on email lists serving arts and humanities disciplines and requested that those interested in participating in an interview separately share an email address. The authors reviewed prospective participants and invited those whose discipline and academic position promoted the most diverse perspectives (Maxwell, 2013, p. 96–7).

The study was approved as exempt by the Illinois State University institutional review board; the interview questions are available in Appendix A. The authors conducted interviews via Zoom in April and May 2024, receiving permission to record the interviews and enable transcription. Drawing on their reconciled notes and interview transcriptions, the authors used interpretive description, an inductive framework that promotes understanding through observation, to organize the data into themes and subthemes (Gariepy, 2021).

The authors leveraged practices highlighted by Creswell and Miller (2000) for promoting the validity of qualitative data. Among these, the authors searched for convergence among multiple and different sources (i.e., triangulation), invited participants for their input on the credibility of the information and account (i.e., member checking), asked external professionals to examine the account and consider its credibility (i.e., audit trail), and quoted participants extensively (i.e., thick, rich description), creating "verisimilitude, statements that produce for the readers the feeling that they have experienced, or could experience, the events being described in a study" (p. 129). The authors investigated the publications of participants to triangulate them with interview data. After drafting a manuscript, the authors shared it with participants and experts external to the study, incorporating their edits and feedback into subsequent drafts.

There are several methodological limitations to this study. Recruiting interview participants from a survey that had been distributed via email lists meant that disciplinary representation and career stage are not representative of the current academic workforce in the United States—communication scholars and historians were overrepresented, for example. All participants are active in the United States, and the findings are limited to an American context. By asking first about research articles, the interview instrument may have biased participants toward that format and not open access publishing more broadly. Finally, the authors are all librarians with an interest in supporting scholars; the framing of questions and direction of the interviews were informed by the authors' vested interests and the participants' perceptions of librarianship.

Results

Research Question 1: How does open access factor into the publication and dissemination of arts and humanities research?

Venue Selection

Participants were asked to discuss the factors they consider when selecting publication venues. As found in other studies, prestige, fit, audience, career stage, impact, peer review, and time to publication emerged as the main criteria scholars weigh in venue selection (Gaines, 2015; Solomon & Bjork, 2012; Warlick & Vaughan, 2007). Participants most often did not explicitly consider OA, privileging other factors instead. Indeed, OA could be understood as competing directly with scholars' desire to place their work in the most prestigious venues in their field and strategically advance their careers through publication.

Prestige and Impact

Open access venues in the arts and humanities—which are newer and infrequently flagship society outlets—tend not to be perceived as the most prestigious (Xu et al., 2020). A literary scholar admitted to playing the "prestige game" when placing a monograph while also acknowledging that esteemed venues are not going to be open: "I'm swinging for the fences." Despite the manifold advantages of publishing OA, doing so may not help one secure a tenure-track position or advance a career in the arts and humanities. Several participants indicated that tenure and promotion is dependent on publishing in the most respected and most selective venues. A philosopher noted that more prestigious outlets are better for your career even if "those journals don't actually always publish better material, and in fact sometimes what they publish might be worse but more attention grabbing—not more rigorous or important." Among participants, impact was not measured via a journal's impact factor, but rather if "it's in the field, familiar, and people I know publish or read there." Scholars agreed that they "wouldn't want to publish to have something languish unread."

Fit and Community

All participants acknowledged the importance of fit within a venue's scope. One historian stated that venue selection was heavily dependent on whom their arguments would benefit; an English scholar described how argument and venue are interrelated: "If I'm trying to make an argument or present research, what would it look like if it were published by a specific journal or press versus another?" They noted that they're "looking for a match in value systems—thinking about the community." Participants emphasized that research is about relationships; a communications scholar wants "to be part of a conversation," and a historian engages audiences "with storytelling and multimodal outputs." For some participants, the connection to community necessitates openness. A design scholar spoke about a project in which they explore the visual design of radical scholarship. They are only considering OA venues: "This needs to be public, it needs to be accessible outside the ivory tower. It's related to openness, to public engagement, to public art." Similarly, a historian who works on French relations with North Africa is

> aware that a lot of research that I produce is hidden behind paywalls, projects that I think would be of more interest to ordinary people and scholars who don't have the infrastructure of a university to get access [...] it's important that what we're producing is available to a larger public.

In many cases, however, the desired audience tied participants to gated venues.

Peer Review and Career Stage

Peer review plays a complex role in considering OA venues. Many participants acknowledged the importance of "the imprimatur of peer review" for tenure and promotion purposes, while also indicating that it is problematic, time-consuming, and fraught. A musicologist stated that peer review "keeps out-of-the-box ideas from being published [...] Academic societies are cliquish; if you're outside, you won't get published." They made a case for depositing work in Humanities Commons, which has subsequently been renamed Knowledge Commons, rather than publishing in peer reviewed journals.

Participants "wouldn't make the same decisions everywhere" and one said venue selection "depends on where I am in my career." A historian shared: "When I was going up for tenure, you needed to signal that you've hit a certain standard by publishing in certain journals. But now I'm more open to publishing in open venues and more public venues." One scholar who recently switched to a tenure-track position and is going up for tenure next year indicated "because of that, I look at journal rankings and impact factor." Although they understand it may be out of their hands, participants also consider time to publication, saying, "pre-tenure, that has serious implications."

Open Access Publishing

Most participants indicated that OA does not influence where they submit their work: "I haven't sought out OA, but I'm not avoiding it either." For several, it is not a consideration: "Frankly, I don't know of many journals that are OA in my field. One reason could be because that's not a criterion I use when choosing a journal." Many participants responded along the lines of: "If I'm looking for a place to publish an article, OA doesn't come into play. But if they offer it, that's a bonus." Others were explicit about weighing OA against prestige and reputation: "I try to negotiate for OA options if it's not in the contract or choose journals that are OA [...] I must balance that with performance expectations as a scholar."

Some participants noted that established journals increasingly offer OA as a possibility and a few alluded to library support for OA publishing. A historian shared their experience having an article published OA via a library agreement:

> The journal sent me an email to ask if I wanted to publish OA in the final stages. I emailed the history librarian to ask what the process would entail. I remember it was extremely seamless. I indicated I wanted to publish OA, Sage got into contact with the library, and they took care of it.

Others expressed pleasant surprise with OA monograph publishing; an art historian whose contribution was published in an OA anthology remarked: "I asked a publisher rep how they make money on it, and she said it pushes sales." Similarly, an English scholar encountered the TOME [Toward an Open Monograph Ecosystem] project as a graduate student: "I saw its immense potential. There was a faculty member who published a monograph and had great sales and then published OA and that book had even more engagement." That said, many remain skeptical about OA book publishing: "I haven't seen them succeed yet."

When participants consider OA publishing venues, it ranges from aspirational ("I wish I prioritized the better open access models, not just closed journals trying to make some papers open access and be profitable"), to intentional ("How high is the barrier of entry for someone without institutional access to get to this thing?"). Even those interested in OA have boundaries: "I wouldn't publish in anything that's for-profit. I would never publish in a shady journal that charges a publication fee." A historian argued that OA venues in the United States are not "where you send your best stuff: it doesn't look good on your resume." They specifically called out reputational costs: "It doesn't look good for graduate students on the job market; if you've sent your dissertation preview to an OA journal, the assumption is that it was the only place you could find that would take it." An English scholar noted OA publishing may be held against scholars, asking, "What part of publishing is social and what part is intellectual? Publishing OA might check the social box and get more engagement." The implication is that it may not check intellectual boxes.

Depositing

Participants were asked to discuss disciplinary perspectives on archiving scholarship in disciplinary or institutional repositories (IR). As confirmed in previous studies, engagement with such repositories is minimal and participants more readily disseminate their work via ASN or through casual sharing mechanisms (Segado-Boj et al., 2024). Although participants' practices for depositing intersect with OA, their statements convey confusion about and lack of interest in the terms of publishing agreements related to green OA.

Depositing activities range considerably among participants. A philosophy scholar actively maintains profiles, depositing every accepted manuscript to ResearchGate and PhilPapers, and even preregistering hypotheses or analytic decisions on Open Science Framework: "Because we have a lot of data and data analysis files, we put it on Open Science Framework so others can use it. It's been used at least once—our data was used for a re-analysis to answer different questions. We usually preregister hypotheses or analytic decisions so we're not p-hacking." More commonly, however, participants "Don't tend that part of my garden." They agreed that the practice of depositing depends on disciplinary norms and one's training: "Deciding on which to use depends on which people you spent time around, what was recommended—wherever your advisor told you, you probably don't change."

Academic Social Networks

Participants appreciate the capacity of ASN to share work with readers worldwide: "Academia.edu is international and gets thousands of hits and lots of downloads. It's really effective." Those who use ASN do so primarily to provide access to their work: "I keep everything on ResearchGate to counteract the fact that my work is gated." Participants vary considerably in their engagement with and perceptions of ASN. As a historian stated: "I don't think there's a consensus position—some people put a lot on them, and others put next to nothing. I have seen a lot of people put their conference papers on them." Part of this variation is confusion about what version of a manuscript can be deposited and when. A theatre scholar remarked, "I notice other scholars post things immediately even though I think agreements with journals say you need to wait some time." Some participants are untroubled by copyright restrictions: "I usually throw the publisher's version on there; it's cleaner and has images." Confusion was

the most common position: "I don't know what laws are being broken when you put things up on Academia.edu. And who is losing money when you can find articles there? Is it the journal, the hosting institution, or the publisher?"

The biggest complaints about Academia.edu relate to the pay structure, for example: "[Academia.edu] wants me to pay to see my mentions, but I don't care, I'd never pay for that," and "Things that are commercial are a little fishy." A philosopher has "grumpy thoughts about Academia.edu." Despite wanting to like it, "I was constantly bombarded with emails saying that people were talking about me, and I should upgrade to premium to find out who/what. I found that really off-putting—they're capitalizing on the worst human tendencies." Participants appreciate that ResearchGate is cost-free: "I upload to ResearchGate whether or not I'm supposed to and put everything there. I'll do that until I'm told not to; I don't want to pay for Academia.edu." Some make use of the request feature that allows readers to request a PDF from the author: "Because of copyright, I'll post things with 'ask me for the PDF,' on ResearchGate. I don't log in regularly and when I do I have several requests from international scholars." An English scholar noted that EPUB files cannot be shared via ResearchGate direct messages; if they receive a request for which they do not have a PDF, they provide a link to LibGen. Only one participant, a philosopher, indicated that they use the social part of ResearchGate: "One of my recent papers [happened] because I published a question on ResearchGate and a startup responded and wanted to collaborate."

Several participants expressed skepticism about the commercial nature of ASN. A literary studies scholar acknowledged that the needs of under-resourced academics drive ASN usage but stated: "Given that I have other alternatives, I'll use those first. I was on the bandwagon with #deleteAcademia.edu and never looked back. If there's a nonprofit option, that's the one I'll lean towards." A legal scholar indicated that authors do not think enough about copyright: "Most are open to putting work in IRs or on LinkedIn or ResearchGate and are not worried about being sued. I don't think publishers are suing scholars. They could." Participants also expressed some skepticism about the stability and discoverability of ASN:

> People might say: I've archived it at Academia.edu but there's no discussion about long-term archiving or sharing to a repository. There is uneven awareness of how those repositories fit into the systems of resource discovery that dominate your experience on a library website. Discovery gets missed in this conversation.

An English scholar who does not have the bandwidth to investigate what can be deposited in ASN directs requestors to platforms on which the articles are available, including piracy websites:

> I grew up in a place where I wouldn't have had access without piracy sites. I've studied piracy; it often is encouraged by the people who hold copyright and patents because it helps with usage which can be transformed into money, it builds dependencies.

They allow students to access materials in any way: "I'll tell them about the piracy sites."

Institutional and Disciplinary Repositories

Over half of participants were aware of their institutional repository (IR): "we know they exist but it's even more out of sight, out of mind [than ASN]." As with ASN, participants expressed confusion about what content is eligible for deposit. A historian said: "I don't think they've ever explained to us what we're allowed to put there." An art historian is "afraid I'm going to get a cease-and-desist letter from [a publisher]. But I figure, after a certain number of years they won't care so much."

A few participants indicated that librarians facilitate their IR deposits and make the process "pretty painless." A scholar in the California State System said a librarian contacted them when they started and offered to deposit on the scholar's behalf. They have not kept up with this work, however: "We get an email once a year that says how often the article was read and that's when I realize I haven't updated it with my other articles [...] It's not essential." A scholar in the University of California System was not aware of an IR because "everything is online." They indicated that their library is so understaffed and underfunded, these responsibilities are the purview of professors. "And people are publishing so much these days there isn't a way to keep track of it."

Those participants who use an IR do not see broad use among others in their fields. An art historian shared that although they have always made use of their IR, others do not: "I see more people in the sciences taking advantage of the IR as well as the data repository." Another participant shared that, "It's always clunkier than I think it will be, there are fields where I'm unsure what they're asking for." A design scholar indicated that they have not submitted anything to their IR in a few years "because the process seemed very manual. And then it wasn't really the article, it was a link." They further noted "My field is not as versed in this as other humanities fields are. We're studying and creating visual artifacts—often there are copyright issues related to artwork." An art historian noted that "There are probably generational differences" in engagement with an IR.

Three participants shared negative experiences with their IR. A language and literature scholar has "no use" for the IR, deprecating it as "chaotic, useless, helter skelter, random, and disorganized." They feel that the publisher's version is the "only thing we can rely on" while also acknowledging that "journals come and go." A musicologist shared that their institution had an IR but lost it due to financial exigency: "Everything we put up there digitally is gone. They got something else and restored some of it." A historian shared a particularly maddening experience related to a digital project: "Our library funded this thing, and they were supposed to print a book for me. They never did, and they took it off the website and now it's just gone." This has left the scholar with

> a lot of confusion and resistance to the notion of depositing work in an IR because it is unclear where it goes, who has access, and what happens with it. Due to the short lifespan of what I put there, I wouldn't go out of my way to deposit anything there.

Participants mentioned MLA Commons, PhilPapers, and SSRN as disciplinary repositories with which they had some experience. A legal scholar shared: "It's not clear if I publish in SSRN if a journal might reject it because it's technically 'published' somewhere. Journals

don't make that clear. Law reviews make it much clearer than other publishers." Accordingly, they err on the side of being conservative. A musicologist noted that their professional association endorses Humanities Commons, and they deposit their work there. They worked on a manuscript that was too long and interdisciplinary for journals, so they deposited it to Humanities Commons: "It's been read by more than it would have been otherwise. Publishing there broke down silos." A literary studies scholar also uses Humanities Commons: "If it's not a publisher's open platform, I'll stick whatever I can into Humanities Commons. That includes syllabi and course materials at times." A media studies scholar finds repositories exciting but does not see that they are particularly useful in their own field: "It's not something that anyone thinks about, considers, talks about, or is cognizant of." They noted exceptions of scholars in Western Europe, those meeting grant requirements, and digital humanities work that intersects with computer science: "there is a greater awareness of openness."

Personal Website

Only four participants maintain a personal website, which can comprehensively list publications and provide access. As one design scholar stated: "We're scholars at a public university so we need to make our work accessible. My website is also a record of all my work—makes tracking easier." Another scholar who "puts everything on my personal website," includes a note on the page saying, "if you hit a paywall, let me know and I'll provide it to you free of charge." Another scholar underlined the tension between what is uploaded and what is linked to: "I put a link to my publications on my personal website. I'll sometimes upload the published copy, but I only do that for articles that I published three or more years ago." Participants indicated that it is not clear what rights they have and linking seems like the safest route. Those who do not maintain a personal website shared that it feels like yet another "nonessential" thing to do. An art historian was told to develop an online presence early in their tenure: "I like to share things but the idea of spending all this time to create an online presence wasn't my idea of big fun." A historian quipped "I was born a few years too early to engage with personal promotion via Facebook, LinkedIn, Twitter, or a personal website."

PrePrints, Data, and Code

Most participants do not have experience depositing preprints. A media studies scholar shared an example of having an award-winning article that had a long publication delay at a top journal: "I asked if I could publish a preprint while it was under review and they said if I did that, they would not publish it, so I didn't do it." They were a graduate student at the time and might make a different decision now: "I think this hampered the visibility of the piece." A historian only feels comfortable sharing the final, copyedited version of record: "The journals that say you can post to repositories don't let you put the final version—do I want to put the version up that is not copyedited? No." A philosopher offered detailed considerations of concerns around preprints:

> I have senior colleagues in philosophy and at least one in social psychology that seem worried about posting papers before they're accepted by a journal. A decade ago, their reasons were that if it was already 'published' in a repository it could

> give a publisher a reason to reject it. Some people are afraid of getting scooped or someone taking the novelty away from them.

Although many journals explicitly allow for posting preprints and sharing data, some participants note that concerns around scooping persist. Although a philosopher is not convinced this is happening, "Some colleagues are afraid that a PI with an army of postdocs could get to it first." This contrasts with younger colleagues in philosophy of science or metascience who are in favor of repositories and look down on those who do not deposit research data and outputs: "There's a meme—if you say 'data is available upon request,' they take it as a middle finger. Because it would be so easy to share the data—it takes just as much energy to write that statement. It's a very closed-minded decision." Given the proliferation of large language model tools, a historian registered concerns that data sharing and scraping are "increasingly an issue we should at least be discussing in the context of OA."

Participants note that scholars of arts and humanities engaged in Scholarship of Teaching and Learning (SoTL) and digital humanities work more frequently "share everything, including your code and other resources." They acknowledge that sharing qualitative and visual data is "messier": "There's an impulse to make as visible as possible what you're doing and how you're doing it. There are still barriers."

Other Dissemination Methods

An art historian noted the "soft market of sharing things" in their field. "I'm a big fan of the idea of OA but the reality of the huge subvention needed makes it unfeasible, which is why [we just] email it. [...] Culturally there isn't any taboo about emailing work in my subdiscipline." Another art historian noted that interlibrary loan and other library approaches to sharing work may be unsuccessful in the discipline because images may be excluded or of low quality. Yet another art historian said:

> sending and receiving PDFs is part of my daily life. I feel like scholars in my circle are sharing knowledge on our own, but it would be nice if that was happening above board. It's a position of privilege to share this way: who do you know, who are you asking?

A recently retired scholar shared they have not suffered at the loss of institutional access:

> I found it didn't stop me or slow me down. If I couldn't get an article, I'd write the author, and they'd send me a PDF copy. [...] Libraries as we know them will cease to exist—digital repositories are more powerful.

A philosopher offered a novel way of disseminating research:

> I read and record the papers where I'm first author to a podcast feed so people can access it [...] This can also help in realizing what sounds unnatural when read out loud and might result in a different type of ordinary language accessibility.

Research Question 2: How are open access venues perceived in arts and humanities disciplines and what considerations contribute to these perceptions?

Participants report a "really wide range" of perceptions on OA venues in their fields. While the individuals interviewed generally had positive views of OA, they characterized disciplinary perceptions as having greater levels of skepticism. A philosopher highlighted considerations that factor into these perceptions, including author payment, rigor, specialization, and methods:

> Some people still think all OA is paying to publish a paper you wouldn't otherwise be able to publish. We know this exists—predatory journals [...] Among the younger people, and those that run statistical analysis, they seem to know the difference between predatory and different quality journals.

Participants' responses underline evolving tensions between the costs and values of OA publishing.

Author Payment

The consensus among participants is "paying to publish papers is seen as bad generally." A design scholar stated "It's seen as pay-to-play, not rigorous. I get so many scammy looking emails." A historian suggested that "having to pay to publish preys upon the vulnerability of academics," and a communication scholar reiterated, "We don't get grants and funding to be able to drop $1,500 to $2,000 on a publication fee." They mentioned knowing only one person who has published via an APC, who did so because they had grant money and knew the editor to be reputable. Nonetheless, "It's hard to tell when those things are and are not predatory," and it "seems shady that something would get 2,000 views in a couple days." Another communications scholar said:

> Whenever I see publishers charging, I stay away from them. They're using IP that we produce with so much effort and our own funding and then they want us to spend money to publish. I don't find them authentic or credible. I don't think it's a moral way of publishing your work.

A language and literature scholar added: "When there is an author charge, I never pay. My reputation is at stake—I'm not paying. Either take it or I don't publish with you," though they also acknowledged that they edit an MDPI journal that charges authors 1,400 euros per article.

A few participants were more ambivalent. An English scholar remarked: "Beyond a general 'paying to publish' is bad, I don't think there's a granular understanding of the difference in payment models." A historian finds that "The distinction isn't necessarily between who charges fees and who doesn't. Once you've been trained in a particular discipline, you know which journals are established and respected versus those that are predatory." In other words, scholars' time and expertise are expenditures when negotiating OA costs and venues. A philosopher noted that, "The people who have the most prestige are generally publishing

in *Science* or *Nature* where it costs a lot to publish OA. But they usually have funding to do it." They argued that negative associations about paying to publish seem generational. They imagine that in the coming years, scholars will aim to make their work open, even by payment: "Making your papers as rigorous and accessible as possible is what everyone should be doing."

Funding and Hybrid Venues

Only a few participants discussed the OA implications of funding compliance: "Funding agencies—public and private—more or less require OA publishing. And they'll pay for it—even above the budget approved." A philosopher shared, "If I get a grant, I'll add the funding in." They highlighted the disparity in funding among disciplines: "The sciences receive huge grants: $2,000 is nothing for them. For us, it's life or death. We don't operate that way. If they have funding from the government, they don't care."

Most participants do not have research funding, and several spoke to other mechanisms of paying for OA publication. One indicated that their library funds up to $2,000 a year to publish in OA journals. A historian mentioned:

> I've recently been talking to our librarians and there have been some agreements I've heard of from publishers where they'll cover fees. I pay more attention to this than others and I was surprised when I found out the library offered it.

A few others reported that hybrid OA was not covered by institutional funding: "We have some funding for OA publishing fees, caps at $1,500 per article. [...] They will only cover publishing in journals that are entirely OA—not hybrid journals. It is a joint program between the Library and Research and Sponsored Programs." One hinted at less transparent guidelines: "Our institution does fund us if we want to publish something, and the publisher is asking for money—they evaluate the publisher and decide if they'll provide money for it."

Participants expressed differing perspectives on hybrid OA—OA articles published in journals that also publish paywalled content. Several mentioned having been asked to publish OA after a manuscript had been accepted; none have paid to do so. One communications scholar stated that they're not opposed to hybrid OA, even if they are not interested: "I don't have as big a problem with [hybrid]. If I see a submission fee, that's more problematic. If they ask to pay to make it OA, I don't see the point—I can get that through ILL." A philosopher expressed skepticism about the quality of hybrid OA articles relative to paywalled content: "There are borderline cases where reputable journals have open access branches. I sometimes notice that papers published in that part of that journal aren't as rigorous as those that get published in the traditional section." A historian argued that a reputable journal would not willingly jeopardize that standing by offering hybrid options: "I don't think they would want to trash their reputation, so I would be less concerned about that one asking for payment for OA."

Rigor and Replicability

Open access publishing makes some participants question "how do we assess value, reliability?" Historians suggested a "general skepticism" about the rigor of some OA venues. For example, "[When] publishing in new spaces there is often talk about making sure it is a

valid journal; anyone who says they can publish in three days isn't doing much editing or peer review." A musicologist noted, "The perception for a long time was that it was vanity publishing—that it hadn't received the proper scrutiny or peer review." An art historian

> would want the publication to be properly vetted—it depends what kind of thing that is. A museum catalog, for example, doesn't go through blind peer review anyway. But I would want the output to adhere to the same standards.

Another art historian said that there are few OA venues in their area: "I've published OA with an MDPI journal but that is seen as a little dicey." They were invited to contribute to a special issue by a colleague and did not pay any fees because of that relationship. "The whole process was really quick. Then things got a little weird; I would review for them, and they would publish regardless of what my review said."

Some participants did not tie concerns about rigor to OA. In design, "We don't have that many journals, so the discipline hasn't been overcome by OA journals that aren't perceived to be rigorous." An early career scholar said, "In my experience, open access has come up after a paper has been accepted, I've been given a choice [...] I haven't heard any conversation about paying for open access to influence acceptance or publication or anything like that." The topic of replicability only came up in one interview but was hinted at in a few others:

> In sciences and STEM there's a push for everything to be available because lives depend on it. Replicability is essential for science; people don't think that's necessary for the humanities, but data replicability is just as important. Without more transparency, we'll see a more biased view of history.

They argued that more OA publishing options in the humanities would advance replicability.

Tenure and Promotion

Participants reported shifting perceptions of OA in tenure and promotion considerations, from hesitance toward acceptance. An emeritus art historian from an R1 institution said, "The university has gotten better; at first, they were hesitant to count OA publishing." A full professor of history also noted changes: "Having been on tenure and promotion committees, OA journals are not as well-viewed overall [...] My sense is that things are changing in younger generations." Two more junior faculty had not experienced hesitance about OA venues in evaluations: "At my institution, there aren't different weights for types of publications as long as they're peer-reviewed," and

> I've been on committees that evaluate research, and I haven't really seen or heard about a lot of negative perspectives [about OA] from my senior colleagues—they're just happy about the fact that we're publishing. When it comes to reviewing the quality of our research, they look at the impact factor and open isn't considered.

An English scholar framed their response around the availability of prestigious OA venues: "I think there's a massive disconnect between what is considered 'top' and the availability

of OA which leads people to not consider OA. *Post45* was well-funded from the beginning but it's the exception." In other words, tenure and promotion requires the very best and such venues are most often not OA.

Some participants noted lists of top journals used within departmental tenure and promotion evaluations. An English scholar suggested that such a list could be used to determine funding priorities and incentivize a greater shift toward OA:

> If there was a list that had OA fees—maybe a tier system of what the library will pay to make articles published in these top journals OA—there could be an opportunity to put money there instead of other places. If any acceptance at a top tier journal had the university step in and pay for OA—and more people saw top tier journals making work OA—the institution would see it as a prestige thing. That could start a domino effect where there would be pressure in the system for journals to publish more OA.

Although participants noted increasing awareness and acceptance of OA in tenure and promotion processes, this did not extend to monographic publishing. University presses and other prestigious venues for monographic publishing have not adopted OA models as quickly as journals; accordingly, there has been less time and opportunity to consider the impact of OA monographs in research evaluation.

Sustainability and Equity

Participants commonly asked, "If it's open access, who pays for it?" Several noted the perceived sustainability of university-funded journals but were skeptical of the viability and sustainability of such models. A literary studies and digital humanities scholar notes increasing awareness of the costs of OA publishing:

> Ten to fifteen years ago, that conversation hadn't matured, but now it has more and more. There are different models like consortial agreements, libraries supporting open publishers and swimming against the tide of commercial publishers. The world of engineering and sciences has to deal with those issues a lot more frequently since they're paying for their own salaries and are expected to spend grant monies on APCs.

They expressed frustration that no sustainable, long-term business model for open publishing has been established, noting, "Humanities Commons has been supported by a lot of soft money."

Participants from a variety of disciplines commented on the disappearance of journals and digital projects. A musicologist said the question is "how long will this server last?" and recalled the demise of *Ethnomusicology Online*: "It was peer reviewed but [...] authors were weary of publishing in an online journal. It should have succeeded but it didn't." While a historian argued that born-digital content is more discoverable than print alternatives, a literary studies scholar pushed back against the assumption that "just being on the web makes something discoverable," and gave an example of a great project "on some academic's server which is the most digitally precarious place on the whole internet." An art historian shared:

> In terms of working with things that are old and physical—as long as the physical book exists, the knowledge exists, but if the journal I'm published in takes down their website, it's gone forever. I'm concerned about the digital longevity of publications.

A communications scholar has "seen OA journals disappear or be subsumed into [commercial publisher]." They gave the example of *Advances for the History of Rhetoric* which was previously OA but is now accessed via subscription:

> I've seen more OA journals disappear than pop up. I've also seen things stagnate. I worry about my work vanishing in the ether if a journal dies. I worry about this more with OA but it's not unique to those journals.

One participant indicated that a journal they edit offers waivers and reduced rates for individuals from specific countries but indicated that this does not satisfactorily address equity concerns. Another participant received a waiver to publish in an MDPI journal: "I said I'd only publish there if they gave me a waiver, and they did. I'm not sure why—it's not like I'm coming from a developing country [...] I wonder how people are getting them. Is it need based?" They expressed ambivalence about having been granted that waiver: "I feel conflicted about that. Having more transparency would be better." A few participants spoke to considerations around co-authored papers, with one early career scholar highlighting potential equity issues when publishing with students: "Charging fees is disliked and discouraged, especially when working with graduate students, unless the university pays the fees themselves."

Terms and Permissions

Participants across fields expressed confusion about OA publishing terms. An early career scholar finds decisions around open access publishing confusing,

> especially for graduate students who don't understand what funding is available or what they are agreeing to if they publish open access. I don't think universities explain the process of how to publish thoroughly, what we are taught as graduate students has no discussion of how work is distributed and disseminated.

More established scholars also expressed confusion, for example: "I'm unsure, do they become OA after a certain period of time?" A literary studies scholar who has sought to retain rights when publishing credits

> librarians and offices on campus for looking over the contracts [...] their expertise has helped me understand what I can ask for without pissing off anyone in an editorial office. I tell everyone I can to talk to their corresponding colleagues if they're lucky enough to have them.

Art historians had much to say about the additional costs of OA publishing due to image rights and permissions. One shared that payment-based OA is inherently problematic

but presents additional issues with image rights: "I've had negative experiences with OA because sometimes the images are removed and that wipes away the evidence for the article—the images are our data." They indicate that there is no stigma around OA in their discipline, "but there's the reality that we don't have support for this, and we have to acquire image permissions, so that's the real barrier to publishing OA in my discipline. That's also probably why there are fewer OA publications in this area." Although not unique to OA, a design scholar further articulated issues with copyright clearance when a designer cannot be traced. "With designers or illustrators, that work sometimes goes uncredited which complicated things."

Topic and Method

Many participants indicated that, although the flagship journals of their respective societies and organizations are not OA, OA journals serve many subdisciplines and area studies. An art historian shared: "The ones I have used are not strictly speaking in my field, they're in area studies instead of art history. In my field, do we have any? I frankly do not know." Several participants named highly respected OA journals in subdisciplines; an art education scholar said that the *Journal of Cultural Research in Art Education* "is fully credible—the range of scholars who publish in the prestigious art education journals also publish here," and another art historian said the *Journal of Historians of Netherlandish Art* "admittedly is a journal in a subdiscipline of a subdiscipline, but it is highly used and cited."

In history, the flagship journals are not OA, "though they might be hybrid so you can pay for OA, but I'm not sure." A medievalist noted OA is viewed positively, "which is interesting since history is usually more conservative." A historian of France offered a qualified endorsement of the *Journal of the Western Society of French History*:

> They've been open access for a long time. They started out in print, now are published through the University of Michigan Library on their site—it's seen as respectable but is seen as a place where you publish a project that is still at an intermediate stage.

Open access venues for military history "Tend to be policy-centric, like *War on the Rocks*; it's well-respected but it's for history related to policy issues going on currently. *Military Review* publishes military history, but it has to speak to a contemporary military issue."

In addition to topic and subdiscipline, the methods and approach have implications for OA publishing. Scholarship of Teaching and Learning (SoTL), for example,

> Is incredibly interdisciplinary and international, and organizations are working to make this field as accessible as possible. For the [SoTL] journal I work on, we have no cost to publish and no cost to read. International colleagues have reached out to say that they appreciate that.

Similarly, digital humanities (DH) work "has fully embraced OA." Participants noted several reputable options for OA publishing in DH, including *Digital Humanities Quarterly* and *Journal of Culture and Analytics*. "In general, that field has co-evolved with discussions about OA and

is constitutionally amenable to providing it as an option." Participants note that DH is more likely to be grant funded than other humanities research, and accordingly the outputs may be required to share publicly. In DH: "You can lose credibility with the crowd if you're not on board with OA and if your project involves datasets or certain collections. You need to at least explain why you don't make them available."

Audience and Innovation

A shift toward public scholarship in arts and humanities has considerable implications for OA publishing:

> We're clearly at some kind of inflection point [where] we're writing things for an academic audience that the public can't necessarily see and wouldn't necessarily want to read if they could, so I do think it behooves scholars to get their work out more publicly through different methods.

An art education scholar shared: "One of my projects is a blog, it's completely open to the public. It's not peer reviewed, but it's intended to be open, and I have no expectation or desire to make money from it." A historian referenced *Age of Revolutions* as "doing a fantastic job in producing distilled research from experts that are peer reviewed and OA. I published there but I'd come upon it before I met the editors because I'd used it in my teaching." They indicated that there should be increased resources for supporting those publications:

> Universities should give more credit in tenure and promotion to public work, but it's not an easy thing to figure out. There's a lot of discussion about these things in my department and there's a disconnect between what is valued by the people who run the media relations versus people in departments.

One historian noted that OA venues have missed opportunities to innovate: "There's a gap in my field in terms of the kinds of publications that are published." Traditional venues serve seven-to-ten-thousand-word pieces and books of seventy to eighty thousand words. They think OA publishing would provide value to the discipline by taking on "that giant space in between."

Research Question 3: What do arts and humanities scholars identify as the costs of open access publishing?

Participants report that the costs of payment-based OA publishing extend beyond the financial, taking a toll on the equity and transparency of scholarly communication; exploiting scholars and making their labor even less visible; damaging their reputations; and diminishing the (perceived) rigor of their scholarship. The costs also pose ethical and moral concerns; have opportunity costs at personal, institutional, and professional levels; divert money from other infrastructural and support needs; perpetuate inflated publishing costs and suggest alignment with the values of commercial publishers; facilitate surveillance and counting frameworks; and sacrifice copyright and intellectual work to the training of large language model (LLM) tools.

Economic

When asked their willingness to participate in payment-based OA publishing, the overwhelming response from participants was: "We have no money." Arts and humanities scholars are often "not flush with either salary or external grant resources." Several participants philosophically support public access to research but lack funding to publish OA under payment-based OA models: "I would love in theory for my work to be completely OA, for undergraduate students new to research, for the general public. I don't have the funding to do it, and I won't pay out of pocket." This leads to cynicism; as an art historian stated, there are "always going to be haves and have nots."

Although some participants have received small creative activities or research grants, most have no external funding and indicated that institutional funding options were limited. Participants indicated that society subvention grants are competitive and small—typically offering no more than a few thousand dollars. A design scholar confirmed: "Society subvention grants are really small—just a couple hundred dollars and they're few and far between." An art historian concurred:

> Grant funding is an issue—where there is some, it is small in scale because there is a perception that humanities research doesn't cost anything. There's more funding for Digital Humanities. That ends up being a buzz term—people will throw something into their project because it's shiny and new, but their research will be compromised.

Some participants shared that the professional development or noncompetitive institutional funds cannot be used for publishing costs. An English scholar shared: "My institution has little to no funding for these sorts of things. Otherwise, it is a resource rich environment. There are provisions where funds can only be used for certain purposes." They note, however, "If you could use it for this purpose, then you would have to decide if publishing OA is more useful than traveling to a conference. Then justify using funds for one and not another expense."

Participants reiterated that their fields are underfunded within academia: "They're such poorly funded fields—art, humanities, education—it's not reasonable to expect that we can fund it. Teachers, students, scholars deserve access to the information." A participant at a large public institution shared:

> Budget cuts have devastated us. My department has no money—we can't fully support conference travel anymore. There is a competitive grant you can apply for within the university to compete for publication fees. It's competitive across disciplines and isn't always the friendliest thing to humanities because selection is rooted in journal metrics and the like.

Some participants suggested that using personal funds for OA publishing would present a poor return on investment. A historian asked:

> Where is the money going to come from to pay for these things? Especially in situations in which my financial reward for publishing is so small—even

> including merit raises—how much money would I want to spend if there's no financial reward? Seems like a bad decision.

An art historian discussed payment-based OA saying, "I could have gotten full professorship earlier if I'd paid $10,000 to get a book published. But do I want a down payment on a house or to publish a book?"

Several scholars engaged in visual arts reiterated that their limited funding pays for images and permissions: "I would never submit something to any place that charges a fee. I am already paying for photographs." Although participants use public domain images where possible, when art is your discipline, the visual image is your evidence. One scholar has earmarked $4,000 for image permissions for their current book-length project: "I won't look into OA because I won't have the money for it. All the money will go to image subvention." For many participants, these costs compel them to seek out a publisher that covers costs: "We signed away royalties and they gave us a lump sum and cleared all the images for us." These costs have promoted creative approaches. A literary studies scholar was going to be "charged for an image I wanted to use, but managed to just buy a copy via eBay, which was probably sketchy." They scanned it and claimed, "author's collection" as the source. Sadly, one scholar has "chosen research projects before because I knew the images would be accessible." These costs constrain publishing choices, especially for arts and art history scholars.

Equity and Transparency

Most participants acknowledged that author payment models privilege authors at well-funded institutions. An early career scholar said, "I don't think it's equitable, especially for students and faculty of color [...] Most people would not be able to afford it, and institutions aren't providing support." An art historian asked if charging fees enables scholars at research institutions to publish while simultaneously constraining the ability of researchers at those less-funded, saying, "It's like a class system in academia." An English scholar at a relatively well-funded research university shared: "In an ideal world, I would like all my work to be OA. If that required payments, I'd make those payments. But I say that from a privileged position."

Participants noted information asymmetry in terms of who can afford to publish OA and socioeconomic barriers to entry which bias the literature. An art historian has, "seen bad scholarship that is open and gets a ton of eyes because they spent a lot of money while better scholarship is gated and can't be read. It's ironic because the university is promoting DEI and yet the humanities is still this elite club that you need money to get into." A historian shared serious concerns about the implications of pay-to-publish models in the academy:

> Public institutions and tuition-based private institutions don't have money to support this. I worry that we'll end up in a world where only people at rich institutions can afford a robust publishing agenda [...] My school is an R1 but we have no spare money—this will hurt the public universities.

Another historian expressed frustration that "People get into the academy to share knowledge but then there are fees and costs that limit that knowledge." As a communication scholar

joked, "If my work takes off, I want it to be because it was worth reading, not because I had more money."

Participants, many of whom have some affiliation with scholarly journals, indicated that the costs of OA publishing are not transparent. A historian shared, "For my journal, we pay for a copyeditor and production manager, and I know exactly how much that costs. But it's certainly not $3,000 an article. Where are those costs going?" Despite supporting OA, a legal scholar has philosophical concerns about it: "If it had the infrastructure that law reviews do and if they were more transparent with labor practices, I'd support them." They indicated that many OA journals are not indexed in major databases. "If my research is going somewhere to die and it's invisible labor that's done by faculty and graduate students, I'm not in favor of that." They contrasted this with law reviews, saying "it's amazing training for the law students and it's a beautiful system we don't have in the social sciences and humanities."

Exploitation and Invisible Labor

Participants were clear that payment-based OA publishing models feel exploitative. An art historian shared, "I got into academia because I loved to teach and share my ideas with others." They argued that humanities professors are not well compensated and are increasingly hired into nontenure track positions. They feel that payment-based OA models are especially exploitative of academics in precarious positions: "Humanities scholars are stuck in adjunct positions and trying to publish to get into a TT job and being exploited by fees." A communication scholar shared,

> I don't have a problem with reviewing things for free, but it has become exploitative because with austerity measures, I'm doing administrative work, and I don't have time to participate in all these scholarly activities. Now people are expected to produce so much; you're not getting tenure on a wink and an article anymore.

An art historian spoke to the predatory nature of such models, with publishers "taking advantage of passionate scholars who get nothing from it." They said,

> in arts and humanities, we feel so small. There's pressure to publish but we don't get paid for it and there aren't any financial benefits like in the sciences (like patents) so to pay to publish when we don't get anything for it seems exploitative. Humanities research is guided by a passion rather than to save the world or make money.

A literary studies scholar has a "dim view of how the OA space has been co-opted first by large publishers and then predatory journals." They do not see that openness is a value proposition relative to prestige in their field. A historian said,

> This is an exploitative academic model. Academics are doing all this work for free (writing, peer review, editing) so why are we paying for OA? I don't think paying for OA means a work is of lessor quality but there's a problem with pushing out the costs this way.

Related to the labor of writing, reviewing, and editing these journals, many participants see a cost in doing work that is not sufficiently recognized or rewarded:

> I know journal editors who've received small stipends of $1,000 a year. I guest edited an issue and it was so much work. A top journal in my field was run by a woman who had a 3/3 load—she did that for twelve years. There is so much labor that is unrecognized [...] It's usually not part of workload, just seen as service to the discipline.

A communication scholar who is on a 4/4 at an institution that requires significant service "fantasize[s] about later in my career having more time to do things. I don't want to be the person who checks out and stops participating in reviews, but if it's too much I will prioritize my health."

Reputational Damage and Rigor

Although several participants hinted that paying to publish would take a toll on their reputation, an art historian did not hold back: "I would lose my reputation if people thought I was paying to publish. It would be catastrophic." One tenure-track scholar acknowledged the reputational risk in paying to publish: "I knew this could be a career risk, so I made it clear that I would not pay to publish." They added a funding statement to the published article indicating that the APC had been waived. A theatre professor reiterated the importance of reputation to tenure and promotion: "One of my colleagues isn't going up for promotion because he's published in predatory journals, and he thinks he won't get promoted because of it." A historian would welcome changes to promotion and tenure guidelines at their institution: "It's ridiculous, but people are told 'I have to get published in X journal to get tenure.'" They would support a statement on the value of OA publishing and societally impactful work.

Some participants tied the risk of reputational damage to the perceived rigor of OA publication venues. A philosopher "would never want to publish in a venue where it's known that peer review is compromised." A design scholar shared concerns that author payment-based journals feel predatory:

> if their online presence looks scammy, they're not trustworthy. If they look too polished, that can be a red flag too. Many of the scammy ones are international, unrecognizable, and require payment; they don't carry credibility. I can't think of a current journal in my field I would pay to publish in.

Acknowledging that some OA venues are rigorous, a historian said, "there are others that send me spam on a regular basis. You could send them anything and for the low, low price of $500–$1,000 they'll put it on their website." They shared,

> It's already that case that you don't get a lot of sales in our discipline—we've long stopped caring about royalties. You're already giving up copyright: now you're going to pay to publish? Open access online publishing already doesn't have the space limitations that print journals have. If you're paying to put them there and

> they don't have a space limitation, that makes a lot of us uncomfortable—are there real scholarly standards being applied?

Ethics and Morals

Most participants feel strongly that publishers should not profit from their labor. A representative statement is: "I don't think academics should have to pay. We're already doing quite a lot of work for free. We're not getting paid for this work, we get paid by promotion from our institutions, so we shouldn't have to pay for this." Whether they frame their perspective as a personal belief or through the values of their community, most participants think charging authors to publish is wrong: "Asking for money from an author and then profiting from that author's work by selling it to folks who don't have access is highly unethical. I'd rather provide my work directly to people who ask for it, and I have done so."

Some participants explored the issue beyond questions of right or wrong, highlighting:

- Ethical concerns around publishing incentives ("If I'm an editor, and I have to incentivize folks to publish with me, are they paying for inflated stats?");
- Public funding ("I don't want the publishers to profit. If it's my money or the university's money—it's the taxpayers' money. It is exploiting the taxpayers to read your work");
- Pirating ("The first actors in Open Science were often those charging high access fees—there's platformization here—so I'm good with talking about alternate routes for access like SciHub, Anna's Archive, LibGen, etc. Open Science was flawed by these interests");
- Student debt ("I love open access and I use OERs in my classes. If I can get something OA or I can steal it, I will. I don't want my students to be in debt like I am. There are barrier concerns and longevity concerns. With my students, they don't know what they don't know. They don't realize they pay money to have access to many things that they'll never have access to again");
- Profit margins of publishers ("As an international student in India, I was asked to pay $30 for an article—it's too much. I understand the value of OA but [I'm morally opposed to] paying journals because they're already profiting through our work"); and
- International wealth disparities ("Whether it's OA or not, I'm against the idea of paying to publish my work. I think they should be paying me instead—I'm giving them my work. If they're going to be selling the article to libraries or people in third world countries that don't have institutional access").

One participant questioned the ethics of redistributing funds from universities to the private sector: "University is an odd model—a neoliberal business model paired with medieval monastic tradition; how can they coexist? To what extent can a University be used for redistribution? Move money from libraries to society to publisher?" They suggested:

> Tighter integration between the library system and subject experts might be the best pathway forward to prevent problems with Open Science [...] I think there should be more quality control so that we're not being extracted by a for-profit entity.

They noted that library-funded OA systems have their own drawbacks: "It seems like a bit of a scam if the library has paid money for one author to publish seven articles OA while others

don't get theirs published and now Springer has $60k?" They noted that financial issues could disincentivize them to publish more, saying, "It gets tricky really quickly."

Opportunity and Time

Some participants asked, "what would take a hit?" if author payment were required. A communication scholar remarked

> If the school was going to pay for it, even then, it adds up to a lot of money. Could we be spending money in better places? What student scholarship could it go to? Could it be spent to abate the asbestos in my building or replace our furniture from 1962?

An English scholar asked, "How much would I be willing to take from my research funds for that?" They continued:

> Maybe ten years from now I'll have enough resources where I could pay. But if I did that right now, I wouldn't be able to go to conferences or use funds for other research activities. [...] It's not that I don't want to pay—my threshold is: does it impact other things I was going to do, research-wise?

An art historian similarly noted:

> I'm at a university where budgets are being tightened—if the funding could be used for a research trip or a conference, I wouldn't want to use it for OA fees. But if the money was sitting around or would be lost if it wasn't spent, I might consider it. But I wouldn't take it out of the pool when my researchers are scrounging for money.

Participants agreed that one of the biggest costs of OA publishing was their time. Whether it was evaluating a journal, depositing accepted manuscripts, maintaining a website, or figuring out which versions could be shared on ASN, time was on their minds. They described depositing processes as manual and cumbersome, and sharing their work via ASN and personal websites as time consuming and potentially questionable. Because this work is a considerable investment of their time, some participants only engage in open practices for a portion of their outputs. A historian creates and disseminates OER through their DH work: "That's not really my scholarly research, but I spend a lot of time taking my research and making it usable in fully open spaces." They do not spend the time making their research for scholarly audiences available OA via deposit.

Infrastructure and Support

Participants reiterated:

> there is infrastructure in sciences that doesn't exist in humanities and social sciences. Sciences have more opportunities for grant funding to line-item APCs, there is not as much funding in humanities and social sciences, so it creates a situation where those fields don't publish OA a lot because of the lack of funding.

An English scholar asked, "What are the infrastructural supports that keep something afloat in this age of precarity? Who is getting money from the payments received?" The distinction for this scholar is between nonprofit presses and for-profit entities:

> I'm on the board of a society that gets most of its money from its journal's JSTOR clicks and not membership fees. Due to the success of the journal, they are doing financially well. If I get elected as an officer for this society, I'd want to charge lower fees or make more OA.

They indicated that the "goal isn't to get to $0—but to get to fair," and would lower APCs, subsidize, and open selected content.

Inflated Costs of Publishing

"These [APC] fees are the cost of rent!" sums up the perspective of many participants. An art historian said "Paying for OA is real money—it's not just like $50. Even if I had access to funding, I don't know that I'd pay it because it seems like a lot." A historian shared that,

> [OA] publishing would be a lot from a monthly paycheck. But even still the cost would become a factor in deciding where I wanted to publish. The higher the cost, even borne by the school, the less willing I'd be. I'd balance it against the outlet: is it worth it?

An English scholar offered additional considerations:

> It depends what the payment looks like. If it's a nonprofit press—I know university presses that are overworked—I could pay more. But I would never pay for Springer and Sage because the fees are absurd. Someone must pay, so I'm not against it in theory. It's the amount the rich publishers are charging.

An art historian recognizes that

> publishing costs money, and somebody has to pay for everything that goes into publishing and editing. But the idea that it's an individual scholar doing it really bothers me. I'd like outlets to be more transparent about who is paying for them to be there. [...] It's a game of musical chairs because someone has to pay, but who is making money and who is paying?

Several participants asked, "I wonder where that money is going?" Participants almost universally feel that the costs outweigh the return on investment: "I know a journal needs money to run but they're asking for thousands of dollars—what is that money funding?" Some participants spoke to advances in technology that have made publishing more cost-effective. A theatre scholar said, "I'm sure maintaining software and updating systems requires some funds [...] but I think it costs less than print journals did." Another participant acknowledges the costs of publishing but asserts "it also breeds predatory spaces. There needs to be more

clarity and definitions and guidelines for how people can understand good OA vs predatory OA." A few participants referred to double dipping. A philosopher said, "Charging authors and continuing to charge libraries millions of dollars—that seems to be double dipping, but I've never studied journal models well enough to know if that is justified." They prefer OA models that are funded by institutions, libraries, or professional societies.

One participant advocated for the work of a commercial publisher based on their experience as an associate editor for a journal published by a major publisher:

> I think there's more value to these publishers than people acknowledge. I have a technical team in India helping with every single article and the publishers are pushing the articles to indexing databases. There's a lot people don't see—the backend work needed to put out content and have it in library databases. If you don't know how to make articles available, you shouldn't be running an OA journal.

They called for transparency in discussing how much it costs to run a journal and thought it cost about $10,000 a year to run the journal they worked on:

> The benefits of the major publishers and the costs aren't always transparent in these discussions [...] Publishers put in so much work to make information available in databases. Journals shouldn't be publishing OA without understanding what it takes to run a journal, this is not always transparent in discussions.

Other participants questioned the value added by publishers. A graphic designer said, "I can put together a PDF of an article, that's not hard—especially with the right software." They went on to discuss the costs of database indexing, copyright, and distribution, but shared "Part of me hopes that more truly OA journals pop up in my discipline that get started in that grassroots way." A historian asked what publishers do to market their work: "Are they working hard to get it out there, or are they more focused on money from me or to embrace wanting to make it accessible and get it out there?" Another historian feels that the quality of the editorial process has declined: "Time to review takes longer and longer and longer post-COVID, even for articles to be sent out to reviewers. More reviewers are turning down reviews. It took eight months for one of my articles to get sent out for first review." The combination of extended timelines, higher costs, and declining quality is a major concern.

Values of Commercial Publishers

Participants expressed concern about commercial publishers and the concentration of power among a few major publishers: "If big conglomerates buy these journals, are there going to be fewer OA options? I tell my students they can't use the for-profit journals and predatory journals and explain what they are." An English scholar finds it "a little icky" when a top-tier journal is controlled by a for-profit press. They gave the example of *Big Data and Society*: "it is a top journal in my field, and I'd like to have an article there as a social signal, but it would make me feel icky to pay a bunch of money to those publishers." Some participants expressed frustration at the co-opting of OA by commercial publishers. An English scholar remarked

> With Open Science, the problem isn't the openness itself, it's that the companies that were already making a ton of money continued making money from OA—so to have to pay higher open access fees is the problem. Those situated to profit have profited off OA.

A literary studies scholar discussed how

> They devised a business model on the backs of an OA ethos that was never supposed to be about commercialization. This is what innovation is now: looking for loopholes. It's not like they broke any rules but it's a shame that this has become a business model in which authors are expected to pay.

They explored the implications of an OA marketplace run by commercial publishers:

> This has spawned predatory schemes that are spurious and fake outlets that profit from people that agree to publish. This is more of an issue in sciences, engineering, medicine where publication and citation counts have such a big impact on how they are evaluated.

Surveillance and Counting

Participants raised concerns around surveillance, censorship, and the culture of counting research outputs. A literary scholar highlighted attention paid to quantity over other measures at the institutional level: "It's more how much you've published than where." Their experience is primarily at universities with missions to serve the public and they noted developing political suspicions about this—especially in Florida:

> Making your work open made it available for public surveillance. I never thought at that time that I might have been helping to build a surveillance machine by advocating for open content. I have colleagues now that are dealing with this in real time. The video surveillance systems in our classrooms as part of this too. I have a more tempered opinion on mandates for open access because of politically motivated surveillance.

An emeritus professor said: "A lot of universities in the South now are conservative and academic freedom is being questioned. If you're being censored, maybe you have to pay to publish OA to get the idea out there." An English scholar said, "We've convinced ourselves that citations and visibility are not important for us in the social sciences and humanities, but OA does improve the reach and impact of your work." Noting discomfort about quantitative methods in their field, they theorized that making the top journals OA "would force more conversations and the university would put more money there."

Copyright and Training LLM Tools

Some participants discussed the costs related to copyright. In addition to concerns about the costs associated with image and other permissions, scholars also noted unease about the

potential for their work to be "stolen" or harvested. A music scholar mentioned the existence of licensing agreements via Creative Commons which would protect the author, but other colleagues may still be apprehensive. A design scholar shared that in discussions of plagiarism with visual work,

> There's a fear that if a publication isn't being published by a credible organization that our work isn't safe there—not just the writing but the visualizations [...] that kind of gets into Creative Commons too... some people are in favor of remixes, some are not.

They spoke to the costs of keeping their work safe from harvesting and training large language models: "We're at the edge of what kind of scraping we're going to see from published work that gets recycled into a tool."

Implications for Practice

Arts and humanities scholars identified several costs associated with open access publishing that have implications for the librarians who support them. As librarians, the authors wish to draw some explicit connections between the results, participants' practices, and the implications for our work as academic librarians. The following section leverages themes from the findings to consider participant practices and work that librarians can undertake to support arts and humanities scholars.

Economic

Participants spoke at length about the economic barriers that prevent them from publishing gold or hybrid OA. Although participants have published under a variety of OA models, including diamond, five scholars (24%) specifically called out publishing in gold or hybrid OA journals; three had received APC waivers to do so, and two had received publishing support through their libraries' institutional agreements. After the interviews, the authors reviewed participants' publications and identified three additional hybrid OA articles. One of the articles included an acknowledgment that APC fees had been paid through an OA fund at a co-author's institution. For the remaining two, the authors checked for active institutional agreements that would cover the corresponding author at time of publication and concluded that institutional agreements either covered or waived APC costs. One of those articles was single authored by a participant who did not disclose the use of an institutional agreement, which could indicate that the scholar was unaware that the library had provided the benefit.

While several participants mentioned that their library provides financial support, the availability of these services is often unclear to constituents and could be better and more frequently promoted. There is an opportunity for librarians to partner with research offices and other campus entities to accommodate and incentivize publishing in certain OA venues by covering or subsidizing costs, and to market these collaborations. Whether via transformative agreements, OA publishing funds, memberships, or other initiatives, librarians increasingly explicitly support OA publishing. Further, librarians can offer opportunities to discuss the publication support on offer through drop-in hours or consultations. Some scholars indicated that they felt that money spent on OA publishing costs could be better spent elsewhere or

would provide a greater benefit to other authors. As they are often not part of the negotiation process, however, scholars may not understand that some open access agreements are cost-neutral, and that their use does not take opportunities from others. Librarians can make themselves available to discuss scholars' needs and the manifold considerations that go into open access agreement negotiations.

Several scholars additionally indicated that they find the cost of APCs to be significantly higher than actual publication costs. It is harder to understand potential roles for librarians in establishing more accessible pricing, but librarians can certainly pass along feedback from their authors to publishers and vendors and advocate for price transparency.

Ethics and Morals

Arts and humanities scholars reported feeling exploited by current OA publishing models. Further, their labor in producing and supporting scholarly and creative outputs are frequently undervalued in academia. They see that OA perpetuates these inequities and that openness has been co-opted by commercial ventures. Librarians can advocate for systemic change and provide education for their campus communities that address these concerns.

Reforming tenure and promotion guidelines was a recurring theme throughout the interviews, and librarians can advocate for the institutional recognition of reviewing, editing, and otherwise engaging with OA publication. They can provide education and input on consolidation in the scholarly publishing market, empowering scholars to make informed decisions about the platforms and venues in which they place their work. Librarians can consult with authors on potential publication venues, with attention to predatory practices that are perpetuated by otherwise legitimate publishers.

A few participants received APC waivers to publish and expressed apprehensions about using them, and most voiced concerns about payment-based OA publishing privileging wealthy researchers and institutions. Librarians can advocate for equity and transparency in OA publishing and waiver programs, and for the expansion of waiver programs to support, for example, alumni authors that are unaffiliated or in precarious positions. Several publishers provide access to their platforms as a benefit of reviewing—why not supply OA publishing waivers to reviewers?

Finally, a few scholars voiced concerns about OA publishing enabling politically motivated surveillance at public institutions. Librarians can provide education about how faculty data systems that use bibliographic and funding data count and track outputs.

Reputational Damage and Rigor

When asked if they would pay for OA publishing costs if funding was made available, several participants responded with a qualified yes, dependent on whether the venue was of sufficient quality. Participants expressed suspicions that OA journals were of lesser quality than traditional, gated journals; even when sharing favorable impressions of OA, they perceived that their views may be more favorable than those of their colleagues or the field overall. Librarians have an opportunity to promote and publicize the benefits of OA publishing and reduce stigmas by helping authors tell the story of their OA publications. They can assist departments with identifying high quality OA journals and can advocate within shared governance structures to revise tenure and promotion guidelines to incentivize OA practices. When considering collection strategies, libraries can support open access memberships and initiatives and can partner with societies to flip established venues to sustainable OA models.

Opportunity, Time, and Copyright

Scholars consistently reported that they did not have the time to fully educate themselves on the varieties of OA models or the subtleties of copyright. While participants shared a wide range of green OA practices—with some sharing much of their work in repositories or via ASN and others none—nearly all expressed uncertainty about what allowances they were given in their publishing agreements. This uncertainty causes some scholars to be more careful with what they include in repositories and ASN, preferring to provide materials upon request instead; still, several others indicated they had no concern for copyright implications, doubted publishers would sue scholars, and thought "very few people outside librarianship worry about copyright." Several expressed confusion about archiving generally and were unclear on its benefits, with some stating it was never explained what they were allowed to do.

Librarians can develop copyright programs that incorporate documentation, training, and consultations to help authors understand their rights, review author agreements, and assist authors in preparing amendments to these agreements. They can identify repository options and clarify their benefits and limitations. Additionally, librarians can provide education on personal identifiers and best practices for collocating scholars' publications to demonstrate impact. Librarians can assist scholars with obtaining permissions and attempting to limit fees, as well as assist in the review of copyrights in publisher agreements. A few scholars mentioned they had utilized librarian assistance in these areas to positive results.

Infrastructure and Support

Early in the interviews, participants were asked about their experience depositing their research articles in disciplinary or institutional repositories. In response to this question, ten participants (48%) acknowledged an IR hosted by their library, but only two indicated that they actively use it—one of whom is employed as a librarian. Seven participants (33%) believed their institution did not have an IR or were unfamiliar with institutional repositories. After the interviews, the authors confirmed that six of those seven institutions have an IR, and found that several works from one participant were included in their IR.

Scholars agreed that the IR is "not something anything thinks about," and several indicated that depositing in their IR was a clunky and burdensome process. A few participants stated that they had deposited works or sent them to librarians for mediated deposit, but had not kept up the routine because of the time-consuming process. Others expressed uncertainty about the sustainability of the IR and whether works would continue to be available over time.

To address concerns about time and process, librarians can deposit work in the IR on behalf of institutional authors and can develop workflows that automate and systematize the process to ensure it is continual. They can additionally provide concise and up-to-date documentation on the IR and clear guidelines on what is included and excluded. To address perception, libraries can advocate for the IR as a centralized repository for scholarly and creative activity across arts and humanities disciplines and can demonstrate the benefits of a well-populated IR, including demonstrating author impact and aiding recruitment efforts. Librarians can also advocate for publishers and platforms to automate these systems—publishers have the author accepted manuscript and could deposit to repositories with institutional support and author consent.

Institutional support was not central to these interviews. Although some participants did work at institutions and systems that have OA policies and guidelines, these were not

mentioned alongside their publishing and depositing practices. This may call into question the effectiveness of policies, or at least the implementation of policies at the individual author level. Librarians at such institutions should not take for granted that an OA policy or guideline translates into compliance; the need for outreach and education at universities is ongoing, and there is always a new audience to reach.

Similarly, OA compliance with funding agencies is also quite dynamic. With the Nelson Memo slated to go into effect by the end of 2025, librarians will need to understand and support the compliance requirements of campus authors. As part of the requirements of the Nelson Memo to provide embargo-free public access to funded research, librarians have the opportunity to expand OA agreements and infrastructure that serve their community.

Conclusion

As the first article to leverage interviews to explore the costs of OA publishing in arts and humanities, this work provides insight into the complexities of time, reputation, equity, opportunity, and material costs scholars contend with as they publish and disseminate their work. Although the findings largely align with results found in surveys and bibliometric studies, quotations from study participants add nuance to the understanding of these costs, as well as how arts and humanities scholars experience them. The authors offer several implications for practice that connect the findings with participants' practices.

Where previous studies have confirmed that OA is not a factor in where arts and humanities scholars disseminate their work, this study documented perspectives on how OA competes with publishing to advance one's career. Although OA venues are slowly gaining acceptance, prestige remains the most important consideration for academics in arts and humanities fields. OA publication remains sidelined and of interest to those working in specific topical areas, conducting SoTL or DH work, or in fields with respected diamond OA venues. Participants confirmed that they do not have the money to fund OA publishing charges; additionally, they described a variety of other costs that OA publishing incurs, taking a toll on reputation, time, equity, and opportunity.

Acknowledgments

The authors are indebted to the study participants, this journal's anonymous reviewers and editor, and several colleagues all of whom generously provided constructive feedback that enriched this article. This research was funded by a University Research Grant from Illinois State University.

References

American Association for the Advancement of Science. (2022). *Exploring the hidden impacts of open access financing mechanisms: AAAS survey on scholarly publication experiences and perspectives.* https://www.aaas.org/sites/default/files/2022-10/OpenAccessSurveyReport_Oct2022_FINAL.pdf

Borrego, Á. (2017). Institutional repositories versus ResearchGate: The depositing habits of Spanish researchers. *Learned Publishing 30*(3), 185–192. https://doi.org/10.1002/leap.1099

Bryant, T., & Thomas, C. (2024). Black, indigenous, and faculty of color awareness of open access. *College & Research Libraries 85*(1),7–29. https://doi.org/10.5860/crl.85.1.7

Cantrell, M. H. & Swanson, J.A. (2020). Funding sources for open access article processing charges in the social sciences, arts, and humanities in the United States." *Publications 8*(1), https://doi.org/10.3390/publications8010012

Creaser, C., Fry, J., Greenwood, H., Oppenheim, C., Probets, S., Spezi, V., & White, S. (2010). Authors' awareness and attitudes toward open access repositories. *New Review of Academic Librarianship 16*(Sup1), 145–161. https://doi.org/10.1080/13614533.2010.518851

Creswell, J. W. & Miller, D.L. (2000). Determining validity in qualitative inquiry. *Theory Into Practice 39*(3), 124–30. https://doi.org/10.1207/s15430421tip3903_2

Dalton, E. D., Tenopir, C., & Björk, B-C. (2020). Attitudes of North American academics toward open access scholarly journals. *portal: Libraries and the Academy, 20*(1), 73–100. https://doi.org/10.1353/pla.2020.0005

Gaines, A. M. (2015). From concerned to cautiously optimistic: Assessing faculty perceptions and knowledge of open access in a campus-wide study. *Journal of Librarianship and Scholarly Communication, 3*(1), eP1212. https://doi.org/10.7710/2162-3309.1212

Gargouri, Y., Larivière, V., Gingras, Y., Carr, L., & Harnad, S. (2012). *Green and gold open access percentages and growth, by discipline*. arxiv. https://doi.org/10.48550/arXiv.1206.3664

Gariepy, L. W., (2021). Acceptable and unacceptable uses of academic library search data: An interpretive description of undergraduate student perspectives. *Evidence Based Library and Information Practice* 16(2), 22–44. https://doi.org/10.18438/eblip29923

Greussing, E., Kuballa, S., Taddicken, M., Schelze, M., Mielke, C., & Haux, R. (2020). Drivers and obstacles of open access publishing. A qualitative investigation of individual and institutional factors. *Frontiers in Communication 5*. https://doi.org/10.3389/fcomm.2020.587465

Harley, D., Earl-Novell, S., Arter, J., Lawrence, S., & King, C. J. (2007). The influence of academic values on scholarly publication and communication practices. *Journal of Electronic Publishing 10*(2). https://doi.org/10.3998/3336451.0010.204

Kirschner, J., Miller, H., Kamat, P., Alcaine, J., Chaparro, S., & Exner, N. (2024). To open or not to open: An exploration of faculty decisions to publish open-access articles. *Journal of Librarianship and Scholarly Communication 12*(1). https://doi.org/10.31274/jlsc.16894

Maxwell, J. A. (2013). *Qualitative research design: An interactive approach*. Sage.

Narayan, B., Luca, E. J., Tiffen, B., England, A., Booth, M., & Boateng, H. (2018). Scholarly communication practices in humanities and social sciences: A study of researchers' attitudes and awareness of open access. *Open Information Science, 2*(1), 168–180. https://doi.org/10.1515/opis-2018-0013

Nicholas, D., Watkinson, A., Abrizah, A., Rodríguez-Bravo, B., Boukacem-Zeghmouri, C., Xu, J., Świgoń, M., & Herman, E. (2020). Does the scholarly communication system satisfy the beliefs and aspirations of new researchers? Summarizing the Harbingers research. *Learned Publishing, 33*(2), 132–141. https://doi.org/10.1002/leap.1284

Olejniczak, A.J. &Wilson, M.J. (2020). Who's writing open access (OA) articles? Characteristics of OA authors at Ph.D.-granting institutions in the United States." *Quantitative Science Studies 1*(4), 1429–1450. https://doi.org/10.1162/qss_a_00091

Pia, A. E., Batterbury, S., Joniak-Lüthi, A., LaFlamme, M., Wielander, G., Zerilli, F. M., Nolas, M., Schubert, J., Loubere, N., Franceschini, I., Walsh, C., Mora, A., & Varvantakis, C. (2020). Labour of love: An open access manifesto for freedom, integrity, and creativity in the humanities and interpretive social sciences. *Commonplace*. https://doi.org/10.21428/6ffd8432.a7503356

Quigley, Niamh. (2021). "Open access in the humanities, arts and social sciences: Complex perceptions of researchers and implications for research support." *Liber Quarterly: The Journal of European Research Libraries 31*(1). https://doi.org/10.53377/lq.10937

Richardson, J. W., McLeod, S., & Hurst, T. (2019). Perceptions of educational leadership faculty regarding open access publishing. *International Journal of Education Policy and Leadership, 15*(5). https://doi.org/10.22230/ijepl.2019v15n5a817

Rowley, J., Johnson, F., Sbaffi, L., Frass, W., & Devine, E. (2017). Academics' behaviors and attitudes towards open access publishing in scholarly journals. *Journal of the Association for Information Science and Technology, 68*(5), 1201–1211. https://doi.org/10.1002/asi.23710

Scott, R. E. (2019). "A selected comparison of music librarians' and musicologists' self-archiving practices." *portal: Libraries and the Academy 19*(4), 635–651. https://doi.org/10.1353/pla.2019.0039

Scott, R. E. & Shelley, A. (2022). Music scholars and open access publishing. *Notes 79*(2), 149–78. https://doi.org/10.1353/not.2022.0093

Scott, R. E. & Dubnjakovic, A. (2026). More alike than not: The open access preferences of humanities scholars. *College & Research Libraries 86*(6): 902-915. https://doi.org/10.5860/crl.86.6.902

Segado-Boj, Francisco, Juan Martín-Quevedo, and Juan-José Prieto-Gutiérrez. Jumping over the paywall: Strategies and motivations for scholarly piracy and other alternatives. *Information Development* (2022): 02666669221144429. https://doi.org/10.1177/02666669221144429

Severin, A., Egger, M., Eve, M.P., & Hürlimann. D. Discipline-specific open access publishing practices and barriers to change: An evidence-based review. *F1000Research 7,* 1925. https://doi.org/10.12688/f1000research.17328.2

Shelley, A., Scott, R. E., & Dubnjakovic, A. (2023, March 3). *Every good belletrist deserves funding: Arts and humanities scholars and open access publishing fees* [Conference presentation]. 92nd Annual Meeting of the Music Library Association, St. Louis, https://ir.library.illinoisstate.edu/fpml/202

Solomon, D. J., & Björk, B.C. (2012). Publication fees in open access publishing: Sources of funding and factors influencing choice of journal. *Journal of the American Society for Information Science & Technology, 63*(1), 98–107. https://doi.org/10.1002/asi.21660

Swan, A., & Brown, S. (2004). Authors and open access publishing. *Learned Publishing, 17*(3), 219–224. https://doi.org/10.1087/095315104323159649

Tenopir, C., Dalton, E. D., Christian, L., Jones, M. K., McCabe, M., Smith, M., & Fish, A. (2017). Imagining a gold open access future: Attitudes, behaviors, and funding scenarios among authors of academic scholarship. *College & Research Libraries 78*(6), 824–843. https://doi.org/10.5860/crl.78.6.824

Thomlin, P. (2011). Every man his book? An introduction to open access in the arts. *Art Documentation: Journal of the Art Libraries Society of North America 30*(1), 3–11. https://doi.org/10.1086/adx.30.1.27949561

Togia, A., & Korobili, S. (2014). Attitudes towards open access: A meta-synthesis of the empirical literature. *Information Services & Use, 34*(3–4), 221–231. https://doi.org/10.3233/ISU-140742

Xu, J., He, C., Su, J., Zeng, Y., Wang, Z., Fang, F. and Tang, W. (2020). Chinese researchers' perceptions and use of open access journals: Results of an online questionnaire survey. *Learned Publishing 33*, 246-258. https://doi.org/10.1002/leap.1291

Warlick, S. E., & Vaughan, K. T. L. (2007). Factors influencing publication choice: Why faculty choose open access. *Biomedical Digital Libraries 4*. https://doi.org/10.1186/1742-5581-4-1

APPENDIX A
Interview Questions

Arts and Humanities Scholars and Open Access Publishing Fees

Demographic and Research Practices

- Please provide your position, rank, discipline, and sub-discipline.
- Approximately how many research articles have you published in scholarly journals?
- Approximately how many research articles have you published open access?
- What has been your experience depositing your research articles in disciplinary or institutional repositories or archiving them in other online platforms (e.g., Academia.edu, ResearchGate, or personal website)?

Venues and Open Access

- What factors play into your selection of a publication venue (e.g., journal, monographic, and other formats)?
- What open access venues exist in your field and how are they perceived by your disciplinary colleagues?
- How would you characterize disciplinary perspectives on archiving scholarship in disciplinary or institutional repositories?
- How would you characterize disciplinary perspectives on open access venues that charge authors fees and those that do not?

Funding and Payment

- What funding is available to support your publishing (e.g., institutional or society subvention funds)?
- What payments have you made related to publishing (e.g., editing, indexing, permissions, open access, etc.)?
- Under which circumstances would you pay to publish your work open access?
- What concerns do you have about open access models that charge authors to publish?

Applying Universal Design for Learning to Support Non-Native English Speakers in an Embedded Information Literacy Classroom: A Case Study

Molly K. Maloney and Keith T. Nichols*

To better serve first-year international students at the University at Buffalo in an embedded, one-credit information literacy (IL) research lab (iLab), undergraduate education librarians built upon a flipped and social constructivist model by employing universal design for learning (UDL). UDL framed the creation of multimodal content targeting trouble areas. The formal assessment instrument was also revised using a pre- and post-test model. Assessment results were used to guide UDL iteration from fall 2018 through fall 2019. The assessment measured the intended IL skills reliably across multiple classes of students. Between fall 2018 and fall 2019, students' pre- to post-test growth increased by 103.92%.

Introduction

Librarians, even those engaged in classroom instruction, often lack access to accommodation information, student background details, or the time to build a relationship with students in which students might become comfortable enough to disclose accommodation needs to us (Mamboleo et al., 2015). Many librarians' standard of operation for information literacy (IL) instruction still relies on the one-shot format, where only one class period in a semester is provided as a guest lecture to cover the complexities of university-level research and information use. It is therefore crucial that IL instruction and supporting materials be as accessible and inclusive as possible so that students are not barred from content.

Further, when given the opportunity to serve a specific demographic in an embedded IL class, such as international students facing unique language and cultural barriers, it is vital to explore and incorporate pedagogy and instructional techniques that will improve the experience not only for that demographic, but for the student body as a whole.

*Molly K. Maloney is Pharmacy Liaison Librarian at the University at Buffalo, email: mkm9@buffalo.edu; Keith T. Nichols is Public Health and Health Professions Liaison Librarian at the University at Buffalo, email: ktn@buffalo.edu.

Literature Review

Non-Native English Speakers in Academic Libraries

The makeup of undergraduates in the U.S. is ever-changing and, at many institutions, highly diverse, with increasing proportions of international students previous to the COVID-19 pandemic (Institute of International Education, 2021). Much literature is devoted to examining the experience of international students in American higher education and, more specifically, their libraries and information literacy classrooms. Many international students are non-native English speakers (NNESs), though not all NNESs are international students. Instead, NNESs indicates that English is not a person's primary language at home from birth but may include those who are bilingual or multilingual.

Best practices articles provide a practical approach based on experience. Clausen (2017) recognizes the diversity encompassed by terms such as English language learners and highlights many of the barriers faced by NNESs in postsecondary institution classrooms. This includes difficulties with class delivery format, linguistic anxiety and participation hesitancy, proficiency in writing, issues with testing, and integration into life at that institution. Martin (2012) specifically saw that librarians needed to be aware of cultural differences in the values and beliefs of NNES students if librarians were to effectively bridge the gaps in their information literacy skills. Carlyle (2013) offers a concise set of directives for improving international students' experiences in the library, while Albarillo (2017) makes note of strategies to improve library orientation materials such as multimodal content and attention to lexical complexity.

Using the metaphor of scholarship as a conversation from the *ACRL Framework for Information Literacy for Higher Education* (2016), Bordanaro (2011, 2015) focuses on the importance of collaboration with English as a second language (ESL) faculty when examining IL instruction in a non-native English-speaking context. Such strategies recognize that expertise in instruction for NNESs is not a credential all librarians have, making collaboration with faculty essential for success (Tran & Aytac, 2018). For embedded IL instruction to be successful, there must be open communication and collaboration between librarian and instructor to allow for a better understanding of and mutual support of overlapping learning objectives (LOs). This mutual support is particularly beneficial to building a relationship with these students and to avoid leaving a gap in their university education compared to their native English-speaking peers (Marchese, 2021; Zhao et al., 2021).

While international students may be the largest source for NNESs on many campuses, Generation 1.5 students also face linguistic and cultural barriers. Generation 1.5 refers to students for whom the majority of their secondary, possibly some primary as well, education was completed in the United States after having been born abroad and emigrating as children (Rumbaut & Ima, 1988). These students and their needs may be invisible to a librarian as a guest speaker in a classroom, creating the need for a more flexible method for engaging with IL instruction.

Universal Design for Learning

The Center for Applied Special Technology (CAST), the organization responsible for the development of universal design for learning (UDL), (2021, What is universal design for learning (UDL)? section) describes it as "a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn." Originally designed to

address learning differences in an elementary school setting, it insists on a curriculum that provides multiple means of representation, expression and engagement (Orkwis & McLane, 1998), which in practice is applicable at all levels of education. Intentionally building flexibility into a course increases the likelihood that students will be able to access that content and make use of it. Specific evidence-based guidance is graphically organized as CAST's "UDL Guidelines," which break down the framework into three principles (representation, expression and engagement) across three stages (access, build and internalize) (2018). Each resulting intersection identifies options demonstrating what implementation might look like in that area, as well as a variety of checkpoints including descriptions and examples to accomplish that goal.

UDL has been embraced by librarians and other educators in higher education to address barriers. A first-year health sciences course at a Canadian university where UDL-inspired course design was used to address accessibility needs saw students taking advantage of the multimodal methods of representation, engagement, and expression, reporting reduced stress and increased feelings of empowerment to guide their own learning (Kumar & Wideman, 2014). A systematic review on UDL in undergraduate STEM education found students increased their self-efficacy among other assessment metrics such as GPAs, test scores, and others (Schreffler et al., 2019). Several academic libraries demonstrated the impact of meeting student information needs in flexible ways, such as intentional design of instruction and tutorials and even mindful use of clear, plain language delivered at a steady pace (Chodock & Dolinger, 2009; Kavanagh Webb & Hoover, 2015; Nall, 2015). A case study by Kirsch (2024) shows that, even when one starts with small UDL-based changes in the library, success can establish a foundation from which to promote its use across campus; this, in turn, can lower educational barriers, and it demonstrates yet another vital contribution librarians make to their institutions.

The parallels are clear when comparing the UDL Guidelines with the best practices recommended for improving international students' experience in libraries (Albarillo, 2017), and go beyond by offering a single evidence-based framework to guide planning, development, and practice for learning and research support. Albarillo's case study on Brooklyn College's Library Online Orientation Program represents a unique combination of a large NNES student group and semester-long embedded instruction to be able to further evaluate the application such practices.

Research Questions

The authors, undergraduate education librarians at the University at Buffalo (UB), sought to answer the following two questions: 1. Would the inclusion of a barrier-reducing pedagogy such as UDL, positively impact information literacy learning outcomes for non-native speakers of English? and 2. Would the difference in assessment scores based on information literacy knowledge be statistically significant or not? To analyze these questions, the authors used a pre- and post-test assessment design to ascertain student learning outcomes and determine if UDL had a positive impact on the overall post-test scores. With results showing a positive impact in the UDL-adapted course, this case adds to the body of evidence demonstrating the intentional lowering barriers impeding student learning makes for more effective IL instruction and a more inclusive learning environment.

Setting

University at Buffalo: iLab

The University at Buffalo is a tier 1 research institute and part of the State University of New York (SUNY) system. Between fall 2017 and fall 2019, UB had undergraduate class sizes of 21,115 students on average. During this time period, approximately 14.9% of the undergraduate body consisted of international students (University at Buffalo Office of Institutional Analysis, 2021). As a top-ranking U.S. institution for hosting international students (Anzalone, 2020, November 25), this student group represents countries and languages from around the world.

The University Libraries Education Services Team consists of six to eight undergraduate education librarians focused on IL instruction and outreach for the university's undergraduate general education curriculum—the UB Curriculum. The UB Curriculum is developed with early undergraduates in mind, acknowledging the different backgrounds of students with varied levels of previous IL instruction and acknowledging that all require a solid foundation in these skills to succeed at UB.

The Education Services Team has delivered embedded IL instruction since the implementation of the UB Curriculum in fall 2016. This one-credit lab, iLab, is delivered as part of the writing and rhetoric course (ENG 105) as the communication literacy I requirement. In addition to weekly lectures with their English instructor, an hour-long lab was held once per week with a librarian. A portion of this course is delegated to the English Language Institute for delivery and designated as ENG 105Z. These classes must have the same rigor and learning objectives but are taught by dedicated ESL instructors to address international students' unique needs. iLab was initially designed and delivered no differently for this group. It was intended to prepare all undergraduate students enrolled in a version of ENG 105 in the same way and to rely upon external factors—such as their lecture faculty and the immersive English-language setting—to address additional needs. While iLab is still embedded in ENG 105Z, it has grown significantly from its original form.

The pedagogy on which iLab was founded in 2016 began with a constructivist model, based on the idea that knowledge is constructed at the individual level through experiences and reflection. Through evaluation and iteration, the librarians evolved the course to embrace a social constructivist model in order to allow students "to experiment with ACRL *Framework* threshold concepts through low-stakes, media-rich group projects, allowing them to construct new knowledge in a social sandbox" (Tysick et al., 2019, p. 105). Social constructivism is a learning theory that asserts "human development is socially situated and knowledge is constructed through interactions with others" (McKinley, 2015, p. 1). This also included use of flipped classroom techniques and active learning strategies. A flipped model or flipped classroom is where a portion of the learning—typically the lecture portion—is done before the students enter the class and then class time is used to practice what was learned. Active learning invited students to engage in learning through engagement with discussion, inquiry, creation and other pursuits.

The next stages can be broken down into two phases: an experimentation phase from fall 2017 through fall 2018; and a second phase from spring 2019 to fall 2019 that ran our final form. This paper will not include the spring 2020 iteration as it includes the emergency transition to remote instruction due to the worldwide COVID-19 pandemic.

In fall 2017, iLab utilized a scaffolded group research project as the context to deliver IL instruction (see Appendix A). Weekly content included a small collection of brief videos

covering the concepts and skills to be applied in class (i.e., a flipped classroom model), a short, multiple-choice quiz based on that content to be completed before class (i.e., prework quizzes), and in-class assignments recording that day's work (i.e., class participation assessments/CPAs). This weekly work built toward a group's outline, ultimately resulting in a group infographic and works cited page. The final assignment in iLab was an individual outline coinciding with preparation for their final research papers in ENG 105. All work involved in iLab counted as 10% of their final ENG 105 grades.

Incorporating Universal Design for Learning for Fall 2018

The intent was to continue innovating through this process of evaluation and iteration with the goal to improve the impact and efficacy of IL instruction. To begin, barriers and issues were identified each semester in a variety of forms. Librarians gathered their experiences delivering the course and working with students and considered student and faculty feedback. Summative assessments were conducted each semester in the form of a pre-test and post-test.

It became apparent that there were issues concentrated in ENG 105Z iLab sections regarding assumed cultural competencies, language barriers, participation, and output. Even though significant gains were seen in summative assessments, students were struggling to apply these skills outside of iLab, even within the ENG 105Z course.

An exploration of ways to address these needs began, and UDL was identified as a practical framework. UDL provided the guidance required to target changes and aligned with typical best practices for teaching in a classroom for NNESs (Clausen, 2017). A taskforce of three undergraduate education librarians grouped the observed barriers by theme and matched them to relevant UDL Guidelines checkpoints (see Table 1).

TABLE 1
A Sample of Compiled ENG 105Z Barriers with Corresponding UDL Checkpoints

Barrier Group	Observed Barriers	Matched UDL Guidelines: Checkpoints
Research Topic Missing Cultural Context, Relevance	Students were unable to connect with topic areas preventing engagement; sometimes cultural barriers were evident. Instruction examples used do not resonate with students. Rigidity of assigned group research topics prevent engagement and student agency.	CHECKPOINT 2.4 Promote understanding across languages CHECKPOINT 7.2 Optimize relevance, value, and authenticity
Academic English and Discipline-Specific Language (i.e., Jargon)	English-only materials and those heavy with discipline-specific jargon (e.g., scholarly materials) impede non-native English speakers from getting through the material, resulting in cascading comprehension and acquisition issues. Foundational materials/scholarly materials for research project take much more time to read and time is short. Library jargon: what parts do they really need? Variety of terms used across research platforms for synonymous functions (e.g., filter, limiter, facet) cause confusion.	CHECKPOINT 2.1 Clarify vocabulary and symbols CHECKPOINT 2.4 Promote understanding across languages CHECKPOINT 3.1 Activate or supply background knowledge CHECKPOINT 5.1 Use multiple media for communication

Brainstorming for targeted solutions that would impact the barriers as widely as possible began. Librarians strived to balance the effort required to rebuild major course elements, the time required, and impact for the students' experience and outcomes. Priority was given to addressing issues of cultural and language barriers in the areas of the research topics, background knowledge, course content, and library jargon for the first wave of changes.

A thorough review was completed of the language used for structure, complexity, consistency, and jargon. While the course itself integrated content and language learning, library-specific and academia-specific terminology was removed wherever possible. When vital for concept or skill development, definitions were explicitly stated in course materials and during instruction (e.g., clarifying the multiple meanings of terms like "scholarship" and "authority"). The flipped classroom model allowed for preteaching of vocabulary as well. Quizzes built in the Blackboard learning management system (LMS) were reviewed to ensure question and answer phrasing matched the source content. Automated responses to incorrect submissions directed students back to the content item that contained the answer.

An additional element resulting from this review included team development and discussions on the language used in class: speaking slowly and clearly; using a microphone when available; and being mindful of figurative language and cultural references. A regular exchange of feedback on student engagement with weekly lessons and content was established.

Progress toward relatable research topics and increasing the modes of representation for background information were combined by establishing "starter packs" within the LMS. Embedded TED Talks would be used as a narrative entrance into a topic. Shorter (i.e., no more than 10 minutes) talks were evaluated along the following criteria: universal appeal and relevance to international undergraduates to activate existing background knowledge; authoritative and compelling speakers; and availability of closed captions and transcript in key languages represented by UB's student population. Candidate talks were then voted upon for final selection. Examples of scholarly and popular sources were provided on the same topic area to be used as reference later for comparing source types and additional information. Instructions were provided for how to navigate the starter packs, including how to turn on closed captioning, and how to access the transcript and switch between languages for comparison.

Additional graphic and video content was created to provide guides through the course, assignments, and concepts with language reviewed as above. Short procedural videos demonstrating how to navigate the LMS for tasks such as submitting assignments proved very valuable to the librarians and students both during class and after. All videos were required to have closed captions, and general guidance was to favor brevity, splitting concepts across installments as needed. Attention was paid to colors, text size, navigation, and other basics of accessibility.

iLab assignment structure was revised during this period (see Appendix B). The seven weekly graded assignments (CPAs) were reduced to three scaffolded group assignments building to the final project deliverables in concert with low-stakes progress check-ins via collaborative assignment via Google Drive. Explicit directions were given as to how the progress made on each assignment would provide the basis for the next step in the research process. While maintaining the flipped classroom structure allowing students to complete these assignments collaboratively during a single class period, an additional day was added to the schedule before submission to lessen pressure and provide time for communication students felt more comfortable asking via asynchronous methods.

Similarly, the schedule of the course was revised (see Appendix C). Content areas where students had demonstrated further time and revision would be beneficial (see Table 1) were given additional in-class time for active application (e.g., building a focused research question). Active learning continued to be employed to improve engagement and efficacy of teaching and learning in concordance with UDL principles (Chodock & Dolinger, 2009; Spina, 2021; Zhong, 2012). Problem areas English Language Institute faculty identified as areas of need were also built out more intentionally to allow for time and application practice (e.g., indirect source citation and synthesis of information). This meant that certain skills-based practice was relegated to the low-stakes video and quiz areas and often served as areas for constructive feedback on assignment check-ins.

Assessment

Methodology: Data Collection

The undergraduate education librarians created a 10-question multiple choice test instrument for students. The instrument draws from five question banks that have five questions each for a total of 25 questions in the pool (see Appendix D). This instrument was created and administered in Blackboard, which allows for randomized questions and the ability to select how many questions from each pool are pulled into a student's session. The students' 10 questions were randomly selected with two questions from each bank and put in a random order. This was to help randomize the test instrument and allow for a fuller review of information literacy concepts within a single cohort of students while simultaneously decreasing the likelihood of academic dishonesty, as students would not all be taking the exact same test in the exact same order. Each student was individually graded out of 100 total points (i.e., 10 points per question). Each class was then averaged together in part because of ease of reporting using Blackboard.

The test instrument was designed in-house by the undergraduate education librarians based on the following criteria: course goals; course content; prior experience; *Framework for Information Literacy for Higher Education* (Association of College & Research Libraries, 2016); and finally, perceived information literacy needs unique to the ENG 105Z students.

The pre-test was given during the first session librarians had with their students before any content delivery. The post-test was given during the final class session, after all content had been delivered, and students were using class time to finalize their projects. For each testing period, students were given 10–15 minutes to complete the test; however, the LMS allowed the test to be completed after time expired, and students were informed of this. We cannot account for previous information literacy skills or knowledge taught to our students as we did not incorporate questions about prior knowledge into the instrument.

The pre-post model was selected for several reasons. First, it fit into the natural schedule of the class, allowing an easy way for the librarian to take attendance in the first session while also determining where the class as whole was situated in the information literacy landscape. Second, it helped to frame the class by covering the topics that were going to be taught. This assisted in both course creation and instruction delivery. Finally, the model allowed the librarian to see where students started and where they ended. This gave a degree of knowledge about the impact the librarian made on the class and if learning outcomes were being met. Without a pre-test it would be impossible to know where the students were at the start of the intervention compared to where they ended. Results for each class were averaged together.

Participants

Our total sample of students (n = 317) who took the information literacy lab pre-test and post-test were in 17 sections of ENG 105Z over three semesters (see Table 2). We accounted for the minor difference in pre and post completion in the fall 2018 and fall 2019 semester based on students being absent when the pre- or post-test was given. One hundred percent of students who started the pre- or post-test are included in the results. We did not exclude student scores from our analysis if they took only one of the tests as the overall average of all students was the desired outcome for review. The reason there were more sections in the fall 2019 semester is due to front loading of the ENG 105 course (i.e., most first-year students take it in their first semester).

TABLE 2
Participant Totals from Fall 2018 Through Fall 2019

Semester	Number of Sections	Total Number of Students
Fall 2018	2	36
Spring 2019	7	121
Fall 2019	8	160
Cumulative Totals	17	317

Results

The first hypothesis (H1) tested whether there is no statistically significant difference in pre-test and post-test scores based on information literacy knowledge. The second hypothesis (H2) tested whether the expansion of UDL content into the course had no impact on student outcomes.

T-Test

Fall 2018 saw a pre-test mean of 60.885 and a post-test mean of 68.89, showing an 8.005 (95% CI+/- 0.312) growth in pre-test versus post-test means. The results of the t-test show a statistically significant difference between the performance level of the pre-test and post-test scores of the population ($t = 35.578$, $p < .05$).

Spring 2019 saw a pre-test mean of 55.157 and a post-test mean of 74.656, showing a 19.499 (95% CI+/- 2.34) growth in pre-test versus post-test means. The results of the t-test show a statistically significant difference between the performance level of the pre-test and post-test scores of the population ($t = 15.139$, $p < .05$).

Fall 2019 saw a pre-test mean of 60.542 and a post-test mean of 76.866, showing a 16.324 (95% CI+/- 0.959) growth in pre-test versus post-test means. The results of the t-test show a statistically significant difference between the performance level of the pre-test and post-test scores of the population ($t = 31.182$, $p < .05$). Between fall 2018 and fall 2019, students' pre- to post-test growth increased by 103.92%.

TABLE 3
Statistical Results by Semester

Semester	Pre-test	Post-test	Growth	Confidence Interval	*t*-Test	*p*-value
Fall 2018	60.885	68.89	8.005	95% CI+/- 0.312	$t = 35.578$	$p < .05$
Spring 2019	55.157	74.656	19.499	95% CI+/- 2.34	$t = 15.139$	$p < .05$
Fall 2019	60.542	76.866	16.324	95% CI+/- 0.959	$t = 31.182$	$p < .05$

Based on these findings, hypothesis 1 was found to be false. Every measured semester produced a statistically significant difference between the pre-test and post-test (see Table 3). The new pre-test implemented in spring of 2019 and run again in the fall of 2019, reliably examined the students' understanding of information literacy concepts. The baseline of 55.157 in the spring was lower than the 60.542 of the fall but was within the projected variance. Interestingly, the post-test results were exceedingly close, with only a 2.21 difference, and perhaps demonstrates that there is a limit to the growth that can be expected of students in a 10-week information literacy lab.

Hypothesis 2 was also found to be false. The expansion of UDL concepts in the fall of 2018 and spring 2019 showed increased growth in student information literacy knowledge compared to previous semesters (see Table 3). However, it should be noted that the authors cannot conclusively say that the UDL implementation was the sole cause of this increase in growth between the pre- and post-tests. While there was anecdotal evidence from instructors suggesting that students find the inclusion of UDL elements beneficial to their learning, those elements or variables could not be tested in isolation. Students were able to achieve a higher average score on the test after UDL was implemented compared to before. Judging by the anecdotal evidence and the test scores, at minimum, UDL has enhanced iLab.

Discussion

As a result of the fall 2017 through fall 2018 experimentation phase for the design, delivery, and assessment of iLab, piloting was first done in a limited number of sections. The realigned pre-post tests were deployed in two sections of the course initially to test validity and reliability. The instrument was considered reliable when a similar spread in both pre- and post-test scores was observed, including the growth from one to the other. This was fully confirmed over the next year when 281 individuals took the test with similar results. The content validity of the instrument was built into the design of the test as the lesson plans with learning objectives had already been created. This helped align the instrument with the overall course objectives and allowed the creators to build a reliable test using those learning objectives. Considering the results of the post-test, we further believe this adds weight to the test instrument being valid and reliable for our purposes.

Standardized lesson plans were followed by the entire team, hoping to control for the instructor variable. Instructor as a variable was not tested for this study but the CI indicates comparable results across classes. Specifically accounting for instructor variables could be undertaken in the future.

Recent survey findings have shown some academic libraries "are not adequately planning to meet accessibility needs for users of library collections" (Peacock & Vecchione, 2020, p. 5). Libraries can begin to address accessibility and inclusion issues through small, stepped changes by employing universal design frameworks (Kirsch, 2024; Pionke & Rutledge, 2021). By dispersing efforts across the services offered by an academic library to include those instruction librarians responsible for building instructional tools, content and development of embedded courses, and intentional use of frameworks such as UDL Guidelines, progress can be made to lower the gates to the information and skills students need to progress.

Chodock and Dolinger (2009) assert that "one-size-fits-all approach will not work for the wide variety of circumstances in which instruction librarians teach" (p. 30) and UDL can serve as a framework for guiding more inclusive teaching practices. Incorporating flexibility and multimodality from the onset is ideal; however, when faced with existing courses and

working arrangements, it is still possible to target areas to improve accessibility and inclusivity to the benefit of students.

When accessibility and inclusion are the priority for serving a diverse population of students, such a framework to guide course design is an asset. It becomes even more valuable when the framework is intuitive and offers practical options and when paired with assessment and intentional iteration.

While international students were the trigger for this work, Generation 1.5—as well as the recognition of unknown, invisible, or otherwise not predicted barriers and learning preferences—motivate continued progress in this area. Broadening the way students can engage with instructional content may increase the likelihood of impactful interactions and growth in information literacy.

The results demonstrated that the effort undertaken by the Education Services Team to incorporate UDL principles into their course design had the desired effect on learning. Students were the beneficiaries, and the assessment shows their knowledge gains were better after UDL was implemented. Considering how many students and instructors were involved, the lack of significant variance in the results and the consistent nature of the improvement gives the Education Services Team hope for continuing to improve the delivery and to hold this baseline of improvement.

Multimodal methodology for delivering this type of content paired underpinned learning and application by providing students with flexibility to meet their needs. The resulting impact was shown in the assessment data. Allowing students to access and engage with content via accessible text, audio and video available in their native languages whenever possible in the LMS, followed by facilitated practice during class allowed for NNESs to navigate the ideas and skills with a wider range of support. A potential future improvement would be to extend this multimodality to assessment methods for the pre- and post-tests, the scaffolded group assignments, and the final research deliverable, while also balancing the scale for the effort this type of instruction and grading requires of a librarian who has multiple sections. Still the employ of UDL as a guiding framework and the multimodal methods used allowed students to access and apply content in ways that increased their learning.

Limitations

Though testing of the assessment proved it to be reliable as described, a test longer than ten questions would further help to improve the validity of the instrument.

Spring 2019 variance is probably related to teacher learning curve and the first full semester rollout. In many ways it was a pilot phase in which instructors delivered new lesson plans designed for the UDL materials. With the need for scalability due to the large population size, some of the lessons needed to be tweaked or modified to accommodate UDL appropriately. It should also be noted that, while the increase in student growth from pre- to post-test could be attributed to the changes made, the authors cannot rule out outside influences such as other classes covering information literacy topics.

Fall 2019 instructors had settled in and were able to go from pilot testing materials to understanding and iterating ways to teach it. While the lesson plans stayed the same, how those lessons were delivered solidified around some best practices. This improvement should be examined in the future to understand how instructor knowledge and comfort with course materials plays a role in pre- and post-test scores. It is also possible that the improvement in the

growth between the pre- and post-test scores were a result of simple variance in the population being studied. A new cohort of ESL students may have had previous knowledge of subject materials, studied more or differently, or had less difficulty adapting to the university setting.

The original intent was to include spring 2020 in the review; however, the COVID-19 pandemic and resulting emergency shift to remote instruction interrupted instruction and was particularly difficult for international students, resulting in unusable data. Changes made to iLab for fully remote ENG 105Z for the fall 2020 and spring 2021 semesters represent another significant stage in the evolution of this embedded information literacy course.

Implications for Future Research

The findings of this case study have implications for academic librarianship not only in the context of IL instruction for NNES undergraduates, but more broadly in improving accessibility and inclusivity in IL instruction and information services to all populations. In practice, the UDL Guidelines are a valuable resource for IL instruction, both in embedded and one-shot contexts, to newly frame or reimagine more inclusive and accessible instruction. Evidence-based methods have the potential to balance the deficits time and knowledge of individual student needs in any classroom into which a librarian is invited. Lowering language and cultural barriers between early undergraduates and IL content—while also creating a more engaging and thereby inviting environment—have the potential to improve not only their research and information use behaviors, but also relationships between the librarian, students and faculty involved. However, with a broader interpretation, other interactions and services academic libraries offer could be opened to students, faculty, and staff alike. Further research into the long-term impact of improved early interactions with international students would provide evidence on retention and continued development semester-to-semester and year-to-year for this demographic. Additionally, with the requisite changes in deployment of the course to fully remote due to the COVID-19 pandemic, an analysis of UDL in entirely online IL instruction would provide guidance for preference and effectiveness in mode of instruction (Fullmer & Strand, 2024; Hays & Handler, 2020). To make progress toward meeting individual, institutional, and professional standards (Association of College & Research Libraries, 2012) and goals, a framework such as UDL is a valuable, evidence-based tool warranting further investigation.

Conclusion

Information literacy is a key component to the UB undergraduate curriculum and provided an opportunity for librarians to develop a semester long lab. For NNES students, it was important to stop and consider if the standard ways of teaching IL were appropriate or if there were opportunities to better assist these students and, in the end all students, with their knowledge and skill acquisition. Using UDL as a guiding principle, the librarians set out to create a learning environment that allowed for increased and varied pathways students could take to learn. Using a pre- and post-test model of evaluation that was built into the course structure, iLab was evaluated before and after the UDL principles were implemented. The results indicated that students could improve their knowledge of information literacy during a 10-week course, and that when UDL was implemented there was a marked improvement in post-test scores. This study's results indicate librarians who work with diverse populations should consider UDL as a possible framework to guide instruction that can positively impact

their students' outcomes. Because the needs of students change, there is value in continuing to evaluate instruction to identify barriers and find new ways to lower them, allowing more students to find their own unique ways to succeed.

Acknowledgment

The authors would like to thank the members of the former Education Services Team at the University at Buffalo: Cindy Ehlers, Bryan Sajecki, Jocelyn Swick-Jemison, Nicole Thomas, Cynthia Tysick, and Tiffany Walsh.

References

Albarillo, F. (2017). Is the library's online orientation program effective with English Language Learners? *College & Research Libraries*, *78*(5). https://doi.org/10.5860/crl.78.5.652

Anzalone, C. (2020, November 25). *UB among nation's top schools for hosting international students*. https://www.buffalo.edu/news/releases/2020/11/044.html

Association of College & Research Libraries. (2012). *Diversity standards: Cultural competency for academic libraries*. ALA. https://www.ala.org/acrl/standards/diversity

Association of College & Research Libraries. (2016). *Framework for information literacy for higher education*. Association of College & Research Libraries. https://www.ala.org/acrl/standards/ilframework

Bordonaro, K. (2011). *Incorporating language skills strategies into library instruction for ESL students* ACRL Conference Proceedings.

Bordonaro, K. (2015). Scholarship as a conversation: A metaphor for librarian-ESL instructor collaboration. *Collaborative Librarianship*, *7*(2), 56–65. https://digitalcommons.du.edu/collaborativelibrarianship/vol7/iss2/3?utm_source=digitalcommons.du.edu%2Fcollaborativelibrarianship%2Fvol7%2Fiss2%2F3&utm_medium=PDF&utm_campaign=PDFCoverPages

Carlyle, C. (2013). Practicalities: Serving English as a second language library users. *Feliciter*, *59*(3), 18–20. http://cla.ca/wp-content/uploads/59_3.pdf

CAST. (2018). *Universal design for learning guidelines version 2.2*. http://udlguidelines.cast.org

CAST. (2021). *About universal design for learning*. CAST. https://www.cast.org/impact/universal-design-for-learning-udl

Chodock, T., & Dolinger, E. (2009). Applying universal design to information literacy: Teaching students who learn differently at Landmark College. *Reference & User Services Quarterly*, *49*(1), 24–32. https://doi.org/10.5860/rusq.49n1.24

Clausen, D. (2017). Empowering English language learners in postsecondary classrooms: An inquiry into best practices. *Journal of Alternative Perspectives in the Social Sciences*, *8*(4), 452–473.

Fullmer, N., & Strand, K. (2024). Fostering UDL-informed library instruction practices developed from the COVID-19 pandemic. *Reference Services Review*, *52*(1), 163–183. https://doi.org/10.1108/rsr-04-2023-0034

Hays, L., & Handler, K. (2020). Good design is universal: Using universal design principles to promote self-regulated learning in learning management systems when teaching information literacy. *Journal of Library & Information Services in Distance Learning*, *14*(2), 127–140. https://doi.org/10.1080/1533290X.2020.1828219

Institute of International Education. (2021). *Fast Facts 2021*. Opendoors. https://opendoorsdata.org/fast_facts/fast-facts-2021/

Kavanagh Webb, K., & Hoover, J. (2015). Universal design for learning (UDL) in the academic library: A methodology for mapping multiple means of representation in library tutorials. *College & Research Libraries*, *76*(4), 537–553. https://doi.org/10.5860/crl.76.4.537

Kirsch, B. A. (2024). Implementing universal design for learning in the library and across campus to promote more inclusive pedagogy. *Reference Services Review*, *52*(1), 184–200. https://doi.org/10.1108/RSR-03-2023-0022

Kumar, K. L., & Wideman, M. (2014). Accessible by design: Applying UDL principles in a first year undergraduate course. *Canadian Journal of Higher Education*, *44*(1), 125–147. https://doi.org/doi.org/10.47678/cjhe.v44i1.183704

Mamboleo, G., Meyer, L., Georgieva, Z., Curtis, R., Dong, S., & Stender, L. M. (2015). Students with disabilities' self-report on perceptions toward disclosing disability and faculty's willingness to provide accommodations. *Rehabilitation Counselors and Educators Journal*, *8*(2), 8-19. https://www.ncbi.nlm.nih.gov/pubmed/31008459

Marchese, M. M. (2021). Generation 1.5 and academic libraries: Strategies for supporting English learners (ELs) in reference and instruction. *Evidence Based Library and Information Practice*, *16*(4), 100–117. https://doi.org/10.18438/eblip30023

Martin, J. A., Reaume, K. M., Reeves, E. M., & Wright, R. D. (2012). Relationship building with students and instructors of ESL. *Reference Services Review*, *40*(3), 352–367. https://doi.org/10.1108/00907321211254634

McKinley, J. (2015). Critical argument and writer identity: Social constructivism as a theoretical framework for EFL academic writing. *Critical Inquiry in Language Studies*, *12*(3), 184–207. https://doi.org/10.1080/15427587.2015.1060558

Nall, C. (2015). Academic libraries and the principles of universal design for learning. *College & Research Libraries News*, *76*(7), 374–375. https://doi.org/10.5860/crln.76.7.9345

Orkwis, R., & McLane, K. (1998). *A curriculum every student can use: Design principles for student access*. Eric Clearinghouse on Disabilities and Gifted Education and ERIC/OSEP Special Project on Interagency Information Dissemination. https://eric.ed.gov/?id=ED423654

Peacock, R., & Vecchione, A. (2020). Accessibility best practices, procedures, and policies in Northwest United States academic libraries. *Journal of Academic Librarianship*, *46*(1), 102095. https://doi.org/10.1016/j.acalib.2019.102095

Pionke, J. J., & Rutledge, L. (2021). Information literacy and instruction: Using universal design for instruction to make library instruction accessible. *Reference and User Services Quarterly*, *59*(3/4), 161–164. https://doi.org/10.5860/rusq.59.3/4.7713

Rumbaut, R. G., & Ima, K. (1988). *The adaptation of Southeast Asian refugee youth: A comparative study. Final report to the Office of Resettlement*. https://scispace.com/pdf/the-adaptation-of-southeast-asian-refugee-youth-a-5cp2j9kkxc.pdf

Schreffler, J., Vasquez, E., III, Chini, J., & James, W. (2019). Universal design for learning in postsecondary STEM education for students with disabilities: A systematic literature review. *International Journal of Stem Education*, *6*, 10, Article 8. https://doi.org/10.1186/s40594-019-0161-8

Spina, C. (2021). *Creating inclusive libraries by applying universal design: A guide*. Rowman & Littlefield.

Tran, C. Y., & Aytac, S. (2018). Strategies for teaching information literacy to English language learners. *Collaborative Librarianship*, *10*(4), 251–266.

Tysick, C. A., Maloney, M. K., Sajecki, B. J., & Thomas, N. (2019). Teaching the creation of new knowledge: Applying the constructivist and social constructivist theories of learning. In M. Mallon, L. Hays, & C. Bradley (Eds.), *The grounded instruction librarian: Participating in the scholarship of teaching and learning* (pp. 99–112). Association of College & Research Libraries.

University at Buffalo Office of Institutional Analysis. (2021). *Enrollment*. https://www.buffalo.edu/oia/facts-publications/factbook/student/enrollment.html

Zhao, S., Zhou, G., Fallis, J., Pillon, K., & Luo, R. (2021). Information literacy skills: Investigating differences between native and non-native English-speaking students. *The Journal of Academic Librarianship*, *47*(5), 102424. https://doi.org/10.1016/j.acalib.2021.102424

Zhong, Y. (2012). Universal design for learning (UDL) in library instruction. *College & Undergraduate Libraries*, *19*(1), 33–45. https://doi.org/10.1080/10691316.2012.652549

APPENDIX A
Fall 2017 iLab Assignments and Weighting

Pre Quiz (10%): A brief, mandatory assessment of your knowledge of information skills prior to taking iLab.

Post Quiz (10%): A brief, mandatory assessment of your knowledge of information skills after taking iLab.

8- PreWork Quizzes (10%): After viewing items in indicated weekly folders, you will be quizzed on your knowledge of the content. Submit the day before your iLab class by 11:59pm in Blackboard LMS.

7- Class Participation Assessments/Attendance (CPA) (10%): Assessments of how well you've mastered the material and count as attendance for class that day. Submit by the end of class that day or 11:59pm in Blackboard LMS. Please refer to course schedule for details.

Group Outline (20%): First component of the Group Project. As a group you will outline your chosen topic using the assigned formula in preparation for the Infographic & Works Cited. Submitted by ONE member on behalf of the group in Blackboard LMS.

Group Infographic & Works Cited (20%): Final component of the Group Project. As a group you will create an infographic and accompanying works cited page using information compiled from Group Outline. Submitted by ONE member on behalf of the group in Blackboard LMS.

Individual Outline (20%): You will be crafting a research outline related to one of your final assignments in ENG 105.

APPENDIX B
Fall 2019 iLab Assignments and Weighting

Pre-Test (5%): A brief, mandatory assessment of your knowledge of information skills prior to taking iLab.
Post-Test (5%): A brief, mandatory assessment of your knowledge of information skills after taking iLab.
Quizzes (30%): A brief quiz will be given at the start of each class to see how well you've mastered the material from the videos assigned for the week. (6 total)
Assignments (15%): 3 assignments that tell us how well you've mastered the material and build on the previous week's lesson. Due by 11:59 pm the day of iLab. Please refer to course schedule for details.
Group Project Draft (15%): Draft of the Group Project. Submitted by ONE member on behalf of the group in Blackboard LMS.
Group Project Final (30%): Final component of the Group Project. Submitted by ONE member on behalf of the group in Blackboard LMS.

APPENDIX C
Fall 2019 iLab Schedule

Week	Before Class	Topic(s)	In-class	After Class
3	Go to ENG 105 in Blackboard LMS. Open the iLab tab, click the Week Three folder to watch the videos and get instructions to navigate Group page.	• The Scholarly Conversation • Finding a Known Item	• **Pre-Test** • Get into groups • Create a shared Google Folder • Understand Scholarly Conversation	**Review Group Page Starter Pack. Click the link to your group's TED Talk. Watch this video.** Select the appropriate option for Closed Captions and Transcript language. Review your group's Popular and Scholarly sources in the Starter Pack.
4	Go to ENG 105 in Blackboard LMS. Open the iLab tab, click the Week Four folder and watch the weekly videos.	• Narrow topic using brainstorming • Citation styles	• Quiz • Groups brainstorm • Peer review brainstorms • Reflect and refine topic • Citing sources	**iLab Week 4 Assignment** Due in Blackboard LMS by 11:59pm the day of iLab
5	Go to ENG 105 in Blackboard LMS. Open the iLab tab, click the Week Five folder and watch the weekly videos. Review feedback on iLab Week 4 Assignment in Blackboard LMS.	• Creating search terms • What is a database? • Identify types of sources	• Quiz • Keyword practice • Basic search *Everything* • Types of sources (popular) • Citation practice (newspaper article)	

APPENDIX C
Fall 2019 iLab Schedule

Week	Before Class	Topic(s)	In-class	After Class
6	Go to ENG 105 in Blackboard LMS. Open the iLab tab, click the Week Six folder, and watch the weekly videos.	• Creating search strategies using Boolean, truncation, and phrases • Advanced searching in *Everything* • Revising keywords based on search results	• Quiz • Search strategies • Advanced search *Everything* using filters • Types of sources (scholarly) • Skimming records • Citation practice (journal article)	**iLab Week 6 Assignment** Due in Blackboard LMS by 11:59pm the day of iLab
7	Go to ENG 105 in Blackboard LMS. Open the iLab tab, click the Week Seven folder and watch the weekly videos. Review feedback on iLab Week 6 Assignment in Blackboard LMS.	• Advanced searching in *Academic Search Complete* • Identifying scholarly articles (skimming) • Record parts (title, source, author, volume, year, pages, subjects, abstract)	• Quiz • Basic and advanced search in *Academic Search Complete* • Identify citation parts of scholarly articles • Skim articles • Citation practice (journal article)	**iLab Week 7 Assignment** Due in Blackboard LMS by 11:59pm the day of iLab
8	Go to ENG 105 in Blackboard LMS. Open the iLab tab, click the Week Eight folder and watch the weekly videos. Review feedback on iLab Week 7 Assignment in Blackboard LMS.	• Indirect source citations and how to avoid them • Synthesis of information	• Quiz • Identify and read in-text citations • Identify relevant and concise evidence • Revise evidence for each student and the group as a whole	
9	Go to ENG 105 in Blackboard LMS. Open the iLab tab, click the Week Nine folder and watch the weekly videos.	• Copyright and image use • Citing images and 3-point attribution • Group project draft	• Quiz • Review iLab citation Guide (image) • Citation activity (image) • Find an image related to group topic • Work on draft of group project	**iLab Group Project Draft** Due in Blackboard LMS as a group submission by one team member by 11:59pm on day of iLab
10	Review feedback on iLab Group Project Draft in Blackboard LMS.	• Final group project • Post-test	• **Post-test** • **iLab group project workshop**	**iLab Group Project Final** Due in Blackboard LMS as a group submission by one team member by 11:59pm on day of iLab

APPENDIX D
Pre- and Post-Test Questions, 2019

Question	Answer A	Answer B	Answer C	Answer D
301: The Cycle of Information refers to the order of progression of media coverage of an event in the news. What is the correct order of the Cycle of Information?	Magazine, Newspaper, Books, Scholarly Journals	Newspapers, Magazines, Scholarly Journal, Books	Books, Newspaper, Scholarly Journals, Magazines	Newspapers, Scholarly Journals, Magazines, Books
303: You have been given the following citation: Profen, Ian B. "The Impact of Alcohol on University Students' Ability to Concentrate During Exams." College Students, vol. 38, no. 3, 2004, pp. 30–45. What type of source are you looking for?	a Magazine Article	a Newspaper	a Book Chapter	a Journal article
302: You need to find information on what the current U.S. President said in reaction to a meeting with a foreign prime minister yesterday. The best source for this type of information is:	an academic journal	a book	a newspaper	a magazine
304: Generally speaking, the best place to find a scholarly article is:	Within a library database	The library catalog	In a Google search	Going to the library
305: You are researching the topic of urban decay and stress on communities. Which of the following would help you evaluate the validity of a website you found?	Number of page visits	Graphs and charts	Numbers and statistics	References for the information
901: You are looking up information about college students and their understanding of how to use the library and you find an article. You see that the author provided the following subject headings: What can you use these subject headings for as your further your research?	In expanding your search by using the new words provided	In limiting the search by avoiding all of those words	There is no use for the subject headings; it is required by the author to submit them in order for the article to be published	You can see what the author is interested in

APPENDIX D Pre- and Post-Test Questions, 2019				
Question	**Answer A**	**Answer B**	**Answer C**	**Answer D**
902: When searching in a library database, what words would the keyword stress* find, in addition to just the word stress?	distressed AND distressful AND stressful	stressed AND stressing AND stress-related	tension AND pressure AND strain	stress AND pain AND tension
903: Your professor tells you that you need to include at least three (3) images in your end of the semester presentation. Due to copyright laws, what kinds of images are you able to use?	You can freely use any images you find in a Google image search	You can only use images you take yourself with a camera or other device	You must purchase any images that you wish to use due to copyright	You may use public domain or creative commons licensed images for sharing and reproduction
904: You are writing a paper on a controversial topic and find strong evidence that changes your mind from your original stance. What do you do?	Ignore the evidence and try to support your original stance	Keep your stance and use your personal experience to disprove the evidence	Keep your stance and use your personal experience to disprove the evidence	Compare and contrast each side in a list
905: Can you use all material found on the internet for educational purposes?	Yes. If it's used for education, it's fair game.	No. There may be copyright restrictions.	Yes. As long as I cite the source, I can use anything.	No. I should also pay for the material I need.
401: What is a periodical that has little to no advertising and is peer-reviewed:	An encyclopedia	A dissertation	A scholarly journal	A newspaper
403: The record below is for a scholarly journal article. Where should you look to find a summary of the article's contents?	The Author affiliations	The Abstract	The Subject terms and keywords supplied by the author	The Source information
404: The record below is for a scholarly, peer-reviewed journal article. What is the volume and issue number for this article represented in MLA 8th format?	17 (3)	Vol 17, Issue 3	volume 3, number 17	vol. 17, no. 3

APPENDIX D
Pre- and Post-Test Questions, 2019

Question	Answer A	Answer B	Answer C	Answer D
405: Your professor requires you to use at least one scholarly source for your research paper in psychology. Which one of these is a scholarly journal article?	Witt, Joseph C., et al. *Assessment of Special Children: Tests and the Problem-Solving Process*. Scott/ Foresman, 1988.	Smith, T. Recent Studies of Parents' Perceptions of Deceptive Children. *Psychology Today*, vol. 43, no.5, 2010, pp. 13–16.	Roos af Hjelmsäter, Emma, et al. "'Mapping' Deception in Adolescents: Eliciting Cues to Deceit Through an Unanticipated Spatial Drawing Task." *Legal & Criminological Psychology*, vol. 19, no. 1, Feb. 2014, pp. 179-188. *Academic Search Complete*, doi:10.1111/j.2044-8333.2012.02068.x. Accessed 10 May 2018.	Jacoby, Jeff. "Right-to-Work Laws Free Workers from Coercive Union Control." *Are Unions Still Relevant?*, edited by Noah Berlatsky, Greenhaven Press, 2013. At Issue. *Opposing Viewpoints In Context*. Accessed 10 May 2018. Originally published as "Right-to-Work Laws Stand for Choice," *Boston.com*, 1 Feb. 2012
406: You find a scholarly journal article that is useful for your research. Where could you look within the article to find a list of resources potentially related to your topic?	the Abstract of the article	the References or works cited the author(s) of the article used	the Article's introduction section	the Subheadings within the article
501: You have been assigned a paper on alternatives to fossil fuels used in North America. You have decided to focus on the use of nuclear power as a possible alternative energy source in Canada. What keywords best describe this particular topic?	Canada AND "alternative energy" AND "nuclear power"	climate AND limitations AND "nuclear power"	effects AND limitations AND "nuclear power"	nuclear power as a possible alternative energy source in Canada

APPENDIX D Pre- and Post-Test Questions, 2019				
Question	**Answer A**	**Answer B**	**Answer C**	**Answer D**
503: You are searching for articles on gender discrimination in the workplace. You searched a library database using the keywords gender, discrimination, and workplace, but got too many results. How would you refine your keywords to get fewer results?	Add more keywords with AND between them	Use broader terms for workplace	Use synonyms for gender	Remove one of your keywords
505: You are using a psychology database to find information about the effect of family relations on teen dating violence. Which combination of keywords should you use in your search?	effect AND family AND "teen dating"	"family relations" AND "dating violence" AND teens	effect AND "dating violence" AND family	teenagers AND dating AND problems
506: Your research question is "How have recent natural disasters in the Philippines affected the mortality rate of infants?"	The database may not have any resources on the topic	This type of information is unavailable because the topic is too recent	There must be an error with your student access to the database articles	The question has not been broken down into searchable keywords
509: While doing research in a database, you search for "body image" AND "eating disorder" and find some great articles about your topic; however, you would like to find more information. What is a good strategy to expand your search within the database?	Use synonyms for your original keywords and add them to your search using OR	Start your search over with new keywords	Filter your results by year	Use synonyms for your original keywords and add them to your search using AND
203: You find a 15-page journal article. Which section of the journal article contains all of the authors' evidence or findings?	Abstract	Discussion/ Results	Methods	Subject headings

APPENDIX D
Pre- and Post-Test Questions, 2019

Question	Answer A	Answer B	Answer C	Answer D
204: What can you use to locate specific words in an article, webpage, or document open on a computer?	The Find tool	Google	Bookmark tool	Copy and paste
207: You are researching drug use to see if it leads to depression in adolescents. What resource below is the most authoritative?	An article in Popular Psychology	An article published in The New England Journal of Medicine	The Wikipedia article about Addiction	The website www.drugrehab.com
208: You read some background information on your topic and come up with 3-4 keywords. What should you do with those 3-4 keywords before you begin searching for articles?	Brainstorm possible synonyms for those 3-4 keywords you can use for your search	Pick 1 or 2 keywords that you like best and only use those keywords	You should not be using keywords when searching in a library database	Google each keyword separately to see what kind of results you get and if any of them will work for your research project
209: You are researching stereotypes and television. You search Google using the two topic keywords, where would be the first place you should go to get an overview and background information on the topic?	Wikipedia article about the topic	Journal article in Google scholar about the topic	Book about the topic	A video on YouTube about the topic

The Evolving Roles of U.S. Academic Librarians: A Snapshot of Job Responsibilities in 2023

Russell Michalak, Laura Rose Taylor, Michelle Reed, Amanda Koziura, and Devon Ellixson*

This study examines the evolving roles of academic librarians across Canada and the United States. Adapting a survey tool published in a prior Canadian study, the authors surveyed over 350 librarians in the United States, analyzing shifts in research support, teaching and learning, digital scholarship, user experience, and scholarly communication. Results indicate significant engagement in information discovery and digital scholarship, with a growing need for training in digital tools and data management. The resulting report highlights the crucial role of academic librarians in adapting to technological and educational changes, underscoring the necessity for ongoing professional development.

Introduction

The roles of academic librarians have evolved considerably over the years, in part due to technological advancements and shifts in societal dynamics. While "traditional" responsibilities—such as collection development, reference, and cataloging—have remained core to librarianship, the integration of "new roles"—such as digital scholarship, research support, and user experience—has considerably expanded the potential responsibilities that librarians have in their roles. Technology has been further integrated into all roles, and renewed emphasis has been placed on the importance of relationship building between patrons and library workers to better adapt to institutional and patron needs. The events of 2020 accelerated the field's adoption of digital and asynchronous modes of content and service delivery. Even now, we are still feeling the effects of this, as expectations around delivery mode and method of many services have shifted to a more remote or hybrid nature to meet patron needs. As higher education wrestles with maintaining academic rigor amid these disruptions, librarians stand as crucial partners in supporting

*Russell Michalak is Director of Library and Archives at Goldey-Beacom College, email: michalr@gbc.edu; Laura Rose Taylor is Senior Director for Strategic Planning and Communication at Northern Arizona University, email: Laura.Taylor@nau.edu; Michelle Reed is Director of Programs at Library Futures at Library Futures, email: michelle@libraryfutures.net; Amanda Koziura is Head of Scholarly Communication & Data Services and Associate Professor at the University of Nevada-Las Vegas, email: amanda.koziura@unlv.edu; Devon Ellixson is Library Student Intern at Goldey-Beacom College, email: devonellixson@gmail.com.

research, fostering collaboration, and making content available to their patrons at the point of need.

The Association for College and Research Libraries (ACRL) has long been interested in new and evolving roles in librarianship. In 2015, for example, ACRL released *New Roles for the Road Ahead*, a collection of essays celebrating its 75th anniversary. The New Roles and Changing Landscapes Committee was established by ACRL's Board of Directors the following year and was charged with carrying out the organization's work on changing landscapes, which includes strategies connected to open educational resources, retention of a diverse workforce, and emerging and add-on roles. This research, which explores the practical implications and real-world responsibility shifts experienced by academic librarians post-2020, was solicited by ACRL's New Roles and Changing Landscapes Committee and completed by a subcommittee thereof.

Building on Ducas et al.'s (2020) prepandemic study, this investigation identifies evolving roles and gauges librarians' confidence levels, training needs, job satisfaction, as well as the perceived impact of their roles on the academic sphere. It uses the same categories for classifying job responsibilities as the 2020 Canadian study for "traditional" and "new" roles, which were based on *the New Roles for New Times: Transforming Liaison Roles in Research Libraries* report by the Association of Research Libraries (ARL). Though these categories and their subcategories may not match how individual libraries or librarians classify their services, we adopted them for use in this research because they are well-established in existing library literature and therefore allow for more accurate comparison with prior studies. However, the difficulties of universal classification for roles—even those that have been common in librarianship for several decades—are a limitation of the study, as discussed at the end of this report. Similarly, which duties the field considers "new" and "traditional" will continue to evolve over time, and future studies may choose to classify job responsibilities in different ways.

The following research questions guided our study:

1. Exploration of Emerging Roles: What are the emerging roles of academic librarians, and how do they compare with traditional functions? What training needs arise from these emerging roles?
2. Job Satisfaction Assessment: How satisfied are academic librarians with their roles, particularly in light of the evolving demands and responsibilities associated with emerging functions?
3. Evaluation of Impact: What perceptions do academic librarians hold regarding the impact of their roles on the academic enterprise? How do they perceive their contributions in advancing institutional goals and supporting scholarly endeavors?

Literature Review

The role of academic librarians has undergone a profound transformation as technology and shifting educational priorities reshape higher education. Librarians have moved far beyond their traditional responsibilities to embrace dynamic, multifaceted roles that address the evolving needs of their institutions. This journey is marked by innovation and adaptability as librarians navigate new challenges and redefine their professional identities. Goetsch (2008) highlighted the initial waves of technological integration, where librarians began reshaping their roles to meet the demands of modern users. This early adaptation laid the groundwork

for the rapid changes observed by Jaguszewski and Williams (2015), who emphasized the shift toward user-centric services that prioritize digital scholarship, research support, and innovative collection development. Martin and Sheehan (2018) further examined how the transition from collection-centric to user-centric library models necessitated a reimagining of library spaces and the acquisition of new skills. Ducas et al. (2020) documented the hybrid capacities in which Canadian librarians increasingly operate, blending traditional tasks with responsibilities in digital initiatives and user experience. These studies collectively underscore the emergence of new, technology-driven roles in librarianship.

Research support has been another critical area of expansion. Once primarily trainers, librarians have become integral collaborators in interdisciplinary research. Roberts and Levy (2005) documented this shift, showing how librarians increasingly contribute to curriculum development. Daland and Hidle (2016) emphasized the importance of building social and professional networks with postgraduate students to enhance research processes. At the University of North Carolina Charlotte, Wu et al. (2020) highlighted librarians' roles in technology instruction and management, meeting the demands of interdisciplinary research. These changes reveal a broader trend of librarians embedding themselves in collaborative research processes to support academic success. Additionally, Rod (2023) found that the increasing demand for data-related services within academic libraries reflects this shift, as librarians now need skills in data management, computational coding, and metadata, building on earlier research that calls for the continual adaptation of librarian roles to include technical competencies.

Scholarly communication has also transformed, with librarians stepping into leadership roles to manage the complexities of the digital age. Ogburn (2012) provided a framework for adapting to these changes, emphasizing leadership and collaboration. McGlone (2014) and Gardner (2014) detailed the expanded roles of librarians in digital project management, web design, and data curation. Frankosky et al. (2014) noted the critical role of librarians in navigating copyright challenges, while Orzech and Abramovich (2018) and Revez (2018) called for a reevaluation of workflows to better support open science and digital scholarship. These developments highlight how librarians have adapted to lead in the face of new academic demands. Falciani-White (2024) also discussed the environmental conditions required for creativity and innovation within academic libraries, noting that although libraries have made strides, they often fall short in supporting creative work, which is critical for keeping pace with advancements in scholarly communication.

Digital scholarship has emerged as a frontier for innovation in librarianship. McGlone (2014) described the expanding responsibilities of digital project librarians, while Gardner (2014) emphasized the adaptation of scholarly communication librarians to digital publishing and data management. Cummings (2020) explored the challenges faced by digital humanities librarians, such as imposter syndrome, while praising successful interdisciplinary collaboration at the University of Utah's Digital Matters Lab. Malone (2020) and Buck and Pino (2020) showcased how librarians are leveraging virtual and augmented reality technologies to enhance educational experiences. Sichani (2024) redefined digital humanities labs as inclusive spaces that promote interdisciplinary collaboration through hybrid activities, illustrating how librarians have embraced leadership in managing innovative digital initiatives. These studies highlight the continued transformation of librarians into leaders in digital scholarship. Kautonen and Gasparini (2024) further expanded this by offering the B-Wheel process

model, which provides a design-thinking approach for librarians to develop AI competencies and tackle the complexities of new technologies in digital scholarship.

The integration of digital tools has also transformed user experience roles in libraries. McGlone (2014) as well as Gardner (2014) noted the evolution of traditional roles like reference and collection development into areas focused on user-centered design principles. Young et al. (2020) found that libraries with advanced UX practices, supported by leadership and collaboration, were better equipped to meet user needs. Sa'ari et al. (2023) highlighted the role of librarians as data scientists, who enhance e-learning environments by optimizing usability and facilitating seamless access to digital resources. These examples illustrate the growing importance of librarians in designing user-centered digital experiences. Hamad et al. (2024) contributed to this by discussing how libraries are increasingly central to advancing climate change literacy, underscoring their role in fostering both social responsibility and user-centered service delivery through strategic outreach and resource development.

The COVID-19 pandemic accelerated these transformations, forcing libraries to rapidly pivot to virtual services. Runyon and Steffy (2021) documented the swift transition to online reference, research consultations, and information literacy instruction, noting how pre-existing digital infrastructure smoothed the process for some institutions. Ibacache et al. (2021) highlighted how tools like Kahoot! and Poll Everywhere became essential for engaging students remotely, while Koob et al. (2022) emphasized the need for enhanced digital literacy training for librarians and students alike. Libraries also worked to bridge the digital divide, providing laptops and Wi-Fi hotspots to ensure equitable access (Ibacache et al., 2021). McClure (2023) reflected on the varied outcomes of these efforts, underscoring the importance of flexibility, equity, and technology integration in shaping future service models.

Beyond these core transformations, librarians have increasingly embraced "add-on" roles that diversify their contributions to academia. Brunner et al. (2013) described the pressures librarians face to adopt new skill sets, particularly at smaller institutions. Perini (2016) explored the concept of librarians occupying a "third space" between faculty and students, highlighting both the opportunities and challenges of these hybrid positions. These evolving roles demand resilience, proactive engagement, and continuous learning, as librarians navigate the complexities of modern academia. Rothfus et al. (2024) echoed these findings in their study on open scholarship, revealing that librarians must continuously adapt and expand their competencies to support researchers navigating the challenges of open science and access.

Across these domains, the emergence of new roles in librarianship reflects a profession that is dynamic, adaptive, and increasingly integral to higher education. By embracing change and continuously expanding their expertise, librarians ensure their relevance as leaders and collaborators in the evolving academic landscape.

Methodology

The ACRL New Roles and Changing Landscapes Committee decided to explore the evolving roles of academic librarians to understand and document shifts in U.S. librarianship influenced by recent technological and societal changes. Ducas et al. (2020) surveyed Canadian librarians, focusing on research support, teaching and learning support, digital scholarship, user experience, and scholarly communication. With permission from the Canadian researchers, a subcommittee of ACRL's New Roles and Changing Landscapes Committee undertook the task of repurposing the survey for a U.S. audience.

Like the Ducas survey, this study examined the evolving roles of academic librarians, focusing on five key areas: research support, teaching and learning, digital scholarship, user experience, and scholarly communication. These areas were primarily drawn from the ARL publication *New Roles for New Times: Transforming Liaison Roles in Research Libraries.* To ensure a comprehensive exploration of current trends, additional functions were identified through a review of relevant literature and job postings.

The survey included a 50-question instrument designed to gather detailed insights. Respondents were asked to indicate the specific functions they perform within each of the five areas, assess their confidence in executing these tasks, and share how they acquired the necessary skills. To identify training gaps, participants were also asked to indicate areas where they felt additional professional development was needed. Furthermore, the survey explored the balance between traditional and emerging roles by asking respondents to classify their duties and estimate how much time they devoted to each category.

To provide a broader understanding of librarians' professional experiences, participants were invited to assess their job satisfaction and reflect on the perceived impact of their roles on the academic mission. These questions aimed to capture not only the functional aspects of their work but also their alignment with institutional goals and personal fulfillment in their roles.

Most questions were close ended, offering predefined options for respondents to select as applicable, with an "other" option available for additional input. At the end of the survey, respondents were encouraged to provide general comments.

In May 2023, the Institutional Review Board (IRB) at Goldey-Beacom College approved the research project. The survey was conducted over a span of nearly two months, from June 2 to July 28, 2023. As ACRL is the largest professional association for academic librarians, distribution targeted members within the ACRL, including subgroups such as the ACRL Leadership Discussion Group, ACRL University Libraries, and ACRL Annual Survey and Statistics Editorial Board, alongside ALA Core members on ALA Connect. Additional dissemination channels included the ACRL Insider blog and the ARL-ASSESS listserv. Social media platforms, primarily Twitter and LinkedIn, were used to promote the survey further, courtesy of ACRL and the project's research team. This strategy resulted in over 400 responses during the active recruitment period.

To maintain consistency with the Canadian survey, an MLS or equivalent degree was required for eligibility. Eligibility was further restricted to academic librarians aged 18 or over and employed in the United States. To manage data quality, a progress indicator of greater than 8% was established as the threshold for inclusion to ensure that respondents engaged with the survey beyond the initial questions. Responses that showed completion as "True" but had all fields blank, and those that did not meet the progress threshold, were excluded from the analysis. This filtering process culminated in a dataset of 350 usable responses. We conducted a descriptive analysis of the resulting dataset. Each question had a different number of respondents, and some questions allowed for multiple responses. Thus, each individual question has a different n value.

Profile of Respondents

Key characteristics of respondents who met the above criteria include:

- Approximately 43% (n = 151) had up to 10 years of experience in postsecondary educational institutions.

- The largest segment (30%, n = 106) reported being in their current position for between four and 10 years.
- Educational qualifications showed that, in addition to holding an MLIS, 31% (n = 107) possessed an additional master's degree, and 7% (n = 25) held a PhD.

This is similar to the Canadian study, which highlighted 52% of respondents with up to 10 years of experience working in a postsecondary institution, 36% of respondents working in their current position for between four and 10 years, 36% with an additional master's degree, and 6% with a PhD.

Results

This research uses the five areas noted in the Canadian study to examine significant shifts in librarians' roles in research support, teaching and learning, digital scholarship, user experience, and scholarly communication. Percentages reported in our textual results summary are rounded figures.

Results from Ducas et al.'s 2017 survey of Canadian academic librarians are used throughout as a comparative benchmark. Variations between the Canadian (n = 205) and U.S. (2023; n = 350) findings should be interpreted cautiously, as they may reflect differences in survey timing, sample size, population scope (research-intensive institutions in Canada versus a broader U.S. academic librarian population), and structural differences in the size of the academic library workforce in each country.

Research Support

The research support area of the U.S. survey had three sections: general; data management; and bibliometric services.

The general section includes information discovery, data management, systematic reviews, bibliometrics services, and grant application support. Of the 348 respondents in the general section (see Figure 1), 273 stated they provide one or more of the services offered as options, and 75 stated they did not provide any of the research support services asked about in the survey. "Information discovery, such as consultations and literature reviews" had the highest percentage of respondents in this section at 75% (n=260). This percentage is identical to the 75% reported in the Canadian study (n = 153). Respondents reported delivering the other services at a range of 12% to 16% (n = 41–55), a decrease from the 23% to 28% range in the Canadian study (n = 46–58).

We asked additional questions about data management and bibliometrics services as these categories include a vast array of services. Again, we replicated the Canadian study when asking about specific facets of these service categories to better understand which aspects U.S. academic libraries may be focusing on. In both data management and bibliometrics in the U.S., the largest percentage of respondents (34% [n = 93] and 64% [n = 166], respectively) selected "none of the above" indicating that while they may be offering services that would generally be classified as data management or bibliometrics, they are not currently offering any of the specific types of services we asked about.

Of the 271 respondents in the data management section (see Figure 2), the top services most likely to be provided were "assistance with the use of technology, infrastructure, and tools" at 38% (n = 103); "finding external data sets" at 35% (n = 96); and "support for data deposit in your institutional repository" at 19% (n=51). While the top service is the same as reported in the Canadian survey ("assistance with the use of technology, infrastructure, and

FIGURE 1
Research Support: General Respondents.

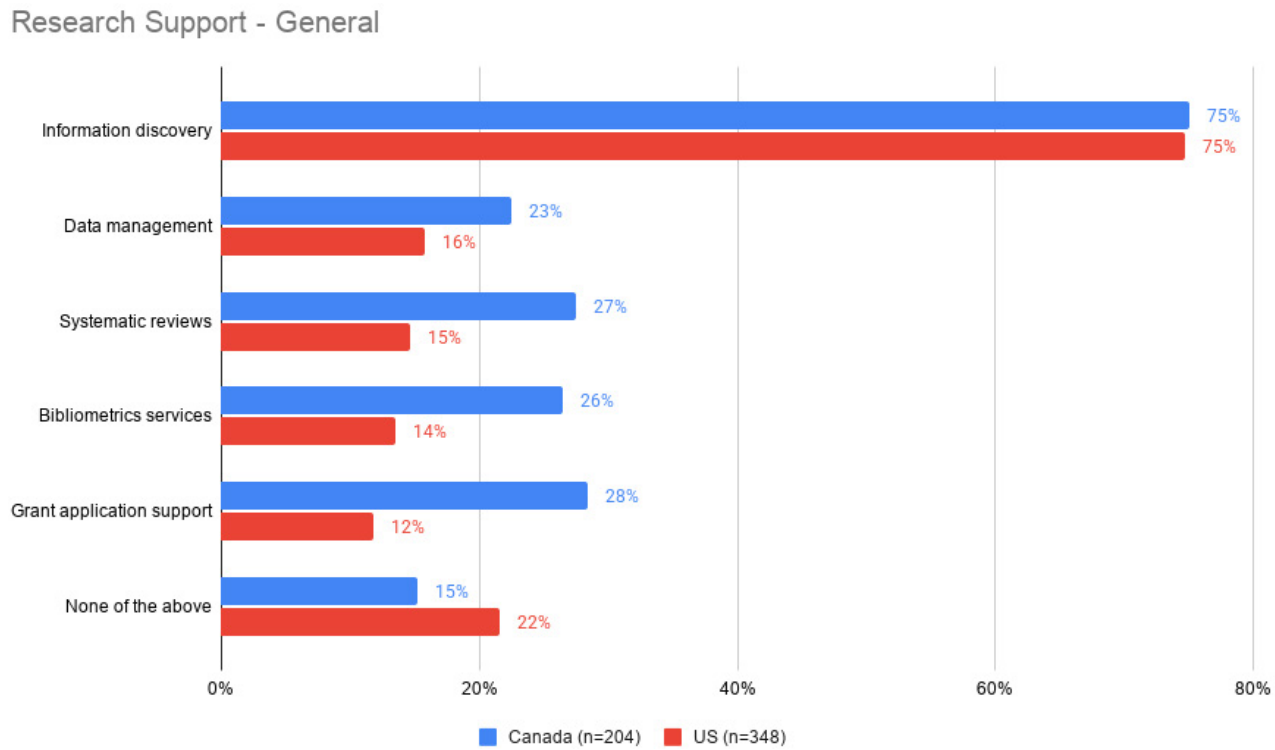
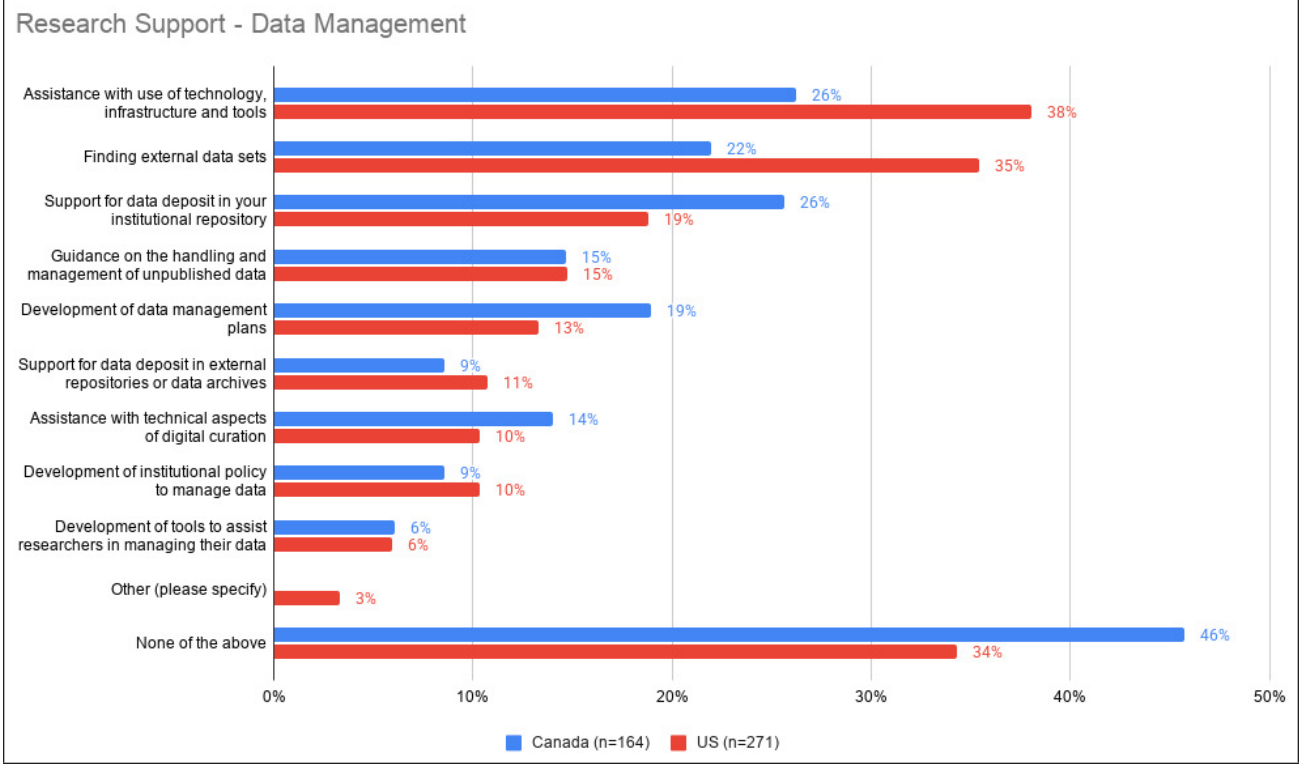


FIGURE 2
Data Management Respondents.



tools" at 26% [n = 43]), the Canadian survey lists "support for data deposit in your institutional repository" in second place at 26% (n = 42) and "finding external data sets" in third place at 22% (n = 36). However, the Canadian survey only had 164 respondents in this section making it an inexact comparison.

The bibliometric services section of the U.S. survey had 258 respondents (see Figure 3). The top services most likely to be provided were "citation reports" at 24% (n = 61) and "altmetrics support" at 14% (n = 37), followed by "bibliometrics training" and "e-research support for recruitment, promotion or tenure application," which both came in at 13% (n = 34). The first three are the same top results found in the bibliometrics services section of the Canadian survey (n = 157), albeit in a different order. In the Canadian survey "bibliometrics training" came in at 30% (n = 47), "citation reports" at 27% (n = 43), and "altmetrics support" at 25% (n = 39), while e-research support for recruitment, promotion, or tenure application was far lower down the list at 8% (n = 13).

Teaching and Learning

In the teaching and learning area of the U.S. survey, 281 of 344 (82%) respondents indicated that they provided at least one of the 12 services provided as options, while 63 (18%) indicated they did not provide any (see Figure 4).

The services most offered in the U.S. survey were "classroom teaching to students" at 70% (n = 242) and "one-on-one teaching" at 63% (n = 216). More than half of respondents reported providing "short videos and screencasts" (55%, n=216), "online learning" (52%, n=180), and "tutorials" (52%, n=178). While the first two services may be considered as core

FIGURE 3
Bibliometric Services Respondents.

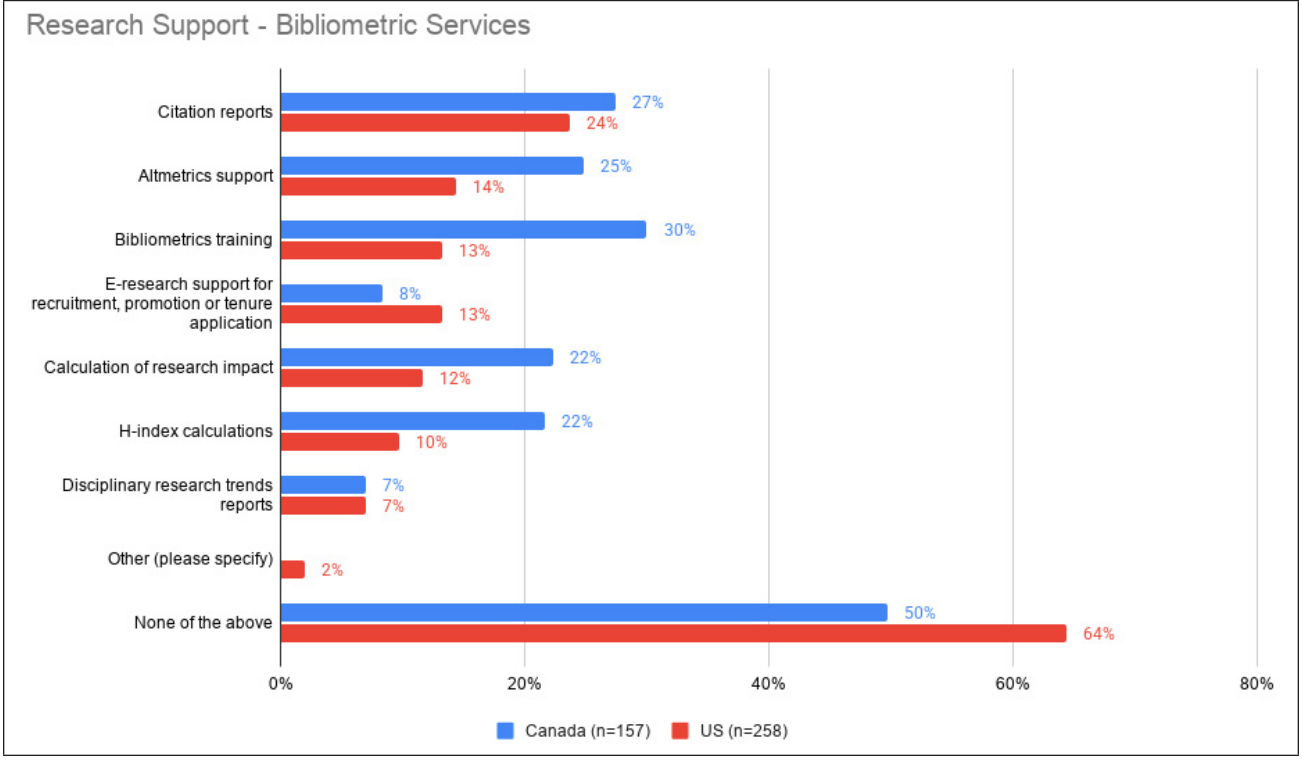
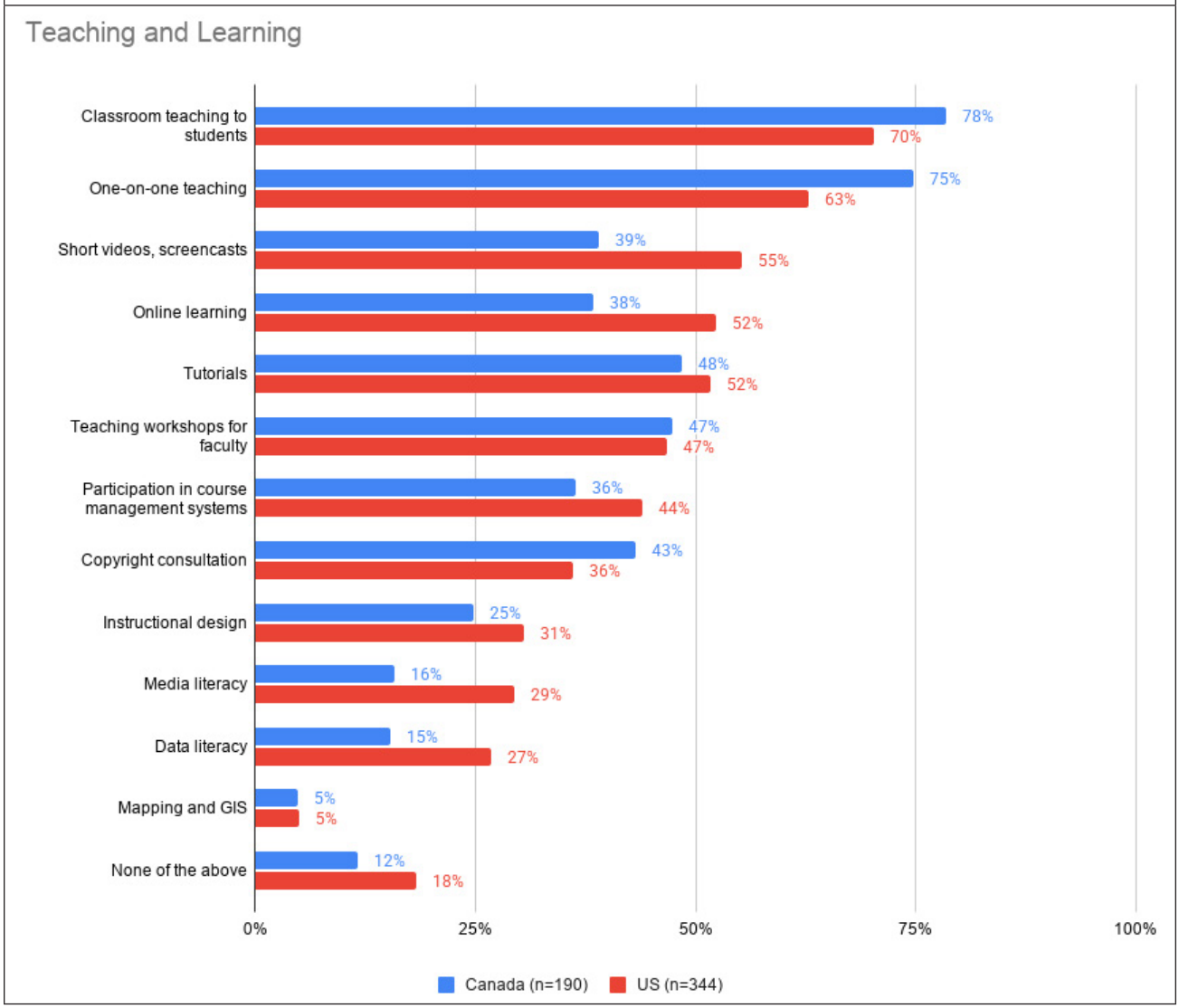


FIGURE 4
Teaching and Learning Respondents.



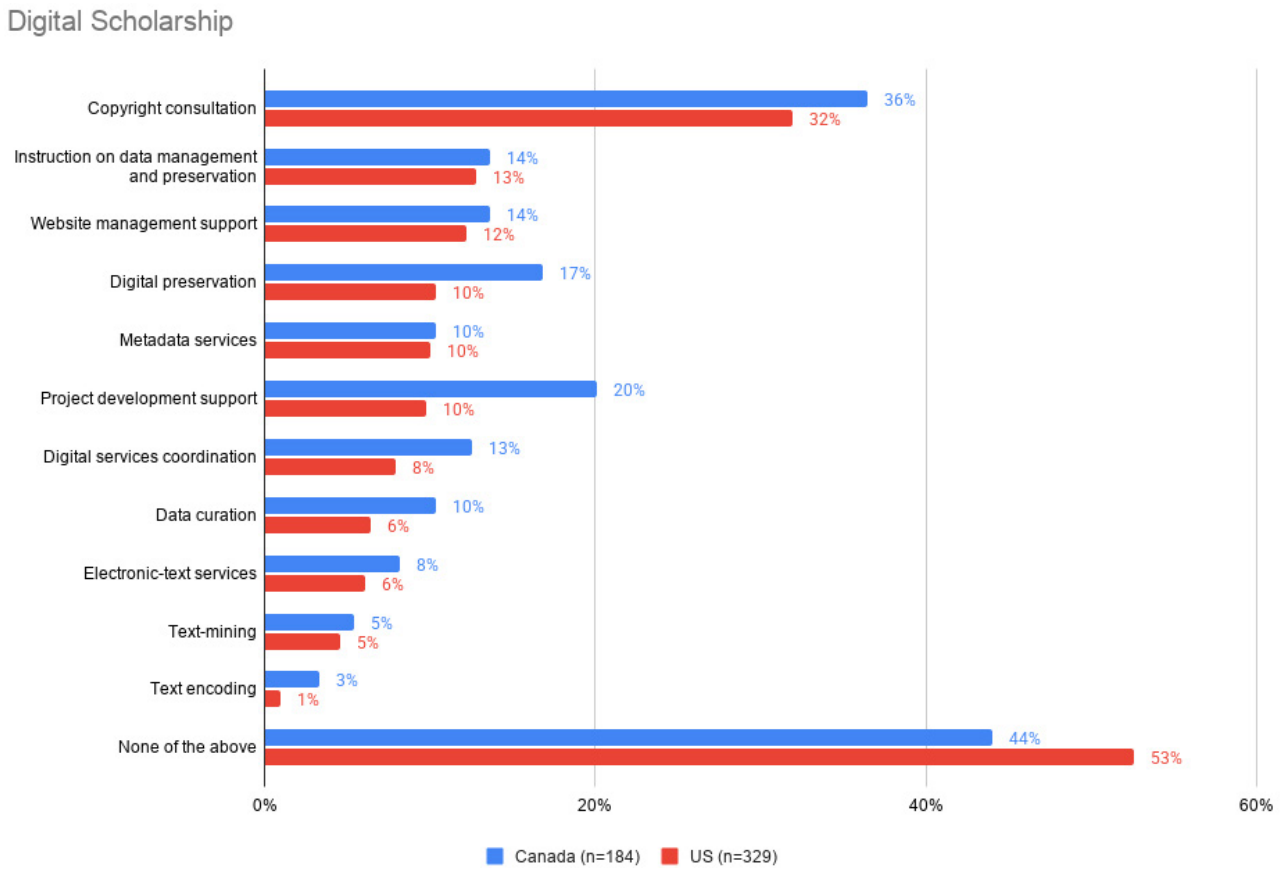
mainstays, the next three services can be leveraged at a distance—and during a pandemic lockdown.

The Canadian survey (n = 190 for this service area) had the same core services at the top of their most offered list: "classroom teaching to students" and "one-on-one teaching" in the top two spots, at 78% (n = 149) and 75% (n = 142), respectively. The next three spots were held by "tutorials" (48%, n = 92), "teaching workshops for faculty" (47%, n = 90), and "copyright consultation" (43%, n = 82).

Digital Scholarship

The digital scholarship area of the U.S. survey had 329 respondents (see Figure 5). More than half (n = 173) indicated that they did not provide any of the 11 services provided as options, while the remainder (n = 156) indicated they provided at least one. The Canadian survey had significantly fewer respondents in this section (n = 184); however, the highest response rate was also for "none of the above" at 44% (n = 81). While digital scholarship

FIGURE 5
Digital Scholarship Respondents.



services are becoming increasingly present in academic libraries, particularly at research-intensive institutions, it is a category that is notoriously difficult to define, and thus the 11 services selected may not be reflective of what respondents consider digital scholarship services.

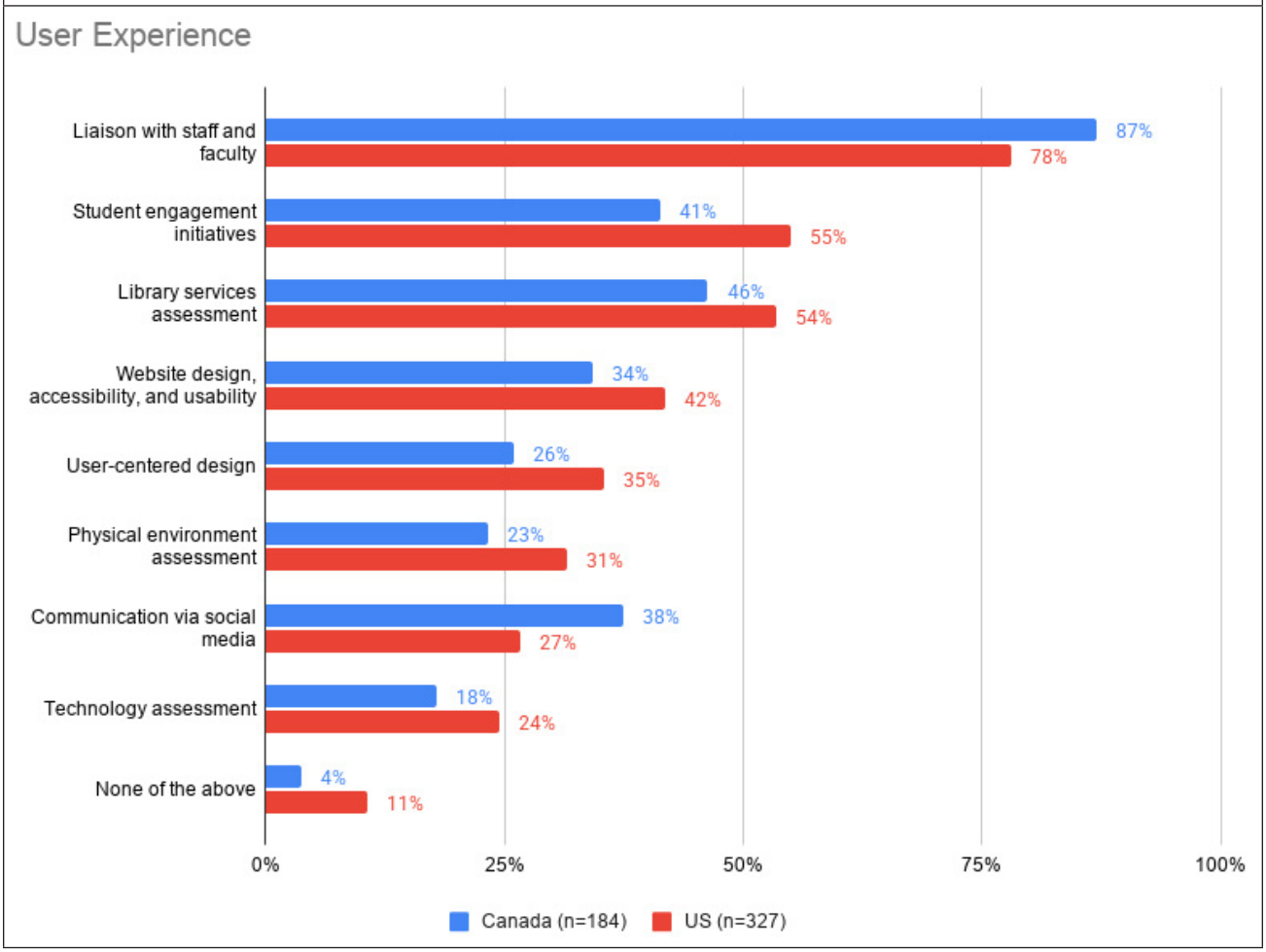
Our results show that "copyright consultation" at 32% (n = 105) was the most-offered service in the U.S survey, which was more than double the next highest service of "instruction on data management and preservation" at 13% (n = 42). The Canadian survey had the same top service: "copyright consultation" at 36% (n = 67), which was followed by "project development support" at 20% (n = 37).

User Experience

The user experience section of the U.S. survey had 327 respondents. Only 11% (n = 35) of U.S. respondents indicated that they did not provide any of the eight service options presented (see Figure 6). The majority (n = 293) reported providing at least one. Similarly, the Canadian survey showed that most of their respondents provide at least one service in this area, with only 4% (n = 7) saying they did not.

The service most offered was "liaison with staff and faculty" at 78% (n = 255), followed by "student engagement initiatives" at 55% (n = 180) and "library services assessment" at 54% (n = 175). The same three services topped the user experience list in the Canadian survey

FIGURE 6
User Experience Respondents.



(n = 184) but in a different order: "liaison with staff and faculty" at 87% (n = 160) was also first, followed by "library services assessment" at 46% (n = 85) and then "student engagement initiatives" at 41% (n = 76).

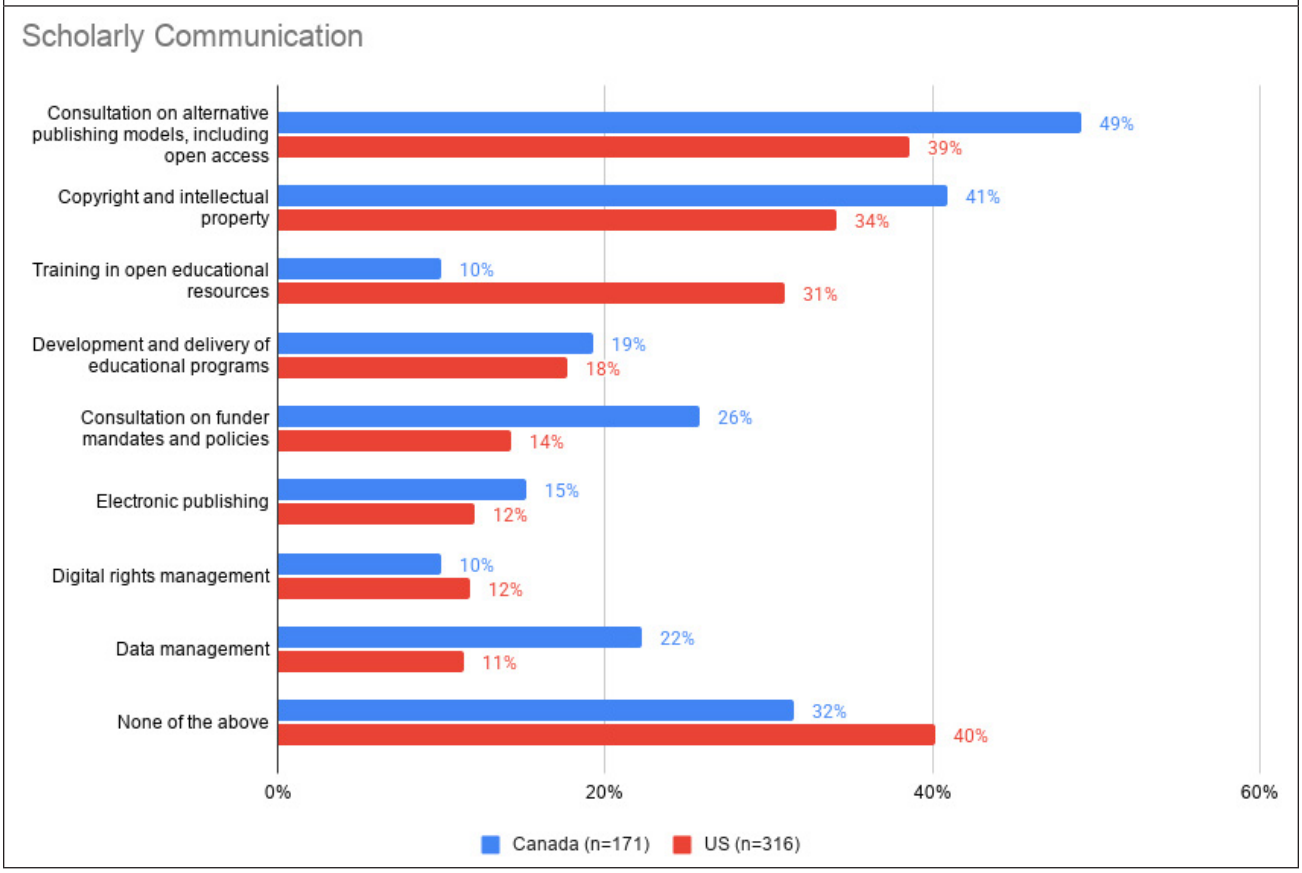
Scholarly Communication

In the scholarly communication area, 60% (n = 189) of respondents reported providing at least one of the eight services provided as options, and the remaining 40% (n = 127) indicated that they did not provide any (see Figure 7). In the Canadian survey, 68% (n = 117) of respondents reported providing at least one of the eight services shown in the table below, with the remaining 32% (n = 54) stating they did not provide any of them.

The most selected answer in the scholarly communication area was "none of the above" at 40% (n = 127). Just behind it was the service provided with the highest percentage, "consultation on alternative publishing models, including open access" at 39% (n = 122), followed by "copyright and intellectual property" at 34% (n = 108), and then "training in open educational resources" at 31% (n = 98).

"Consultation on alternative publishing models, including open access," also had the top spot in the Canadian survey at 49% (n = 84), again followed by "copyright and intel-

FIGURE 7
Scholarly Communication Respondents.



lectual property" at 41% (n = 70). However, "training in open educational resources" was only reported by 10% of respondents (n = 17) in the Canadian survey, compared to 31% of respondents (n = 98) in the U.S. survey.

Librarians' Confidence Levels

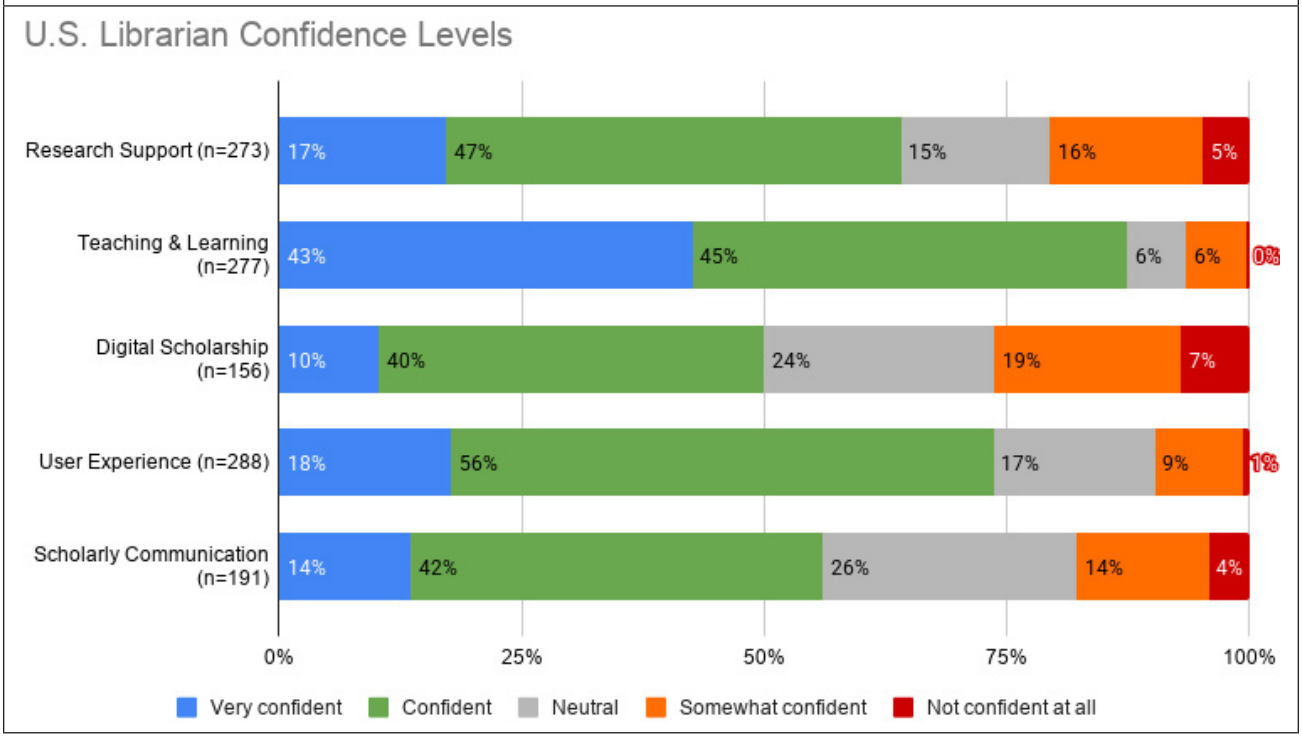
U.S. respondents were asked to rate their confidence across each of the five areas (see Figure 8). Each area of expertise had a different number of respondents as follows:

- Research support: 273
- Teaching and learning: 277
- Digital scholarship: 156
- User experience: 288
- Scholarly communication: 191

Survey participants indicated being most confident in the area of teaching and learning, with 87% (n = 242) of them reporting being confident or very confident, followed by user experience with 74% (n = 212). Sixty-four percent of respondents (n = 175) were confident or very confident in the area of research support, followed by scholarly communication at 56% (n = 107), and digital scholarship at 50% (n = 78).

In the Canadian survey, respondents were also most confident in the area of teaching and learning, with 75% (n = 126) selecting confident or very confident, followed by research

FIGURE 8
Confidence in Abilities to Perform Duties.



support at 62% (n = 102) and user experience at 60% (n = 104). Again, at the bottom of the list were respondents reporting they were confident or very confident in terms of scholarly communication at 51% (n = 62) and digital scholarship at 50% (n = 53).

Survey participants reported being least confident in the area of digital scholarship, with 26% (n = 41) of them reporting being somewhat confident or not confident at all, followed by research support with 21% (n = 56).

Training and Training Needs

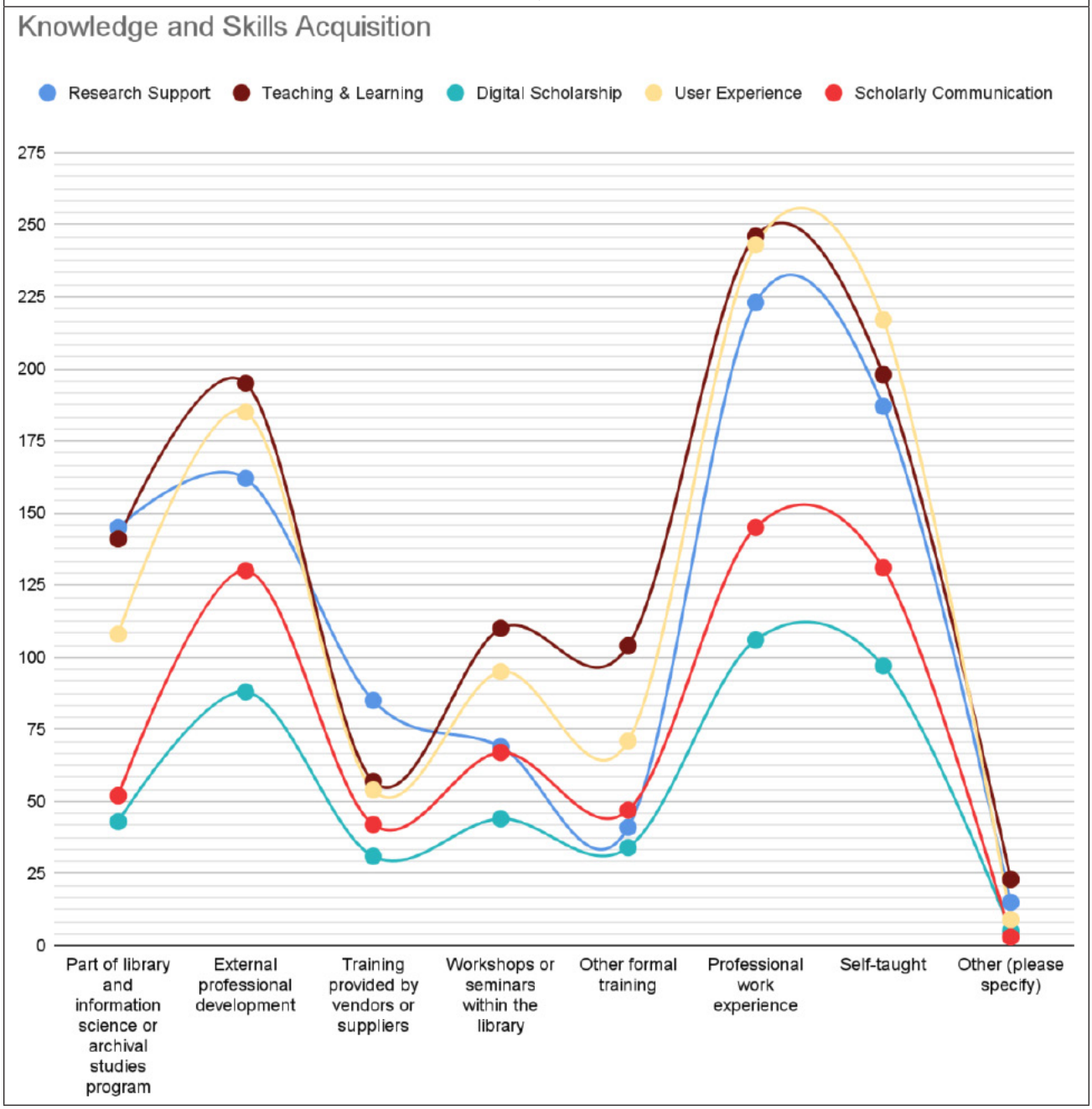
In the U.S. survey "Professional work experience" was, on average, the most common way that respondents acquired their skills, followed by "self-taught" and "external professional development" (see Figure 9). The next highest were via "library and information science or archival studies programs" and "workshops or seminars within the library."

In the Canadian survey, respondents had the same three at the top, followed by "workshops or seminars within the library." The lower utilization of "workshops or seminars within the library" in the U.S. survey likely reflects the impact of the COVID-19 pandemic on libraries and librarians.

In the U.S. survey, "training provided by vendors or suppliers" showed more utilization across the five areas than in the Canadian survey, in which "research support" was much more likely than for the other four areas to be reported for "training provided by vendors or suppliers."

Respondents also shared areas in which they felt a need for additional training. The highest percentages were recorded in the research support area (n = 270), where the most

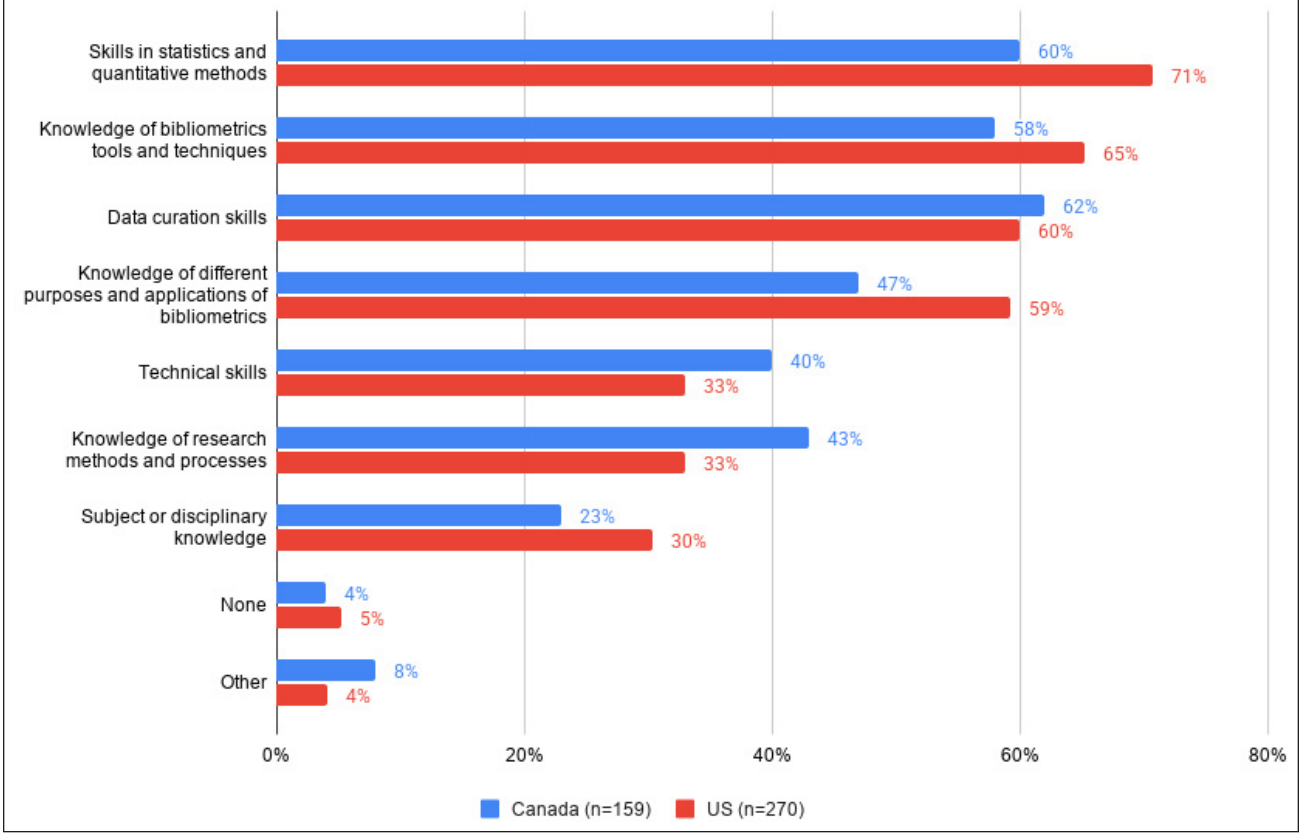
FIGURE 9
Responses to Question: *"How were your knowledge and skills acquired?"*



desired training type was for "skills in statistics and quantitative methods" at 71%, followed by "knowledge of bibliometrics tools and techniques" at 65%, and "data curation skills" at 60% (see Figure 10).

In the teaching and learning area (n = 267), the highest desired training type was for "mapping and GIS" at 54%, followed by "data resources" at 46%, and "instructional design" at 44% (see Figure 11). In the Canadian survey, none of the teaching and learning options registered more than 50% of respondents.

FIGURE 10
Training Needs: Research Support.



For the digital scholarship area (n = 151), "digital tools and methods" and "text-mining training" were both desired by 58% of respondents, followed by "data management" at 54% (see Figure 12).

For the user experience area (n = 276), "assessment methodology and techniques" training was desired by 47%, followed by "web usage analysis" at 44% (see Figure 13). "User-centered design" and "knowledge of process improvement tools" were desired by 41% and 40% of respondents, respectively.

In the scholarly communication area (n = 180), "digital rights management" topped the list at 56%, followed by "data management" at 50%, and "funder mandates and policies" at 49% (see Figure 14).

Traditional Versus New Roles

One question asked respondents whether they were performing a new role related to research support, teaching and learning support, digital scholarship, user experience, or scholarly communication, and another asked whether they were performing a traditional role (e.g., reference, instruction, cataloging, collection development, administration).

Of the 350 respondents who completed the survey, 304 (87%) responded with a "yes" or "no" response to both questions. Respondents who skipped one or both, or who answered

FIGURE 11
Training Needs: Teaching and Learning.

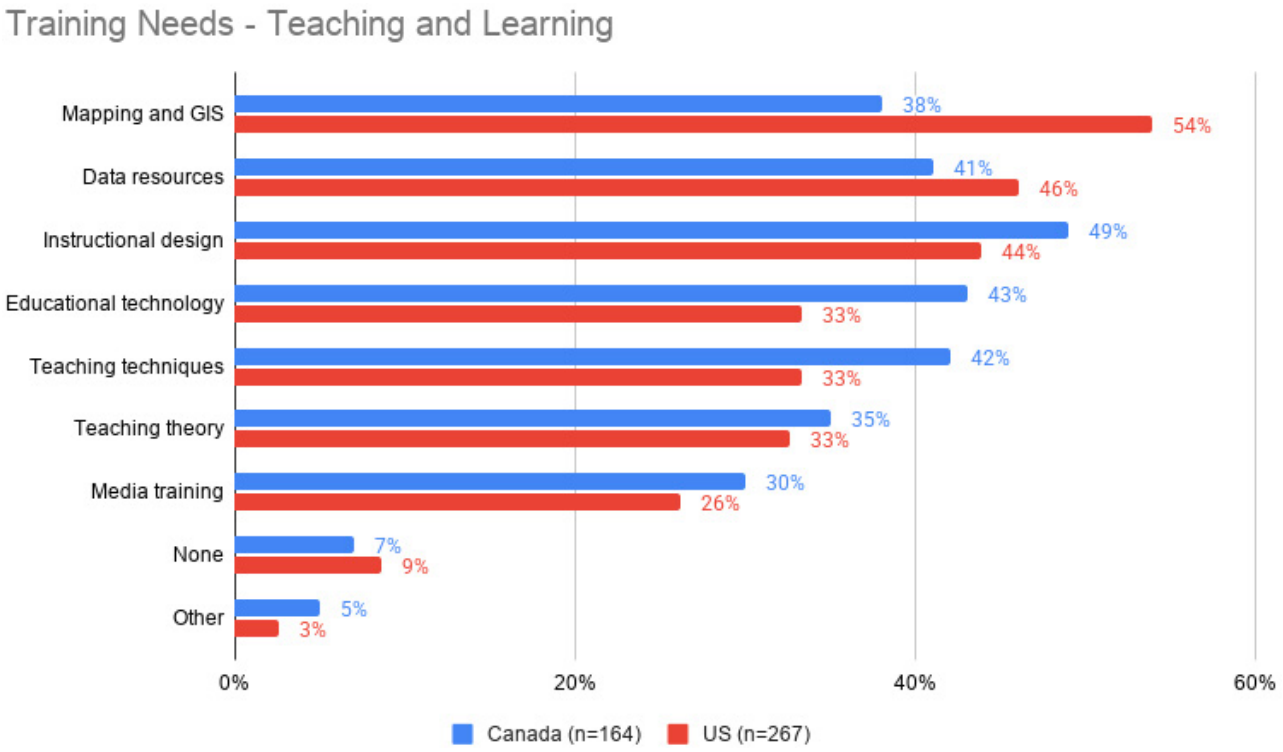


FIGURE 12
Training Needs: Digital Scholarship.

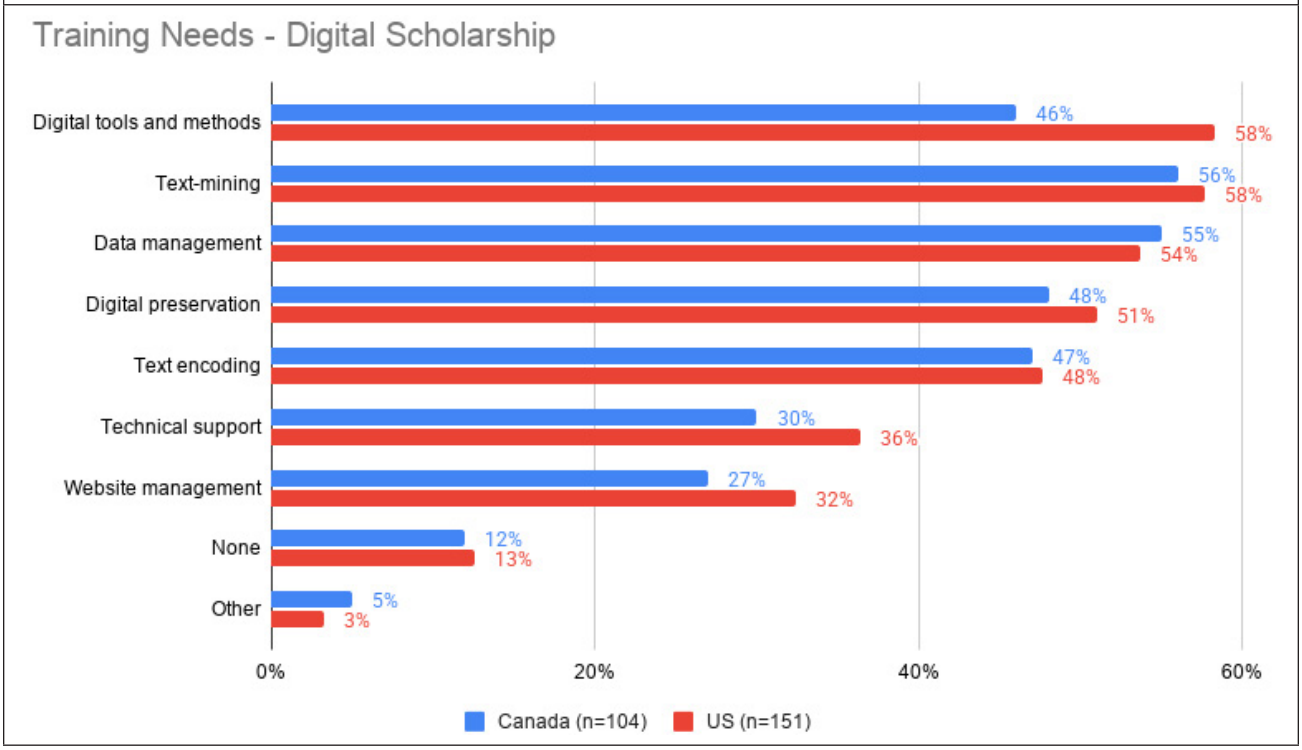


FIGURE 13
Training Needs: User Experience.

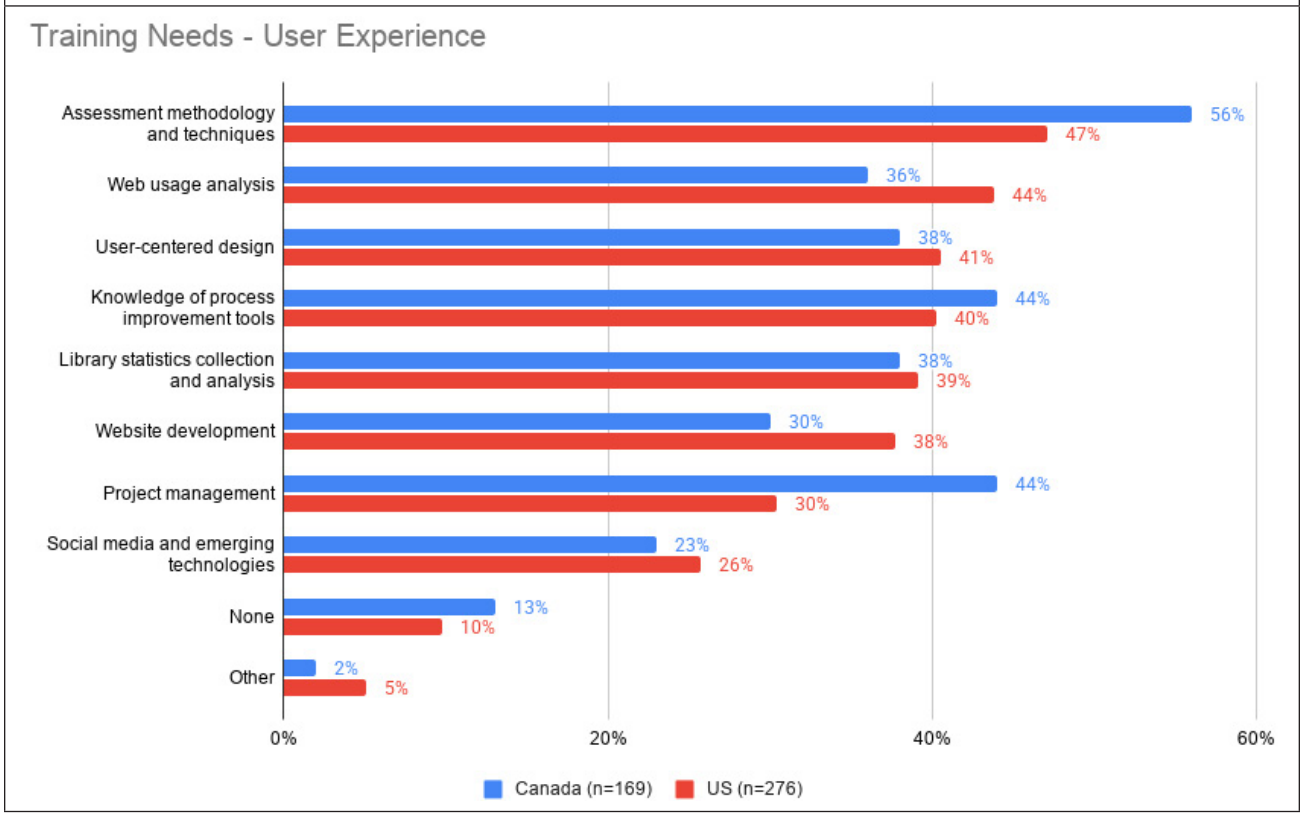
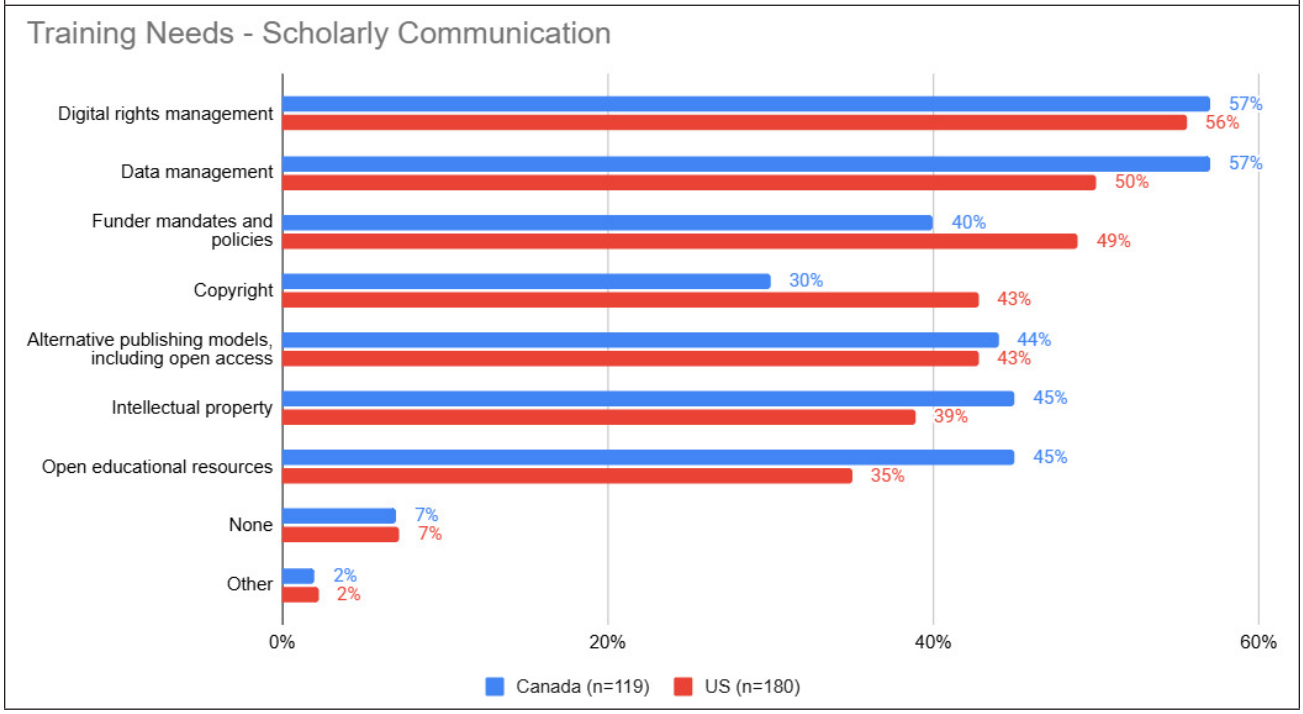


FIGURE 14
Training Needs: Scholarly Communication.



"no" for both questions were excluded when calculating the proportions of librarians who perform either of the traditional or new roles.

Of the 304 respondents, 52% (n = 158) said they are performing only a traditional role, and 15% (n = 44) said they are performing only a new role. A total of 33% (n = 102) reported performing a hybrid role. In the Canadian survey, the percentage of librarians performing only new roles was similar at 13%, while the percentage performing traditional and hybrid roles was 44% each. However, the count of librarians performing traditional roles in the Canadian survey was slightly higher than the count of those who reported performing hybrid roles.

Of the U.S. survey's 350 respondents, 317 responded to a question that asked if they spend most of their time delivering traditional services, new services, or equal time on both. Nearly half of the respondents (49%, n = 156) said they spent the majority of their time delivering traditional services (e.g., reference, instruction, cataloging, collection development, administration), followed by equal time on both (31%, n = 98), and delivering new services (e.g., research support, teaching and learning support, digital scholarship, user experience, scholarly communication) (20%, n = 63).

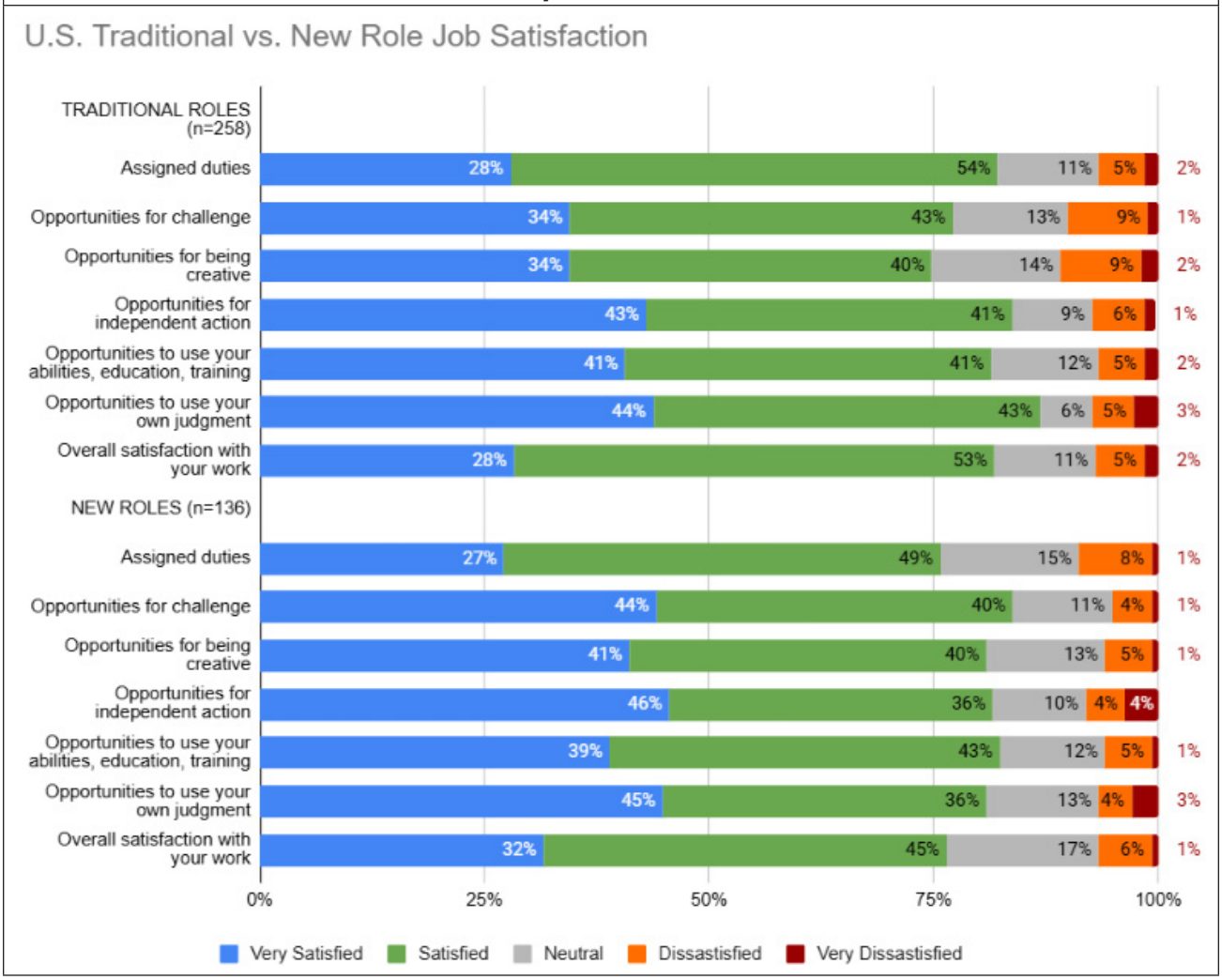
These results are similar to those in the Canadian survey, in which the highest percentage was also for delivering traditional services (45%, n = 79), followed by equal time on both (36%, n = 62) and delivering new services (19%, n = 33).

Job Satisfaction

Most respondents to the U.S. survey expressed general satisfaction with their traditional roles, defined as reference, instruction, cataloging, collection development, and administration (n = 258) (see Figure 15). A significant number of librarians (n = 140, 54%) report being satisfied with their assigned duties, with 72 (28%) indicating they are very satisfied. Satisfaction is also strong in areas such as using their own judgment (111 satisfied, 43%; 113 very satisfied, 44%) and opportunities for independent action (105 satisfied, 41%; 111 very satisfied, 43%). However, satisfaction declines in categories like opportunities for creativity and challenge. In these areas, 37 (14%) respondents are neutral and 23 (9%) are dissatisfied regarding creativity, while 33 (13%) are neutral and 23 (9%) are dissatisfied with the level of challenge in their roles. Overall, job satisfaction remains positive, with 138 (54%) satisfied and 73 (28%) very satisfied, though there are areas for potential growth, particularly in providing more opportunities for creativity and challenges.

For respondents performing new roles (defined as research support, teaching and learning support, digital scholarship, user experience, and scholarly communication) (n = 136), most are satisfied or very satisfied with their assigned duties (66 satisfied, 49%; 37 very satisfied, 27%) and opportunities for creativity (54 satisfied, 40%; 56 very satisfied, 41%). High satisfaction is also evident in the use of abilities and education, where 62 (46%) are very satisfied, and 49 (36%) are satisfied. Opportunities for independent action and using judgment also show strong satisfaction, with 56 (41%) and 61 (45%) respondents very satisfied, respectively. However, a notable number of respondents express neutrality or dissatisfaction in some areas, particularly in assigned duties, with 21 (15%) neutral and 12 (9%) dissatisfied. While the general trend reflects positive job satisfaction, more opportunities for independent action, being trusted to use their own judgment, and a review of assigned duties could enhance the experiences of librarians in these emerging roles.

FIGURE 15
Responses for Traditional and New Roles to Question: *"How satisfied are you with your position?"*

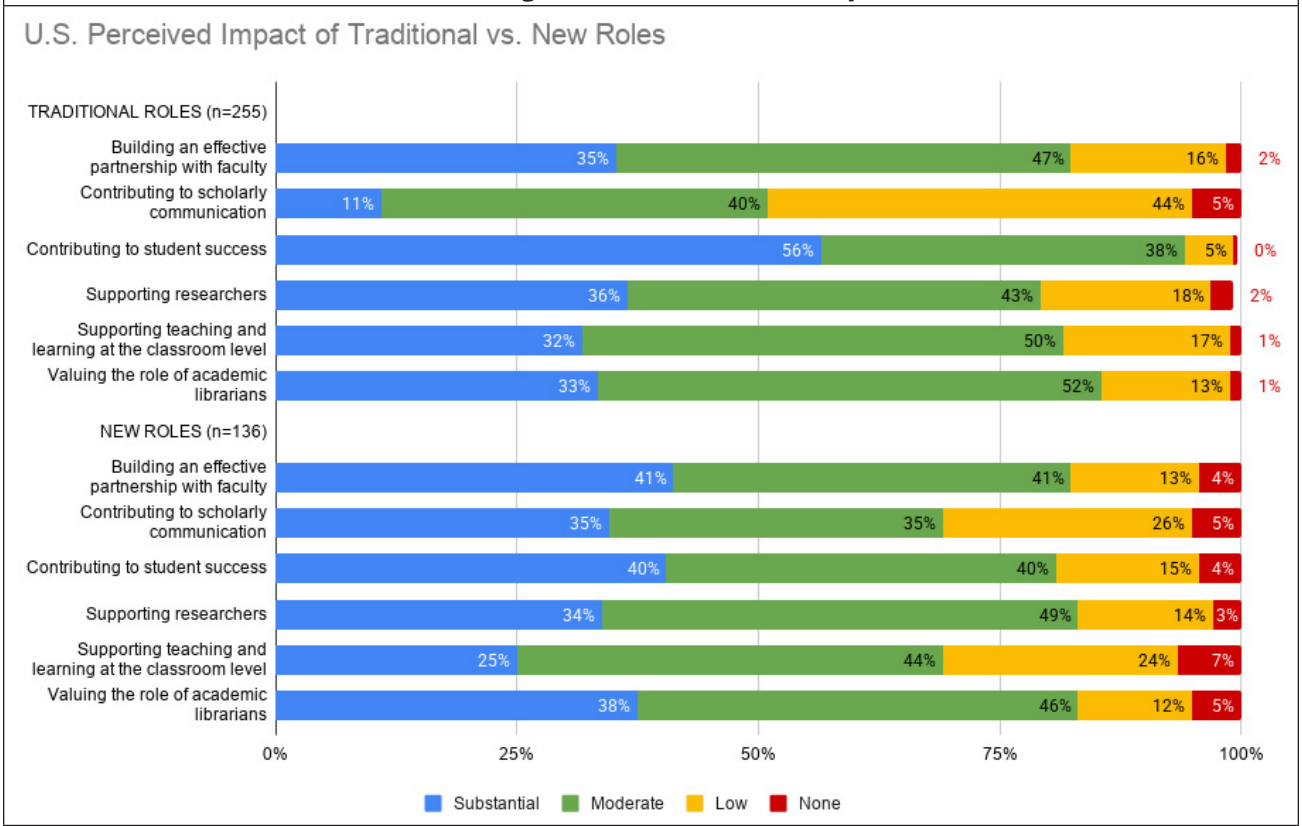


Impact on the Academic Enterprise

The survey asked U.S. respondents performing both traditional and new roles as defined above, "what impact do you believe your role is having on the academic enterprise?"

The results indicate that respondents performing traditional roles (n = 255 responses) perceive a substantial impact in several areas, particularly in building effective partnerships with faculty (35%, n = 90), contributing to student success (56%, n = 144), and supporting researchers (36%, n = 93) (see Figure 16). Moderate impact is most frequently noted in supporting researchers (50%, n = 127) and valuing the role of academic librarians (52%, n = 133). However, some respondents report a low impact in areas like contributing to scholarly communication, with 112 (44%) respondents indicating a minimal impact in this area. These findings highlight that, while many academic librarians in traditional roles feel they have a meaningful impact on student success, research support, and faculty partnerships, contributions to scholarly communication may be perceived as less influential.

FIGURE 16
Responses for Traditional and New Roles to Question: *"What impact do you believe your role is having on the academic enterprise?"*



The results show that many respondents performing new roles (n = 136 responses) perceive a substantial impact in contributing to student success and building effective partnerships with faculty, with 55 (40%) and 56 (41%) respondents, respectively, selecting substantial for these categories. Similarly, supporting researchers is also seen as impactful, with 46 (34%) respondents indicating a substantial effect. Most responses across all categories, however, tend to reflect a moderate impact, particularly in supporting teaching and learning at the classroom level (49%, n = 67) and valuing the role of academic librarians (46%, n = 62). In contrast, contributing to scholarly communication shows a more mixed impact, with 35 (26%) respondents indicating a low effect, suggesting that this area may need further development. These findings suggest that while librarians in new roles see themselves as key contributors to student success and faculty partnerships, there is room for growth in their perceived impact on scholarly communication and teaching support at the classroom level.

Discussion

Emerging Roles of Academic Librarians

This study suggests that academic librarianship is evolving in response to technological innovation and institutional shifts, but that transformation is layered onto longstanding professional foundations. Time-allocation data reinforce this: nearly half of respondents reported spending most of their time delivering traditional services, while a substantial share reported hybrid

work that blends traditional and emerging responsibilities. Confidence levels provide essential context for understanding this transition. Respondents reported the highest confidence in teaching and learning (87%) and user experience (74%), suggesting that many librarians feel well prepared to support instruction and relationship-centered, user-facing work even as roles expand. In contrast, lower confidence in scholarly communication (56%) and digital scholarship (50%) points to areas where emerging responsibilities may be outpacing training and institutional support. These patterns highlight clear opportunities for targeted professional development and resourcing to help librarians sustain hybrid roles and meet evolving campus needs.

As seen in the survey results, 33% of respondents identified themselves as performing hybrid roles that blend traditional and new responsibilities, a finding that mirrors Ducas et al. (2020) and Jaguszewski and Williams (2015), who emphasized the growing complexity of liaison and research support functions. The transition from collection-centric to user-centric models, as described by Martin and Sheehan (2018), is reflected in the prominence of roles such as digital scholarship (50% confidence) and user experience (75% confidence). These hybrid capacities not only redefine professional identities but also challenge librarians to navigate multifaceted responsibilities while staying responsive to their institutions' evolving needs. Close attention should be paid to the needs of librarians navigating these roles and additional resources and training provided as needed to improve their ability to meet patron needs. Further, the blend of traditional and new roles seen in each position should be evaluated to ensure they are complementary enough to be included together in a single position. If they are not, then separating duties into multiple roles may increase confidence by allowing individuals to spend an appropriate amount of time mastering each responsibility without being spread too thin.

The survey results also underscore the heightened focus on research support, with 74% of respondents providing services like consultations and literature reviews. This aligns with studies by Roberts and Levy (2005) and Daland and Hidle (2016), which documented the librarian's role as a key collaborator in interdisciplinary research. However, a notable gap emerges in advanced areas such as bibliometrics and data curation, where 65% and 60% of respondents, respectively, identified training needs. These findings highlight the growing importance of research impact and data-related services in academic libraries, as evidenced by Rod (2023), who argued that technical expertise in areas like data visualization and analysis is becoming foundational for modern research support. Institutions, particularly research-intensive ones with significant patron needs related to data, can benefit from putting additional training, positions, and resources into data and research impact related areas to both increase librarian confidence in providing expertise in these areas and better meeting patron needs.

Job Satisfaction in Changing Roles

The relationship between job satisfaction and confidence in role performance emerges as a critical theme. Respondents reported the highest satisfaction and confidence in traditional areas like teaching and learning (87%) and user experience (74%), while emerging areas like digital scholarship (50%) and scholarly communication (56%) showed significantly lower confidence levels. This aligns with the findings of McGlone (2014) and Gardner (2014), who noted that inadequate preparation for technology-driven responsibilities often leads to lower confidence and, subsequently, job dissatisfaction.

While most respondents were generally satisfied with their roles, there is room for improvement in traditional role areas requiring creativity (25% neutral or dissatisfied) and opportunities for challenge (23% neutral or dissatisfied). These results echo Falciani-White (2024), who identified the lack of institutional support for innovation as a barrier to job fulfillment. Libraries need to foster environments where creativity and experimentation are encouraged. All areas of libraries, from circulation to cataloging to teaching and digital scholarship, can benefit from innovative thinking and exploration of ways to improve both public-facing services and behind-the-scenes workflows. Providing librarians with greater autonomy and resources to innovate, and then rewarding them for resulting innovations, can not only enhance job satisfaction but also position libraries as hubs of academic and creative engagement.

Moreover, the survey revealed that librarians performing hybrid roles often face greater challenges balancing competing responsibilities, and that those with newer roles have comparatively lower satisfaction with their assigned duties (24% neutral or dissatisfied). This supports a thoughtful reexamination of assigned duties, as Heady et al. (2020) warned that role overload, when not accompanied by workload adjustments, contributes to burnout and turnover. To address this, institutions must adopt equitable workload distribution models and redefine role expectations to ensure sustainability and professional well-being.

Contributions to the Academic Enterprise

Academic librarians play a pivotal role in advancing institutional goals, yet their perceived impact varies significantly across domains. Respondents across both new and traditional roles highlighted substantial contributions to student success (56%) and supporting researchers (36%), reinforcing Daland and Hidle's (2016) assertion that librarians are indispensable collaborators in teaching and research. However, the comparatively lower perceived impact reported in scholarly communication suggests either a disconnect between this emerging role and broader institutional priorities or that librarians are not aware of the full impact of their activities in this area.

This misalignment may stem from insufficient institutional support and training in areas like copyright management, open access, and funder compliance. For example, while 39% of respondents reported providing consultations on alternative publishing models, many indicated a lack of confidence in navigating complex scholarly communication landscapes. As Ogburn (2012) and Revez (2020) argued, librarians must be equipped with both leadership skills and technical expertise to fully integrate into the scholarly communication ecosystem. By prioritizing training in this area, institutions can empower librarians to contribute more effectively to the dissemination of knowledge and the promotion of open science. Further, institutions should take a more active role in recognizing the expertise of librarians in this area and encourage faculty colleagues to consult with them.

In digital scholarship, the study reveals a troubling gap between institutional needs and librarian preparedness. With 52% of respondents indicating no involvement in digital scholarship services, this area remains underdeveloped despite its growing importance. Studies by Malone (2023) and Sichani (2024) emphasized the transformative potential of digital scholarship labs and interdisciplinary collaboration. To bridge this gap, libraries must invest in dedicated digital scholarship positions, tools, and training, enabling librarians to lead initiatives in areas like text mining, metadata, and data preservation.

Professional Development and Training Needs

Professional development emerges as a cornerstone for the effective integration of emerging roles. Respondents overwhelmingly indicated a need for targeted training in research support (71% seeking skills in statistics and quantitative methods), digital scholarship (58% requesting training in digital tools and methods), and user experience (47% identifying gaps in assessment methodologies). These findings are consistent with Kautonen and Gasparini (2024), who argued that structured training programs are essential for equipping librarians with the competencies needed to navigate AI, data science, and other advanced technologies and research methodologies.

However, the reliance on self-taught methods and informal learning pathways, as reported by respondents, underscores a critical gap in institutional support. While professional experience remains a valuable source of skill acquisition, it cannot replace formalized training programs designed to address the complexities of modern librarianship. Koob et al. (2022) and Ibacache et al. (2021) similarly found that pandemic-era disruptions highlighted the inadequacy of ad hoc training, particularly in digital literacy and remote service delivery. Moving forward, institutions must adopt a proactive approach to professional development, offering and funding participation in workshops, certifications, and collaborative learning opportunities that align with both librarian and institutional goals. Comanda et al. (2021) highlight the particular importance of professional development being funded by institutions, for leaving librarians to cover the costs themselves is unfair, inequitable, and inherently excludes people based on their economic status.

Balancing Traditional and Emerging Roles

The survey suggests an ongoing shift, with traditional responsibilities still dominant but emerging roles expanding, with 49% of respondents dedicating most of their time to traditional responsibilities and 33% balancing both. This reflects Perini's (2016) concept of the "third space," where librarians navigate dual identities as traditional knowledge curators and innovative collaborators. However, the risk of overburdening librarians with additional responsibilities without adjusting workloads is a recurring theme in the literature. As Heady et al. (2020) warned, role expansion without corresponding support leads to decreased morale and retention.

To address these challenges, libraries must adopt a strategic approach to role integration. This includes redefining job descriptions, ensuring equitable workload distribution, and providing the necessary resources and support for emerging responsibilities. By doing so, institutions can create sustainable roles that balance innovation with tradition, fostering both professional satisfaction and organizational success.

Enhancing the Impact of Librarianship

Despite the challenges, academic librarians are uniquely positioned to drive institutional transformation through their roles in research, teaching, and digital innovation. However, to maximize their impact, libraries must address several key areas:

1. Institutional Alignment: Align librarian roles with broader institutional priorities, particularly in areas like digital scholarship, scholarly communication, and data services. This requires not only training but also the integration of librarians into decision-making processes that shape academic and research strategies.

2. Creative Environments: Foster environments that support creativity and innovation, addressing the dissatisfaction many librarians feel in these areas. This could include dedicated time for experimental projects, collaborative initiatives, and recognition of creative contributions.
3. Sustainable Workloads: Ensure that the integration of emerging roles is accompanied by workload adjustments and support structures. Sustainable role design is critical for maintaining morale, productivity, and long-term retention.
4. Comprehensive Training Programs: Develop targeted professional development initiatives that address gaps in digital scholarship, research support, and user experience. Leveraging vendor partnerships, cross-disciplinary collaborations, and formal certifications can help librarians stay ahead in a rapidly evolving landscape. Institutions must be willing to fund these opportunities otherwise librarians may not be able to take advantage of them.
5. Advocacy and Visibility: Promote the visibility of librarians' contributions, particularly in underrecognized areas like scholarly communication and digital scholarship. Highlighting success stories and measurable outcomes can strengthen librarians' roles as institutional leaders.

As this study illustrates, the evolving roles of academic librarians reflect a profession in flux, balancing tradition with innovation. By addressing the identified gaps and challenges, institutions can empower librarians to thrive in their hybrid capacities, ensuring they remain integral to the academic enterprise. Future research, particularly longitudinal and comparative studies, will be essential in tracking these transformations and guiding the strategic development of the profession.

Study Limitations

This study provides valuable insights into the evolving roles of academic librarians, but it also highlights several limitations that must be considered when interpreting the findings. Understanding these constraints is crucial for contextualizing the results and identifying areas for future exploration.

The self-selecting nature of the survey respondents may have introduced bias, as those who participated likely had particular views or experiences that may not reflect the wider population of academic librarians. This raises questions about the generalizability of the findings and the extent to which they represent diverse perspectives across the profession.

Geographical and institutional variation further constrains the study's scope. By focusing primarily on academic librarians in the United States, the study does not account for differences in librarianship across international contexts or nonacademic institutions. Libraries in other countries or institutions with distinct educational and technological landscapes may face unique challenges and opportunities, which this study does not address.

The temporal context of the data collection also presents limitations. Conducted shortly after the significant global disruptions caused by the pandemic, the findings represent a snapshot of a transitional period. As institutions continue to adapt and recover, long-term trends may differ significantly from the immediate observations captured in this study. Moreover, the rapid pace of technological advancements, particularly in generative artificial intelligence (AI) and digital tools, risks rendering some findings outdated, underscoring the need for ongoing research to remain relevant.

Survey design issues also impacted the study. Although the survey categorized services familiar to academic librarians, some respondents may have interpreted the service areas differently, potentially leading to inconsistent responses. Additionally, the exclusion of certain emerging services may have influenced the results, limiting the scope of insights. Providing clearer definitions and examples in future surveys could improve the consistency and clarity of responses.

Finally, the qualitative portion of the survey suffered from low engagement, with the highest response rate to open-ended questions reaching only 20%. The limited responses and thematic inconsistencies made it challenging to draw meaningful conclusions, precluding the use of a grounded theory approach. As a result, we were unable to draw conclusions from the open-ended responses.

Future Research Directions

To address these limitations and expand on the findings, future research should explore several promising areas. First, an in-depth analysis of emerging "add-on" roles could provide valuable insights into how these responsibilities integrate with librarians' primary duties. Understanding the impact of these roles on job satisfaction, professional identity, and workload distribution could inform better role design and organizational support.

The increasing prevalence of generative AI in educational and research settings presents another critical area for exploration. Research should examine how AI tools are being utilized in libraries, the skills librarians need to work effectively with these technologies, and the ethical implications of AI in information management and literacy. This would ensure librarians are equipped to navigate the opportunities and challenges posed by AI integration.

Longitudinal studies offer another valuable approach to understanding how the roles of academic librarians evolve over time. Tracking these changes would provide insights into how libraries adapt to technological advancements, societal shifts, and emerging educational priorities. Such studies could identify trends and inform strategic planning for the future.

Expanding research to include international and nonacademic contexts would provide a more comprehensive understanding of global trends in librarianship. Comparative studies could reveal how differing educational systems and cultural contexts influence librarians' roles and responsibilities, offering a broader perspective on the profession.

Further research into the training and development needs of librarians is essential for preparing professionals for emerging roles and technologies. By identifying specific skill gaps and professional development priorities, library schools and professional associations could tailor their offerings to better support the evolving needs of the profession.

Finally, as digital literacy becomes increasingly important, examining the role of librarians in promoting these skills could yield valuable insights. Understanding how librarians teach and facilitate digital literacy would highlight their contributions as leaders in education and their importance in supporting students and faculty in an increasingly digital world.

By addressing these areas, future research can build on the foundation laid by this study, ensuring that academic librarians are well-prepared to navigate the complexities of their evolving roles and responsibilities. These efforts will help libraries remain vital, adaptive institutions in a rapidly changing educational and technological landscape.

Conclusion

The study confirms that academic librarians are taking on new roles in research support, digital scholarship, and user experience, while still maintaining traditional responsibilities. These emerging roles require new skill sets, particularly in technology and digital tools, highlighting a pressing need for targeted training and professional development to ensure librarians can effectively meet the evolving demands of their institutions.

Academic librarians view their roles as critical to the academic mission, contributing significantly to the research and teaching. Job satisfaction is also generally positive, though confidence and satisfaction are lower in areas related to emerging roles. To sustain and improve job satisfaction, librarians must receive additional training in digital scholarship and other research support areas. Librarians also perceive that being able to implement the skills from such training could increase their impact on the research and teaching missions of our institutions. Institutions should focus on providing resources for professional development to ensure their librarians are equipped to responsibilities in these newer areas. However, these additional responsibilities can only be added to librarian workloads if their other responsibilities are adjusted accordingly to prevent overwork, otherwise there can be negative impacts on morale and retention.

Finally, the employment landscape for academic librarians emphasizes the importance of flexibility, adaptability, and continuous learning. As roles continue to evolve, librarians who develop expertise in emerging areas will find themselves better positioned for career advancement. Institutions should provide ongoing training in both traditional and emerging areas to ensure librarians can meet the demands of the modern academic environment.

The survey questionnaire and aggregate data from this study are deposited in the Open Science Framework.

References

Brunner, M., Borovsky, Z., Osorio, J., & Benedetti, A. (2013). Transformation begins when the renovation is done: Reconfiguring staff and services to meet 21st-century research needs. *The New Academic Librarian: Essays on Changing Roles and Responsibilities.*

Buck, W., & Pino, J. (2020). Libraries as the vanguard of virtual and augmented reality for academic instruction. In T. Diamond (Ed.), *The academic librarian in the digital age: Essays on changing roles and responsibilities* (pp. 71–83). McFarland.

Comanda, B., Wilkinson, J., Bradham, F., Koziura, A., & Seale, M. (2021). Service ceiling: The high cost of professional development for academic librarians. *In the Library with the Lead Pipe.* https://www.inthelibrarywiththeleadpipe.org/2021/service-ceiling/

Cummings, R. (2020). Why digital matters: Building a digital humanities center at the University of Utah. In T. Diamond (Ed.), *The academic librarian in the digital age: Essays on changing roles and responsibilities.* McFarland.

Daland, H., & Hidle, K. M. W. (2016). New roles for research librarians: Meeting the expectations for research support. Chandos Publishing.

Ducas, A., Michaud-Oystryk, N., & Speare, M. (2020). Reinventing ourselves: New and emerging roles of academic librarians in Canadian research-intensive universities. *College & Research Libraries, 81*(1), 43–65. https://doi.org/10.5860/crl.81.1.43

Falciani-White, N. (2024). Conditions for creativity and innovation in the work environment of academic libraries in the United States and Canada. *Journal of Library Administration, 64*(6), 655–681. https://doi.org/10.1080/01930826.2024.2371274

Frankosky, J., & Blair, A. (2013). Copyright in academic libraries: The future is now. In T. Diamond (Ed.), *The new academic librarian: Essays on changing roles and responsibilities* (pp. 147–160). McFarland.

Gardner, S. A. (2014). Reshaping views and leading change in scholarly communications. In T. Diamond (Ed.), *The new academic librarian: Essays on changing roles and responsibilities* (pp. 85–101). McFarland.

Goetsch, L. A. (2008). Reinventing our work: New and emerging roles for academic librarians. *Journal of Library Administration, 48*(2), 157–172. https://doi.org/10.1080/01930820802231351

Hamad, F., Elfadel, M., Fakhouri, H., & Abu-Qaadan, A. (2024). Advancing climate change literacy: Are academic libraries part of the solution? *New Review of Academic Librarianship, 30*(4), 345–367. https://doi.org/10.1080/13614533.2024.2369503

Heady, C., Fyn, A., Kaufman, A., Hosier, A., & Weber, M. (2020). Contributory factors to academic librarian turnover: A mixed-methods study. *Journal of Library Administration, 60*(6), 579–599. https://doi.org/10.1080/01930826.2020.1748425

Ibacache, K., Rybin Koob, A., & Vance, E. (2021). Emergency remote library instruction and tech tools: A matter of equity during a pandemic. *Information Technology & Libraries, 40*(2), 1–30. https://doi.org/10.6017/ital.v40i2.12751

Jaguszewski, J., & Williams, K. (2013). New roles for new times: Transforming liaison roles in research libraries. *Association of Research Libraries.*

Kautonen, H., & Gasparini, A. A. (2024). B-wheel: Building AI competences in academic libraries. *Journal of Academic Librarianship, 50*(4), N.PAG. https://doi.org/10.1016/j.acalib.2024.102886

Koob, A., Ibacache O., K. S., Williamson, M., Lamont-Manfre, M., Hugen, A., & Dickerson, A. (2022). Tech tools in pandemic-transformed information literacy instruction: Pushing for digital accessibility. *Information Technology & Libraries, 41*(4), 1–32. https://doi.org/10.6017/ital.v41i4.15383

Levy, P., & Roberts, S. (Eds.). (2005). *Developing the new learning environment: The changing role of the academic librarian.* Facet Publishing.

Malone, A. (2020). From liaison to coordinator: How digital humanities influenced a role change and restructure. In T. Diamond (Ed.), *The academic librarian in the digital age: Essays on changing roles and responsibilities.* McFarland.

Malone, A. (2023). Trends in research impact librarianship: Developing a new program and services. *Journal of Library Administration, 63*(7), 867–876. https://doi.org/10.1080/01930826.2023.2262364

Martin, E. A., & Sheehan, L. A. (2018). The new "Jack of all": The evolution of the functionality and focus of the academic librarian in new spaces and new roles. In S. C. Hudson-Vitale, L. G. Briney, & S. S. Swords (Eds.), *Challenging the "Jacks of all trades but masters of none" librarian syndrome* (Vol. 39, pp. 67–90). Emerald Publishing Limited. https://doi.org/10.1108/S0732-067120180000039006

McClure, J. (2023). The COVID-19 pandemic and the rapid shift to an exclusively online format: Tracking online instructors' utilization of library services over a year of virtual learning at the University of Memphis. *College & Research Libraries, 84*(1), 100–120.

McGlone, J. (2014). Looking under the hood: A view of the digital projects librarian in the academic library. In T. Diamond (Ed.), *The new academic librarian: Essays on changing roles and responsibilities.* McFarland.

Meyer, A., Holmner, M., Rorissa, A., Fourie, I., Alemneh, D., & Hartel, J. (2024). The evolving role of information professionals in navigating places, spaces, and nurturing new discourses in the in-between. *Proceedings of the Association for Information Science & Technology, 61*(1), 795–798. https://doi.org/10.1002/pra2.1104

Miller, L. N. (2024). Library assessment and decreasing resources: Making things work. *Partnership: The Canadian Journal of Library & Information Practice & Research, 19*(1), 1–8. https://doi.org/10.21083/partnership.v19i1.7773

Ogburn, J. L. (2012). The movement to change scholarly communication has come a long way: How far might it go? *Journal of Librarianship & Scholarly Communication, 1*(1), 1–3. https://doi.org/10.7710/2162-3309.1041

Orzech, M. J., & Abramovich, S. J. (2020). Perceptions and practice of openness among academic librarians. *The International Journal of Open Educational Resources, 3*(1).

Perini, M. (2016). *The academic librarian as blended professional: Reassessing and redefining the role.* Chandos Publishing.

Prince, N. (2023). Continuing education and data training initiatives are needed to positively impact academic librarians providing data services. *Evidence Based Library & Information Practice, 18*(3), 81–83. https://doi.org/10.18438/eblip30382

Revez, J. (2020). Inside the laboratory: Open science and the skills of research librarians. In T. Diamond (Ed.), *The academic librarian in the digital age: Essays on changing roles and responsibilities* (pp. 42–55). McFarland.

Rothfus, M. A., MacLeod, L., Gillis, L., & MacPherson, E. (2024). Researcher perspectives on obstacles and facilitators of open scholarship at a Canadian university. *Partnership: The Canadian Journal of Library & Information Practice & Research, 19*(1), 1–44. https://doi.org/10.21083/partnership.v19i1.7596

Runyon, D., & Steffy, C. J. (2021). Making your own luck: Academic libraries and the digital shift. *New Review of Academic Librarianship, 27*(3), 349–363.

Sa'ari, H., Goulding, A., & Sahak, M. D. (2023). Can academic librarians as data scientists revolutionize user-centric e-learning? *Proceedings of the European Conference on E-Learning (ECEL), 295–304.* https://doi.org/10.34190/ecel.22.1.1580

Sichani, A.-M., Baker, J., Eldridge, A., Hitchcock, T., Roberts, B., Tatham, S., Wakeford, A., Walton, J., Webb, S., & Sussex Humanities Lab (SHL) team. (2024). In U. Pawlicka-Deger & C. Thomson (Eds.), *Digital humanities and laboratories: Perspectives on knowledge, infrastructure and culture.* Routledge.

Wu, S. K., & Caruso, B. (2020). From nodes to networks. In T. Diamond (Ed.), *The academic librarian in the digital age: Essays on changing roles and responsibilities.* McFarland.

Young, S. W. H., Chao, Z., & Chandler, A. (2020). User experience methods and maturity in academic libraries. *Information Technology & Libraries, 39*(1), 1–31. https://doi.org/10.6017/ital.v39i1.11787

Librarian IRB Participation

Emmett Lombard*

While Institutional Review Boards (IRBs) are crucial for research integrity, the amount of librarian membership is limited. This study examines IRB rosters and membership criteria to describe librarian involvement. Surveys of IRB members assessed their views on the value of librarian membership and importance of literature review evaluation within IRB process. Results indicate low librarian representation and a de-emphasis on literature review importance to human subject research. These findings highlight need for increased librarian IRB involvement—including promoting importance of high-quality literature reviews—to further ensure human subject safety.

Introduction

College and university Institutional Review Boards (IRBs) review research involving human subjects to protect them from physical or psychological harm. IRBs strive to ensure that research is ethically acceptable, complies with institutional, state, and federal regulations, and promotes voluntary participation. Although research is arguably the main institutional construct with which academic librarians are associated, there seems to be relatively modest IRB involvement on parts of librarians (Harnett & Cantwell-Jurkovic, 2015).

Granted, IRBs commonly review research involving the health sciences (e.g., clinical trials, behavioral studies, health care delivery). Given this focus on human subjects, the IRB's main concern is primary research methods, rather than secondary research (i.e., a librarian's purview); this secondary research is often not even considered, let alone required. Therefore, it is unsurprising that librarians would not often be associated with IRBs. However, if IRBs are to best ensure human safety and institutional integrity, then perhaps 1) more attention to secondary research should be facilitated, and 2) librarians—arguably the colleagues with most secondary research tool expertise— should be involved in that facilitation. After all, how can a study be safe for humans if the researcher has not saturated the high-quality literature that addresses the study's topic? This study aims to better understand and describe the reality of librarian IRB involvement in United States higher education along with IRB perceptions of secondary research as related.

Literature Review

Searching DE "Institutional review boards" in Library, Information Science & Technology Abstracts returned 64 results. Research methodology, including experimental design, was a major theme (Folkers & Bateman-House, 2018; Gray, 1975; Hoogland, 2023; Mehta, 2021; Rincon-Gonzalez et al., 2023). Folkers and Bateman-House (2018) assessed what they

*Emmett Lombard is a librarian at Gannon University, email: lombard002@gannon.edu.

determined was lack of IRB scrutiny in terms of expanded online information access, while Hoogland (2023) outlined components of research protocol and preprotocol submission training. These studies emphasized IRB accountability and membership, though they did not solely focus on librarianship. Their focus on accountability and membership suggests potential relevance for considering how librarian involvement, especially regarding privacy concerns, might improve IRB operation.

Several authors also considered privacy in relation to human safety (Arango et al., 2016; Hoogland, 2023; Jungkunz, 2021; Park et al., 2018; Shen et al., 2022; Travis & Ramirez, 2020). Travis and Ramirez (2020) discussed knowledge aspects of Big Data and IRB implications for ethical usage. Shen et al. (2022) provided an "ethics checklist" that focused on procedural safeguards, including concerns about privacy in artificial intelligence (AI) contexts; their research indicated that existing guidance and laws are insufficient for privacy assurance. This growing focus on privacy within digital environments raises questions about areas where librarian expertise might expand IRB frames of reference, given librarianship's history of privacy advocacy (e.g., ALA's battles against the Patriot Act).

The vast majority of IRB literature focused on health care research, particularly primary research directly involving human subjects/patients. However, Jungkunz et al. (2021) focused more on secondary research as they deemed current literature and research insufficient concerning risk assessment. As a byproduct, they indirectly illuminated the importance of secondary research to the IRB process: methodology is crucial to research and to the literature review. Jungkunz et al. noted that identifying best methods (and perhaps just as importantly, methods that failed) lessens risk to human subjects. This emphasis on secondary research importance is relevant to this study as it suggests that the general, secondary research expertise competent librarians possess may be valuable to an IRB, especially at institutions that only support one board and have (by necessity) disciplinary-eclectic rosters.

More directly related to librarianship, Delgado and Greg (2020) viewed IRB and librarians in terms of information literacy instruction; they presented a law school library case study in which IRB orientation was part of mandatory training. Izenstark et al. (2021) discussed the librarian role as researcher. Although IRB was not their sole focus, its importance to the research process was acknowledged, as was the idea that librarians, especially library students, should become well acquainted with IRBs to conduct ethical human subject research and/or to be taken seriously as researchers.

Whereas Izenstark et al. (2021) discussed IRB value to librarians, some studies illustrated librarian value to IRBs. Farrell's (2014) study showed how librarians can help integrate assessment, research, and IRB operations to create "research cultures." Harvey (2003) envisioned how medical librarians can work within IRBs as advisors, or even full board members. Cantwell and Van Kampen-Breit (2015) identified three typical librarian roles in the IRB process (when librarians were involved): lead investigator, IRB reviewer, ex-officio member. They found librarians with full IRB appointments to be least common. However, Sullo and Gomes (2016) discussed how librarians were expanding their roles in academic health sciences, including the IRB. Lacroix (2021) also reviewed literature about Canadian librarians on IRBs; again, the context was usually health sciences. It is also worth noting that Harvey's vision of medical librarians as full board members represent a notable perspective considering the traditionally perceived roles of librarians in health care settings as mostly supportive, rather than equal, participants.

Arguably the most in-depth work on the librarian/IRB connection was Harnett's and Cantwell-Jurkovic's (2015) *Finding Your Seat at the Table: Roles for Librarians on Institutional Regulatory Boards and Committees*. They found that IRB service is uncommon for librarians despite their own individual institutional research. They attribute this dearth to, among other things, lack of "scientific" background (despite many boards requiring at least one nonscientific member, and library science itself being considered a social science) and supervisor concerns about librarian workloads. Despite these challenges, their book shares experiences of librarians who did substantive IRB work.

The literature well informed this study. Most of it was published within the last 20 years, indicating increasing librarian interest in IRBs. Building on ideas raised from this literature, the purpose of this study was to expand on previous findings, including revisiting the state of librarian IRB membership as well as examining IRB investment in literature reviews as an application quality criterion.

Methodology

A convenience sample was obtained by reviewing Google search results sequentially until 100 American colleges and universities were identified that posted their IRB rosters on their public websites. This sampling approach was necessitated by the variable availability of IRB information across institutional websites.

The string (college OR university) AND (irb OR "institutional review board") AND (roster OR membership) site:edu was searched in Google. The purpose of this search was to sample college and university websites to identify how many had librarians on their IRBs. Not all colleges and universities had their IRB rosters publicly available on their websites (which raises a question for a potential future study: should they?) Some institutions had multiple rosters to accommodate different boards.

Using the same Google search, IRB pages were then sampled to identify IRB membership criteria. This method's purpose was to identify if schools encouraged, discouraged, or were unintentional regarding IRB librarian membership. Not all schools made their IRB membership criteria publicly available. Some schools posted both membership criteria and roster(s); some just roster(s); some just criteria; some neither roster(s) nor criteria. Therefore, the 100-school roster and 100-school criteria samples are not identical in terms of schools included.

A five-question survey was also created and emailed to 385 IRB members for additional insight into this study's interests. Survey questions were designed to capture both current practices regarding librarian IRB membership and respondents' perceptions of librarian value in the IRB process. Questions employed a combination of yes/no responses and 5-point Likert scales to enable both descriptive analysis and comparison of importance ratings. Questions were:

1. Do you see value in having a librarian IRB member(s): Yes or No?
2. Do you have at least one librarian IRB member: Yes or No?
3. Does your IRB(s) evaluate literature review quality of a research application: Yes or No?
4. If literature review quality is one of your IRB(s) evaluation criteria, then what is its importance to application approval (one being lowest importance, five highest)?
5. If literature review quality is one of your IRB(s) evaluation criteria, then how important do you think librarian input is/would be regarding it (one lowest, five highest)?
6. Comment(s):

Results

Of the 100-school sample that posted IRB rosters, 15 identified librarians as IRB members; none had more than one librarian. Comments are provided as written without edit. Of the 100-school sample that posted IRB membership criteria, the following criteria proved particularly noteworthy, if not completely relevant, to this study's main purposes:

- Fifty required at least one IRB member to have "scientific" background and at least one to have "nonscientific" background; one required that a "scientist" be a member and did not require a nonscientist; one required a "nonscientist" member and did not require a scientist.
- Forty-four did not state membership criteria; five stated that this was intentional.
- Seventeen required that IRB membership be demographically diverse; sex and race were the most common demographics specified.
- Three universities required that IRB membership include representation from all their colleges; none required library representation.
- Five required that more than one "profession" or "discipline" be represented.
- Two required that faculty, staff, students, and community each have members.
- Two required an "ethicist."
- One required a "children's expert."
- Zero had any specifications regarding librarians.

Twenty-nine IRB members responded to the five-question email survey (7.5% response).

TABLE 1
Survey Question 1

Survey Question 1: Do you see value in having a librarian IRB member(s)?		
Response	**Count**	**Percentage**
Yes	10	34.5%
No	17	58.6%
Neither	2	6.9%

Additional comments to survey question 1 included:

- "I could see value in this. Honestly, I had never given it any thought. However, our librarians do conduct research, though it is rarely of the human subject type. Historically, our IRB tries to recruit members from departments and programs that regularly send protocols to us."
- "Yes, because we must have a nonscientist to make quorum, and just because it is a very good member with attention to detail and fast turnaround, not because of their specific training background."
- "Not at my institution. I run the IRB essentially alone; while we have a committee, I do all the work."
- "Not particularly (i.e., no general value added in terms or research, content and/or admin knowledge/experience but certainly no detriment)."
- "Yes. Anyone willing to sit on the IRB and offer their input is valuable to the committee."
- "Not especially."
- "Yes, they could serve as IRB community members."

- "No, but I honestly have not thought about it."
- "I don't know. I'm not familiar with what kind of research librarians do with human subjects."

TABLE 2
Survey Question 2: Do You Have at Least One Librarian IRB Member?

Response	Count	Percentage
Yes	3	10.3%
No	24	82.8%
Neither	2	6.9%

TABLE 3
Survey Question 3: Does Your IRB(s) Evaluate Literature Review Quality of a Research Application?

Response	Count	Percentage
Yes	7	24.1%
No	20	69%
Neither	2	6.9%

Additional comments to survey question number three included:

- "We do not. We see that as overreach."
- "No, as we get proposals before research starts, generally speaking."
- "Not really."
- "Not explicitly."
- "Yes, there has to be enough evidence that the research is not going to waste subjects' time."
- "Not really, although a literature review is included in the IRB proposal protocol. The literature generally only comes into play when determining discipline specific standards for intervention best practices, potential harm to the subject, etc."
- "Yes, but it is not the highest of importance. Ethical treatment of participants is."
- "Scientific evaluation is mostly the responsibility of the applicant's department vetting prior to submission; reviewers often supplement this."

Additional comments to survey question number four included:

- "We do not require a literature review. For full review cases that carry more than minimal risk, we ask for a brief description of relevant studies that support the methodology being proposed."

TABLE 4
Survey Question 4: Importance of Literature Review Quality to Application Approval (One Lowest, Five Highest)

Rating	Count
1	6
2	4
3	2
4	1
Average Rating	1.85

TABLE 5
Survey Question 5: Importance of Librarian Input Regarding Literature Review Quality (One Lowest, Five Highest)

Rating	Count
0	1
1	3
2	1
3	2
4	1
5	3
Average Rating	2.73

- "As noted in the last item, we do not review literature review quality. However, if something were egregious in the description of the research project question, which does ask for literature connections, we would ask the researchers to address it."
- "N/A we do not evaluate the lit review. We focus on the methodology."
- "Our IRB does not consider literature review quality, nor would they have the expertise to do so. I think this would rank low (1) as having the expertise to evaluate it is not present."
- "There is some evaluation of the value of the research, but there isn't a formal criteria for the literature review."
- "A literature review is always included in the study's application."
- "Literature review is only part of scientific benefit in the ratio to harm."

Additional comments to survey question five included:

- "It is not one of our formal evaluation criteria."
- "Maybe a 3. But honestly, I am not sure it would impact the approval process or changes the IRB application/protocol either."
- "Pretty low—I would value the input of a specialist in the area being evaluated over that of a librarian."
- "0, the librarian does not know the field, other peer researchers are the best bet."
- "I like your idea, but it is just not feasible. You are asking the librarian to be an expert in the field of every research project. It would take hours of a librarian's time on every project just to judge how complete the review is, let alone how good the summary of the literature is. It is just impossible for one person, the librarian, to look at all of the applications for each IRB meeting."

Survey Comments Option

Responses to the optional survey question seeking additional comment(s) included:

- "The scientific IRB member also reviews the literature provided as background for the study. In addition, besides IRB review, there need to be Scholarly and Scientific Validity review. These two processes usually take care of the literature review quality."
- "The focus on our IRB is on human subject protection. Efforts on more direct participant protection is what consumes the committee's time and energy."
- "It's unclear here what is meant by review of literature. Do you mean is the review accurate, does it use appropriate citations, is it accurate and unbiased ... what type of review could a librarian provide that is not what a peer researcher could provide?"
- "We do not have a librarian and as for the lit review it is not part of our IRB to judge quality of IRB."
- "We depend on scientific review of the application. This would mean that the background/research literature would be evaluated by experts in the field."
- "Scientist/academic reviewers are adept at evaluating literature reviews and conducting their own if needed."
- "We have no librarian. Our IRB is human subjects research not for secondary literature access."

Discussion

Although this study had no hypotheses—its goal is more to describe than predict—its results should not surprise. Related literature indicated little librarian IRB involvement, and this study further validated this assertion; if anything, it was somewhat impressive to find 15%

of the IRB sample having librarian representation. However, survey comments illuminate three key barriers to greater librarian participation: limited awareness of librarian research expertise, undervaluing information literacy in IRB processes, misunderstanding IRB scope and responsibilities

Limited Awareness of Librarian Research Expertise

Survey responses revealed a significant knowledge gap regarding librarian scholarship and human subjects research capabilities. Two respondents explicitly acknowledged unfamiliarity, stating: "I don't know. I'm not familiar with what kind of research librarians do with human subjects," and "I could see value in this. Honestly, I had never given it any thought. However, our librarians do conduct research, though it is rarely of the human subject type." These comments indicate lack of awareness about librarian human subject research requiring IRB oversight (e.g., patron usage studies, perception studies).

This misperception extends beyond research activities to fundamental understanding of librarian qualifications. One troubling comment suggested that librarians "could serve as IRB community members," implying they are viewed as laypeople rather than scholars. Another respondent demonstrated limited understanding of librarian expertise, writing: "The value of a librarian would not be so much in evaluation of the quality of the lit review ... but rather in addressing ethical concerns regarding archival research." This view overlooks librarians' broader research competencies while assuming archival expertise that arguably most librarians do not possess. Such comments indicate serious need for library outreach and advocacy to communicate scope of librarian scholarship.

Undervaluing Information Literacy in IRB Processes

Responses that failed to recognize the connection between literature review quality and participant safety were concerning. The 1.85 average ranking for literature review importance in application approval reflects fundamental misunderstanding of how comprehensive secondary research informs risk assessment. Comments such as, "I think this would rank low as having the expertise to evaluate it is not present" suggest that since IRB members do not have the same level of expertise, supposedly, as the researcher/applicant, that they should not be held responsible for the lit review quality.

Multiple respondents prioritized subject expertise over information literacy skills when evaluating literature reviews. As one wrote, "the librarian does not know the field, other peer researchers are the best bet." However, this perspective overlooks a crucial distinction: while content experts possess disciplinary knowledge, they may lack comprehensive search strategies essential for identifying all relevant research, including studies documenting potential risks or harmful methodologies. A person can have fantastic content knowledge; however, if they cannot locate high quality literature in a comprehensive fashion, that knowledge could be outdated, misinformed, or incomplete. Librarians' information literacy expertise enables them to assess whether researchers have conducted due diligence in their literature reviews by examining search strategies, database selection, controlled vocabulary use, and methodological comprehensiveness.

Misunderstanding IRB Scope and Responsibilities

Survey responses revealed troubling perspectives on IRB authority regarding literature review evaluation. Four respondents characterized such evaluation as "overreach" or

"inappropriate," with comments like "I worry literature review quality is out of the IRB's lane" and "We see that as overreach." This resistance contradicts fundamental IRB responsibilities to ensure researchers understand potential risks before engaging human subjects.

Literature reviews should identify potential risks and past incidents of harmful methodologies (e.g., problematic research with vulnerable populations that later came under federal scrutiny). A well-informed literature review could be essential to human subject safety. This disconnect between safety concerns and understanding what has been done previously may indicate that some IRBs operate within incomplete risk assessment frameworks.

These findings collectively suggest that greater librarian IRB participation faces institutional barriers rooted in misperceptions about librarian expertise, undervaluation of information literacy skills, and narrow interpretations of IRB scope. Addressing these barriers could involve education about librarian research capabilities and critical relationship between comprehensive literature review and human safety.

Conclusion

According to this study's findings, not much has changed over the years concerning librarians and IRBs as there are still relatively few on board. This could be disappointing itself, in terms of perceptions regarding academic librarianship; however, coupled with the finding that a literature review is low IRB priority, if a priority at all, then disappointment turns into concern.

The survey responses suggest that IRBs do not necessarily disregard secondary research's importance to human subject research, but that they may misunderstand, or make assumptions about, secondary research efficacy. Such assumptions may reflect broader challenges in higher education regarding information literacy evaluation. Institutions vary in their understanding of contemporary information seeking and evaluation, which may explain why some IRBs may appear to be satisfied with proposals—and may assume that proposals are well-grounded in the literature—without closer scrutiny.

The findings suggest that IRBs offer a potential venue for addressing information literacy concerns within research contexts. Demonstrating to IRBs the importance of solid understanding of literature to human subject research could provide opportunities to highlight information literacy expertise and its relationship to research integrity. This is especially relevant at smaller institutions that have only one IRB composed of only a few disciplinary experts. Study comments about IRBs not having sufficient expertise to evaluate all literature reviews particularly apply at single-IRB schools, which represent a large percentage of institutions in the U.S. A librarian may not be expert on all matters but can at least help ensure IRB applications are informed through overall competent approaches to secondary research.

Questions about literature review competence may become increasingly relevant as research demographics shift. Some faculty in professional programs (e.g., allied health, business, engineering) never completed theses or dissertations. If they intended to be practitioners not scholars, they may not have as strong a research background as might be assumed of faculty who completed such research in graduate school. Additionally, more undergraduate students are now encouraged to conduct human subject research and may have varying levels of preparation for understanding what has already been done and not done, let alone how to best locate, evaluate, and use information. Librarians could potentially help evaluate literature shortfalls within IRB parameters in all these regards and could provide outreach to help prospective researchers with IRB applications before they even submit them.

Despite—and because of—this study's simplicity, it has limitations. One is its sample sizes. There are thousands of IRBs at work in American higher education; however, only some were sampled for their membership roster(s) and criteria, and only 29 IRB members out of thousands answered this study's questions. Additionally, in an attempt to gain more participation, the study included only a small number of questions, which were also concisely worded (i.e., easier to be misinterpreted). For example, regarding 'literature review,' one respondent stated/asked, "it's unclear here what is meant by review of literature. Do you mean is the review accurate, does it use appropriate citations, is it accurate and unbiased ... what type of review could a librarian provide that is not what a peer researcher could provide?"

Despite its limitations, the study's findings still offer insights into the state of librarian IRB participation and IRB perception of secondary research importance. Identifying more complex questions for future studies would require a better understanding of how librarians are already involved. There are plenty of quotes from the survey that can be used to further pursue research, and while responses were few, they provide enough data to design a more complex study.

The findings also suggest several directions for future research. One possibility involves examining higher education perception regarding librarianship, specifically whether faculty status correlates with how IRB members perceive librarian expertise. Is there a correlation between librarian faculty status and IRB involvement? This study did not ask whether librarians had faculty status, and a few comments relegated potential librarian participation within the role of community representative. Perhaps a survey of librarians at institutions with different faculty status models could be conducted and IRB participation rates between faculty-status versus non-faculty-status librarians compared. Qualitative interviews about barriers/facilitators to IRB involvement could also be conducted to provide deeper insight. For example, is there higher and/or different regard for librarian IRB membership at an institution if librarians are faculty? The question of whether librarian IRB involvement improves IRB integrity merits investigation as does the topic of overall institutional perception about librarians.

One colleague who reviewed this article was surprised that no respondent mentioned ghost citations or the impact they could have on designing ethical research from the start. As chatbots become more prevalent in the research landscape, this represents an intriguing concern related to secondary research assumptions for both researchers and IRBs. A study examining potential correlation between chatbot awareness and IRB concern regarding secondary research could reveal important findings.

In sum, there are other possible inquiries that librarian/IRB involvement presents. This study raised questions about the current state of involvement (or noninvolvement), suggesting that academic librarians may need to consider how to address these findings, not only for their own professional development but for institutional and overall human subject research improvement.

Acknowledgments

I thank the editor and reviewers for their help with this article.

References

Arango J., Chuck T., Ellenberg S. S., Foltz B., Gorman C., Hinrichs H., McHale S., Merchant K., Seltzer J., Shapley S., & Wild G. (2016). Good Clinical Practice Training: Identifying Key Elements and Strategies for Increasing Training Efficiency. *Ther Innov Regul Sci*. Jul;50(4):480-486. doi: 10.1177/2168479016635220.

Cantwell, L., & Van Kampen-Breit, D. (2015). Librarians and the Institutional Review Board (IRB): Relationships matter. *Collaborative Librarianship, 7*(2), 66–78.

Delgado, A., Ewing, G., & Rosenof, L. (2020). Strategies for redesigning library research training programs. *AALL Spectrum, Sep/Oct*, 34–37.

Farrell, R. (2014). Action research, assessment, and Institutional Review Boards (IRB): Conflicting demands or productive tension for the academic librarian? *New Review of Academic Librarianship, 20*(2), 167–184.

Folkers KM, Bateman-House A (2018). Improving Expanded Access in the United States: The Role of the Institutional Review Board. *Ther Innov Regul Sci*. May;52(3):285-293. doi: 10.1177/2168479018759661.

Gray, BH (1975). An assessment of institutional review committees in human experimentation. *Medical Care, 13*(4), 318–328.

Harnett, S. M., & Cantwell-Jurkovic, L. P. (Eds.). (2022). *Finding your seat at the table: Roles for librarians on institutional regulatory boards and committees*. Rowman & Littlefield Publishers.

Harvey, S. (2003). Institutional Review Boards: Another way for hospital librarians to add value to their organization. *Journal of Hospital Librarianship, 3*(2), 99–102.

Hoogland (2023). "Theirs was not to make reply, theirs was not to reason why." *Hypothesis: Journal of the Research Section of MLA, 35*(1), 1–6.

Izenstark, A. A., Jackson, A., Sandelli, H., Roberts, A., & Lindsay, A. (2021). So you want to publish: Becoming a researcher. *College & Research Libraries News, 82*(1), 10–13.

Jungkunz, M., Köngeter, A., Mehlis, A., Winkler, K., Schickhardt, E. C., & Christoph. (2021). Secondary use of clinical data in data-gathering, non-interventional research or learning activities: Definition, types, and a framework for risk assessment. *Journal of Medical Internet Research, 23*(6), N.PAG-N.PAG.

Labaree, R. V. (2010). Working successfully with your institutional review board. *College & Research Libraries News, 71*(4), 190–193.

Lacroix, D. (2021). Canadian librarians as research ethics board members: An exploratory case study. *Partnership: The Canadian Journal of Library & Information Practice & Research, 16*(1), 1–9.

Mehta P, Raymond J, Han MK, Larson T, Berry JD, Paganoni S, Mitsumoto H, Bedlack RS, & Horton DK. (2021). Recruitment of patients with amyotrophic lateral sclerosis for clinical trials and epidemiological studies: Descriptive study of the national ALS registry's research notification mechanism. *Journal of Medical Internet Research, 23*(12), e29514.

Park, Y. R., Yoon, Y. J., Koo, H., Yoo, S., Choi, C.-M., Beck, S.-H., & Kim, T. W. (2018). Utilization of a clinical trial management system for the whole clinical trial process as an integrated database: System development. *Journal of Medical Internet Research, 20*(4), 1.

Rincon-Gonzalez L, Selig WKD, Hauber B, Reed SD, Tarver ME, Chaudhuri SE, Lo AW, Bruhn-Ding D, & Liden B. (2023). Leveraging patient preference information in medical device clinical trial design. *Therapeutic Innovation & Regulatory Science, 57*(1), 152–159.

Shen, F. X. S., Monette, B. C., Kimble, P., Rauch, S., Baker, S. L., & Justin, T. (2022). An ethics checklist for digital health research in psychiatry: Viewpoint. *Journal of Medical Internet Research, 24*(2), N.PAG-N.PAG.

Sullo, E., & Gomes, A. W. (2016). A profession without limits: The changing role of reference librarians. *Medical Reference Services Quarterly, 35*(2), 145–157.

Travis, T. A., & Ramirez, C. (2020). Big data and academic libraries: The quest for informed decision-making. *portal: Libraries & the Academy, 20*(1), 33–47.

Three Discovery Tools: A Comparative Analysis of Retrieval Scope, Ranking Effectiveness, and Topic Diversity

Can Ekşi and Yurdagül Ünal*

Discovery tools facilitate access to large-scale academic collections, yet their retrieval performance varies. This study presents a comparative analysis of three discovery tools—EBSCO Discovery Services (EDS), EKUAL Discovery Services (EKUAL DS), and Piri Discovery Services (Piri DS)—evaluating retrieval scope, ranking quality, and topical diversity index. The iSearch test collection, derived from arXiv articles, was used with predefined search queries. To assess coverage, the full arXiv corpus was queried to identify indexing differences. A total of 63 queries were executed, and retrieved lists were analyzed for relevance and ranking distribution. Expert-evaluated relevant articles were used to assess retrieval accuracy. Ranking was measured using Discounted Cumulative Gain (DCG) and Normalized DCG (NDCG), and topical diversity was evaluated using the Shannon Diversity Index. EDS and EKUAL DS retrieved identical results, while Piri DS retrieved fewer records, affecting its retrieval completeness. Piri DS ranked relevant articles higher, but with broader distribution. While all tools exhibited comparable ranking performance, EDS and EKUAL DS demonstrated greater topical diversity. These findings offer empirical insight into the strengths and limitations of discovery tools and support libraries in improving search efficiency and retrieval strategies.

Introduction

The discovery of library resources is a concept independent of the size and scope of collections. Libraries have a responsibility to enhance the discoverability of their collections, to facilitate users' access to the information they need. With the advancement of computer and internet technologies, catalogs and indexes, which played an important role in the discovery of library resources in the past, have been replaced by web-based online library catalogs. The proliferation of electronic resources has led to the need for the development of new systems which would make the process of accessing information more efficient. In addition to online catalogs, discovery systems have emerged that make libraries' local collections, and licensed memberships discoverable. As a result, catalogs have been transformed into discovery services, and

*Can Ekşi is an independent librarian, email: can.eksi@hotmail.com; Yurdagül Ünal is an Associate Professor in the Department of Information Management at Hacettepe University, email: yurdagul@hacettepe.edu.tr.

bibliographic information of electronic publications has been integrated into these systems. Publishers providing subscriptions to electronic resources initially developed centralized search services by integrating their own platforms (e.g., EBSCOhost). However, over time, centralized indexes that also included other resources available in libraries were introduced (Breeding, 2015, p. 24). As a result, web-based discovery tools have emerged, not merely as a part of library catalogs, but also as comprehensive search services which encompass library catalogs as well.

The key factors influencing a library's choice of a discovery tool are the scope of resources covered by the discovery tool, integration capabilities, the number of results retrieved for queries, and the ranking of these results based on relevance, ease of access, interface features, and personalization options.

The effectiveness of discovery tools is directly linked to the up-to-dateness and comprehensiveness of the collections they index. Ensuring regular updates is the shared responsibility of both service providers and the library itself. Libraries must verify that all resources within their collections are fully indexed by the discovery tool, and provide feedback regarding any potential omissions, or necessary improvements. Hartman and Bowering Mullen (2008, p. 211) state that web-based academic search engines serve as portals for open-access materials available on the internet and in institutional repositories. Users may prefer discovery tools over traditional search engines to access open-access resources online. Therefore, it is crucial for discovery tools to include prominent open-access resources across different disciplines, to enhance their search capabilities.

Topic diversity is another critical factor that discovery tools should consider when ranking search results. Particularly in literature reviews, the diversity of topics among retrieved articles is considered essential (Akbulut, 2022, p. v). In searches using query terms spanning multiple disciplines, limited topic diversity in top-ranked results may restrict users' access to findings from a broader range of topic areas. Ensuring diversity in search results is also crucial for queries conducted using short or ambiguous terms. In such cases, search results should be ranked within a defined relevance framework, while also considering users' diverse information needs (Santos et al., 2015, p. 1529).

The placement of relevant results—as determined by users—in the top-tier of the rankings is one of the most critical indicators of a discovery tool's performance. A notable information-seeking behavior in long search result lists is that users tend to prioritize higher-ranked publications, often disregarding lower-ranked results as irrelevant. A study conducted by Nichols et al. (2014) highlights a phenomenon referred to as the "first result syndrome." According to the study, users tended to assume that the most relevant result appears first, thus ignoring other results. This highlights the critical role of relevance-based ranking in search results. However, optimization strategies employed by discovery tools to expand result coverage can paradoxically lead to an overwhelming number of results, many of which may be contextually less relevant, thereby complicating the information retrieval process. In the context of electronic resources, viewing and full-text download statistics serve as key decision metrics for libraries when renewing electronic resource subscriptions, or evaluating alternative access models. Because the ranking of search results in discovery tools directly influences these statistics, ensuring that search results are appropriately ranked based on relevance is essential for usage statistics to accurately reflect actual user behavior.

Discovery tools, which Breeding (2005) defines as "centralized search," vary in terms of their interface features, the richness of indexed collections, and the relevance of search results. Over time, features designed to facilitate research during the search process or to organize search results have been continuously updated. Enhancements such as improved visual design, relevance-based ranking, and the integration of user-generated reviews for resources have been incorporated into these systems (Breeding, 2010, p. 32). As a result, discovery tools have increasingly resembled internet search engines, evolving into a single search box model. However, many librarians argue that simple searches conducted with a single keyword may lack precision and could potentially mislead users (Chickering & Yang, 2014). Despite these concerns, there has been a growing trend toward expanding search scopes, with many systems prioritizing a broad, unified search option, such as "search across all fields," or "search everything," rather than allowing users to refine searches by specific access points, such as title, author, abstract, or keyword.

This study aims to analyze the scope, relevance, and topical diversity of search results generated by discovery tools in response to queries. The research focuses on evaluating the performance of widely used discovery tools in university libraries throughout Turkey. Performance assessment is based on search result retrieval, ranking quality, and topic diversity index. For the comparative analysis, discovery tools with the highest usage rates in Turkey—EBSCO Discovery Service (EDS), EKUAL Discovery Service (EKUAL DS), and Piri Discovery Service (Piri DS)—were selected.

Developed by EBSCO, EKUAL DS was among the first discovery tools adopted by university libraries in Turkey. It serves as an indexing tool for databases made accessible to universities under the EKUAL (National Academic License for Electronic Sources) framework. For institutions seeking to integrate licensed electronic publications and bibliographic records of physical resources into the discovery ecosystem, EDS emerged as a significant alternative. However, the most notable competitor of EDS and EKUAL DS for university libraries is Piri DS, introduced to the market in 2021. Developed by INSERES, Piri DS is a specialized discovery tool that integrates library catalogs and databases, employing modern search algorithms enhanced with artificial intelligence (INSERES, n.d.).

This study seeks answers to the following research questions:

- Is there a significant difference among EDS, EKUAL DS, and Piri DS tools in terms of the number of retrieved results, the ranking of results based on relevance, and topic diversity of retrieved results?
- Are there differences among the discovery tools analyzed in terms of functions, such as search fields, search options, and filtering options?

Literature Review

With their adoption rates steadily increasing, web-based discovery tools have become an integral part of library services. Connaway et al., (2020) conducted a study involving over 1,300 participants from 68 countries, revealing that 84% of libraries used at least one discovery tool. The most frequently preferred discovery tools were identified as WorldCat Discovery (WDS) (36%) and EDS (35%). It is evident that libraries are centralizing discovery tools in their information access processes, thereby reducing their dependence on multiple platforms.

Comparing discovery tools with other academic platforms is crucial for understanding system usage trends. Wang et al., (2018) analyzed DOI link referrals and, based on data from

the Chronograph project (2010–2018), found that most DOI accesses were obtained through ProQuest (Summon, Primo, and other ProQuest databases) and Web of Science. Google (including Google Scholar and Google Search) ranked third, followed by Scopus and EBSCO (EDS), while WorldCat (WorldCat Discovery and WorldCat Local) exhibited a lower usage rate. These findings indicate that while discovery tools play a significant role in academic information access, users still tend to favor general platforms such as Google and Google Scholar.

User information-seeking behavior plays a critical role in the development of discovery tools. A study conducted by Ndumbaro (2023) using data from the University of Dar es Salaam Library catalog revealed that, on average, 1.9 terms were used for 5,018 queries, while the number of terms increased to 2.66 for 5,456 reformulated queries. The fact that 95.92% of a total of 30,474 queries contained three or fewer terms indicates that users predominantly prefer short and simple queries. These findings highlight the need for optimizing discovery tools to effectively accommodate and respond to short queries.

Comparative studies assessing the performance of discovery tools have established various criteria for measuring system effectiveness. Lee and Chung (2016) conducted a study comparing EDS with the ERIC, ERC, LISA, and LISTA databases, developing a formula to assess search result relevance. The study evaluated the top 10 search results by assigning relevance scores and comparing their impact levels. Search result evaluation was based on the degree of alignment between retrieved items and the search query, with a composite score calculated from the total assigned points. The study concluded that while EDS retrieves a broad range of results, its ranking algorithms require improvement to enhance result relevance and ordering.

A similar comparative analysis was conducted by Pulikowski and Matysek (2021) for Google, Google Scholar, EDS, and LISA. In this study, nine queries were performed under three topic categories within the field of library and information science, and the top 10 retrieved results were analyzed. The findings indicated that Google provided the best results for simple searches, although it was noted that Google does not eliminate duplicate results. Google Scholar demonstrated a performance similar to Google, whereas EDS fell below expectations.

Similarly, Hanneke and O'Brien (2016) compared EDS, Summon, and Primo OneSearch in terms of the number of results retrieved, and their relevance in the field of medicine and health sciences. Their findings suggested that EDS retrieved more relevant results than the other discovery tools. However, it was emphasized that the study was based on a limited dataset, making it insufficient for providing a general recommendation.

While these studies identified limitations in the ranking effectiveness of discovery tools, Akbulut and Tonta (2022) specifically examined ranking algorithms themselves. Their study evaluated commonly used ranking methods and proposed an alternative approach utilizing pennant access techniques to incrementally enhance relevance rankings. The findings suggest that this method could be implemented across various information systems, including discovery tools.

Further studies have also compared the effectiveness of various discovery tools and academic search platforms. Ciccone and Vickery (2015) compared Summon, EDS, and Google Scholar based on user queries. In this study, relevance assessment was conducted solely based on whether the query term appeared in the title or abstract. The results revealed no statistically significant difference among the three tools when searching for

a known item, while all three returned a comparable number of relevant results for topic searches. Similarly, Trujillo's (2025) study compared Primo, EDS, WorldCat Discovery, and Summon in terms of their performance in known-item searches. Focusing on the retrieval of popular books, the study found that Google and Amazon outperformed the library discovery tools analyzed. It was also observed that the library discovery tools' algorithms tended to emphasize certain factors, such as citation counts and the number of editions.

Walters (2009) compared Google Scholar with 11 bibliographic databases and found that, based on recall and precision values, Google Scholar outperformed most of the databases. Singh et al., (2023) conducted a comparative study of Web of Science, Scopus, and Dimensions, analyzing various attributes such as altmetrics, bibliographic matching, and abstract texts, along with a relevance assessment. According to participants' relevance scores, Web of Science outperformed the other databases in three of five queries, while Web of Science and Scopus performed equally well in one.

While these studies primarily focused on the technical performance and ranking effectiveness of discovery tools, user search behaviors and interface usability were equally critical factors in assessing their overall effectiveness. Asher et al. (2013) analyzed the search behaviors of users from Bucknell University and Illinois Wesleyan University across Summon, EDS, Google Scholar, and traditional library databases to evaluate the effectiveness of these tools based on retrieved results. The findings indicated that EDS was more effective in providing access to academic sources, and guided users more efficiently. However, Summon and Google Scholar were also preferred, particularly for their ease of use and user familiarity. In a comparable study, AlHamad (2025) compared abstracting and indexing (A&I) databases with discovery tools, using a survey conducted with 69 academic library staff. The study found that discovery tools were perceived as effective in terms of usability and broad access, but A&I databases were considered indispensable for conducting comprehensive and in-depth academic research.

The usability of discovery tools is another key variable influencing their effectiveness. Hamlett and Georgas (2019) conducted a study measuring the ease users experience with discovery tool interfaces and functionalities. Their study analyzed user interactions with Primo OneSearch, revealing that participants found the interface complex and overwhelming. Additionally, 23.3% reported difficulties in accessing full texts, while 40% struggled to locate the citation function.

A comparative study by Niu et al. (2014) examined Primo OneSearch and VuFind, assessing their prominent features through log data analysis. The results indicated that Primo OneSearch was preferred for retrieving articles, whereas VuFind was more frequently used for books and media sources.

Similarly, Tonyan and Piper (2019) investigated user opinions and experiences with Summon at the University of Colorado, concluding that, although Summon retrieved a high number of results, participants spent more time navigating these results. Nichols et al. (2014) also conducted a study on the Primo OneSearch discovery tool. Participants who used filtering completed the assigned tasks with ease; however, they struggled with sorting and refining long result lists.

Beyond individual usability assessments, broader trends and perceptions toward discovery tools in academic libraries have also been explored. Nichols et al. (2017) investigated trends, approaches, and librarian attitudes toward discovery tools. Aharony and Prebor (2015)

assessed key features, such as conceptual evaluation, satisfaction levels, attitudes, and user experiences. Wong (2024) conducted a study focusing on the organizational placement and management of discovery tools within academic libraries. Based on survey data collected from library staff, the study identified the specific roles and responsibilities held by staff members in the administration of discovery systems. It concluded that increased collaboration is needed among departments involved in the management process.

Data Sources and Methodology

Test collections used in the performance evaluation of information retrieval systems typically consist of three fundamental components: a document collection, search scenarios, and relevance assessments (Carevic & Schaer, 2014). This study was conducted using the iSearch test collection, which incorporates all three components. Developed within the framework of Lykke et al. (2010), the iSearch test collection comprises 434,813 physics articles from arXiv. A total of 65 scenarios were created by academics and graduate students in the field of physics. For each scenario, an average of 200 articles was selected from the iSearch test collection, and relevance assessments were performed. Participants rated the articles on a scale of 0 (irrelevant) to 3 (high relevance).

Data Collection and Query Process

To determine the coverage rate of the discovery tools in the arXiv collection, the entire corpus was queried, and the total number of results was determined by selecting the arXiv collection. When the results from 2009 and earlier, which were covered by the articles in the iSearch test collection, were filtered, EDS and EKUAL DS returned 579,000 results, while Piri DS returned 442,000 results. This difference indicates that arXiv records are missing in Piri DS's index.

A total of 63 queries[1] were run on EDS, EKUAL DS and Piri DS systems, and the result lists were analyzed. For example, when Query 1 (manipulation, nano spheres, peptides, immobilization) was run, EDS and EKUAL DS returned 13,234 results, while Piri DS returned 10,000 results.[2] In response to this query, it was verified whether the articles in the iSearch test collection were included in the result lists. It was found that only one of the nine articles with an interest score of between 1 to 3 was included in the lists. All 63 queries were run, and the ranking values of the accessible articles were entered into the dataset.

In the study, the query terms in the iSearch test collection were combined with Boolean operators to form composite queries. The queries were realized by using the "OR" operator in the Title and Abstract fields. After each query was run, the results were filtered by selecting the arXiv collection.

---

[1]*The iSearch test collection also includes records of printed materials from the Royal Library of Denmark (Lykke et al., 2010, p. 628). However, since these records do not contain arXiv articles, they were excluded from the study. Additionally, 1,163 records with incomplete data were removed from the dataset. The 5th query was excluded as it contained only records outside the study's scope. Similarly, for the 17th query, all evaluated articles received a relevance score of 0, indicating that they were deemed irrelevant. Following these exclusions and adjustments, the dataset included 63 queries with at least one article assigned a relevance score of 1 to 3, totaling 2,403 articles.*

[2]*In EDS and EKUAL DS, the first 25,000 results could be exported, whereas in Piri DS, only the first 10,000 results were accessible for export. Therefore, the cutoff point for each query was set at 10,000.*

Data Analysis and Performance Evaluation

After completing the queries, all articles with positive relevance scores in the iSearch test collection were searched within the result lists. The rank positions of the retrieved articles and the search result depth were recorded in the dataset. Queries that did not return any results were excluded from the analysis.

As EDS and EKUAL DS were found to return exactly the same number and order of results, the results of these two discovery tools were shown in a single list. Rank positions, total number of results, and the formulas to be used in the calculation of metrics were organized as two separate data sets: EDS / EKUAL DS, and Piri DS.

The articles subjected to relevance assessment constituted only 2% of the collection. However, articles that were not assessed for relevance, but which were related to the query terms, were also included among the results retrieved by the discovery tools. The extent to which these unassessed articles influenced the ranking of other articles deemed highly relevant by experts remains unknown. The presence of unassessed articles and their potential impact on result rankings were among the limitations of this study.

Measures and Calculations

DCG (Discounted Cumulative Gain) is a metric used to measure the ranking performance of search systems based on the relevance of the results (Cossock & Zhang, 2008). DCG is calculated based on the relevance score and rank position of the results returned for a query. In this study, the DCG value was calculated using the following formula:

$$DCG = \sum_{i=1}^{p} \frac{rel_i}{\log_2(i+1)}$$

The i value in the formula represented the ranking, p represented the total number of results, and *rel* represented the relevance value (Singh et al., 2023).

The DCG value varies depending on the search result depth. Therefore, it is necessary to normalize the data, recalculate DCG, and obtain a valid value for each ranking. NDCG (Normalized Discounted Cumulative Gain) evaluates ranking performance regardless of the number of retrieved results (Brama et al., 2022). For the normalization process, the IDCG (Ideal DCG) was computed, and the NDCG (Normalized Discounted Cumulative Gain) value was obtained. IDCG represents the recalculated DCG value based on the optimal ranking order (Wang et al., 2013). The formula is as follows:

$$IDCG = \sum_{i=1}^{|REL_p|} \frac{2^{rel_i} - 1}{\log_2(i+1)}$$

In this context, the NDCG value is calculated as the ratio of DCG to IDCG.

The NDCG value varies between 0 and 1. A value closer to 1 indicates that the ranking is closer to the ideal ranking.

The Shannon Diversity Index was used to measure the diversity of topics in the study. This Index evaluates the diversity of information provided by the system by measuring the distribution of different topics within a defined range. The Shannon Diversity Index was calculated according to the following formula:

$$H(\dot{I}) = -\sum p_i \log_2 p_i$$

In the formula, p_i denotes the probability of a particular topic category being found in the total results (Han & Kobayashi, 2002). In the literature, it is stated that users are generally interested in the results on the first page, but users searching for specific topics examine a wider set of results (Wu & Kelly, 2014). Therefore, in this study, the first 20 results were set as the threshold value in the diversity analysis.

Findings

When the entire arXiv corpus was selected, EDS and EKUAL DS returned 2.371 million results, while Piri DS returned 2.228 million results. When all publications from 2009 and earlier which constituted the iSearch test collection were retrieved, EDS and EKUAL DS returned 579,000 results, while Piri DS returned 442,000. The analysis showed that the difference between the number of results retrieved by the discovery tools was due to the fact that the year information of the results retrieved by Piri DS was largely inaccurate. It was found that there were problems in accessing articles dating back to 2007. Articles with incorrect year information in Piri DS were eliminated from the search results when the year filter was applied.

In the iSearch test collection, a total of 9,905 articles were evaluated for relevance and assigned a score. Of these, 7,502 articles received a relevance score of "0;" 1,603 articles were scored "1;" 524 were scored "2;" and 276 were scored "3." In total, 2,403 articles were categorized as low, adequate, or high interest.

In this study, 63 queries from the iSearch test collection were run on the discovery tools. No discovery tool returned results for queries 49 and 62. Therefore, the number of queries that returned results in at least one discovery tool was 61, and the total number of articles in these queries was 2,356.

The number of queries in which at least one article appeared within the top 10,000 results was 40 (65%) for EDS and EKUAL DS, with a total of 524 articles (22%) listed within these results. In contrast, for Piri DS, the number of queries with at least one article within the top 10,000 results was 47 (77%) with a total of 832 articles (35%) included in these queries. These findings indicate that Piri DS retrieved articles from the dataset at a higher rate within the top 10,000 results compared to EDS and EKUAL DS. Additionally, an examination of the results ranked beyond the top 10,000 in EDS and EKUAL DS revealed that a total of 207 articles (8%) were ranked between 10,000 and 25,000.

The queries with the highest percentage of results within the top 10,000 were identified as Query 20 and Query 41 for EDS and EKUAL DS. In Query 20, 39 out of 62 articles (63%) were ranked in the result lists, while 83 out of 145 articles (57%) in Query 41 appeared within the top 10,000. For Piri DS, the queries with the highest retrieval percentage were Query 27 (N = 63, 72%), Query 29 (N = 102, 88%), and Query 41 (N = 77, 53%). An analysis of queries that retrieved a high number of results in EDS and EKUAL DS revealed that they frequently contained multiword terms and compound expressions (e.g., "far-zone calculations"). Similarly, Query 27, which yielded a high number of results in Piri DS, also included compound terms, such as "single-photon indistinguishability." For Query 32, which contained special characters (e.g., "N = 4 SYM"), all three discovery tools returned the same number of results (N = 26, 56%). In contrast, when examining queries for which none of the discovery tools retrieved any results (e.g., Query 5, Query 19), no differences were found in the number of terms, nor was there any use of punctuation, or special characters. These findings indicated that the number of terms, punctuation marks, and special characters did not have a direct determining effect on search performance.

The limited presence of corpus articles in the results retrieved by the discovery tools may be attributed to the prevalence of articles with a relevance score of 1. Therefore, it is essential to conduct a detailed examination of the distribution of articles with relevance scores of 2 and 3 within the result lists. The distribution of retrieved results based on relevance scores is presented in Table 1.

TABLE 1
Retrieval Performance of Discovery Tools for iSearch Test Collection Articles

Relevance Score	iSearch	Retrieval of Relevance-Scored iSearch Articles in Discovery Tools			
	Total	EDS / EKUAL DS		Piri DS	
	N	N	%	N	%
1	1,573	296	18.8	479	30.5
2	512	150	29.3	234	45.7
3	271	78	28.8	119	43.9
Total	2,356	524	22.2	832	35.3

EDS and EKUAL DS retrieved 78 out of 271 articles with a relevance score of 3, and 150 out of 512 articles with a relevance score of 2; whereas, Piri DS retrieved 119 and 234 articles, respectively. It was observed that Piri DS covered approximately half of the articles with relevance scores of 2 and 3; this proportion remained lower in EDS and EKUAL DS. Additionally, EDS and EKUAL DS retrieved only 228 out of a total of 783 articles with relevance scores of 2 and 3 within the top 10,000 results. This finding indicates a significant limitation of these systems.

EDS and EKUAL DS retrieved fewer results within the top 10,000 rank positions, and the retrieved results were positioned at lower rankings compared to Piri DS. The rank distribution of results based on relevance scores is presented in Table 2. Within the top 100 results EDS and EKUAL DS ranked only 2.6% of the articles with a relevance score of 3 and 2.0% of the articles with a relevance score of 2. In contrast, in Piri DS, these percentages were 20.2% for articles with a relevance score of 3 and 13.7% for those with a relevance score of 2.

TABLE 2
Ranking Distribution of Retrieved Results Based on Relevance Scores in Discovery Tools

Distribution of Rankings	EDS / EKUAL DS Relevance Score						Piri DS Relevance Score					
	1		2		3		1		2		3	
	N	%	N	%	N	%	N	%	N	%	N	%
1–100	4	1.4	3	2.0	2	2.6	42	8.8	32	13.7	24	20.2
101–500	30	10.1	6	4.0	9	11.5	82	17.1	49	20.9	37	31.1
501–1,000	36	12.2	18	12.0	12	15.4	57	11.9	39	16.7	15	12.6
1,001–5,000	172	58.1	103	68.7	44	56.4	207	43.2	83	35.5	32	26.9
5,001–10,000	54	18.2	20	13.3	11	14.1	91	19.0	31	13.2	11	9.2
Total	**296**	**100.0**	**150**	**100.0**	**78**	**100.0**	**479**	**100.0**	**234**	**100.0**	**119**	**100.0**

An analysis of the lower-ranked results revealed that relevant articles in EDS and EKUAL DS fell outside the first 1,000 positions. EDS and EKUAL DS ranked 68.7% of the articles with an interest score of 2 between the 1,001st and 5,000th ranking positions; this ratio was 35.5% in Piri DS. For articles with an interest score of 3, the distribution was 56.4% for EDS and EKUAL DS, and 26.9% for Piri DS. These findings indicated that EDS and EKUAL DS tended to rank high-interest articles lower in the result lists, while Piri DS ranked these articles higher.

Within the top 500 results, it was found that 14.1% of articles with an interest score of 3 and 6.0% of those with an interest score of 2 were ranked within this range in EDS and EKUAL DS. In contrast, 51.3% of articles with an interest score of 3 and 34.6% of those with an interest score of 2 were within the top 500 in Piri DS. When the lower rank positions were examined, it was determined that 70.5% of articles with an interest score of 3 in EDS, and EKUAL DS were ranked outside the 1,000th rank position. Similarly, 82.0% of articles with an interest score of 2 were listed outside the 1,000th rank position. In Piri DS, these rates are comparatively lower than in EDS and EKUAL DS, with 48.7% for articles with an interest score of 3 and 36.1% for those with an interest score of 2. These findings indicate that EDS and EKUAL DS not only retrieved fewer relevant results but also tended to position them in lower rank positions. On the other hand, Piri DS provided a more balanced ranking distribution for relevant results, demonstrating a comparatively superior performance to EDS and EKUAL DS in this regard.

The values obtained in DCG calculations depend on the quality of the top-ranked results (Cossock & Zhang, 2008). In discovery tools, DCG values increase when relevant results are accessed in higher ranks (Akbulut, 2022, p. 56). For instance, in Query 42, the result list contained 44 articles with relevance scores of 1, 2, and 3. Among these, the article entitled "Flow Instabilities of Magnetic Flux Tubes—III. Toroidal Flux Tubes," which had a relevance score of 3, held the highest DCG value (0.903) in Piri DS. The position of this article within the 10,000 retrieved results was ninth. Conversely, the lowest DCG value (0.076) belonged to the article listed first in the query results. This article had an interest score of 1 and was positioned in 8,808th place. The DCG values for each query in the discovery tools are illustrated in Figure 1.

FIGURE 1
DCG Values of Discovery Tools.

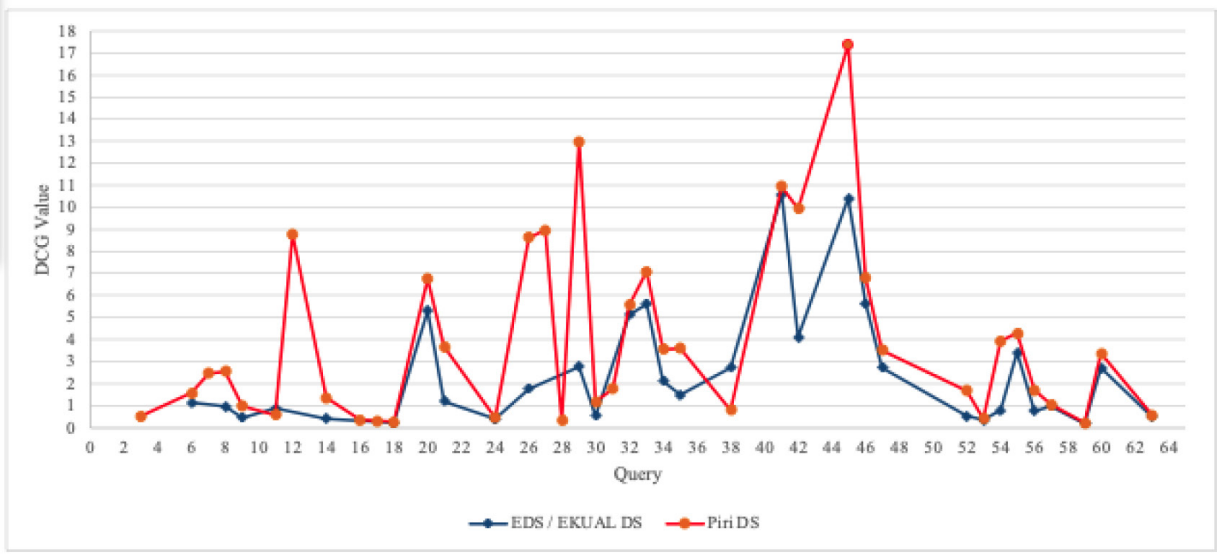


Table 3 presents the DCG and NDCG values for all queries where multiple articles were retrieved. Queries that retrieved only a single article were excluded from the analysis, as they did not provide a meaningful assessment of ranking performance. Because such queries inherently have an NDCG value of "1," they tend to inflate the average values. According to the values presented in Table 3, the lowest NDCG value in EDS and EKUAL DS (0.780) was obtained from the ranking results of Query 29. In Piri DS, the lowest NDCG value (0.649) was calculated for the ranking results of Query 21.

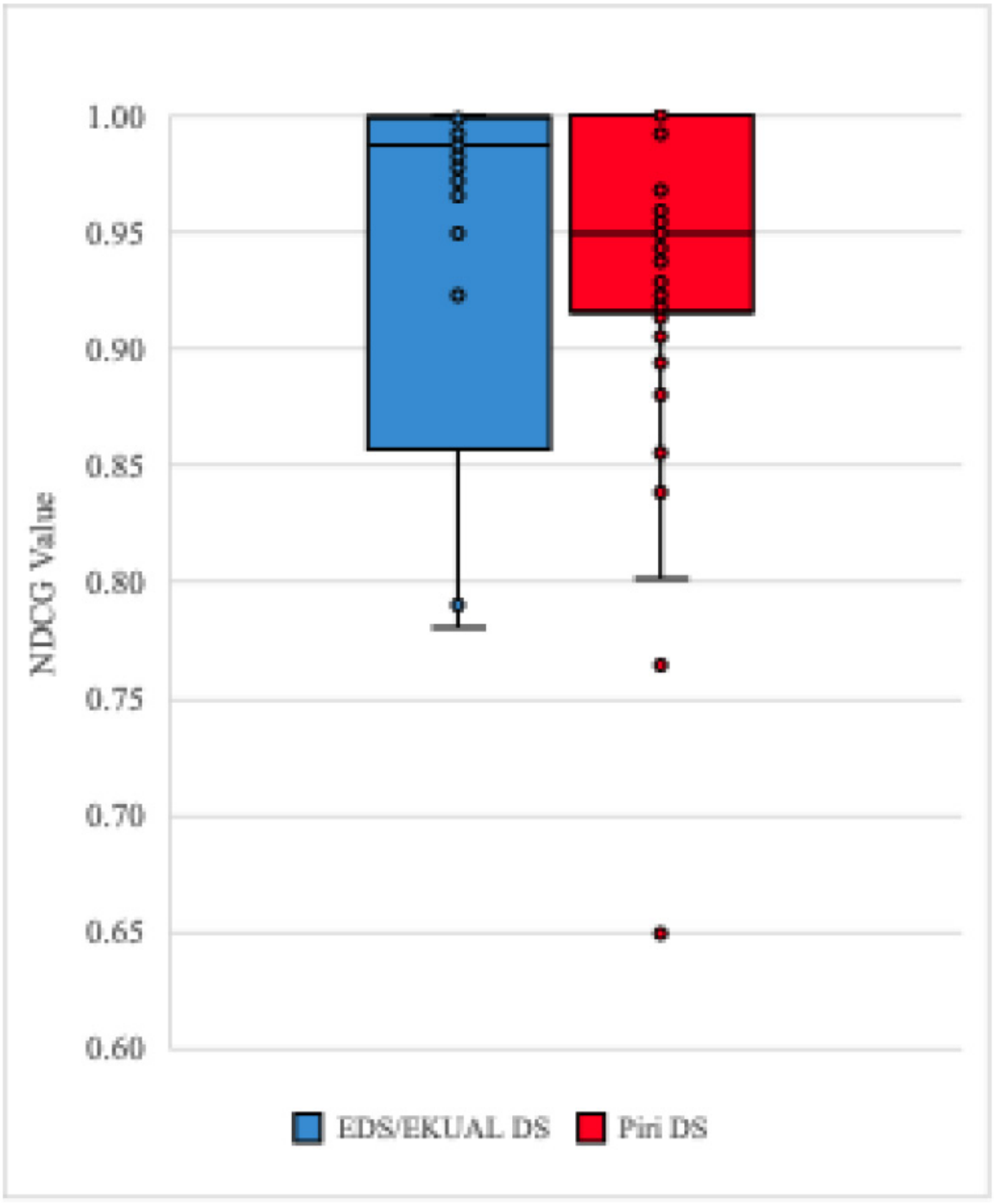
TABLE 3
DCG and NDCG Values of Discovery Tools

Query	EDS / EKUAL DS		Piri DS		Query	EDS / EKUAL DS		Piri DS	
	DCG	NDCG	DCG	NDCG		DCG	NDCG	DCG	NDCG
3	N/A	N/A	0.525	1.000	**32**	5.121	0.972	5.573	0.943
6	1.127	1.000	1.559	1.000	**33**	5.616	0.968	7.083	0.894
7	N/A	N/A	2.464	1.000	**34**	2.116	0.991	3.565	0.923
8	0.945	0.993	2.542	0.954	**35**	1.469	0.987	3.605	0.949
9	0.453	1.000	0.966	1.000	**38**	2.729	1.000	0.803	1.000
11	0.864	1.000	0.573	0.895	**41**	10.573	0.982	10.938	0.956
12	N/A	N/A	8.765	0.992	**42**	4.096	0.980	9.944	0.928
14	0.402	1.000	1.338	1.000	**45**	10.403	0.974	17.363	0.959
16	N/A	N/A	0.340	0.968	**46**	5.630	0.988	6.782	0.919
17	N/A	N/A	0.297	1.000	**47**	2.725	0.990	3.521	0.919
18	0.204	1.000	0.248	1.000	**52**	0.515	0.990	1.684	0.764
20	5.297	0.988	6.750	0.918	**53**	0.345	0.923	0.403	0.838
21	1.202	0.790	3.660	0.649	**54**	0.772	0.965	3.935	0.880
24	0.377	1.000	0.457	1.000	**55**	3.410	0.949	4.286	0.801
26	1.767	0.977	8.637	0.905	**56**	0.750	1.000	1.705	0.937
27	N/A	N/A	8.959	0.920	**57**	0.976	0.989	1.039	0.926
28	N/A	N/A	0.344	0.960	**59**	0.187	1.000	0.215	1.000
29	2.776	0.780	12.951	0.913	**60**	2.702	0.992	3.361	0.958
30	0.546	1.000	1.175	1.000	**63**	0.493	0.998	0.566	1.000
31	N/A	N/A	1.763	0.855					

When examining the average DCG[3] values, EDS and EKUAL DS had an average of 2.470, while Piri DS had a higher average of 3.863. Although the higher DCG average in Piri DS suggested that it ranked results more effectively, differences in search result depth necessitated the calculation of Normalized DCG (NDCG). The NDCG average for EDS and EKUAL DS was calculated as 0.973; whereas, for Piri DS, it was 0.933. These values were quite close to each other, indicating that both discovery tools approached the ideal ranking (1.0). The

[3] $DCG = \sum_{i-1}^{p} \frac{rel_i}{\log_2(i+1)}$

FIGURE 2
NDCG Values of Discovery Tools.



distribution of NDCG values is presented in Figure 2. In Piri DS, NDCG values predominantly ranged between 0.800 and 1. While Piri DS exhibited a broader and more balanced distribution, the values in EDS and EKUAL DS tended to cluster around the median (0.990) and the mean (0.973).

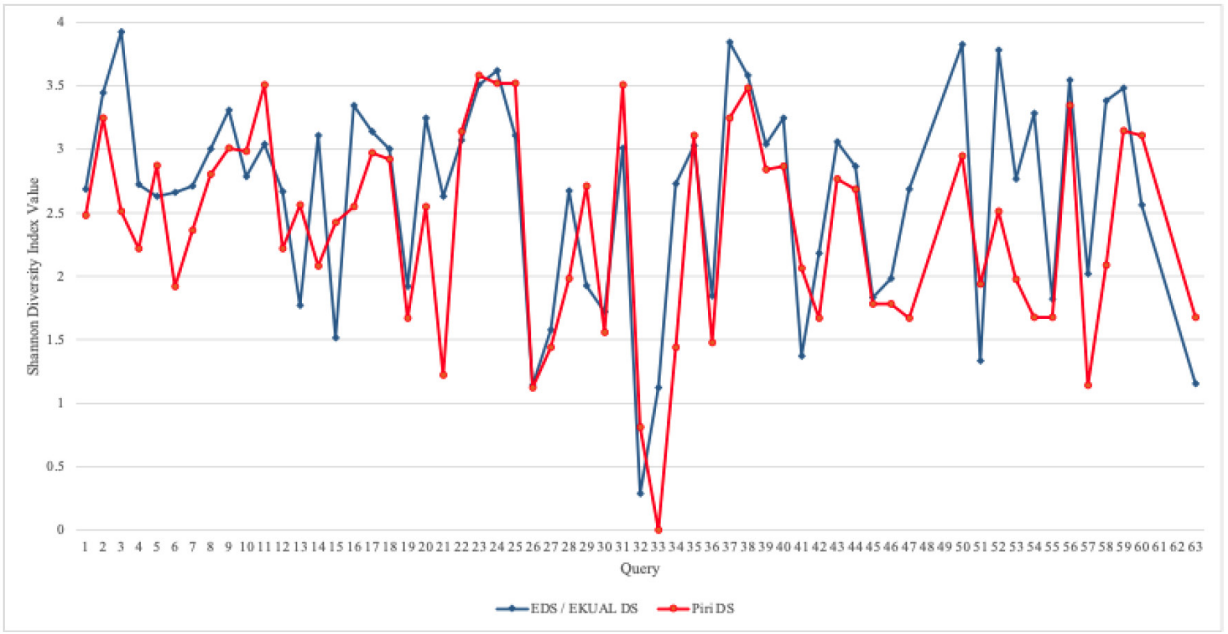
In 59 out of the 61 queries that returned results in the discovery tools, more than 20 results were retrieved, and the diversity index values for these queries were calculated.

According to the Shannon Diversity Index, as diversity decreases, the values approach 0. For example, in Query 32, because 19 out of the top 20 results retrieved by EDS pertained to the field of "high energy physics-theory," the diversity index for this query was 0.286. Similarly, in Query 33, because all the top 20 results retrieved by Piri DS were related to "high energy physics-theory," the diversity index for this query was 0. The diversity index values for all queries are presented in Table 4.

TABLE 4
Shannon Diversity Index Values of Discovery Tools

Query	Shannon Diversity Index		Query	Shannon Diversity Index	
	EDS / EKUAL DS	Piri DS		EDS / EKUAL DS	Piri DS
1	2.684	2.480	**33**	1.122	0.000
2	3.446	3.246	**34**	2.728	1.437
3	3.922	2.509	**35**	3.028	3.109
4	2.722	2.215	**36**	1.843	1.479
5	2.626	2.871	**37**	3.846	3.246
6	2.659	1.919	**38**	3.584	3.484
7	2.709	2.361	**39**	3.039	2.839
8	3.004	2.802	**40**	3.246	2.866
9	3.309	3.009	**41**	1.369	2.064
10	2.784	2.984	**42**	2.183	1.671
11	3.041	3.509	**43**	3.061	2.766
12	2.666	2.215	**44**	2.864	2.684
13	1.771	2.558	**45**	1.833	1.781
14	3.109	2.081	**46**	1.981	1.781
15	1.517	2.423	**47**	2.684	1.671
16	3.346	2.546	**48**	N/A	N/A
17	3.141	2.971	**49**	N/A	N/A
18	3.004	2.922	**50**	3.822	2.946
19	1.919	1.671	**51**	1.336	1.939
20	3.246	2.546	**52**	3.784	2.509
21	2.628	1.219	**53**	2.764	1.977
22	3.071	3.141	**54**	3.284	1.675
23	3.509	3.584	**55**	1.817	1.679
24	3.622	3.522	**56**	3.546	3.346
25	3.109	3.522	**57**	2.020	1.141
26	1.141	1.122	**58**	3.384	2.090
27	1.579	1.437	**59**	3.484	3.146
28	2.671	1.980	**60**	2.558	3.109
29	1.923	2.709	**61**	N/A	N/A
30	1.717	1.557	**62**	N/A	N/A
31	3.009	3.509	**63**	1.154	1.679
32	0.286	0.811			

FIGURE 3
Comparison of the Shannon Diversity Index of Discovery Tools.



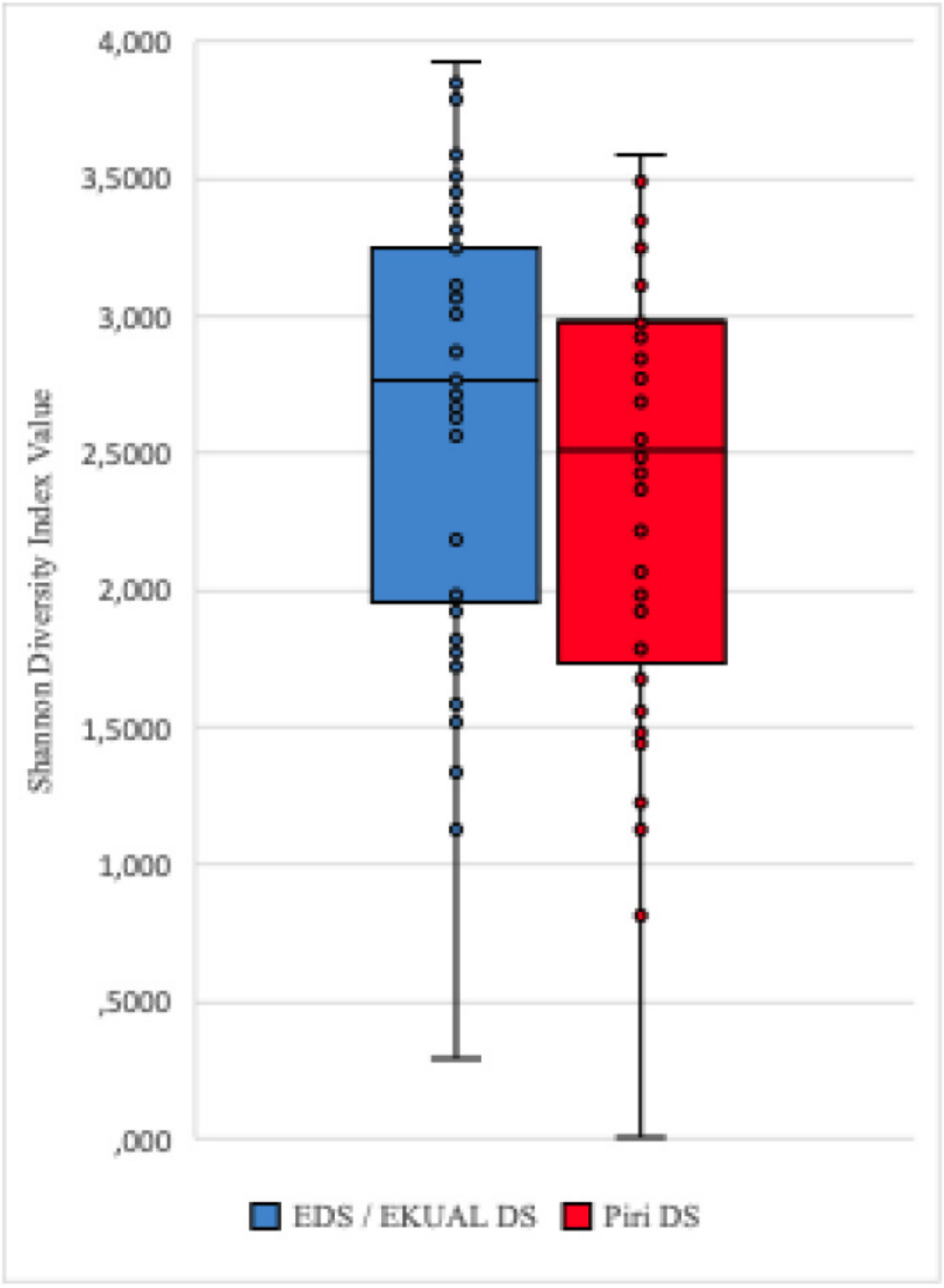
The greatest variation in diversity index values occurred in Query 3, Query 21, and Query 54. When the topic categories of the results of these queries were analyzed, it was found that EDS and EKUAL DS included a wider variety of topics in the top 20 results. The comparison of the Shannon Diversity Index between EDS / EKUAL DS, and Piri DS is presented in Figure 3.

For Query 3, it was found that the results retrieved by Piri DS were predominantly concentrated in the fields of quantitative methods and machine learning. By contrast, EDS and EKUAL DS included results not only from these fields, but also from diverse disciplines such as general economics, medical physics, and information theory, thereby offering a broader topical coverage. Similarly, in Query 21, while the results retrieved by Piri DS were largely focused on optics and quantum physics, EDS and EKUAL DS retrieved results from additional fields—such as signal processing and applied physics—contributing to greater topic diversity. Likewise, in Query 54, Piri Discovery primarily retrieved results related to mesoscale and nanoscale physics and materials science, whereas EDS and EKUAL DS also retrieved results from nuclear theory, applied physics, astrophysics, and optics, contributing to a broader range of topics.

The average topical Diversity Index was calculated as 2.648 for EDS and EKUAL DS and 2.374 for Piri DS. It was found that EDS and EKUAL DS offered relatively higher topical diversity than Piri DS. The distribution of Diversity Index values is presented in Figure 4.

In diversity indices, the maximum value is achieved when all categories are completely distinct from each other (Peet, 1975, p. 496). Similarly, in the topic diversity index, the maximum value is reached when the retrieved results contain an equal number of different topics up to the threshold value. The Diversity Index for a single-topic result in a query was calculated as 0.216. Because a query can contain results from a maximum of 20 different topics, the maximum possible Diversity Index was 4.321 (20×0.216). Accordingly, the highest Diversity Index was calculated as 3.922 (Query 3) for EDS and EKUAL DS, and 3.584 (Query 23) for Piri

FIGURE 4
Shannon Diversity Index Values of Discovery Tools.



DS. The lowest Diversity Index was 0.286 (Query 32) for EDS and EKUAL DS, while it was 0 (Query 33) for Piri DS. An analysis of the values indicated that EDS and EKUAL DS exhibited a higher number of queries with values closer to the maximum index, whereas Piri DS tended to cluster around the mean and median Diversity Index values (2.509). The median Diversity Index for EDS and EKUAL DS was 2.764. The findings suggest that while the diversity indices of the discovery tools were close to their median values, their average values remained below 3, indicating a significant gap from the maximum possible diversity. This suggests that the discovery tools did not provide sufficient topic diversity in their retrieved results.

Conclusions and Recommendations

This study presents a comparative analysis of the discovery tools EDS, EKUAL DS and Piri DS in terms of ranking accuracy, coverage rate, accessibility of high-interest articles, and topic diversity. The search terms used in the construction of the iSearch test collection were executed as queries in the discovery tools, and their retrieved results were examined to assess their coverage rate. The ranking quality of these tools was evaluated by determining the position of relevance-judged articles within the retrieved results. Additionally, the topic diversity index was calculated for the top 20 results retrieved by each query, providing a basis for comparing the diversity of topics across the discovery tools. The findings reveal significant differences in ranking performance, accessibility of high-relevance articles, and topic diversity.

EDS and EKUAL DS were found to be ineffective in ranking high-relevance articles in top positions, with a significant portion of relevant results appearing outside the first 1,000 rank positions. Specifically, EDS and EKUAL DS ranked 70.5% of articles with an interest score of 3, and 82.0% of articles with an interest score of 2, outside the first 1,000 results. While Piri DS performed better in this regard, its ability to retrieve only half of the relevant articles indicated similar limitations. This issue requires users to exert more effort in locating high-relevance results, often necessitating extensive filtering to refine result lists. To enhance ranking performance, discovery tools might improve their ranking algorithms to prioritize high-relevance articles. AI-driven ranking models might be implemented for complex queries, and relevance-based ranking algorithms might be developed to ensure that the most relevant results appear in higher positions.

EDS, EKUAL DS, and Piri DS exhibited similar performances in terms of overall coverage; however, when the entire arXiv collection was queried, Piri DS retrieved 172,000 fewer results. This indicated missing bibliographic records and suggested that certain publications had not been integrated into the discovery system. To ensure that discovery tool indices remain complete and up to date, closer collaboration between libraries and discovery service providers would be essential. Specifically, missing records might be regularly audited and incorporated into the discovery systems. Additionally, a significant portion of the publications retrieved from the arXiv collection in Piri DS contained incorrect publication year information. This metadata error rendered the year filter ineffective, which probably made it difficult for users to locate relevant publications. To resolve this issue, bibliographic records should be systematically verified, and erroneous metadata should be corrected. Moreover, libraries might conduct periodic audits of the collections included in their discovery tools, to ensure accuracy and completeness.

EDS and EKUAL DS provide greater topic diversity, compared with Piri DS. However, the topic diversity index values for both discovery tools remained significantly below the maximum threshold, indicating insufficient distribution of topics among retrieved results. To

address this limitation, ranking algorithms should be optimized to enhance topic diversity without compromising ranking quality. Specifically, ranking models that prioritize topic diversity up to a certain threshold could be developed to ensure a more balanced distribution of subjects in search results.

It was found that discovery tools differ in search fields, filtering options, and query processing mechanisms. Notably, variations in scope and functionality within the interfaces of EDS and EKUAL DS can create inconsistencies in user experience. To address this issue, it is recommended that discovery tools' user interfaces and functionalities be standardized. A single, unified interface for all libraries would ensure that all users have access to the same features and functions in a consistent manner.

Regarding discovery tools, libraries currently have only limited control of the management of their collections. To strengthen collection management, authorized accounts should be assigned to libraries, allowing them to manage collections, configure filtering options, and regulate access statistics. Additionally, some publishers do not fully integrate the collections they provide under subscription agreements into discovery tool indices, thereby restricting the scope of these tools. Stronger collaboration between discovery tool providers and publishers is essential to ensure the inclusion of missing collections in discovery indexes.

Acknowledgment

This article is based on the master's thesis of the first author, conducted under the supervision of the second author. The authors would like to thank the developers of the iSearch test collection for granting permission to use the dataset in this study. We also gratefully acknowledge Müge Akbulut for her valuable contributions to this research.

Declarations

Conflict of interest: The authors declare that there is no conflict in interest or financial or non-financial interests that are directly or indirectly related to the work submitted for publication.

Declaration of generative AI and AI-assisted technologies in the writing process: During the preparation of this work the authors, as non-native speakers of English, occasionally used ChatGPT to refine grammatical expression and terminology. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

References

Aharony, N., and Prebor, G. (2015). Librarians' and information professionals' perspectives towards discovery tools: An exploratory study. *The Journal of Academic Librarianship*, *41*(4), 429–440. https://doi.org/10.1016/j.acalib.2015.05.003

Akbulut, M. (2022). Bilgi erişimde ilgi sıralamalarının artırımlı olarak geliştirilmesi [Incremental refinement of relevance rankings in information retrieval], (Doctoral thesis, Hacettepe University).

Akbulut, M., and Tonta, Y. (2022). İlgi sıralamalarının artırımlı olarak geliştirilmesi: Pennant erişimle desteklenen yeni bir yöntem önerisi [Incremental refinement of relevance rankings: Introducing a new method supported with Pennant retrieval]. *Türk Kütüphaneciliği*, *36*(2), 169–203. https://doi.org/10.24146/tk.1062751

Asher, A. D., Duke, L. M., and Wilson, S. (2013). Paths of discovery: Comparing the search effectiveness of EBSCO Discovery Service, Summon, Google Scholar, and conventional library resources. *College & Research Libraries*, *74*(5), 464–488. https://doi.org/10.5860/crl-374

AlHamad, M. M. (2025). Balancing precision and usability: Librarian perspectives on abstracting and indexing databases versus discovery services in academic libraries. *Internet Reference Services Quarterly*, 1–12. https://doi.org/10.1080/10875301.2025.2472419

Brama, H., Dery, L., & Grinshpoun, T. (2022). Evaluation of neural networks defenses and attacks using NDCG and reciprocal rank metrics. *International Journal of Information Security*, *22*(2), 525–540. https://doi.org/10.1007/s10207-022-00652-0

Breeding, M. (2005). Plotting a new course for metasearch. *Computers in Libraries*, *25*(2), 27–29.

Breeding, M. (2010). The state of the art in library discovery 2010. *Computers in Libraries*, *30*(1), 31–34.

Breeding, M. (2015). Future of library discovery systems. *Information Standards Quarterly*, *27*(1), 24–30. https://doi.org/10.3789/isqv27no1.2015.04

Carevic, Z., and Schaer, P. (2014). On the connection between citation-based and topical relevance ranking: Results of a pretest using iSearch. *BIR@ECIR*. https://ceur-ws.org/Vol-1143/paper5.pdf

Ciccone, K., and Vickery, J. (2015). Summon, EBSCO Discovery Service, and Google Scholar: A comparison of search performance using user queries. *Evidence Based Library and Information Practice*, *10*(1), 34–49. https://doi.org/10.18438/b86g6q

Chickering, F. W., and Yang, S. Q. (2014). Evaluation and comparison of discovery tools: An update. *Information Technology and Libraries*, *33*(2), 5–30. https://doi.org/10.6017/ital.v33i2.3471

Connaway, L. S., Cyr, C., and Gallagher, P. (2020). *Global Perspectives on Discovery and Fulfillment: Findings from the 2020 OCLC Global Council Survey*. OCLC Research. https://doi.org/10.25333/0pmf-gy24

Cossock, D., and Zhang, T. (2008). Statistical analysis of Bayes Optimal Subset Ranking. *IEEE Transactions on Information Theory*, *54*(11), 5140–5154. https://doi.org/10.1109/tit.2008.929939

Hamlett, A., and Georgas, H. (2019). In the wake of discovery: Student perceptions, integration, and instructional design. *Journal of Web Librarianship*, *13*(3), 230–245. https://doi.org/10.1080/19322909.2019.1598919

Han, T. S., and Kobayashi, K. (2002). *Mathematics of information and coding* (Vol. 203). American Mathematical Society.

Hanneke, R., and O'Brien, K. K. (2016). Comparison of three web-scale discovery services for health sciences research. *Journal of the Medical Library Association*, *104*(2), 109–117. https://doi.org/10.5195/jmla.2016.52

Hartman, K. A., and Bowering Mullen, L. (2008). Google Scholar and academic libraries: An update. *New Library World*, *109*(5/6), 211–222. https://doi.org/10.1108/03074800810873560

INSERES. (n.d.). *Piri Discovery Tool*. https://inseres.com/en/product/piri.html

Lee, B., and Chung, E. (2016). An analysis of web-scale discovery services from the perspective of user's relevance judgment. *The Journal of Academic Librarianship*, *42*(5), 529–534. https://doi.org/10.1016/j.acalib.2016.06.016

Lykke, M., Larsen, B., Lund, H., and Ingwersen, P. (2010). Developing a test collection for the evaluation of integrated search. In: Advances in Information Retrieval, 32nd *European Conference on IR Research, ECIR 2010, Milton Keynes, UK, March 28-31, 2010. Proceedings (LNCS 5993)*, p. 627–630. Springer. https://doi.org/10.1007/978-3-642-12275-0_63

Ndumbaro, F. (2023). Remote OPAC users' search query reformulation (SQR) patterns: A transaction log analysis. *Online Information Review*, *47*(1), 162–176. https://doi.org/10.1108/oir-09-2020-0389

Nichols, A., Billey, A., Spitzform, P., Stokes, A., and Tran, C. (2014). Kicking the tires: A usability study of the Primo discovery tool. *Journal of Web Librarianship*, *8*(2), 172–195. https://doi.org/10.1080/19322909.2014.903133

Nichols, A. F., Crist, E., Sherriff, G., and Allison, M. (2017). What does it take to make discovery a success? A survey of discovery tool adoption, instruction, and evaluation among academic libraries. *Journal of Web Librarianship*, *11*(2), 85–104. https://doi.org/10.1080/19322909.2017.1284632

Niu, X., Zhang, T., and Chen, H. (2014). Study of user search activities with two discovery tools at an academic library. *International Journal of Human-Computer Interaction*, 30(5), 422–433. https://doi.org/10.1080/10447318.2013.873281

Peet, R. K. (1975). Relative diversity indices. *Ecology*, *56*(2), 496–498. https://doi.org/10.2307/1934984

Pulikowski, A., and Matysek, A. (2021). Searching for LIS scholarly publications: A comparison of search results from Google, Google Scholar, EDS, and LISA. *The Journal of Academic Librarianship*, *47*(5), 1–8. https://doi.org/10.1016/j.acalib.2021.102417

Santos, R. L. T., Castells, P., Altıngovde, I. S., and Can, F. (2015). Diversity and novelty on the web: Search, recommendation, and data streaming aspects. In *24th International Conference on World Wide Web* (pp. 1529–1530). ACM.

Singh, P., Singh, V. K., and Piryani, R. (2023). Scholarly article retrieval from Web of Science, Scopus and Dimensions: A comparative analysis of retrieval quality. *Journal of Information Science*, *0*(0). https://doi.org/10.1177/01655515231191351

Tonyan, J., and Piper, C. (2019). Discovery tools in the classroom: A usability study and implications for information literacy instruction. *Journal of Web Librarianship*, *13*(1), 1–19. https://doi.org/10.1080/19322909.2018.1530161

Trujillo, N. (2025). Finding popular books in library discovery services: Known item searches in Primo, EDS, WorldCat Discovery, and Summon. *Journal of Electronic Resources Librarianship*, 1–13. https://doi.org/10.1080/1941126X.2025.2455781

Walters, W. H. (2009). Google Scholar search performance: Comparative recall and precision. *Portal: Libraries and the Academy*, *9*(1), 5–24. https://doi.org/10.1353/pla.0.0034

Wang, X., Cui, Y., and Xu, S. (2018). Evaluating the impact of web-scale discovery services on scholarly content seeking. *The Journal of Academic Librarianship*, 44(5), 545–552. https://doi.org/10.1016/j.acalib.2018.05.010

Wang, Y., Wang, L., Li, Y., He, D., Chen, W., and Liu, T.-Y. (2013). A theoretical analysis of NDCG ranking measures. In *JMLR: Workshop and Conference Proceedings* (pp. 1–30). Annual Conference Computational Learning Theory.

Wong, S. (2024). Organizational structure around web-scale discovery services in Canadian academic libraries. *Partnership: The Canadian Journal of Library & Information Practice & Research*, 19(1), 1–18. https://doi.org/10.21083/partnership.v19i1.7336

Wu, W.-C., and Kelly, D. (2014). Online search stopping behaviors: An investigation of query abandonment and task stopping. In *Proceedings of the American Society for Information Science and Technology* (pp. 1–10). American Society for Information Science and Technology.

Academic Success and Campus Engagement: Insights from Library Usage at Two Universities

Jung Mi Scoulas, Sandra L. De Groote, Kimberly Shotick, Ian Christensen, and Yishan Yu*

This paper presents the findings from a survey distributed at two academic institutions, exploring undergraduates' campus engagement, self-regulated learning, and definitions of academic success. The library was the most frequently visited campus service, and students used it for both academic and nonacademic activities. Students identified obtaining good grades as their top definition of academic success. Participation in library and campus activities, use of online library resources, social learning, and improved concentration were positively associated. These findings highlight the crucial role of academic libraries and their potential for collaboration with other campus units to support student success.

Introduction

Student success is central to the mission of higher education, though understanding what success is and how to help students achieve it is an ongoing challenge. While institutions typically look at success metrics such as grade point average (GPA) and retention, these data lack sufficient detail to tell the story of students' experiences, goals, and hurdles. To better understand students' experiences on campus and their relationship with student success, this study seeks to identify students' own definitions of success and how academic engagement—including library use, correlates with their success. Additionally, this study looks at the challenges students face in meeting their academic goals to inform interventions aimed at reducing barriers to success. Academic libraries are well-positioned to investigate these questions, as libraries are not only centers of information, but providers of services, spaces, and resources designed to foster students' academic growth and development across disciplines.

*Jung Mi Scoulas is Associate Professor and Assessment Coordinator at the University of Illinois Chicago University Library, email: jscoul2@uic.edu; Sandra L. De Groote is Professor and Head Scholarly Communications Librarian at the University of Illinois Chicago University Library, email: sgroote@uic.edu; Kimberly Shotick is Assistant Professor and Learning Commons Coordinator at the Northern Illinois University, email: kshotick@niu.edu; Ian Christensen is a Therapist at LifeStance Health, email: ianc8912@gmail.com; Yishan Yu is a Graduate Research Assistant in the University of Illinois Chicago College of Education, email: yyu92@uic.edu.

To get a fuller understanding of students' experiences, the research team developed two assessment tools with the support of federal funding (Institute of Museum and Library Services, 2022). One of the assessment tools is a one-time Student Academic Engagement and Success (SAES) survey that examined students' campus engagement activities; reasons for using or not using the library building and online resources; perceptions of their own abilities in goal management, information literacy, and social learning; and views on their academic success. Additionally, an eight-week online weekly journal allowed students to track their campus engagement, to identify factors affecting their academic work, and to capture and evaluate their academic success. After validating and pilot-testing the assessment tools at a public research university (see Scoulas et al., 2024), the team revised and implemented the updated versions at both the University of Illinois Chicago (UIC) and Northern Illinois University (NIU) in spring 2024.

This paper presents the findings from the SAES survey conducted at both institutions, exploring how undergraduate students engage in campus activities. As the student demographics at both institutions were similar, similar and differing undergraduate student academic experiences will provide further valuable insights into students' academic success. Ultimately, this project aims to make assessment tools accessible to other academic libraries that seek to better understand their students' academic engagement and success. By utilizing these tools, libraries will be equipped with evidence-based data that empowers them to understand their institution's unique needs and lead conversations on student success. These insights will also enable academic libraries to gain a comprehensive understanding of students' academic experiences at their institution and will aid in developing programs that are integral to campus initiatives and contribute to enhancing student outcomes.

Literature Review

Engagement Across Campus

Student campus engagement has been explored in relation to student success, both at the campus level and specific to academic libraries. Student engagement is multifaceted but focuses on outcomes-related activities (Appleton, 2020). The activities can include teaching and learning, extra-curricular activities, and/or how students interact with the library—or other support services—to seek assistance with outcomes. Ferrari et al. (2009) explored goal orientations focused on performance avoidance, performance approach, and mastery and the relationship with campus engagement. Their study revealed that students with increased engagement in campus activities were likelier to report goal orientations focused on performance and mastery. A study exploring academic engagement and student success used the Latent Profile Analysis to classify student variables related to engagement in studies, study exhaustion, disinterest, indifference to self-regulation, and uncertainty of career choice (Ketonen et al., 2016). From this, four types of students were identified: alienated, undecided, disengaged, and engaged. Students in the engaged group received the highest grades, while those in the disengaged or undecided groups tended to earn the lowest grades.

Studies have also explored engagement with specific academic campus services—including the library—and extracurricular activities. At one institution, students' engagement with the University Career Center, the University Center for Academic Excellence, the Writing Resources Center, the University Speaking Center, Greek organizations, and sports clubs were positively associated with student success and graduation (Croxton & Moore, 2020). Further,

students who accessed the library's online resources, booked study rooms, attended library instruction, and checked out library books had higher GPAs than those who did not. Students have also reported that academic library spaces influenced their academic and social engagement; students could study independently and interact on group projects and assignments, depending on the space used (Deville & Sughrue, 2023). Another study explored students' campus engagement, including their use of the physical library building and online library; the academic library was the top academic support service visited by students (Scoulas et al., 2024b). The physical library was visited by 55% of the students at least once a month, and the online library was accessed by 54% at least once a month. Students with lower GPAs were likelier to visit the library, while those with higher GPAs were less frequent visitors. In contrast, students with lower GPAs were less likely to use the online library, while those with higher GPAs were more frequent visitors. Attending student organization events was the next highest campus activity, where 41% of the students reported engagement at least once a month.

Self-Regulation and Information Literacy

College students face multiple responsibilities, including academic work, internships, employment, as well as social and family commitments. Given these responsibilities, success in college depends on students' capacity to regulate their learning by setting goals, maintaining focus, and sustaining effort to manage both academic and personal demands effectively. Self-regulation refers to "self-generated thoughts, feelings, and actions that are planned and cyclically adapted to the attainment of personal goals" (Zimmerman, 2000, p.14). Extensive research indicates that students' self-regulated skills are key factors in their academic achievement. For example, a systematic review by Broadbent and Poon (2015) indicates that students' use of self-regulatory strategies, metacognition (monitoring and control of one's thinking and behaviors), time management (planning and organizing study time and tasks), and effort regulation (persisting through academic challenges), were strongly associated with online academic achievement in higher education. Similarly, Tao and colleagues (2025) reported that self-regulated learning strategies, particularly monitoring and planning, were positively associated with academic success among college students. In addition to these positive associations, lower levels of self-regulation are associated with negative academic and personal outcomes. For example, students with low levels of self-regulation are more likely to experience behavioral (e.g., aggression) and health-related (e.g., binge eating) issues (Zimmerman, 2000), as well as higher levels of academic procrastination (Tao et al., 2025).

Social forms of learning can also be understood through the lens of self-regulatory strategies. In this context, library spaces serve as hubs for self-directed, collaborative, and peer learning, where students can engage in independent study or group discussions that reinforce their knowledge (Yip et al., 2019). While the use of online library resources continues to increase, physical library buildings remain indispensable for fostering social and collaborative interactions essential to student success. These spaces cannot be fully replaced by virtual libraries (Yip et al., 2019). Social learning spaces, in particular, promote student engagement in their education by fostering social interactions (Matthews et al., 2011). Lotfy et al. (2022) showed that being able to socialize and interact with students in the library was the most important factor for using the library space.

In an era of information abundance, the information-seeking process poses significant challenges for all scholars, who often struggle to navigate the overwhelming volume of available information. In one study, faculty and graduate students expressed concerns about

their competency regarding the accuracy, reliability, and quality of the electronic information sources they use (Ge, 2010). This challenge is particularly pronounced for college students, especially undergraduates, who must not only locate reliable sources but also critically evaluate the quality and relevance of the information they encounter. Research indicates that many students enter college without adequate information literacy skills, and those with lower proficiency often overestimate their abilities in this area (Gross & Latham, 2012). Conversely, another study found that most college students possess a moderate level of information literacy skills upon entering, regardless of whether they are first-generation college students (Lemire et al., 2021). Komissarov and Murray (2016) conducted a survey examining undergraduate students on their information seeking behavior. Using regression analysis to predict what factors influence students' information seeking behavior, the results showed that students who receive encouragement from instructors are more likely to use library databases, articles, and books. Also, library staff's classroom visits end to increase students' engagement with library resources and an appreciation for peer-reviewed sources.

Academic Success

Definition of academic success remains complex and varies across studies. In their analytical literature review focused on definition of academic success in higher education, York et al. (2015) proposed a revised multidimensional conceptualization of academic success. They expanded the definition of academic success as "inclusive of academic achievement, attainment of learning objectives, acquisition of desired skills and competencies, satisfaction, persistence, and post-college performance" (p. 5). Other researchers have also explored the definition of academic success in higher education, and research suggests that students' own definitions of success are more varied. For example, in a mixed methods study of 119 undergraduate students, the most-cited factors for student success were process oriented (e.g., personal goal achievement, time management, happiness, applying class knowledge to real life), and academic performance (e.g., passing classes and avoiding probation) (Arellanes et al., 2022). While graduating on time and obtaining a high GPA were reported, there were notably fewer responses that included these more traditional outcomes to success. Additional research on student definitions has found that their definitions encompass the ability to manage their personal and academic life (Arellanes et al., 2022; Jennings et al., 2013). Regarding learning, research shows that students associate success with managing their own learning, setting goals, staying motivated, and utilizing external supports (e.g., tutors and family) (Cachia et al., 2018; Jennings et al., 2013). Additionally, research on first-in-family students demonstrated that these students define success in varied ways, including as a sense of validation and resiliency (O'Shea & Delahunty, 2018).

However, when it comes to measuring academic success, traditional outcome indicators—such as GPA (e.g., Atuahene, 2021; Choi, 2005; Mahdavi et al., 2021; Wibrowski et al., 2017), as well as graduation rates, retention, and course completion (e.g., Larson et al., 2022)—continue to be widely used in higher education. Similarly, in library studies, academic success is tied to outcomes such as student performance, retention, persistence, career preparedness, and graduation rates (Brown & Malenfant, 2015). Several library studies have explored library use in relation to these outcomes to demonstrate the library's impact and value. Selicean and Ilea (2024) reviewed many of these studies and summarized the findings: students' borrowing practices, use of interlibrary loan, attendance at instructional sessions, computer logins, library visits, database logins, and general use of library services and resources were found

to correlate with measures related to student success, such as GPA, retention, and grades. Libraries often use these definitions to demonstrate their impact and value.

Fewer studies have explored the importance of libraries in relation to students' own definition of success. One study found most students view success as having "made their best possible effort," and that the "gained knowledge or learned something new" regardless of the grade they received (Mayer et al., 2020). They also discussed how the library contributed to their academic success; many students viewed the physical library as a crucial space that supports their academic success by offering a focused, distraction-free environment. It fosters a sense of belonging among peers and provides access to essential resources and technology that might otherwise be unavailable to them. Another study found that when students were asked how the library supported their success, they highlighted both the value of its resources and the physical space in helping them stay focused and achieve their goals (De Groote & Scoulas, 2022). Their responses also offered insight into how they define success including passing tests and improving their grades.

Earlier findings from the pilot phase of this research project indicated that students' top definition of academic success was related to outcomes such as grades and graduating on time (Scoulas et al., 2025). Additionally, results from the pilot program align with previous research by Scoulas and De Groote (2022), which found that students also defined success in terms of the process of learning and application of skills (Scoulas et al., 2025). These more nuanced definitions can impact the interventions that libraries develop to support students—as well as the way they communicate their value to students—appealing to the students' own sense of accomplishment and success.

The literature above was foundational to guide the current research. Most research has focused on college students' use of library services, such as library instructions and consultations and logging into resources (e.g., Croxton & Moore, 2020; Mayer et al., 2020; Soria et al., 2013). However, few studies have explored how students' abilities to regulate their behaviors, concentrate, and engage in information-seeking are interconnected with their library usage and their reasons behind it. This paper explores how undergraduate students at two institutions engage in campus activities—including their use of library buildings and websites—and their reasons for doing so. It also investigates how their goal setting, concentration, and information-seeking abilities relate to one another. The findings will highlight commonalities and differences between the two institutions, offering a deeper understanding of students' overall campus engagement, perceptions of their abilities, and academic success. These insights will help campus partners, including academic libraries, enhance support for student success.

Methods

Study Sites

The study was conducted at the University of Illinois Chicago and Northern Illinois University. UIC, a large public research university in Chicago, serves a diverse student body with more than 33,000 students consisting of 65% undergraduates, and with no single racial or ethnic group dominating the population. NIU, a public research university in suburban DeKalb with about 17,000 students, also has a predominantly undergraduate population (about 70%) and shares a commitment to serving racially diverse students, many of whom are Pell Grant recipients and first-generation students. Both institutions are ideal for studying diverse undergraduate populations, which will enable the researchers to refine the assessment tools and expand

their applicability to other academic libraries, benefiting both traditional and nontraditional students. Both serve as a strong peer institution to each other for comparison and tool testing.

Design

The Student Academic Engagement and Success (SAES) Survey is a one-time online survey originally designed to assess how undergraduate students engage with campus activities, including their use of the library. Prior to conducting the survey, both institutions obtained approval from their respective Institutional Review Boards (IRB) and collected student demographic data from their Institutional Research offices. The demographics included class standing, college affiliation, GPA, first-generation status, and other variables.

Survey Instrument Revision and Measurement

The SAES explores campus engagement; the reasons students visit the physical library building or use the library website; their ability to self-regulate their behavior; and their perceptions of their academic success. The pilot SAES survey was initially developed by the research team and validated by several content experts (e.g., educational psychologists, psychometricians, a library practitioner) and students (Scoulas et al., 2024). After conducting a pilot test at UIC during spring 2023, the survey data (Scoulas et al., 2024b) were further analyzed using factor analysis to determine how many distinct factors emerged, which would inform decisions about grouping or separating items into different constructs. Additionally, the research team analyzed the open-ended responses on academic success collected during the pilot phase and identified the most frequently cited definitions (Scoulas et al., 2025).

A subset of content experts involved in the pilot phase were re-engaged to review the pilot results (Scoulas et al., 2024b; 2025), including findings from the factor analysis, and to provide input for further revisions. Their feedback contributed to content validation and informed further revisions of the instrument. As a result, the original 12 self-regulation items were regrouped into three constructs: goal setting and management (8 items), social learning (3 items), and concentration (3 items). In addition, information literacy (5 items) was developed as a new construct to capture students' library-related information skills. During this process, the research team's coded list of academic success definitions was also reviewed by the content experts (Scoulas et al., 2025), and the final list of definitions was converted into multiple-choice items.

The revised survey instrument consists of all multiple choice questions about campus engagement (e.g., frequency of visiting campus centers including the physical library building and online library website); physical library building activities—both academic-related (e.g., participating in online courses) and nonacademic related reasons (e.g., taking a nap); online library activities (e.g., accessing a research guide); and the reasons why they do not use the library (e.g., "I could not find a space easily"). Additionally, the survey asked for students' perceptions of their abilities in various areas and asked them to select their top three definitions of academic success. All self-regulation and information literacy items use a five-point Likert scale (1= strongly disagree to 5= strongly agree). Goal setting and management assesses students' ability to set and manage goals; social learning captures their tendency to work with others and be inspired by their peers; concentration measures their ability to remain focused and productive in various environments, such as at home, in noisy surroundings, or while interacting with family; and information literacy examines their ability to locate and evaluate information, seek help, and apply the information effectively. To view the full survey

instrument that was used at UIC, please refer to Appendix A. For academic libraries wishing to adapt and use a generic version of the survey, please refer to Scoulas et al. (2024a).

Demographics

While most of the students' demographic information was obtained from the Institutional Research office at each institution and linked to the survey responses for those who answered the survey, some demographic questions were included directly in the survey. For example, Pell Grant status was not available from Institutional Research, so this question was incorporated into the survey.

Data Set Up

In January 2024, demographic data from UIC and NIU Institutional Research was obtained from each institution. This data included class level, race/ethnicity, gender, GPA, and more. Before importing the demographic data into Qualtrics, institutional data was carefully reviewed and matched as needed between the institutions to facilitate institutional comparisons. For example, UIC recorded age as a numerical value, while NIU used age ranges. UIC's age data was grouped to match NIU's format to ensure consistency. After matching the demographic data labels, the dataset—originally including email addresses—was imported into Qualtrics as embedded data. A setting was applied to exclude identifiable information, such as email addresses, from being recorded during the import process to ensure students' anonymity once data collection began. Each survey for the respective institution was set up separately in UIC's Qualtrics system. After the demographics data were uploaded to Qualtrics, they were destroyed. For more information on how the survey responses were matched with demographic data on Qualtrics, please refer to the studies by Scoulas and De Groote (2019) or Scoulas et al. (2024b).

Data Collection

All undergraduate students aged 18 and older enrolled at UIC and NIU were invited to participate in the SAES survey in January and February 2024. During this time, reminder emails were sent to students who did not respond to the survey on January 31 and February 8, 2024. The email invitation informed the students that participation in the survey was entirely voluntary and that students might opt out at any moment. Additionally, the email invitation contained information on how the research team set up, used their demographics, and protected their anonymity. No demographics data was recorded from students who did not agree to participate in the survey.

Compensation

All survey respondents were automatically enrolled in a lottery to win a $100 e-gift card. A total of 10 survey lottery winners per institution were randomly selected by the research team, and each lottery winner received a $100 e-gift card. Winners were notified through their university email. Due to university regulations regarding incentivization via random drawing at NIU, the winners were required to pick up and sign for their e-gift card code as proof of receipt. Once all the winners were announced, the list of respondents was destroyed.

Data Analysis

Given that data was collected in separate surveys for each institution, the data from each institution had to be downloaded separately. After downloading the data from each survey

on Qualtrics, a new variable was created in each dataset to indicate the institution, and the datasets were then merged into a single dataset in SPSS 28, a statistical software tool. SPSS 28 was predominantly used for the overall quantitative analysis, which included descriptive statistics (i.e., frequency and percentages), and inferential statistical analysis (i.e., examining the relationships among variables, and statistical differences between institutions).

Results

Participants

In spring 2024, both institutions conducted the SAES survey concurrently. Out of a total student undergraduate population of 19,371 at UIC, 1,899 students participated, resulting in a response rate of 10%. During the same period, 577 NIU undergraduate students participated in the survey, representing a response rate of 7% out of their total undergraduate population of 8,423.

While some demographic characteristics (e.g., gender, class, and college) are similar between both institutions, disparities exist in their first-generation status, transfer status, and race/ethnicity. Respondents from both institutions exhibited a nearly identical distribution across class levels, with the majority being seniors. Additionally, most respondents from both institutions were enrolled in liberal arts and sciences programs. Notable differences emerged between both institutions for the second-largest category of programs. At UIC, engineering was the second-largest program, whereas at NIU, health sciences held that position.

Respondents from both institutions were predominantly noninternational students, although the proportion of noninternational students was higher at NIU (99%) compared to UIC (90%). Additionally, respondents from UIC (50%) tended to have a slightly higher Pell Grant status compared to those from NIU (46%). Significant differences were observed in first-generation and transfer status. At NIU, respondents were evenly split between first-generation and non-first-generation status, whereas at UIC, there were more respondents with non-first-generation status than first-generation status. Regarding race/ethnicity, most respondents at UIC identify as Hispanic, followed by White, while at NIU, the majority identify as White, followed by Black/African American.

Campus Engagement

Library visits were the most frequently reported campus engagement activity at both institutions, but the second most frequent type of activity differed. At UIC, students accessed the library website as often as they visited the library, followed by student organizations. At NIU, student organizations ranked second, followed by visits to the library website.

Upon examining the frequencies, it becomes evident that UIC students are more inclined to visit campus centers overall than those from NIU. Also, there are notable disparities in campus engagement between both institutions, particularly concerning the writing center and campus services dedicated to academic support. At UIC, 64% of students reported never visiting the writing center, while this percentage was higher at NIU, with 80% of students indicating no visits. Similarly, for campus services focused on academic support, 30% of UIC students never visited, compared to 44% of NIU students, and the mean academic support score for UIC ($M = 1.27$) was higher than that of NIU ($M = 0.99$). It is noteworthy that respondents from NIU indicated the highest level of unawareness regarding commuter centers.

TABLE 1
Demographics of UIC and NIU

Demographics	UIC		NIU	
	Survey ($n = 1,899$)	Undergraduate Population ($N = 19,371$)	Survey ($n = 577$)	Undergraduate Population ($N = 8,423$)
Class	%	%	%	%
Freshman	24.0	17.5	23.7	20.2
Sophomore	21.7	20.6	20.1	22.0
Junior	24.8	25.4	30.2	29.8
Senior	29.3	36.1	24.1	26.6
Nondegree	0.2	0.5	1.9	1.4
College				
Architecture, Design, & the Arts	4.9	5.6	7.6	7.0
Business Administration	18.1	18.5	15.9	17.3
Education	2.0	2.7	11.3	11.5
Engineering	19.1	22.5	9.4	10.2
Health Sciences	7.6	8.9	16.3	16.3
Liberal Arts & Sciences	47.2	40.6	37.6	35.8
Urban Planning & Public Affairs	1.1	1.0	N/A	N/A
Others	N/A	0.2	1.9	1.9
First Gen.				
No	66.9	65.0	48.2	48.9
Yes	33.1	35.0	51.8	51.1
Gender				
Female	63.3	53.7	62.4	53.0
Male	32.4	46.1	32.5	47.0
Gender non-conforming	2.6	N/A	3.3	N/A
Another gender identity	0.3	N/A	0.5	N/A
Prefer not to say	1.3	0.2	1.3	N/A
International Status				
Yes	9.1	7.2	1.5	N/A
No	90.9	92.8	98.5	N/A
Pell Status				
Yes	49.8	N/A	45.9	N/A
No	40.8	N/A	41.6	N/A
Unsure	9.4	N/A	12.5	N/A

TABLE 1
Demographics of UIC and NIU

Demographics	UIC		NIU	
	Survey ($n = 1,899$)	Undergraduate Population ($N = 19,371$)	Survey ($n = 577$)	Undergraduate Population ($N = 8,423$)
Race				
Asian	22.0	21.1	9.7	7.2
Black/African American	7.8	7.6	19.1	19.7
Hispanic	32.7	35.7	13.5	11.8
International	9.2	7.2	N/A	N/A
White	23.5	23.3	39.5	43.8
Others[a]	4.7	4.9	18.2	17.5
Transfer				
No	95.6	96.9	48.2	48.9
Yes	4.4	3.1	51.8	51.1

[a]Others include Asian American and Native Hawaiian/Pacific Islander (AIANNIPH), Multi-race, and Unknown.

TABLE 2
Campus Activities for UIC and NIU

Activity	Total	Never	Seldom	Sometimes	Often	Weekly	Unaware of This	*M*[a]	*SD*
UIC		%	%	%	%	%	%		
Library	1,728	10.1	20.0	15.8	16.3	36.9	1.0	2.50	1.42
Online Library	1,725	22.5	25.6	20.2	17.7	12.7	1.4	1.72	1.34
Student Org.	1,720	39.0	20.1	14.8	12.4	11.9	1.7	1.37	1.42
Commuters Center	1,713	56.0	17.6	8.7	6.3	8.6	2.8	0.91	1.31
Academic Support	1,721	29.8	35.5	16.5	10.4	6.2	1.6	1.27	1.18
Well-being Support	1,722	63.0	19.3	8.2	4.5	2.9	2.1	0.62	1.02
Cultural Center	1,722	68.2	16.7	6.2	3.5	2.8	2.6	0.52	0.97
Writing Center	1,715	64.2	21.3	7.3	3.0	1.9	2.2	0.54	0.91
NIU									
Library	518	21.6	17.6	15.3	16.8	28.2	0.6	2.12	1.53
Online Library	520	29.6	26.7	19.8	13.8	7.1	2.9	1.40	1.26
Student Org.	516	39.1	13.8	16.3	11.4	18.2	1.2	1.55	1.54
Commuters Center	518	64.1	10.0	4.8	4.1	2.7	14.3	0.50	1.01
Academic Support	515	44.1	28.3	13.4	9.1	3.9	1.2	0.99	1.14
Well-being Support	518	67.6	15.1	6.4	4.4	4.4	2.1	0.60	1.09
Cultural Center	518	70.1	15.4	5.2	3.3	4.2	1.7	0.54	1.03
Writing Center	515	80.2	10.3	3.3	1.7	0.8	3.7	0.26	0.68

[a]Scale from 0 (Never) to 4 (Weekly). Responses marked as "Unaware of this" were excluded from the analysis to calculate mean scores.

Library Visits in Person

Those who stated that they visited the library in person were subsequently asked to specify their reasons for doing so and their frequency. Notably, students from NIU reported slightly higher frequencies across all activities related to visiting the library compared to students from UIC. The primary reasons visiting the library in person at both institutions were for individual study purposes, followed by computer use and taking breaks. The least common reasons for visiting the library were to obtain physical library materials and to attend instruction and consultations.

TABLE 3
Physical Library Activities for UIC and NIU

Activity	Total	Never	Seldom	Sometimes	Often	Weekly	*M*[a]	*SD*
UIC		%	%	%	%	%		
Individual Study	1,413	8.9	10.5	12.2	17.8	50.5	2.90	1.36
Computer Use	1,412	28.5	11.5	5.9	9.5	44.5	2.30	1.74
Break	1,412	21.2	11.4	14.0	16.8	36.6	2.36	1.57
Socializing	1,411	17.9	15.8	17.2	17.5	31.5	2.29	1.49
Printer Use	1,412	23.8	16.6	18.0	21.4	20.2	1.98	1.46
Nonschool Activities	1,412	44.1	17.9	12.2	9.5	16.4	1.36	1.51
Online Classes	1,413	35.8	21.8	14.2	13.0	15.1	1.50	1.46
Prayer/Meditation	1,412	62.0	11.0	5.9	6.2	14.9	1.01	1.51
Group Study	1,413	25.5	23.0	19.2	17.7	14.6	1.73	1.39
Other	550	83.6	3.5	2.5	4.0	6.4	0.46	1.14
Material Acquisition	1,410	63.0	20.4	8.2	6.1	2.3	0.64	1.13
Instruction/Consult	1,419	81.9	12.3	3.2	1.6	1.0	0.28	0.69
NIU								
Individual Study	370	7.3	8.1	12.4	18.6	53.5	3.03	1.28
Computer Use	372	27.2	5.4	4.6	6.5	56.5	2.60	1.77
Break	373	19.3	8.3	14.2	16.9	41.3	2.53	1.55
Socializing	372	17.2	12.9	12.6	16.1	41.1	2.51	1.54
Printer Use	373	34.6	15.5	14.2	18.8	16.9	1.68	1.52
Nonschool Activities	372	43.5	12.6	13.2	12.9	17.7	1.49	1.57
Online Classes	372	40.3	11.6	11.3	8.9	28.0	1.73	1.69
Prayer/Meditation	372	56.7	11.3	8.1	7.0	16.9	1.16	1.56
Group Study	372	25.0	21.2	16.4	21.2	16.1	1.82	1.43
Other	146	83.6	3.4	6.2	2.1	4.8	0.41	1.04
Material Acquisition	374	53.2	25.4	11.5	4.5	5.3	0.83	1.13
Instruction/Consult	374	81.8	12.6	2.9	1.6	1.1	0.28	0.70

[a]Scale from 0 (Never) to 4 (Weekly).

Reasons for Not Visiting the Library

Those who stated they never visited the library were asked to elaborate on their reasons for not doing so. While two main reasons (i.e., studying at home or in their dorm and not

requiring materials for their classes), were consistent for both groups, the primary reason differed notably between UIC and NIU. At UIC, online access was ranked as the third most common reason for not visiting the library, whereas for NIU respondents, the top reason was the distance from their residence.

TABLE 4
Reasons for Not Visiting Library for UIC and NIU

	UIC[a]		NIU[b]	
Reasons	***n***	**% of cases**	***n***	**% of cases**
Could not find a space easily	18	11.2	1	1.0
Did not like the library environment	17	10.6	3	2.9
Did not need library materials/resources for my coursework	47	29.2	32	30.5
Used study space at home/residence hall	49	30.4	42	40.0
Used other study space on campus	37	23.0	17	16.2
Used other study space off campus	38	23.6	28	26.7
Concerned for personal safety	1	0.6	1	1.0
Was concerned about COVID-related health issues	N/A	N/A	1	1.0
Unsure where the library was	11	6.8	11	10.5
Able to access what I needed online	41	25.5	21	20.0
Too far from where I live	24	14.9	44	41.9
Library hours were not convenient to me	4	2.5	4	3.8
Other (Please specify)	26	16.1	26	24.8
Total	313		231	

[a]Number of respondents for UIC = 161;[b] number of respondents for NIU = 105.

Online Library Use

Those who indicated that they utilized the library website were further questioned about their reasons and the frequency of their usage. Overall, respondents from UIC were slightly more inclined to use the website for specific purposes compared to those from NIU. In both institutions, the primary reasons for using the library website included searching databases for articles, followed by searching for books. However, the third rank differed at UIC and NIU. For UIC, accessing research guides was ranked third, whereas checking library hours was the third-ranked reason for ranked NIU. The least common reasons for using the library website were to engage in one-on-one library consultations and to request materials. More than 80% of respondents from both institutions indicated that they had never used library consultations via the library website.

Reasons for Not Using Library Website

Those who indicated they never used the library website were asked about their reasons for abstaining. The rank order of the primary reasons for not using the library website was consistent for both institutions, with respondents from NIU showing a higher percentage than those from UIC. In both cases, the top reason cited was the lack of necessity for library materials and resources for their coursework, followed by difficulties in navigating the library website.

TABLE 5
Online Library Website Activities

Activity	Total	Never	Seldom	Sometimes	Often	Weekly	Unaware of This	*M*[a]	*SD*
UIC		%	%	%	%	%	%		
Database Search (Articles)	1,205	19.6	20.1	21.2	23.7	14.9	0.7	1.94	1.35
Database Search (Books)	1,203	26.6	21.1	18.8	19.9	13.1	0.6	1.71	1.39
Research Guides	1,202	29.2	24.3	18.9	15.4	9.9	2.3	1.51	1.33
Library Hours	1,199	40.4	26.3	15.8	10.8	6.2	0.7	1.16	1.24
Librarian Chat/ Email	1,204	63.9	21.9	6.6	4.2	2.5	0.9	0.58	0.97
Librarian Consult	1,197	82.3	9.4	3.1	1.8	1.8	1.7	0.29	0.77
Material Request	1,205	74.9	14.3	5.1	2.7	1.7	1.2	0.40	0.85
Other	488	77.9	5.5	2.9	2.7	3.3	7.8	0.35	0.94
NIU									
Database Search (Articles)	330	33.0	18.2	18.5	18.5	9.7	2.1	1.53	1.38
Database Search (Books)	329	32.2	26.1	14.9	16.4	8.5	1.8	1.42	1.33
Research Guides	327	37.3	24.2	16.2	11.3	7.6	3.4	1.25	1.29
Library Hours	330	29.4	30.9	20.9	12.4	5.2	1.2	1.32	1.18
Librarian Chat/ Email	326	75.8	13.5	5.5	2.1	1.2	1.8	0.37	0.79
Librarian Consult	327	86.2	6.7	2.8	1.8	0.6	1.8	0.21	0.64
Material Request	330	75.8	11.8	4.8	3.3	2.4	1.8	0.42	0.92
Other	133	79.7	3.0	6.0	3.0	0.8	7.5	0.29	0.80

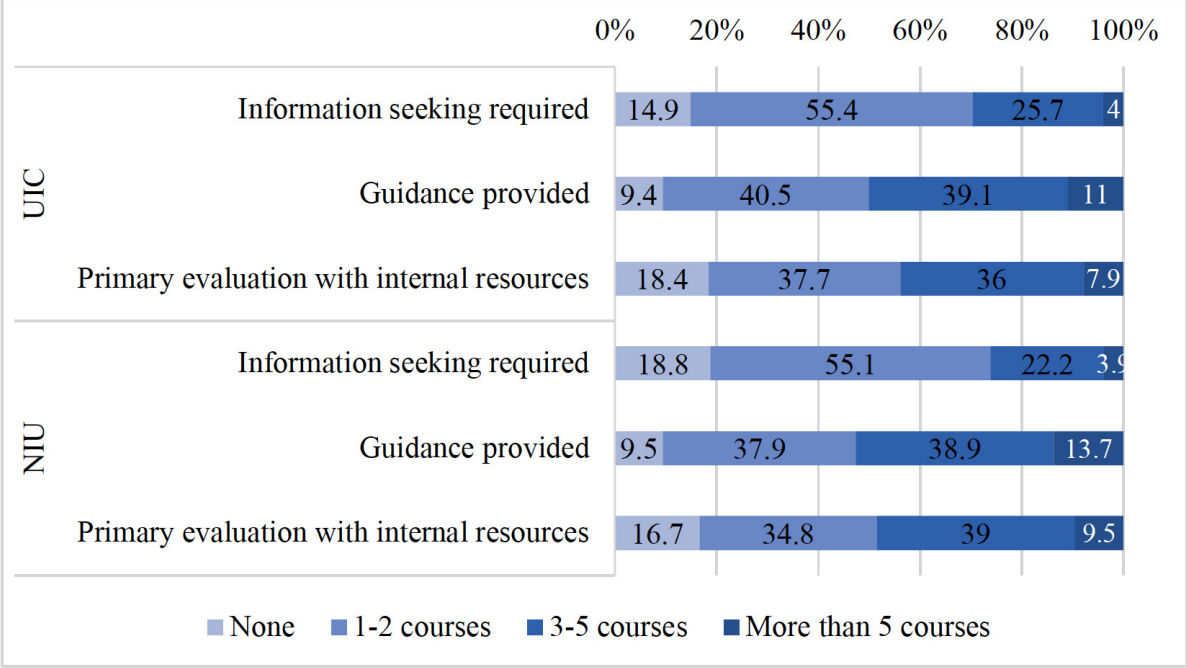
[a]Scale from 0 (Never) to 4 (Weekly). Responses marked as "Unaware of this" were excluded from the calculation of mean scores.

TABLE 6
Reasons Not Visiting Library Website

	UIC[a]		NIU[b]	
Reasons	***n***	**% of cases**	***n***	**% of cases**
Did not need library materials/resources for my coursework	224	63.1	99	72.3
I could find what I needed on Google	118	33.2	58	42.3
It was difficult to navigate the library website	33	9.3	10	7.3
I was not familiar with online library resources or how to search them	87	24.5	37	27.0
Other (please specify)	17	4.8	12	8.8
Total	479		216	

[a]Number of respondents for UIC = 355; [b] number of respondents for NIU = 137.

FIGURE 1
Information Literacy Related Courses Taken for UIC and NIU.



Number of Courses Required Information Seeking and Evaluation

In general, both UIC and NIU students exhibited similar trends regarding their coursework requirements concerning information seeking and evaluation. Over 90% of respondents from both institutions reported receiving guidance in more than one course on where and how to locate necessary information for assignments. Additionally, more than 80% of students from both UIC and NIU needed to access resources, including those in the library, for multiple courses. However, it's noteworthy that over 80% of respondents from both universities also indicated that more than one course did not mandate any additional information evaluation beyond what was provided within the class materials.

Students' Perceptions of Their Goal Management, Social Learning, Concentration, and Information Literacy

The findings from UIC and NIU reveal both commonalities and differences in students' responses to statements about goal management, learning support, concentration abilities, and information seeking. There were similar challenges UIC and NIU students face regarding distraction and concentration, as well as their confidence in information seeking. Both UIC and NIU students showed high levels of agreement with the statements "I have personal standards and I try to live up to them" (UIC: $M = 4.25$, NIU: $M = 4.28$), "I can usually plan how to reach a goal" (UIC: $M = 3.91$), and "I am able to accomplish goals I set for myself" (NIU: $M = 3.90$). Both groups were less likely to agree with the statement "I do not get easily distracted from my plans" (UIC: $M = 2.95$, NIU: $M = 2.76$). Regarding information seeking behaviors, students at both institutions expressed overall confidence in their ability to read and apply information they find (UIC: $M = 4.09$, NIU: $M = 4.10$). Generally, students agreed that they could find the information needed to complete their coursework without assistance. With respect to the concentration abilities, students at both UIC and NIU indicated that they

could stay focused at home or in the library, but struggled with concentration when noise, friends, or family were present.

However, there are differences in how each group perceived learning support and their concentration abilities, suggesting areas for targeted support interventions at each institution. UIC students leaned toward agreeing that they were inspired by others to complete their coursework and were willing to seek support, while NIU students showed less conclusive agreement on these points (UIC: generally positive mean scores, NIU: $M = 3.45$ and $M = 3.41$ with higher standard deviations indicating more variability). While both groups showed some uncertainty, NIU students had a slightly more positive response toward their concentration abilities compared to UIC students, who were less conclusive in their responses.

TABLE 7
Descriptive Statistics on Students' Various Abilities: Goal Management, Social Learning, Concentration, Information Seeking

	UIC		NIU	
Statement	*M*	*SD*	*M*	*SD*
Goal Management				
1. I do not have a hard time setting goals for myself	3.47	1.12	3.50	1.12
2. I usually keep track of my progress toward my goals	3.76	0.98	3.73	1.00
3. I am able to accomplish goals I set for myself	3.84	0.85	3.90	0.78
4. I have personal standards and try to live up to them	4.25	0.77	4.28	0.68
5. Once I have a goal, I can usually plan how to reach it	3.91	0.83	3.88	0.89
6. I do not get easily distracted from my plans	2.95	1.09	2.76	1.16
7. I can stick to a plan that's working well	3.89	0.82	3.90	0.80
8. I am able to resist temptation when working to accomplish my goals	3.30	1.04	3.22	1.02
Social Learning				
9. I am inspired to study or complete my coursework by observing how others study	3.56	1.06	3.45	1.11
10. I interact with and get support from other students to enhance my learning	3.51	1.08	3.41	1.17
11. I enhance my learning by working with my TAs and instructors' support	3.46	1.08	3.28	1.15
Concentration				
12. I can stay focused and productive whether I'm at home, in a library, or even on the go	3.33	1.12	3.39	1.17
13. I can stay focused in noisy environments	2.82	1.20	2.80	1.23
14. I can concentrate on my studies despite being around friends or family	2.95	1.18	3.01	1.18
Information Literacy				
15. I can easily find information I need to complete my coursework without assistance	3.86	0.81	3.90	0.75
16. Whether it's online or in a library, I can confidently find information to complete my coursework	3.94	0.77	3.99	0.71
17. I am confident that I can evaluate information I find to determine whether or not it is reliable to use for my coursework	3.99	0.72	4.07	0.67
18. I am confident in my ability to read and apply the information I find	4.09	0.71	4.10	0.72
19. I am comfortable asking for assistance if I need help seeking information	3.80	0.98	3.85	0.97

Student's Own Definition of Academic Success

The top ranked definition of academic success, as reported by UIC students, was getting good grades/doing well in class. The second most prevalent description of academic success was also obtaining good grades, followed by two closely related definitions: working hard, and balancing school, life, and other responsibilities. The third most common description of academic success was balancing school, life, and other responsibilities. Taken together, the order of best descriptions of academic success, from first to third, were obtaining good grades; balancing school, life, and other responsibilities; and working hard. For NIU students, the top definition of academic success was obtaining good grades, which aligns with the responses from UIC students. The second most common definition also involved achieving good grades; however, when excluding this, students most frequently mentioned working hard, achieving personal fulfillment, and feeling satisfied. The third most common definition was balancing school, life, and other responsibilities. Taken together, for both UIC and NIU students, the top definition of academic success was obtaining good grades. When excluding this, the second most common descriptions were working hard and achieving personal fulfillment and satisfaction. Finally, balancing school, life, and other responsibilities ranked third for both groups.

Relationships Among Students' Academic Achievement and Various Factors

Further analysis was conducted to explore relationships between students' academic achievement (i.e., GPA) and various factors including their level of campus engagement, goal management, and information literacy. At both institutions, students' GPA was positively but weakly associated with their perceived information literacy competencies (UIC: $r = .119$, $p < .01$; NIU: $r = .096$, $p < .05$). However, there were discrepancies between the two institutions. For UIC students, their GPA was found to be associated with their physical library activities—both academic related ($r = -.102$, $p < .01$) and nonacademic related ($r = -.081$, $p < .01$)—and goal management ($r = .134$, $p < .01$). Interestingly, the directions of these relationships varied; there were negative relationships between GPA and their physical library activities, suggesting that students with higher GPAs tended to engage less in physical library activities. Conversely, positive relationships were observed between GPA and both goal management and information literacy, indicating that students with higher GPAs exhibited greater confidence in their goal management and were more active in seeking out information. The analysis of relationships among NIU students revealed significant associations between GPA and campus engagement ($r = .164$, $p < .01$), and GPA, and online library website activities ($r = -.130$ $p < .05$). Interestingly, the directions of these relationships varied; students' GPA was negatively associated with online library website activities, indicating that those with higher GPAs tended to engage less with online library resources. Conversely, their GPA was positively associated with campus engagement and information literacy, suggesting that students with higher GPAs were more likely to be actively involved on campus, and actively seek out information to support their academic endeavors.

When examining the connections between physical library activities (both academic related and nonacademic related) and other variables, both UIC and NIU findings suggest a positive association between academic related library activities (e.g., taking online class) and nonacademic related library activities (e.g., taking a nap) (UIC: $r = .774$, $p < .01$, NIU: $r = .761$, $p < .01$); participation in campus activities (UIC: $r = .325$, $p < .01$, NIU: $r = .149$, $p < .01$); use of online library resources (UIC: $r = .378$, $p < .01$, NIU: $r = .207$, $p < .01$);

TABLE 8
Definition of Academic Success

Definition of Academic Success	1st Choice		2nd Choice		3rd Choice	
UIC	***n***	**%**	***n***	**%**	***n***	**%**
Getting good grades/doing well in class	546	38.0	298	20.9	154	10.8
Balancing school, life, and other responsibilities	191	13.3	186	13.0	196	13.7
Working hard, personal fulfillment and satisfaction	167	11.6	190	13.3	170	11.9
Learning and applying skills and knowledge	102	7.1	118	8.3	139	9.7
Getting a degree/graduating	101	7.0	123	8.6	173	12.1
Achieving goals or staying on track	88	6.1	153	10.7	144	10.1
Being proud/exceeding expectations or earning recognition	75	5.2	111	7.8	91	6.4
Passing classes	71	4.9	98	6.9	74	5.2
Getting a job	48	3.3	63	4.4	109	7.6
Being able to stay organized	16	1.1	41	2.9	62	4.3
Others. Please specify:	16	1.1	6	0.4	10	0.7
Being able to help others	9	0.6	12	0.8	43	3.0
Improving social skills with peers, professors, instructors, or TAs	8	0.6	27	1.9	62	4.3
Total	1,438	100	1,426	100	1,427	100
Definition of Academic Success	**1st Choice**		**2nd Choice**		**3rd Choice**	
NIU	***n***	**%**	***n***	**%**	***n***	**%**
Getting good grades/doing well in class	156	35.9	78	18.0	53	12.2
Balancing school, life, and other responsibilities	57	13.1	72	16.6	62	14.3
Working hard, personal fulfillment and satisfaction	60	13.8	54	12.4	56	12.9
Learning and applying skills and knowledge	39	9.0	41	9.4	51	11.8
Getting a degree/graduating	26	6.0	36	8.3	58	13.4
Achieving goals or staying on track	29	6.7	41	9.4	41	9.4
Being proud/exceeding expectations or earning recognition	25	5.7	39	9.0	29	6.7
Passing classes	21	4.8	29	6.7	18	4.1
Getting a job	8	1.8	16	3.7	19	4.4
Being able to stay organized	4	0.9	11	2.5	18	4.1
Others. Please specify:	1	0.2	N/A	N/A	2	0.5
Being able to help others	5	1.1	7	1.6	11	2.5
Improving social skills with peers, professors, instructors, or TAs	4	0.9	10	2.3	16	3.7
Total	435	100	434	100	434	100

social learning (UIC: $r = .168$, $p < .01$, NIU: $r = .268$, $p < .01$); and improved concentration (UIC: $r = .116$, $p < .01$, NIU: $r = .133$, $p < .05$). Regarding the differences between the two institutions, for UIC, it was observed that students who engaged in physical library activities, both academic and nonacademic, showed a positive correlation with perceived effectiveness in goal management (both academic related ($r = .056$, $p < .05$) and nonacademic related ($r = .071$, $p < .05$), and information literacy (both academic related ($r = .068$, $p < .05$) and

nonacademic related ($r = .088$, $p < .01$) physical library activities. This suggests that students who actively use the library for academic purposes are also more engaged in nonacademic activities and campus events, and that they make greater use of online library resources, while demonstrating stronger perceived confidences in goal management and information literacy. Among NIU students, a correlation was found between nonacademic related physical library activities and goal management ($r = .137$, $p < .05$), but no significant correlations were found between academic related physical library activities and goal management ($r = .100$, $p = .069$). There were no significant relationships between information-literacy and physical library activities [both academic related ($r = -.024$, $p = .658$) and nonacademic related ($r = .028$, $p = .612$) physical library activities].

Another significant finding revealed by Pearson correlations is the existence of relationships between students' preposition abilities, observed in both UIC and NIU undergraduates. Specifically, students who demonstrate greater confidence in their goal setting and progress management are more likely to report higher levels of social learning, focus, and information literacy. It is also important to highlight that, among students at both institutions, all four areas—goal management, social learning, concentration, and information literacy—were positively interrelated, indicating that students who believed that they had strengths or challenges could influence their peers.

Statistical Differences in Students' Academic Engagement, Ability, and GPA Between UIC and NIU

An independent sample t-test was conducted to examine whether there are statistically significant differences, between UIC and NIU, in students' levels of campus engagement, their ability to set goals, maintain focus, their tendency to seek information, and their GPAs. Interestingly, there were no statistically significant differences in students' perceptions of goal management [t (1,905) = 0.30, p =.766], ability to focus [t (1,895) = -0.69, p =.491], and information-seeking ability [t (1,902) = -1.62, p =.106] between UIC and NIU. However, their involvement in campus activities, use of physical and online library resources, socializing ability, and academic outcomes differed significantly. UIC undergraduates exhibited higher mean scores than NIU in campus engagement (UIC: $M = 9.30$, SD 5.24, NIU: $M = 7.76$, $SD = 5.36$); online library usage (UIC: $M = 7.47$, $SD = 5.35$, NIU: $M = 6.35$, $SD = 5.06$); social learning (UIC: $M = 10.51$, $SD = 2.55$, NIU: $M = 10.14$, $SD = 2.70$); and GPA (UIC: $M = 3.34$, $SD = 0.69$, NIU: $M = 3.00$, $SD = 1.17$). Conversely, NIU students had higher mean scores in utilizing physical library spaces ($M = 19.54$, $SD = 10.30$) than UIC students ($M = 18.24$, $SD = 9.88$).

Discussion

Campus Engagement, Including Library Use

While studies have explored engagement with campus academic services (e.g., library and writing center) and extracurricular activities (e.g., students' organizations), this study's findings highlight that students' campus engagement includes both academic and nonacademic purposes, and it underscores the library's importance in student campus engagement for both purposes. Physical library visits were students' most frequently reported campus engagement activities at UIC and NIU. Engagement with student organizations and the online library were the next most reported, although their order differed between the two institutions. These top campus engagement activities reflect engagement most likely for academic purposes (i.e.,

TABLE 9
Correlations Among Students' Academic Achievement and Various Factors

UIC									
Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1. GPA	1								
2. Campus Activities	.012	1							
3. Academic Related Library Activities	-.102**	.325**	1						
4. Nonacademic Related Library Activities	-.081**	.261**	.774**	1					
5. Online Library Website Activities	.010	.453**	.378**	.238**	1				
6. Goal management	.134**	.018	.056*	.071*	.070*	1			
7. Social Learning	.009	.266**	.168**	.175**	.132**	.277**	1		
8. Concentration	-.001	.043	.116**	.115**	.117**	.433**	.233**	1	
9. Information literacy	.119**	.066*	.068*	.088**	.072*	.514**	.257**	.295**	1
NIU									
Variable	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1. GPA	1								
2. Campus Activities	.164**	1							
3. Academic Related Library Activities	-.075	.149**	1						
4. Nonacademic Related Library Activities	-.096	.129*	.761**	1					
5. Online Library Website Activities	-.130*	.462**	.207**	.113	1				
6. Goal management	.092	-.053	.100	.137*	.043	1			
7. Social Learning	-.058	.204**	.268**	.299**	.148*	.304**	1		
8. Concentration	.032	-.037	.133*	.124*	.069	.482**	.294**	1	
9. Information literacy	.096*	-.034	-.024	.028	.082	.496**	.205**	.319**	1

***: $p < .001$
**: $p < .01$
*: $p < .05$

library, both physical and online) and extracurricular nonacademic engagement (i.e., student organizations). Other academic services were widely underutilized at both institutions (e.g., writing center, academic support services), although the degree to which varied. While this finding aligns with the earlier study by Scoulas et al. (2024b), which focused on a single institution, these results reveal that, across both institutions, students view both physical and online library activities as among the most important campus activities. This suggests that libraries—whether in-person or digital—play a central role in student engagement and are considered essential for both academic and nonacademic aspects of campus life.

The findings further revealed that at both institutions, students visited the physical library for both academic reasons (e.g., studying and using computers) and nonacademic reasons (e.g., taking a break and socializing). This finding provides the evidence that the library serves a dual role for students. While its primary function is to support academic activities like studying,

TABLE 10
Independent Sample T-Test in Various Variables Between UIC and NIU

Variable	Institution	*n*	*M*	*SD*	*t*	*df*	Sig.
Campus Engagement	UIC	1,723	9.30	5.24	5.83	2,240	$p <$. 001***
	NIU	519	7.76	5.36			
Library Activities	UIC	1,421	18.24	9.88	-2.25	1,793	$p <$ .05*
	NIU	374	19.54	10.30			
Online Library Website Activities	UIC	1,209	7.47	5.35	3.41	1,537	$p <$ .01**
	NIU	330	6.35	5.06			
Goal Management	UIC	1,465	29.23	5.58	0.30	1,905	.766
	NIU	442	29.14	5.30			
Social Learning	UIC	1,457	10.51	2.55	2.67	1,893	$p <$ .01**
	NIU	438	10.14	2.70			
Concentration	UIC	1,457	9.08	2.80	-0.69	1,895	.491
	NIU	440	9.19	2.96			
Information Literacy	UIC	1,461	19.60	3.14	-1.62	1,902	.106
	NIU	443	19.87	2.75			
GPA	UIC	1,773	3.34	0.69	8.41	2,348	$p <$ .001***
	NIU	577	3.00	1.17			

***: $p <$ .001
**: $p <$ .01
*: $p <$ .05

it also provides a space for relaxation and nonacademic purposes. The least common reasons for visiting the library were to obtain physical library materials and to attend instruction and consultations. While attending an instructional session was one of the reported reasons for using the physical library, the survey did not ask more broadly about library instruction across formats (e.g., in-library, classroom, or online), which may have resulted in underreporting. To get a better sense of how library instruction may play a role in student success, an additional question in future iterations of the SAES survey could ask students to quantify their participation in library instruction sessions across modalities and time.

For students who did not visit the library, their reasons were mostly related to not needing library materials for their courses, utilizing alternative study spaces, and the ability to access resources online. At NIU, the distance from the library was also a barrier, suggesting that location plays a significant role in library usage, indicating a potential need for more decentralized resources or services. While students' main reasons for using the online library website were related to database searches for journal articles and books, the main reason for not using the online library website and resources was not needing library materials for their coursework. Taken together, these findings suggest that libraries have room for improvement and need to take a more strategic approach to engage students effectively. Access to online resources has decreased the need for physical library visits, suggesting that libraries should prioritize and promote their digital offerings to align with students' preferences. The main reason for not using the library's website is the lack of perceived need for its materials, indicating a potential gap in students' awareness of the full range of online resources available.

Relationships Among Variables

Initially, we hypothesized that students who could concentrate in any environment would be less likely to use the physical library, as they could study in other locations (e.g., dorms and houses). However, the results from both institutions indicate that concentration confidences are positively related to library use but in an unexpected direction. Students with stronger concentration ability are actually more inclined to use the physical library. Alternatively, those who frequently visit the library, whether for academic or nonacademic purposes, tend to report higher concentration abilities. This suggests that students who are better at concentrating may prefer the library environment for studying or relaxing, as research has shown that students use the library for both quiet and collaborative spaces (Giffen, 2020; Scoulas & De Groote, 2019), perceive it as social environment (Mayer et al., 2020) and feel inspired to stay focused by observing others (Scoulas & De Groote, 2022).

How engagement correlated, including by GPA, differed by institution. At UIC, there was no significant correlation between GPA and campus engagement, unlike NIU, where a weak positive correlation was observed. At UIC and NIU, both academic and nonacademic library activities were negatively correlated with GPA, although this was only significant for UIC. At UIC, online library use did not correlate with GPA, although it did positively correlate with campus activity engagement, as well as with academic and nonacademic library activities. At NIU, online library use correlated negatively with GPA and positively correlated with campus engagement and academic-related library use only. These findings also contradict previous studies at UIC, where physical library use was negatively correlated with GPA and online library use was positively correlated with GPA (Scoulas et al., 2024b; Scoulas & De Groote, 2022). Thus, while student use of the academic library and campus engagement are crucial in the lives of students, the relationship between GPA and library use is less clear.

It is noteworthy that their perceived abilities in goal management, social learning, concentration, and information literacy are interconnected. This suggests that strengths in one area can positively influence the others. In the context of library use, students who use the library are more likely to effectively manage their goals, maintain focus, feel inspired to learn by observing and collaborating with their peers, and successfully find resources or seek help when needed. Interestingly, the results regarding the relationships between students' GPA and their abilities in these areas revealed both similarities and differences across the two institutions. At both institutions, students demonstrated that higher information literacy confidences were associated with higher GPAs, meaning that students with stronger information literacy confidences tend to achieve better academic performance. However, only students at UIC showed a relationship between GPA and goal management, with higher GPAs linked to stronger perceived goal management confidences.

These findings are crucial for academic libraries and librarians because it highlights the need for a comprehensive approach to skill development. Understanding the connection between information literacy, goal management, social learning, and concentration allows librarians to design more effective programs, collaborate with faculty, and allocate resources to better support student success. It also enables them to assess and improve their initiatives, fostering not just academic achievement but lifelong learning. By addressing these interconnected confidences, libraries can play a key role in enhancing students' overall academic performance.

Student Success

Students' top definition of academic success at both institutions matches the indicators often used as a primary metric by institutions (e.g., getting a higher GPA). This is unsurprising, given the traditional definition of success and the link between GPA and persistence (Brown & Malenfant, 2015). However, when looking at the second and third top definitions at each institution, there are some notable differences from this traditional conceptualization. When looked at together, students at UIC and NIU described success as balancing school, life, and other responsibilities; achieving personal fulfillment and feeling satisfied; and working hard. Given that both institutions have high concentrations of first-generation students, the findings are in line with previous research that demonstrated first-in-family students to define success in terms of validation and hard work (O'Shea & Delahunty, 2018). The findings provide valuable insights into how we can support students' personal definitions of academic success, particularly from the perspectives of both institutions. To better understand how students' definitions of academic success related to other variables, such as campus engagement and library use, further analysis using students' demographic data will be conducted.

Limitations

All undergraduate students who were age 18 or older at each institution were eligible and invited to participate in the survey; participation was entirely voluntary. As a result, the final sample consisted of students who choose to respond, which is a common approach in voluntary online surveys. This can lead to self-selection bias, especially if the likelihood of responding is related to the survey topic, resulting in data that may not fully represent the target population (Lavrakas, 2008). Despite this, the sample largely reflects the undergraduate population at both institutions, apart from a slightly lower representation of seniors and more of freshmen at UIC, and a higher proportion of female respondents at both institutions. In relation to this, the survey generated a 9.8% response rate at UIC and 6.9% at NIU. It is possible that survey fatigue may have contributed to the low response rate at UIC and NIU, where multiple ongoing surveys have been a topic of concern across campus. Additionally, NIU may have faced an additional challenge, as library surveys had not previously targeted the entire undergraduate population. This lack of familiarity may have affected their willingness to participate. While these may be considered low, such response rate are not uncommon for voluntary online surveys. Research shows that web-based surveys yield lower response rates than paper surveys among college students (Sax et al., 2003).

The strengths of the relationships among variables were weak (most $rs < |.20|$) based on Cohen's (1988) criteria, except for variables related to participants' perceptions of their abilities in goal setting, information processing, concentration, and social learning, which showed small to moderate effects. It is possible that potential confounding variables may have influenced the observed relationships. Further research is needed to understand these variables and their effects. Given these results, we recommend interpreting these findings with caution. Nonetheless, the findings provide valuable insights into patterns of campus engagement, library activities within both physical building and online, and student's own definitions of academic success at both institutions.

Conclusion and Recommendations

According to O'Shea & Delahunty (2018), higher education "has a valuable role in assisting individuals to operationalise their own desires, thereby facilitating achievement of their preferred human flourishings" (p. 1072). This perspective resonates with how students in this study defined academic success, not only getting good grades, but also balancing school, life and other responsibilities, achieving personal fulfillment, and working hard. Our findings highlight how the library is positioned to support these diverse forms of success. The library was the most frequently visited campus service at both institutions, underscoring its role as a central hub for student engagement. Students reported using the library not only for academic purposes but also for personal well-being, such as resting or socializing. Additionally, students who use the library are more likely to manage goals, stay focused, collaborate effectively, and seek help when needed. Across both institutions, higher information literacy confidence was consistently linked to higher GPAs. These insights can inform library instruction design and space planning. For example, libraries can incorporate messaging that aligns with student experiences to promote workshops and usage, create spaces that support concentration and productivity, and ensure both physical spaces and librarian interactions validate students' academic and personal needs.

Additionally, these findings present an opportunity for academic libraries to initiate communication and to collaborate with other campus units that have experience in supporting student challenges in certain areas, such as concentration and time management, that are crucial for student success. This notion has been supported by the Association of College and Research Libraries (ACRL) (2016) *Framework for Information Literacy for Higher Education*, which emphasizes the importance of working with academic departments and other support units. For example, partnering with academic departments allows libraries to enhance curriculum integration through the development of research guides, lectures, workshops, and joint assignments.

Engagement with student affairs and academic success programs is another critical avenue for libraries to foster student engagement. As the library is a central hub for students to study and socialize, there are opportunities for campus units to engage students in library spaces to enhance students' awareness of—and access to—programs and services that support their success and sustain their motivation. Further, libraries can collaborate externally with partners to increase awareness of and access to library services, resources, and spaces. For example, by participating in orientation and other welcoming activities, libraries can develop early relationships with new students who may not yet have the need to play a vital role in enhancing the overall student experience. Libraries should also establish assessment and feedback mechanisms, actively participate in university committees, and facilitate avenues for students and faculty to provide input on library services. In addition, engaging in joint events and collaborations with diversity and inclusion offices, technology services, wellness centers, and integrated tutoring programs demonstrates the library's commitment to supporting diverse student populations. Collectively, these initiatives illustrate the pivotal role of academic libraries in fostering student success and enriching educational experience.

Funding

This research project was made possible through funding from the Institute of Museum and Library Services (LG-252338-OLS-22).

References

Appleton, L. (2020). Academic libraries and student engagement: A literature review. *New Review of Academic Librarianship*, *26*(2–4), 189–213. https://doi.org/10.1080/13614533.2020.1784762

Arellanes, J., Noël-Elkins, A., & Friberg, J. (2022). Is student success an outcome or process?: A student-led definition and description. *College Student Journal*, *56*(4), 411–421. https://research.ebsco.com/c/7xnk7b/viewer/pdf/j54p7imc5j?route=details

Association of College and Research Libraries. (2016). *Framework for Information Literacy for Higher Education*. https://www.ala.org/sites/default/files/acrl/content/issues/infolit/Framework_ILHE.pdf

Atuahene, F. (2021). Predicting the academic success of minority male students in a public 4-year institution in the USA. *Journal of African American Studies*, *25*(1), 29–51. https://doi.org/10.1007/s12111-020-09512-4

Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review. *The Internet and Higher Education*, *27*, 1–13. https://doi.org/10.1016/j.iheduc.2015.04.007

Brown, K., & Malenfant, K. (2015). *Academic library contributions to student success: Documented practices from the field*. https://alair.ala.org/server/api/core/bitstreams/cf8d29e4-877a-46a3-9955-918d6374e418/content

Cachia, M., Lynam, S., & Stock, R. (2018). *Academic success: Is it just about the grades? Higher Education Pedagogies*, *3*(1), 434–439. https://doi.org/10.1080/23752696.2018.1462096

Choi, N. (2005). Self-efficacy and self-concept as predictors of college students' academic performance. *Psychology in the schools*, *42*(2), 197–205. https://doi.org/10.1002/pits.20048

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Croxton, R. A., & Moore, A. C. (2020). Quantifying library engagement: Aligning library, institutional, and student success data. *College and Research Libraries*, *81*(3), 399–434. https://doi.org/10.5860/crl.81.3.399

De Groote, S. L., & Scoulas, J. M. (2022). The impact of the academic library on students' success, in their own words. *portal: Libraries and the Academy*, *22*(2), 355–374. https://doi.org/10.1353/pla.2022.0021

DeVille, S. D., & Sughrue, J. A. (2023). Linking library use to student engagement. *Journal of Library Administration*, *63*(2), 179–199. https://doi.org/10.1080/01930826.2022.2159240

Ferrari, J. R., McCarthy, B. J., & Milner, L. A. (2009). Involved and focused? Students' perceptions of institutional identity, personal goal orientation and levels of campus engagement. *College Student Journal*, *43*(3), 886–897. https://research.ebsco.com/c/7xnk7b/viewer/html/jp7pmxkcvb

Ge, X. (2010). Information-seeking behavior in the digital age: A multidisciplinary study of academic researchers. *College & Research Libraries*, *71*(5), 435–455. https://doi.org/10.5860/crl-34r2

Giffen, F. C. (2020). *A space to belong: Space and a sense of belonging among teen and young adult patrons in the Fresno County public library system* (Doctoral dissertation, California State University, Fresno). ProQuest Dissertations & Theses. https://proxy.cc.uic.edu/login?url=https://www.proquest.com/dissertations-theses/space-belong-sense-belonging-among-teen-young/docview/2432909882/se-2

Gross, M., & Latham, D. (2012). What's skill got to do with it?: Information literacy skills and self-views of ability among first-year college students. *Journal of the American Society for Information Science and Technology*, *63*(3), 574–583. https://doi.org/10.1002/asi.21681

Institute of Museum and Library Services. (2022). *Developing and testing assessment tools for measuring library impact on student academic success* (Grant No. LG-252338-OLS-22). https://www.imls.gov/grants/awarded/lg-252338-ols-22

Jennings, N., Lovett, S., Cuba, L., Swingle, J., & Lindkvist, H. (2013). "What would make this a successful year for you?": How students define success in college. *Liberal Education*, *99*(2) 1–11. https://core.ac.uk/download/pdf/217019546.pdf

Ketonen, E. E., Haarala-Muhonen, A., Hirsto, L., Hänninen, J. J., Wähälä, K., & Lonka, K. (2016). Am I in the right place? Academic engagement and study success during the first years at university. *Learning and Individual Differences*, *51*, 141–148. https://doi.org/10.1016/j.lindif.2016.08.017

Komissarov, S., & Murray, J. (2016). Factors that influence undergraduate information-seeking behavior and opportunities for student success. *Journal of Academic Librarianship*, *42*(4), 423–429. https://doi.org/10.1016/j.acalib.2016.04.007

Larson, K. C., Downing, M. S., Nolan, J., & Neikirk, M. (2022). High impact practices through experiential student philanthropy: A case study of the Mayerson student philanthropy project and academic success at Northern Kentucky University. *Journal of College Student Retention: Research, Theory and Practice*, *24*(3), 832–855. https://doi.org/10.1177/1521025120952083

Lavrakas, P. J. (2008). *Encyclopedia of survey research methods*. SAGE Publications.

Lemire, S., Xu, Z., Balester, V., Dorsey, L. G., & Hahn, D. (2021). Assessing the information literacy skills of first-generation college students. *College and Research Libraries*, *82*(5), 730–754. https://doi.org/10.5860/crl.82.5.730

Lotfy, M. W., Kamel, S., Hassan, D. K., & Ezzeldin, M. (2022). Academic libraries as informal learning spaces in architectural educational environment. *Ain Shams Engineering Journal*, *13*(6), 101781. https://doi.org/10.1016/j.asej.2022.101781

Mahdavi, P., Valibeygi, A., Moradi, M., & Sadeghi, S. (2021). Relationship between achievement motivation, mental health and academic success in university students. *International Quarterly of Community Health Education*. https://doi.org/10.1177/0272684X211025932

Matthews, K. E., Andrews, V., & Adams, P. (2011). Social learning spaces and student engagement. *Higher Education Research and Development*, *30*(2), 105–120. https://doi.org/10.1080/07294360.2010.512629

Mayer, J., Dineen, R., Rockwell, A., & Blodgett, J. (2020). Undergraduate student success and library use: A multimethod approach. *College and Research Libraries*, *81*(3), 378–398. https://doi.org/10.5860/crl.81.3.378

O'Shea, S., & Delahunty, J. (2018). *Getting through the day and still having a smile on my face*! How do students define success in the university learning environment? *Higher Education Research & Development*, *37*(5), 1062–1075. https://doi.org/10.1080/07294360.2018.1463973

Sax, L. J., Gilmartin, S. K., & Bryant, A. N. (2003). Assessing response rates and nonresponse bias in web and paper surveys. *Research in Higher Education*, *44*(4), 409–432. https://doi.org/10.1023/A:1024232915870

Scoulas, J. M., & De Groote, S. L. (2019). The library's impact on university students' academic success and learning. *Evidence Based Library and Information Practice*, *14*(3), 2–27. https://doi.org/10.18438/eblip29547

Scoulas, J. M., & De Groote, S. (2022). Impact of undergraduate students' library use on their learning beyond GPA: Mixed-methods approach. *College & Research Libraries*, *83*(3). https://doi.org/10.5860/crl.83.3.452

Scoulas, J. M., De Groote, S. L., Shotick, K., & Osorio, N. (2024a). Student Academic Engagement and Success (SAES) survey. University of Illinois at Chicago. https://doi.org/10.25417/uic.26828848

Scoulas, J. M., De Groote, S. L., Shotick, K., & Osorio, N. L. (2024b). A holistic approach to understanding undergraduates: Campus engagement, library use and psychological factors. *The Journal of Academic Librarianship*, *50*(5), 102936. https://doi.org/10.1016/j.acalib.2024.102936

Scoulas, J.M., Shotick, K., De Groote, S.L., & Osorio, N.L. (2024). Developing and validating assessment tools for measuring undergraduate students' academic engagement and academic achievement: Lessons learned from a pilot research project. *Journal of Library Administration*, *64*(2), 243–251. https://doi.org/10.1080/01930826.2024.2305075

Scoulas, J. M., Shotick, K., De Groote, S. L., & Osorio, N. (2025). From grades to growth: Understanding undergraduate perceptions of academic success. *The Journal of Academic Librarianship*, *51*(1), 102982. https://doi.org/10.1016/j.acalib.2024.102982

Selicean, C.F., & Ilea, M. (2024). Current trends in research on the role of university libraries in students' academic success: A review. *Bulletin of the University of Agricultural Sciences & Veterinary Medicine Cluj-Napoca. Horticulture*, *81*(1). https://doi.org/10.15835/buasvmcn-hort:2023.0031

Soria, K. M., Fransen, J., & Nackerud, S. (2013). Library use and undergraduate student outcomes: New evidence for students' retention and academic success. *portal: Libraries and the Academy*, *13*(2), 147–164. https://doi.org/10.1891/9780826153630.0011

Tao, X., Hanif, H., & Lieqin, W. (2025). The effects of self-regulated learning strategies on academic procrastination and academic success among college EFL students in China. *Frontiers in psychology*, *16*, 1562980. https://doi.org/10.3389/fpsyg.2025.1562980

Wibrowski, C. R., Matthews, W. K., & Kitsantas, A. (2017). The role of a skills learning support program on first-generation college students' self-regulation, motivation, and academic achievement: A longitudinal study. *Journal of College Student Retention: Research, Theory and Practice*, *19*(3), 317–332. https://doi.org/10.1177/1521025116629152

Yip, T., Chiu, D. K. W., Cho, A., & Lo, P. (2019). Behavior and informal learning at night in a 24-hour space: A case study of the Hong Kong Design Institute Library. *Journal of Librarianship and Information Science*, *51*(1), 171–179. https://doi.org/10.1177/0961000617726120

York, T. T., Gibson, C., & Rankin, S. (2015). Defining and measuring academic success. *Practical Assessment, Research and Evaluation*, *20*(5), 1–20. https://doi.org/10.7275/hz5x-tx03

Zimmerman, B. J (2000). *Attaining self-regulation: A social cognitive perspective*. In M. Boekaerts, P.R. Pintrich, & M. Zeider (Eds.), Handbook of self-regulation (pp. 13-39). Academic Press.

Appendix A

Note: For academic libraries wishing to adapt and use a generic version of the survey, please access it here: https://doi.org/10.25417/uic.26828848

UIC Student Academic Engagement and Success Survey

Start of Block: Block 1

Q1 I have read the "Agreement to Participate" document and agree to participate in this research.

- ○ Yes
- ○ No

End of Block: Block 1

Start of Block: Default Question Block

Q2 Category 1: Demographics

Q3 Which of the following best describes your racial/ethnic background?

- ○ American Indian or Alaska Native
- ○ Asian or Asian American
- ○ Black or African American
- ○ Hispanic or Latinx
- ○ Middle Eastern or North African
- ○ Multi-racial (two or more races)
- ○ Native Hawaiian/Other Pacific Islander
- ○ White
- ○ I do not identify with any of these categories. Please specify.

  _____

- ○ I prefer not to respond

Q4 Are you an international student?

- ○ Yes
- ○ No

Q5 What is your gender identity?

- ○ Female
- ○ Gender non-conforming
- ○ Male
- ○ Prefer not to say
- ○ Another gender identity. Please specify.

  _____

Q6 Did you receive a Federal Pell grant or Illinois MAP grant as part of your financial aid package? (This does not include private student loans)

- ○ Yes
- ○ No
- ○ Unsure

Q7 Category 2: Academic engagement activities

Q8 During the past semester (fall 2023), how often have you visited the following?

	Never	Seldom (once or twice a semester)	Sometimes (about once a month)	Often (2-3 times a month)	Weekly (once or more times a week)	Unaware of this
A university library at UIC	○	○	○	○	○	○
Campus service to support academics (e.g., peer coaching, tutoring, advising, etc.)	○	○	○	○	○	○
Campus service to support well-being (e.g., counseling, disability, health center, wellness center, etc.)	○	○	○	○	○	○
Cultural Center (e.g., African American, Asian American, etc.)	○	○	○	○	○	○
Student Organization meeting or event	○	○	○	○	○	○
UIC's online library website	○	○	○	○	○	○
UIC Commuters center	○	○	○	○	○	○
Writing center	○	○	○	○	○	○

Display this question:

If During the past semester (Fall 2023), how often have you visited the following? = A university library at UIC [Seldom (once or twice a semester)]

Or During the past semester (Fall 2023), how often have you visited the following? = A university library at UIC [Sometimes (about once a month)]

Or During the past semester (Fall 2023), how often have you visited the following? = A university library at UIC [Often (2-3 times a month)]

Or During the past semester (Fall 2023), how often have you visited the following? = A university library at UIC [Weekly (once or more times a week)]

Q9 During the past semester (fall 2023), how often did you do the following in the library?

	Never	Seldom (once or twice a semester)	Sometimes (about once a month)	Often (2-3 times a month)	Weekly (once or more times a week)
Attended library instructional sessions One-on-one consultation/meeting with a librarian	○	○	○	○	○
Attended online classes	○	○	○	○	○
Met with friends	○	○	○	○	○
Obtained physical library materials (e.g., books, course reserves)	○	○	○	○	○

Prayed or meditated	○	○	○	○	○
Studied and/or worked on homework or research projects on my own (Individual)	○	○	○	○	○
Studied and/or worked on homework or research project with other students (Group)	○	○	○	○	○
Engaged in nonschool activities (e.g., job interviews, confidential conversations)	○	○	○	○	○
Took a break (e.g., took a nap, watched videos, played games)	○	○	○	○	○
Used a computer	○	○	○	○	○
Used a printer	○	○	○	○	○
Other (please specify)	○	○	○	○	○

Display this question:

If During the past semester (fall 2023), how often have you visited the following? = A university library at UIC [Never]

Q10 Please select the reasons you never visited the university library. Select all that apply.

- ○ I could not find a space easily
- ○ I did not like the library environment (e.g., too loud or too dark)
- ○ I did not need library materials/resources for my coursework
- ○ I used study space at home/residence hall
- ○ I used other study space on campus
- ○ I used other study space off campus
- ○ I was concerned for personal safety (e.g., crime near campus)
- ○ I was concerned about COVID-related health issues
- ○ I was unsure where the library was
- ○ I was able to access what I needed online
- ○ It was too far from where I live
- ○ The library hours were not convenient to me
- ○ Other (Please specify) _____

Display this question:

If During the past semester (fall 2023), how often have you visited the following? = UIC's online library website [Seldom (once or twice a semester)]

Or During the past semester (fall 2023), how often have you visited the following? = UIC's online library website [Sometimes (about once a month)]

Or During the past semester (fall 2023), how often have you visited the following? = UIC's online library website [Often (2-3 times a month)]

Or During the past semester (fall 2023), how often have you visited the following? = UIC's online library website [Weekly (once or more times a week)]

Q11 During the past semester (fall 2023), how often did you do the following from the online library website (any location)?

	Never	Seldom (once or twice a semester)	Sometimes (about once a month)	Often (2-3 times a month)	Weekly (once or more times a week)	Unaware of this
Accessed research guides	○	○	○	○	○	○
Chatted with or emailed a librarian	○	○	○	○	○	○
Checked library hours	○	○	○	○	○	○
One-on-one consultation/meeting with a librarian	○	○	○	○	○	○
Requested material from another library	○	○	○	○	○	○
Searched library databases for journal articles	○	○	○	○	○	○
Searched library databases or catalogs for books or other online materials	○	○	○	○	○	○
Other (Please specify)	○	○	○	○	○	○

Display this question:

If During the past semester (fall 2023), how often have you visited the following? = UIC's online library website [Never]

Q12 Please select the reasons you never used a library website. Select all that apply.

- ○ I did not need library materials/resources for my coursework
- ○ I could find what I needed on Google
- ○ It was difficult to navigate the library website
- ○ I was not familiar with online library resources or how to search them
- ○ Other (please specify) _____

Q13 In your program, how many courses last semester match the following statements?

	More than 5 courses	3-5 courses	1-2 courses	None
My assignments require me to seek out information from resources (such as online or in the library) in order to complete them	○	○	○	○
I am provided guidance in my classes on how and/or where to find the information I need to complete my assignments.	○	○	○	○
I am mostly evaluated in my classes for coursework that does NOT require me to seek additional information beyond what I am provided in my course(s).	○	○	○	○

Q14 Category 3: Goal setting/attainment, social learning, self-directed learning, information seeking behaviors

Q15 Please rate the level of agreement on the following statements.

	Strongly disagree	Disagree	Uncertain or unsure	Agree	Strongly agree
I do not have a hard time setting goals for myself	○	○	○	○	○
I usually keep track of my progress toward my goals	○	○	○	○	○
I am able to accomplish goals I set for myself	○	○	○	○	○
I have personal standards, and try to live up to them	○	○	○	○	○
Once I have a goal, I can usually plan how to reach it	○	○	○	○	○
I do not get easily distracted from my plans	○	○	○	○	○
I can stick to a plan that's working well	○	○	○	○	○
I am able to resist temptation when working to accomplish my goals	○	○	○	○	○

Q16 Please rate the level of agreement on the following statements.

	Strongly disagree	Disagree	Uncertain or unsure	Agree	Strongly agree
I am inspired to study or complete my coursework by observing how others study	○	○	○	○	○
I interact with and/get support from other students to enhance my learning	○	○	○	○	○
I enhance my learning by working with my TAs and instructors' support	○	○	○	○	○

Q17 Please rate the level of agreement on the following statements.

	Strongly disagree	Disagree	Uncertain or unsure	Agree	Strongly agree
I can stay focused and productive whether I'm at home, in a library, or even on the go.	○	○	○	○	○
I can stay focused in noisy environments.	○	○	○	○	○
I can concentrate on my studies despite being around friends or family.	○	○	○	○	○

Q18 Please rate the level of agreement on the following statements.

	Strongly disagree	Disagree	Uncertain or unsure	Agree	Strongly agree
I can easily find information I need to complete my coursework without assistance.	○	○	○	○	○
Whether it's online or in a library, I can confidently find information to complete my course work.	○	○	○	○	○
I am confident that I can evaluate information I find to determine whether or not it is reliable to use for my coursework.	○	○	○	○	○

I am confident in my ability to read and apply the information I find.	○	○	○	○	○
I am comfortable asking for assistance if I need help seeking information.	○	○	○	○	○

Q19 Category 4: Students' own definition of academic success

Q20 Please select the best description that matches how you think academic success looks and feels to you.

- ○ getting good grades/doing well in class
- ○ passing classes
- ○ achieving goals or staying on track
- ○ being able to stay organized
- ○ working hard, personal fulfillment and satisfaction
- ○ being proud/exceeding expectations or earning recognition
- ○ balancing school, life, and other responsibilities
- ○ learning and applying skills and knowledge
- ○ improving social skills with peers, professors, instructors, or TAs
- ○ getting a job
- ○ getting a degree/graduating
- ○ being able to help others
- ○ others. Please specify: _____

Q21 Please select the second-best description that matches how you think academic success looks and feels to you.

- ○ getting good grades/doing well in class
- ○ passing classes
- ○ achieving goals or staying on track
- ○ being able to stay organized
- ○ working hard, personal fulfillment and satisfaction
- ○ being proud/exceeding expectations or earning recognition
- ○ balancing school, life, and other responsibilities
- ○ learning and applying skills and knowledge
- ○ improving social skills with peers, professors, instructors, or TAs
- ○ getting a job
- ○ getting a degree/graduating
- ○ being able to help others
- ○ others. Please specify: _____

Q22 Please select the third best description that matches how you think academic success looks and feels to you.

- ○ getting good grades/doing well in class
- ○ passing classes
- ○ achieving goals or staying on track
- ○ being able to stay organized

- ○ working hard, personal fulfillment and satisfaction
- ○ being proud/exceeding expectations or earning recognition
- ○ balancing school, life, and other responsibilities
- ○ learning and applying skills and knowledge
- ○ improving social skills with peers, professors, instructors, or TAs
- ○ getting a job
- ○ getting a degree/graduating
- ○ being able to help others
- ○ others. Please specify: _____

Q23 Thank you for your time. The following is the final question of the survey. By clicking your answer below, your response to this survey will be submitted. Are you willing to participate in an eight-week online journal to report your weekly academic engagement activities between March 4 and May 3, 2024? If you choose to participate, you will receive up to $80. If your response is yes, you will be directed to a separate survey to enter your contact information. Your contact information will not be linked with your survey responses.

- ○ Yes
- ○ No

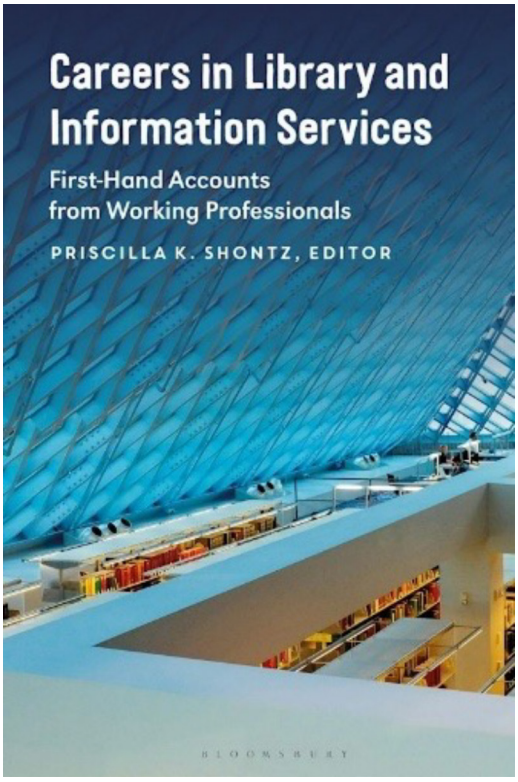
End of Block: Default Question Block

Careers in Library and Information Services: First-Hand Accounts from Working Professionals, Priscilla K. Shontz (ed.), Bloomsbury Publishing, 2025. 392pp. eBook, $53.95. 9798216185765.

Nearly 20 years after publishing *A Day in the Life: Career Options in Library and Information Science*, editor Priscilla K. Shontz offers *Careers in Library and Information Services: First-Hand Accounts from Working Professionals* as a much-needed update for candidates navigating the 2020s job market. In this edited volume, scores of practitioners across the landscape offer aspiring professionals 101 profiles describing the numerous opportunities our field offers. In the informal style of a fireside chat, contributors provide overviews of their positions; discuss the most enjoyable and demanding parts of their jobs, their professional trajectories, and surprising aspects about their roles or the profession; offer advice to anyone interested in their respective lines of work; and share any final thoughts not already covered.

Contributions are organized thematically into five main occupational sections: 1. Public Libraries; 2. School Libraries; 3. Academic Libraries; 4. Special Libraries; and 5. Beyond the Library (i.e., information careers adjacent to librarianship). Within each section, practitioners' entries are further organized alphabetically by job titles. This ease of navigation enables readers to effortlessly locate positions they are interested in learning more about. Between the conversational prose and straightforward layout, users will find this volume an engaging and accessible read.

The greatest strength of *Careers in Library and Information Services* is its reflection of the diverse opportunities that exist across the sector. In addition to demonstrating various career paths within librarianship and archival work, the book features 30 adjacent information roles, ranging from consulting and consortium work to digital asset management and fundraising. Even longtime practitioners may be surprised to learn about unconventional possibilities in areas like competitive intelligence. Collectively, the authors of the "Beyond the Library" section thoroughly discredit the common misconception that the library degree only opens doors to careers in libraries and archives.



Despite the number of contributors representing different backgrounds and walks of life, common themes emerge. Besides their shared passion for connecting patrons to information, practitioners frequently describe how their professional goals evolved during library school, suggest that skills gained in previous jobs are transferable to the field, emphasize the importance of networking for career advancement, and exhort future colleagues to embrace self-care and guard against burnout. While aspiring

professionals are the intended audience, early career practitioners will benefit from reading the book as well.

Conversely, this edited volume demonstrates that the profession is far from monolithic. As with any group of people, information services practitioners often hold conflicting opinions and perspectives. Beliefs regarding the ease of transitioning to another area within the field aptly illustrate this point. Library Development Consultant Reagen A. Thalacker (Special Libraries), for instance, was surprised to find that the "longer you're in an area of librarianship, the harder it is to shift to something else" (p. 208). Learning and Training Manager Shanna Hollich (Beyond the Library), however, disagrees: "I have heard many librarians over the years talk about how difficult it is to transition from one type of library to another, or even from one type of library work to another. I have never found this to be the case" (p. 318).

Arguably the most insightful and sobering aspect of the work is its largely critical assessment of library school programs' effectiveness in training aspiring practitioners. While some contributors state that their respective programs adequately prepared them for working in the field, many more (at least 15) suggest that this was not their experience. Adult and Teen Librarian Zack North (Public Libraries), for example, believes that his previous experience in residence life better equipped him for his career than his MLIS did. Likewise, Electronic Resource Management Librarian Lucy Campbell (Academic Libraries) warns interested readers that for her line of work, "the curve is steep coming out of the MLIS degree" (p. 117). And most damning of all was one seasoned veteran's advice to Children's Librarian Yesenia Villar (Public Libraries) as she embarked on her career: "Forget all that shit you learned in library school" (p. 16). While these commentaries will come as no surprise to many practitioners, library school administrators and professors would do well to reflect on the volume's generally unflattering evaluation of LIS education in North America and reform their curricula to better align with the practical needs of the profession they are meant to serve.

One criticism of the work is that the biographical sketches for all contributors are listed in a separate concluding section. This is standard practice for library and information science volumes with multiple authors; however, given the sheer number involved in this publication, frequently flipping back and forth proves tiresome. The editor would have better served users by prefacing practitioners' contributions with these sketches throughout the book for a more enjoyable experience.

This minor critique notwithstanding, *Careers in Library and Information Services: First-Hand Accounts from Working Professionals* is a welcome addition to the literature. While libraries serving ALA-accredited library and information science programs are the most likely to acquire this work for their collections, all academic libraries are encouraged to offer and recommend this resource to dedicated student workers who demonstrate promise as potential information services professionals.

— *A. Blake Denton, Collection Management Librarian, University of Southern Mississippi*

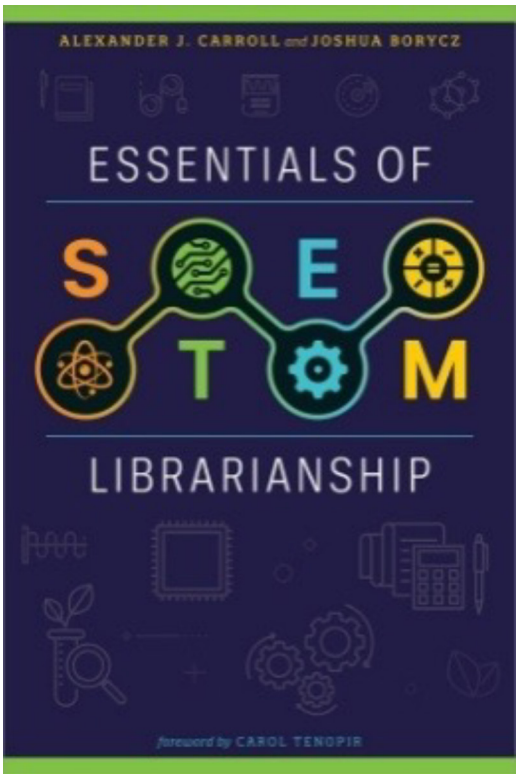
References

Shontz, P. K., & Murray, R. A. (Eds.) (2007). *A day in the life: Career options in library and information science.* Libraries Unlimited.

Essentials of STEM Librarianship, Alexander J. Carroll and Joshua Borycz, ALA Neal-Schuman, 2025. 264pp. Softcover, $64.99. 9798892555845.

Essentials of STEM Librarianship seeks to answer two questions: What is the purpose of a STEM librarian when everything appears to be available online; and how can modern STEM librarians effectively engage with their departments? As the title of this book suggests, Carroll and Borycz offer an overview of what they consider to be the fundamentals of STEM librarianship. Arguing that librarians should be more aware of—and involved in—the entire research lifecycle, the authors provide information on the higher education landscape, skills, and knowledge they consider fundamental, as well as strategies for supporting STEM departments. Organized in a clear three-part structure, this book is an excellent starting point for anyone interested in or beginning a career as a science librarian at a large, STEM-research-heavy academic institution that employs many science subject liaisons, such as those with a R1 Carnegie Classification.

Part I, "STEM and the American Higher Education Environment," includes chapters on how STEM education interacts with academic libraries and in what ways science is different from other academic disciplines. This section provides a unique context to better understand how large research institutions are organized and how scientists approach their work differently from other academic disciplines. Chapters 4 and 5, the most useful in the book, describe the various "personas" of campus stakeholders, such as research faculty or deans. Considering the different information each stakeholder group might be interested in or motivated by suggests how to interact with them. While basic, these chapters are a highlight of the book and introduce the important partners that new librarians may be interacting with to build stronger relationships.



Part II introduces necessary skills and knowledge for aspiring STEM librarians. This section covers the bulk of what novice and experience STEM librarians may want to know. The four chapters in this section cover information-seeking behavior of various user groups, the major STEM databases, how science is communicated, and the methods of managing data. Chapter 8, "Managing Data and Evaluating Research," was especially interesting as the authors anticipate an increasing role for librarians in research data management, as well as increasing inclusion within the broader research lifecycle of large research enterprises. The authors make a compelling argument for the addition of research data management skills to a STEM librarian's toolbox. A chapter on artificial intelligence may also tempt experienced academic science librarians who are interested in learning more about the growing field and how to apply it to their own work.

Part III is about the design and structure of liaison librarian programs. Chapters include how to support a university's teaching and research mission, ways to manage relationships, and suggestions for designing liaison librarian programs. Although these chapters are interesting and possibly helpful to new librarians, the last chapter is confusingly aimed at administrators or supervisors rather than the previously assumed audience of new STEM librarians. Some suggestions—such as curriculum mapping and building relationships by being responsive and reliable—are easily followed. Others—such as joining weekly research lab meetings and switching from a single subject liaison model to a team-based liaison model—may be difficult to implement without significant work embedding oneself into STEM departments and subject liaison cooperation. The need for broad library departmental buy-in may be why the authors aimed this final chapter at administrators, although the purpose is not explicitly stated.

The entire book does an excellent job acknowledging that higher education is changing and addressing how liaison librarian interactions with their departments likewise need to adapt. The authors provide suggestions and ideas based on their own experiences and what has worked for them. Many science librarians will appreciate the clear writing and helpful tables, as well as the summaries at the end of each chapter.

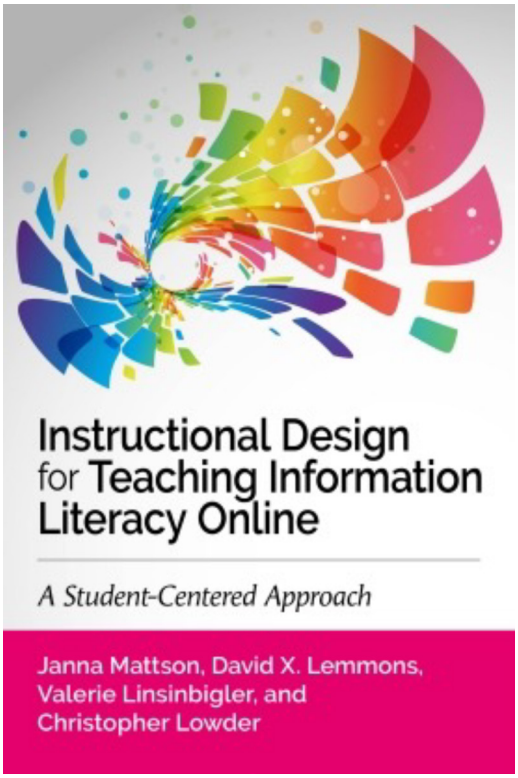
There are, however, a few flaws that limit the potential usefulness of this book for some readers. The most important is the underlying assumption that all institutions of higher education operate just like R1 Carnegie Classification STEM-focused research institutions. Another major challenge is a lack of definitions regarding what is and is not considered "STEM" for the purposes of this book. Additionally, neither STEAM (science, technology, engineering, art, math) nor STEMM (science, technology, engineering, math, medicine) is acknowledged as growing variations. As a result, readers looking to learn more about sciences that lean social-science heavy, such as environmental science, psychology, or health, may find relevant information missing. A short positionality statement acknowledging that the authors cover the traditional STEM world of science librarianship could have helped. A description of various science departments, their unique information-seeking behaviors, as well as how science librarians can most effectively engage with them, is also absent.

Although there are many citations included throughout the book, there are very few sources from any major science librarianship journals, no articles on the information-seeking behavior of science library users, and limited references about current science liaison librarian responsibilities (which are arguably out of date). The authors appear to draw from their own experiences, evident from their statement, "although many liaison librarians view research data as the domain of functional specialists, we believe these areas of expertise are as foundational for STEM liaison librarians as information retrieval or literature management" (p. 121). Support from research journals or perspectives from other librarians would provide further evidence of their arguments. While the skills and ideas presented in this book are interesting and helpful, some readers may find the suggestions to be secondary goals, rather than fundamental to their work. — *Clarissa M. Ihssen, Sciences Librarian American University*

Instructional Design for Teaching Information Literacy Online: A Student-Centered Approach, Janna Mattson, David X. Lemmons, Valerie Linsinbigler, and Christopher Lowder, Association of College and Research Libraries, 2025. 282pp. Softcover, $70.00. 9798892556231.

Developing information literacy instruction can be a daunting task for new and seasoned librarians alike. Adapting instruction to synchronous and asynchronous online instruction can present additional challenges and opportunities. *Instructional Design for Teaching Information Literacy Online: A Student-Centered Approach* looks to support librarians in their online teaching roles.

By organizing the text around the ADDIE instructional design model, the authors demonstrate a succinct and pragmatic approach to online instruction that would benefit librarians with any level of prior knowledge or experience. Except for the initial four chapters in Part 1, each section corresponds with a step in the ADDIE model: analysis; design; development; implementation; and evaluation. "Kicking Off" chapters at the beginning of each section define learning outcomes, making readers explicitly aware of what to expect. Uniquely, these introduction chapters include playlists of songs the authors found relevant to each section. While some readers might find the playlists superfluous, they suggest a unique pedagogical approach, one that library instructors might try in an asynchronous class to engage students and set the tone for the learning module. "Wrapping Up" sections are provided at the end of each part to recap the primary learning objectives and emphasize key concepts. Between "Kicking Off" and "Wrapping Up," individual chapters focus on a manageable and well-scaled list of learning outcomes.



While the organization of the book makes the authors' instructional design expertise apparent, the content included in the text provides proof of their combined experience. The "Foundational Knowledge" discussions offer just enough theory and framework to support readers through the rest of the book, and in their work, without being overwhelming. For example, three central learning theories—behaviorism, cognitivism, and constructivism—are introduced in under three pages along with specific applications in information literacy instruction settings, providing tangible examples of theory in practice. While this abbreviated treatment of the topic may, on the surface, seem limited, it is well aligned with the scope and purpose of the overall text. In good instructional design tradition, readers are presented with the right amount of content at the right time. Additional connections and applications of these learning theories are also seamlessly integrated throughout the chapters.

This book addresses the challenges and specific context of academic library instruction in an online setting which is something other texts and professional development opportunities sometimes generalize. For example, Part II, Chapters 3 and 4 address the "learning problem," specifically in an online setting. Authors discuss how much time and support students need in an online learning environment to successfully complete assignments. The librarian's role as subject matter expert ensures students learn the foundational resources and skills to meet the online curriculum requirements. This grounding in online library instruction adds to the value of the book in comparison to more general instructional design texts.

Part III, "Design" (the first 'D' in ADDIE) is especially pragmatic. Bloom's Taxonomy is introduced alongside a helpful list of verbs and practical guidance for librarians to use as they create their own learning outcomes (Chapter 5). Subsequent chapters discussing learning activities (Chapter 6) and assessment (Chapter 7) close the loop on the backward design process. Understanding the alignment between learning outcomes, activities, and assessment is critical knowledge for instruction librarians. While these three chapters are well-positioned within the book, they could also stand on their own as an excellent primer in designing library instruction.

The digital teaching space is central to the entire book, and examples are grounded in the online classroom; however, much of the content is transferable to in-person instruction. "Implementation," Part V, is an exception as it focuses specifically on the online modality wherein instruction is happening. Librarians who feel they have a solid understanding of instructional design but want to improve how they interact with students in online settings would benefit from the chapters about teaching online with confidence (Chapter 14) and facilitating the online classroom (Chapter 15).

Working through the book, readers are encouraged to complete an instructional design document (IDD) that will walk them through the ADDIE process, ultimately leading to a completed teaching plan for their own classroom. In the appendices readers will find a completed IDD, as well as a blank template that can be modified to complete their own ADDIE model. Other highlights of the back matter include a glossary of critical terms and a blank lesson plan.

The clear organizational structure and accessible language used throughout the book makes for quick reading. LIS students and early career professionals will appreciate the immediate applications and practicalities of the book, while more seasoned librarians will value a deeper reading to draw connections to the multiple layers of theories and frameworks. *Instructional Design for Teaching Information Literacy Online: A Student-Centered Approach* would fit well in any college or university library with an LIS collection or any teaching librarian's professional development collection. True to the quality instructional design it looks to model, this book centers the learner, regardless of their previous knowledge or experience with online library instruction. — *Patrick Leeport, Teaching & Learning Librarian, University of Wisconsin–Madison*