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Articles

Reviews

Evolving Trends: A Bibliometric Analysis of Academic Librarians' Publications at Twelve AAU Member Universities

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The goal of this bibliometric study was to explore the broader publication patterns of academic librarians in both information and library science (ISLS) and interdisciplinary research for the years 2009 to 2023. Web of Science data were collected for 12 academic libraries. The results showed that while the number of ISLS publications has dropped, interdisciplinary publications have increased dramatically with a broad range of disciplines represented, and that collaborations in the medical sciences were a major contributor to this increase. The study suggests that some academic libraries have shifted their priorities over the past 15 years and that the assessment of libraries' scholarly publications must evolve to capture this shift.

Introduction

Academic units are often under pressure to demonstrate their impact on the mission of their parent institution. The Association of American Universities (AAU) includes 71 leading research universities with membership indicators that include funded federal research, faculty awards, research citations, and book publications (Association of American Universities, 2025). Importantly, AAU uses only the Clarivate InCites Benchmarking and Analytics (Association of American Universities, 2025), and this database includes only publications that are indexed in Web of Science (WoS).

Academic libraries are no stranger to pressure, and academic libraries continually seek ways to communicate their value (*ACRL Plan for Excellence*, 2006; Evidence Base, 2021; Oakleaf, 2010). Many academic librarians are expected to engage in research, regardless of their employment category. When librarians are tenure-track faculty, their research efforts may be under increased scrutiny to achieve promotion. Librarians may initiate research related to their role with a library or collaborate on projects that leverage the librarian's expertise with researchers in other disciplines.

Academic libraries are well-poised to contribute to the research mission of their parent institution. Library faculty and staff are steeped in the culture and resources of research, have a broad range of expertise, and actively seek collaboration (Evidence Base, 2021; Oakleaf, 2010).

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Despite this, many studies that focused on the research publications of academic librarians examined only publications in specific information science and library science (ISLS) journals (Blecic et al., 2017; Weller et al., 1999; Wiberley et al., 2023; Wiberley et al., 2006). To minimize confusion, the term *information science and library science* (ISLS) will be used rather than library and information science (LIS) because ISLS is a Web of Science (WoS) journal research category. A few studies examined publications without targeting specific ISLS journals (Borrego et al., 2018; Chang, 2018) searching the databases more broadly. While these studies are valuable, they each had inherent limitations.

Studies that focused only on ISLS journals limited the target journals because the data were manually coded. This approach must necessarily exclude interdisciplinary research because there are far too many non-ISLS journals to screen. For studies that considered interdisciplinary research, the authors had to impose other limitations due to the difficulty of attributing a publication to a library and a librarian.

Two of the authors of this study are tenure-track library faculty at Purdue University, an AAU member university, and sought to get a more detailed picture of the research publications of librarians at similar academic research libraries. There were four principal research questions:

1. What is the productivity of academic librarians across all document types and disciplines at a sample of AAU institutions?
2. Is there a change in ISLS publications for academic librarians over the last 15 years?
3. If there is a decline in ISLS publications, are academic librarians engaging in more interdisciplinary research?
4. How do the citation rates vary between ISLS and interdisciplinary research and between articles and reviews?

Literature Review

A series of four studies published from 1999 to 2023 specifically focused on the publishing patterns of U.S. academic librarians in important ISLS journals (Blecic et al., 2017; Weller et al., 1999; Wiberley et al., 2023; Wiberley et al., 2006). In each of these studies, articles were manually examined to determine whether the author was an academic librarian. This required the authors to limit the number of target journals. These seminal and invaluable studies provide a wealth of information on the productivity of librarians, co-authorship patterns, the importance of librarian tenure status and the characteristics of their parent institution.

The first of this series (Weller et al., 1999) examined the articles in 32 North American ISLS journals for the years 1993–1997. This study found that 1,515 academic librarians produced a total of 1,579 articles in the journals during the analyzed time. Most authors (78.35%) produced a single article in the period under consideration, and most (55.03%) of these articles had a single author. This study also produced a list of the 20 most productive academic libraries. Librarians had faculty status at nine of the institutions, eight of which were AAU members. Four additional institutions also belonged to the AAU. The authors of the study speculated that institution prestige and faculty status both contribute to productivity of librarians.

The second of this series (Wiberley et al., 2006) covered the years 1998–2002. The results of this study are comparable to the first, with 77.67% of academic librarians publishing a single article in five years, 58.91% of which had a single author. The authors did note a small

decline in articles by academic librarians from 43.57% in 1993–1997 dropping to 39.56% in 1998–2002, but the cause and significance was not clear. In the top 20 libraries, librarians had faculty status at 12 with nine in the AAU. Six additional institutions were also AAU members.

The third in the series (Blecic et al., 2017) covered 10 years of data (2003–2012), although the authors also analyzed the data in two five-year chunks. While most academic librarians still produced a single article in each of the five-year periods (73.56% for 2003–2007 and 73.37% for 2008–2012), there was an increase in the percentage of authors who produced multiple articles. This study also noted a decline in the number of articles by academic librarians. The authors suggested that this decline could be the result of the decline in sole-authored articles with an increase in co-authored articles with two or more librarian authors. The number of institutions with tenure-track librarians increased to 19, with 10 in the AAU. One additional institution was an AAU member.

The fourth and most recent in the series (Wiberley et al., 2023) covered the years 2013–2017. Again, the percentage of academic librarians with a single article dropped slightly to 72.02%; however, more authors had multiple articles. This study noted an increase in the incident of academic librarians as co-authors. This helps to explain both the overall decline in the number of articles and the increase in number of articles for authors. The 2013–2017 top academic libraries list contains 23 institutions because of ties in position 20. Librarians had faculty status at 19 of the institutions, 10 of which were AAU members. Three additional institutions were also AAU members. Like previous studies, the authors noted that prestige of an institution and faculty status for academic librarians correlated with productivity.

Wiberely et al. (2023) suggested that future research into academic librarian publishing should broaden the scope to include other types of scholarly output, noting that it would entail focusing on a subset of academic librarians. Although they did not explicitly mention publications in non-ISLS journals, they speculated that traditional ISLS journals may not meet all the needs of academic librarians. Two previous studies (Borrego et al., 2018; Chang, 2018) pointed to the importance of interdisciplinary research for academic libraries.

Chang (2018) examined the interdisciplinary publications of librarian authors in non-ISLS journals indexed in WoS for the years 2005–2014. ISLS authors were defined in part by the occurrence of "library" or "information" in the address field of their publications. The search retrieved 4,567 articles, which was reduced to 1,270 after manual review. Further review created a subset of 479 articles by ISLS authors with verified ISLS educational backgrounds. This study showed that ISLS authors publish articles on diverse topics such as computer science, medicine, history, music, law, business, and education in non-ISLS journals. Most of the authors were affiliated with libraries and not ISLS departments. Strikingly, 41.3% of the ISLS authors had non-ISLS educational backgrounds which may be a contributing factor to the breadth of research.

Borrego, et al. (2018) took a similar approach, searching Scopus for the pattern "librar*" in the affiliation field for the years 2006–2015. This study included articles and reviews in all Scopus-indexed journals and retrieved more than 26,000 publications from 4,283 journals. The study revealed that the number of publications in ISLS journals was stable across the 10-year period but that there was a consistent increase in the publications in non-ISLS journals, starting at ~750 in 2006 and reaching nearly 1,400 in 2015. A detailed analysis of the affiliation data for 2015 revealed limitations on data interpretation (at least from the perspective of academic librarians) as 9% of the 2015 papers were false hits to nonlibrarians, 11% were

attributable to library schools, and 13% were authors affiliated with the National Library of Medicine. Regardless of this limitation, this study revealed that librarian authors participate in a broad range of research, noting the prevalence of systematic reviews and meta-analyses.

Methods

Terminology

For the sake of clarity, the terminology in this paper conforms to the terminology used in WoS bibliometric records as much as possible, which will be indicated by quoting and capitalization. Thus, library and information science will be referred to as "Information Science and Library Science" (ISLS). In WoS, "Publication" refers to the "Source" publication (i.e., "Book," "Journal" or "Conference"). WoS "Document Types" include "Articles," "Reviews," "Proceedings Papers," "Meeting Abstracts," "Letters" and more. In this paper, "Articles" and "Reviews" rely solely on the classification by WoS, which uses not only publisher information but also the occurrence of keywords in the title, abstract or introduction of the article (Clarivate, 2025a). WoS uses several schemes to classify "Publications," not individual "Documents," including "WoS Category" and "Research Area." The present study uses "WoS Category" as a starting point for a simplified research area classification based on Milosevic (2020). Finally, interdisciplinary will be used broadly to refer to any publication with a library-affiliated author that is not published in an ISLS journal. The rationale for this is that it is more descriptive than non-ISLS and reflects the likelihood that a library-affiliated author brings their expertise to research in another discipline.

Library Selection Criteria

Twelve academic libraries were selected for this study. Selection criteria included the following:

1. Membership in the Association of American Universities (AAU).
2. Librarians may have faculty status with tenure.
3. Public university.

These criteria were adopted to focus on libraries with similar pressures to publish and to have a manageable sample size. The selected libraries include Indiana University, The Ohio State University, The Pennsylvania State University (Penn State), Purdue University (Purdue), Rutgers University (Rutgers), Stony Brook University, University at Buffalo, The University of Arizona (Arizona), University of Colorado–Boulder (UC-Boulder), University of Illinois at Urbana-Champaign (UIUC), University of Maryland (Maryland), and The University of Utah.

AAU can be specific as to which campuses are AAU members, but there are exceptions in terms of reporting. For example, data for Indiana University School of Medicine in Indianapolis are reported through Indiana University Bloomington. A similar situation exists for University of Maryland for the College Park and Baltimore campuses (Association of American Universities, 2025). Accordingly, this study used an inclusive strategy with respect to campuses, especially when there was evidence that the libraries' organization spanned multiple campuses. For example, Rutgers included three campuses as this reflects the organization of the library. For Penn State, the study was limited to the State College and Hershey campuses because there are more than 20 regional campuses that could skew the results for Penn State. Of the libraries selected, only Purdue, UC-Boulder, and UIUC do not have a medical school. The goal of our selection strategy was to choose a sample that was representative of academic librarians that are most likely to engage in a broad range of research.

Database Search

The Web of Science Core Collection All Editions (SCI-EXPANDED, SSCI, AHCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, and IC) was searched in June of 2024 for "Publication Date" of 1/1/2009 to 12/31/2023. WoS was selected because this data is used by InCites and AAU to measure research productivity and quality. The time span of 15 years was chosen so that the study would have enough data to reveal trends over time, while also maintaining a manageable sample size. Additional details for the bibliometric data are available from WoS (Clarivate, 2025b).

The search strategy included three search types: by address, by author, and by ORCID iD each also linked to the general address for the parent university, including campus or city, as necessary. The first search was based on "Address" to discover publications from specific libraries, using a search string the included "library" or "libraries," university name and location such as city or campus (see Table 1). Full bibliometric records were downloaded as tab-delimited text files and imported into R. The addresses for all documents were extracted from the "Author Address" field of the records and analyzed to refine the address pattern. For some libraries, it was necessary to include other patterns (e.g., Purdue University Library includes a School of Information Studies). For other libraries, especially those where the parent institution has a separate library science unit, it was necessary to develop patterns that would remove specific addresses (e.g., Indiana University has a Department of Information and Library Science).

TABLE 1
Web of Science Search Strings

Search Type[a]	Search Component		
	Address	**Author/Identifier**	**Date**
Address	(AD=(university SAME (library OR libraries) SAME (location))	Not applicable	DOP=(2009-01-01/2023-12-31)
Author	(AD=(university) SAME (location))	(AU=last 1 first 1 OR AU=last 2 first 2 OR AU=last 3 first 3 OR ...)	DOP=(2009-01-01/2023-12-31)
ORCiD	(AD=(university) SAME (location))	(AI=ORCiD ID 1 OR AI=ORCiD ID 2 OR AI=ORCiD ID 3 OR ...)	DOP=(2009-01-01/2023-12-31)

[a] Search components for each search type were joined with the Boolean AND.

Once refined, author names were extracted from the "Author Address" field of the bibliometric record. Many authors have multiple name variants (bylines) depending on the use of middle name, initials, nicknames, or variations in the last name. Bylines were tagged as having full author status if the last name and either the first or middle name is spelled out. Bylines that only included first or middle initials were excluded from later searches because they were too ambiguous and retrieved off-target results.

The author bylines were used to extract ORCID iDs from the records. Names with multiple matches to ORCID iDs were checked on the ORCID website and incorrect matches were dropped. If all matches to ORCID were incorrect, the author's name was still retained for the "author" search.

Separate "Author" and "Author Identifier" searches were created with custom R scripts, with the general forms shown in Table 1. Importantly, the pattern "library OR libraries" was

dropped from the searches so that documents by a librarian that lacked specificity in the published address could be discovered.

The "Address," "Author" and "Author Identifier" results were imported into R and combined. Many documents were retrieved by all three searches, but it was also common for documents to be retrieved by only one or two searches. These documents were subjected to two levels of manual curation, the first to reveal nonlibrarian authors and the second to reveal publications by a librarian author that was not affiliated with the library at the time of publication.

Nonlibrarian authors can accidentally receive a library address when collaborating with librarians on published research. To identify this issue, all addresses for each author were extracted and tabulated. When an author frequently (more than one-third of the time) used addresses lacking "library" or "libraries," the author affiliations were confirmed by searching library websites, ORCID, LinkedIn, Facebook, and other websites. Authors not affiliated with the institution's library were removed from the author list. This removed all papers for that author that do not also have a librarian author.

The second level of manual curation was to discover publications by confirmed librarian authors published when they were not affiliated with a library. This can happen, for example, when an author receives their degree from their parent institution prior to joining the library, or when a graduate student collaborates with a librarian. Each publication that lacks a "library" address pattern was manually examined to determine the author affiliation, and publications with only affiliations to a nonlibrary department were removed.

Data Analysis

All data manipulation, statistical analyses and figures were generated with the R language for statistical computing (R Core Team, 2023) with tidyverse (Wickham, 2017) packages installed. Color palettes from the package ggsci (Xiao, 2023) were used in the figures.

Results and Discussion

Addresses and Authors

The searches discovered 1,040 library-associated authors using 1,275 author name variations. The complete data for authors are shared on Open Science Framework (OSF) as Supplemental File 1 (https://osf.io/8u6bz/files/r4nxm). Bylines often varied not only in the use of middle initials, but also due to other issues, such as misspellings, hyphenations, or the use of nicknames. This result showed one advantage of searching by address rather than author name as it would be difficult to create all bylines for an author given the possible variations and misspellings that can occur.

For 798 authors, no ORCID iD was extracted from the WoS records. While this appears to indicate that less than a third of library authors use or have an ORCID iD, this low adoption of ORCID may also reflect the fact that ORCID was only established in 2012, and that some journals still do not require authors to use it.

No attempt was made to determine if authors had faculty status because the purpose of this study was to include publications for all authors affiliated with the library. Observed employee categories include faculty, professional staff, undergraduate and graduate students, and postdoctoral associates.

Academic Librarians Scholarly Output Encompasses Many Document Types

The searches discovered more than 3,500 documents for the 12 libraries. Select bibliometric data are shared on OSF as Supplemental File 2 (https://osf.io/8u6bz/files/fuvwm). WoS indexes

many "Publication" and "Document Types" including "Journals," "Books," "Conferences," "Articles," "Reviews," and "Proceeding Papers" (Clarivate, 2025a). In addition, "Editorial Material," "Letters," "Book Reviews," "Database Reviews," "Software Reviews" and similar documents are indexed. In general, research documents, such as "Articles," "Reviews," or "Proceeding Papers," are peer-reviewed while the other material is not. No attempt was made to determine peer review status of individual documents because a broad overview of academic librarians' scholarly output necessitates including all documents.

To reveal patterns across the libraries, we developed a simplified "Document Type" scheme (see Table 2). The simplified "Document Types" were tabulated for each library and visualized as a proportional bar plot to make it easier to discern how each library balances its scholarly efforts (see Figure 1). The actual document count is shown as a number when space permits. Six of the 12 libraries had articles as the majority (50% or greater) of their scholarly output. Libraries at institutions that have a medical school tended to have a higher percentage of reviews with both Arizona and Maryland leading the libraries. Rutgers, UIUC, Ohio State, University at Buffalo, and Penn State have 25% or more of their scholarly output as resource reviews.

The observed patterns may reflect the priorities of the libraries or choices of individual librarians. Libraries with a high percentage of articles and reviews likely place stronger emphasis on research for the purposes of librarian tenure and promotion. Other factors that might contribute to this include collaboration with students or faculty in other disciplines and increased support by area specialists within the library. Libraries with a higher percentage of resource reviews may place more emphasis on service and engagement with librarianship.

TABLE 2
Simplified Document Type Scheme

Web of Science	Simplified
Article	Article
Article; Book Chapter	Article
Article; Data Paper	Article
Article; Early Access	Article
Article; Proceedings Paper	Article
Biographical-Item	Other
Book Review	Resource Review
Correction	Other
Database Review	Resource Review
Editorial Material	Other
Editorial Material; Book Chapter	Other
Film Review	Resource Review
Letter	Other
Meeting	Meeting
Meeting Abstract	Meeting
Music Performance Review	Resource Review
Music Score Review	Resource Review
News Item	Other
Proceedings Paper	Proceedings Paper
Record Review	Resource Review
Reprint	Other
Review	Review
Review; Book Chapter	Review
Review; Early Access	Review
Software Review	Resource Review
TV Review, Radio Review	Resource Review

Number of Authors for a Library Is a Predictor Variable for Number of Documents

The libraries differed in terms of the total number of publications indexed in WoS. An obvious explanation is that the staffing levels of the libraries differed. Rather than rely on external data to normalize the results, the hypothesis that the number of authors for a library was a predictor variable for the number of publications was tested. Both the author count and publication count relied only on WoS data. Two simple linear regressions were performed.

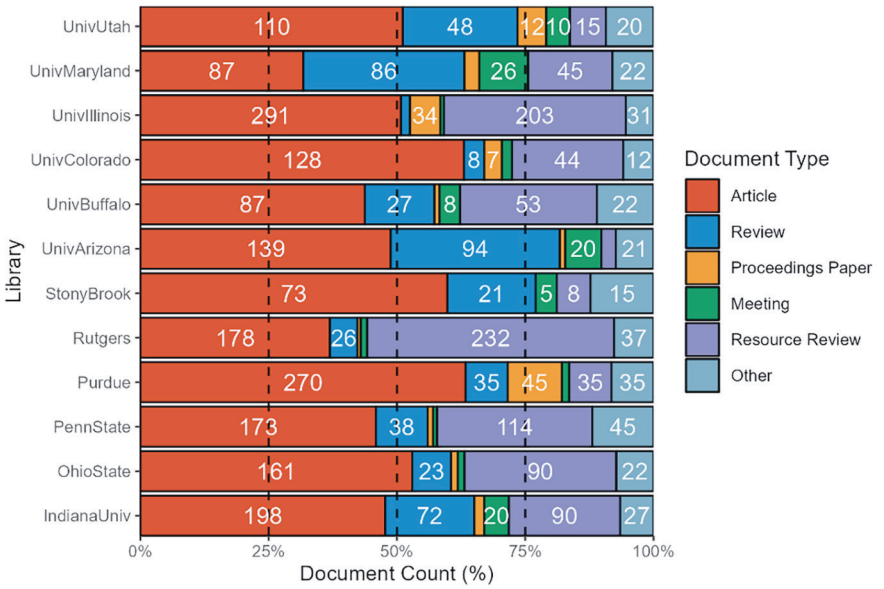

Figure 1. Distribution of Document Types by Library.

In the first, publication count included all "Document Types." In the second, only "Articles," "Reviews," and "Proceedings Papers" were included and designated as research publications.

For the first regression (see Table 3), author count was a statistically significant predictor for all publications ($F(1,10) = 15.32$, $p = .003$). The adjusted R^2 of .566 indicates that author count explains over 56% of the variability for publication count. The results are also visualized as a scatterplot with the linear model included (see Figure 2). In the second regression (see Table 3), author count was a statistically significant predictor for research publications ($F(1,10) = 13.37$, $p = .004$), and the adjusted R^2 of .529 indicates that author count explains nearly 53% of the variability for publication count. The second model is visualized in Figure 3.

The correlation between publication count and author count is not surprising, but the result should be interpreted with caution. Libraries above the fitted model (see Figure 2 or Figure 3) appear to be more productive than libraries below the fitted model. However, the publication count is based solely on WoS indexing, and the publication count could be biased against certain libraries whose authors choose to publish in journals not indexed in WoS. In addition, certain types of research take longer to complete from study design to publication. Systematic reviews and meta-analyses, for example, often take a year or more.

Academic Libraries Are Engaging in More Interdisciplinary Research

Previous research noted a decline in the number of articles by academic librarians in ISLS journals during the period 1993–2017 (Wiberley et al., 2023). In addition, other studies noted a surprising number of non-ISLS research publications with library-affiliated authors (Borrego et al., 2018; Chang, 2018). Another important trend to consider is the increasing importance of systematic and other review types to many research disciplines and the increasing demand for librarians on these research projects (Slebodnik et al., 2022).

One explanation for the decline in ISLS publications might be the increase in interdisciplinary research, especially "Reviews." To test this hypothesis, "Articles," "Reviews," and "Proceedings Papers" were classified as ISLS or interdisciplinary based on the WoS

TABLE 3
Linear Regression Analysis of Author Count as a Predictor of Publication Count

						CI[b]	
Model	**Term**	**Coefficient**	**SE[a]**	**t Value**	**p-value**	**Lower**	**Upper**
All Publications ~ Authors	Intercept	-13.31	89.56	-0.15	.884	-212.87	186.25
	Authors	3.12	0.80	3.92	.003**	1.34	4.89
Research Publications ~ Authors	Intercept	13.60	55.85	0.24	.813	-110.84	138.05
	Authors	1.81	0.50	3.66	.004**	0.71	2.92

[a] Standard error
[b] 95% Confidence interval
** $p < .01$

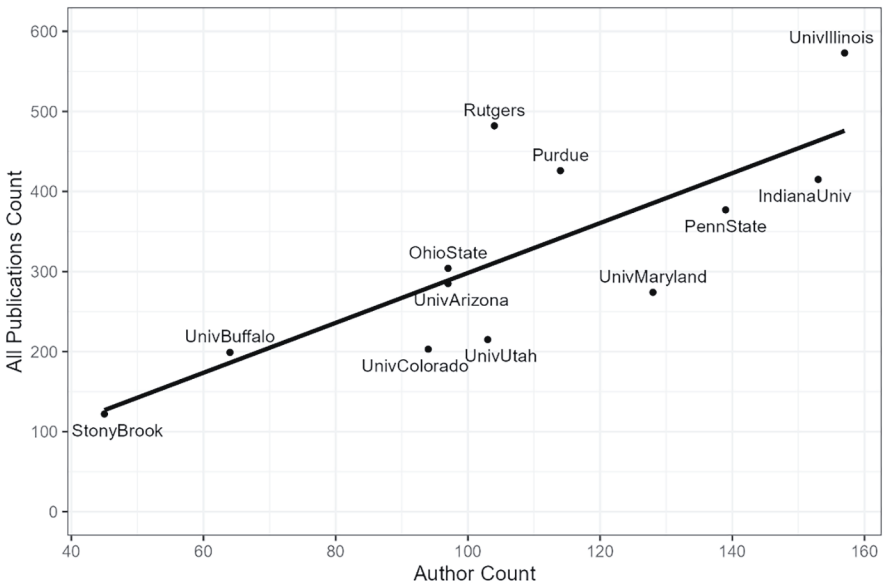

Figure 2. Visualization of Author Count as a Predictor Variable for All Publication Count.

subject category for the document. Any document tagged with "Information Science & Library Science" was classified as ISLS and all others were tagged as interdisciplinary. The number of publications by "Document Type," ISLS versus interdisciplinary, and "Publication Year" were tabulated. The search strategy limited publications to 2009–2023; however, when the bibliometric data were updated on June 20, 2024 (to normalize citation counts) 20 previous 2023 publications now had a 2024 "Publication Year." These publications were included as 2023.

Table 4 shows that 44.9% of the research publications in the dataset were not published in ISLS journals and can be considered interdisciplinary with "Reviews" as large part of this research. Figure 4 shows that there was an overall increase in "Articles" and "Reviews" for the selected libraries, peaking in 2018 ("Proceedings Papers" were omitted to simplify the figure). Since then, total publications plateaued or declined slightly. There was a decline in ISLS publications after reaching a peak in 2017. In contrast, interdisciplinary publications showed a steady increase across most of the period with reviews displaying strong increases since 2015.

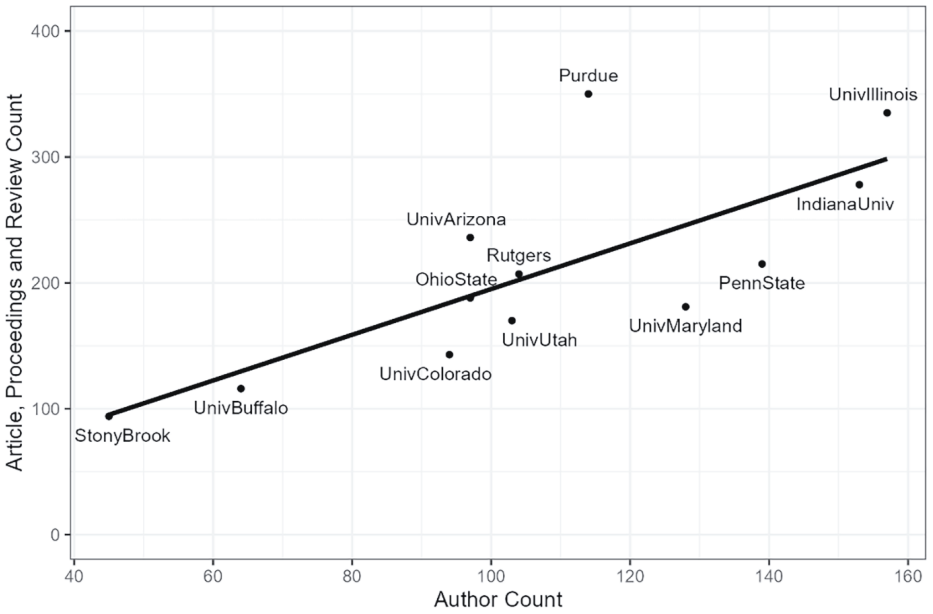

Figure 3. Visualization of Author Count as a Predictor Variable for Research Publication Count.

These results were striking but not entirely unexpected. What is surprising is that the current study showed ISLS publications fluctuating or trending upward from 2009 to 2017, a period in which earlier studies noted a decline (Wiberley et al., 2023). Other studies have noted an increase in interdisciplinary research (Borrego et al., 2018; Chang, 2018); however, these studies lacked the individual library-level resolution needed to link the increases in interdisciplinary research to decreases in ISLS research. Because the current study focused on specific institutions, the results suggested that the two phenomena are correlated. To understand this correlation, more details are needed about the nature of the interdisciplinary research.

TABLE 4
Publication Count by Document Type and Research Area

Document Type	Discipline	Count	Percentage
Article	ISLS	1,251	50.9
Article	Interdisciplinary	598	24.3
Review	Interdisciplinary	437	17.8
Proceedings Paper	Interdisciplinary	68	2.8
Proceedings Paper	ISLS	58	2.4
Review	ISLS	47	1.9

Academic Libraries Engage in a Broad Range of Interdisciplinary Research

To help understand the trends revealed above, we classified "Articles" and "Reviews" with a simplified version of the "WoS Categories" using a published scheme (Milojević, 2020) with some modifications. This simplification was required to group similar types of research and to minimize duplicate counting of articles that were published in journals categorized with two or more "WoS Categories."

Details of the simplification scheme are in included on OSF as Supplemental File 3 (https://osf.io/8u6bz/overview), but the major modification was to "professional fields" category of

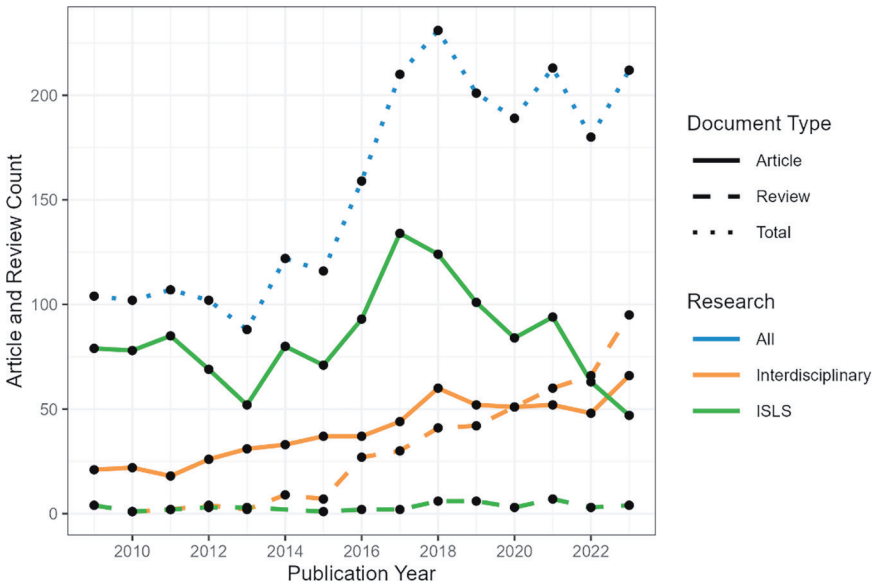

Figure 4. Interdisciplinary Research in Academic Libraries Has Increased Dramatically.

Milojević (2020) that included diverse professions such as "Information Science & Library Science," "Education," "Law," and "Business." Each of these examples was elevated to its own category in our scheme, while others were recategorized to other suitable existing categories. Some publications still have multiple categories, so they contributed to the count for more than one category, depending on how the data were analyzed.

To determine the percentage of ISLS and interdisciplinary research publications for each library, all publications were classified as in Figure 4 (i.e., any document with an "Information Science & Library Science" tag was classified as ISLS, and all other publications were classified as interdisciplinary). The data were tabulated for each library and visualized as a proportional bar plot (see Figure 5). This revealed striking differences among the libraries with Maryland at nearly 75% for interdisciplinary publications and UC-Boulder and UIUC both below 25%. Penn State and Purdue have had the median value for interdisciplinary publications at 42%. A contributing factor to the interdisciplinary research could be the relationship between the libraries and a medical school.

To reveal the types of interdisciplinary research, all publications with an ISLS tag were dropped, including ISLS journals with the following tags: "Information Science & Library Science; Computer Science," "Information Science & Library Science; Law," "Information Science & Library Science; Education," and "Information Science & Library Science; Humanities," which have 52, 33, 23, and 19 publications, respectively. Representative journals were *Information Technology and Libraries*, *Law Library Journal,* and *Journal of Scholarly Publishing*. These publications were considered only as ISLS because other important ISLS journals touching on other disciplines, such as *The Journal of the Medical Library Association* and *The Journal of Business & Finance Librarianship,* are categorized solely as "Information Science & Library Science" by WoS.

The simplified research categories for the remaining 606 "Articles" and 438 "Reviews" were tabulated for each library. Some publications still had multiple simplified research categories such as "Medical Sciences; Social Sciences," "Humanities; Social Sciences," "Medical Sciences; Education," "Social Sciences; Education," "Biological Sciences; Medical Sciences,"

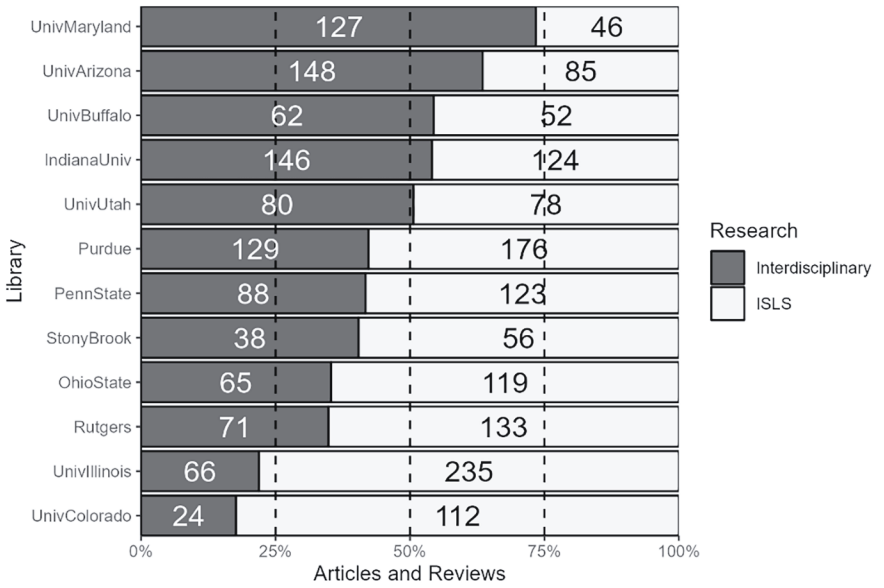

Figure 5. Interdisciplinary Research Can Be a Major Emphasis for Many Academic Libraries.

and "Medical Sciences; Psychology," which contributed 52, 17, 16, 15, 14, and 12 counts, respectively, to their categories. Of the 1,044 interdisciplinary publications, there are were only 254 duplicate counts.

The majority (575) of the interdisciplinary publications were categorized as "Medical Sciences." Of these, 347 were classified as "Reviews," and 288 of these had the keywords "systematic," "scoping," "meta-analysis," "umbrella," or "integrative" in the "Title." This is not unexpected given that nine of the 12 libraries are affiliated with institutions that have medical schools, and evidence synthesis research is prevalent in the medical sciences. The interdisciplinary research for other libraries focused on "Humanities," "Education," and the "Social Sciences;" this is especially true for libraries with a lower percentage of interdisciplinary research. However, many disciplines were represented and may reflect the presence of subject specialists with training in areas such as data management, geographic information systems and bioinformatics. Unlike publications in "Medical Sciences," "Articles" were more abundant than "Reviews" with 370 and 90 publications, respectively (73 of the "Reviews" have keywords for high-level reviews).

Analysis of Citations

AAU considers citations as one of the Phase I Indicators for membership, and the data are derived from WoS (Association of American Universities, 2025). For AAU libraries with faculty on the tenure-track, the citation data can be particularly important for promotion decisions. To acquire detailed citation data for the libraries' publications, we grouped the publications by research category (ISLS or interdisciplinary) and "Document Type" ("Articles" and "Reviews") and extracted the WoS "Accession Numbers." A citation analysis of these documents was performed at WoS on December 3, 2024, and the full records were retrieved. Unlike the bibliometric records, the citation records include annual citation numbers for each publication.

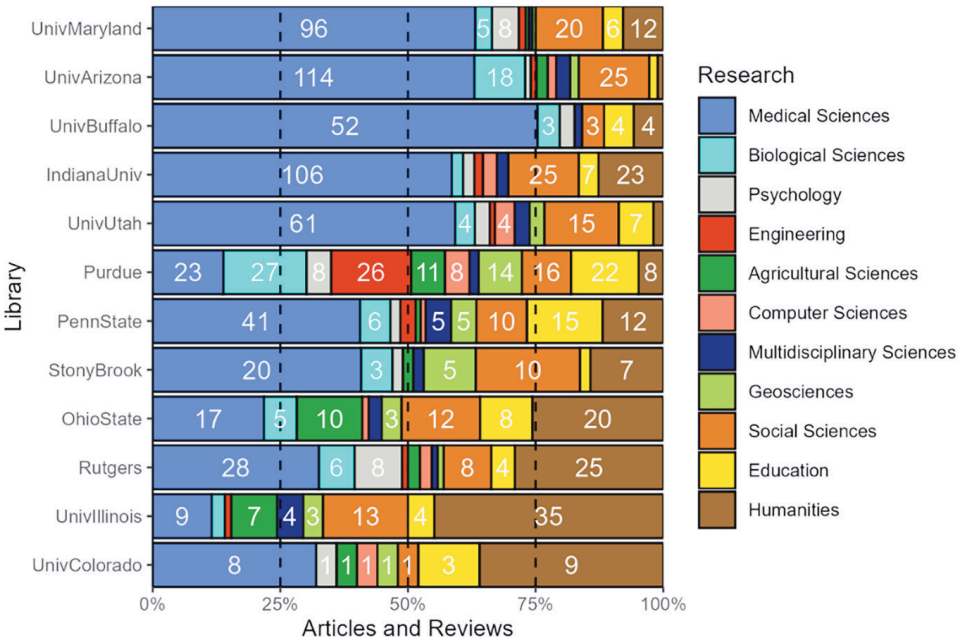

Figure 6. Academic Libraries Are Engaged in a Broad Range of Interdisciplinary Research.

To understand the overall citation numbers, the data were grouped as ISLS versus interdisciplinary and by "Document Type," and summary statistics were calculated (see Table 5). The median citations were included because the median is robust to outliers in the data such as "Reviews" incorrectly classified as "Articles." Given the research trends revealed in Figure 4, the annual citation trends were also visualized in Figure 7.

This analysis revealed that interdisciplinary publications received more citations than ISLS publications, with interdisciplinary "Reviews" as the publications with the highest total and median citations (see Table 5). However, the median citations for ISLS and interdisciplinary articles were similar. The average citations showed similar trends.

When visualized by year, the citation trends showed an increase in citations to interdisciplinary research that is even more dramatic than the increase in the number interdisciplinary publications (see Figure 7). Whereas interdisciplinary publications surpassed ISLS publications in 2020 (see Figure 4), citations to interdisciplinary research surpassed ISLS research in 2016. The impact or quality of research is often measured in terms of citations, and AAU explicitly uses WoS data. In this light, academic libraries research may have its most demonstrable impact through interdisciplinary research.

TABLE 5
Summary Table of Citation Data

Research Category	Document Type	Count	Citations (Total)	Citations (Median)	Citations (Average)
Interdisciplinary	Review	437	11,358	10	26.0
	Article	598	9,758	4	16.3
ISLS	Article	1,251	8,415	4	6.7
	Review	47	255	2	5.4

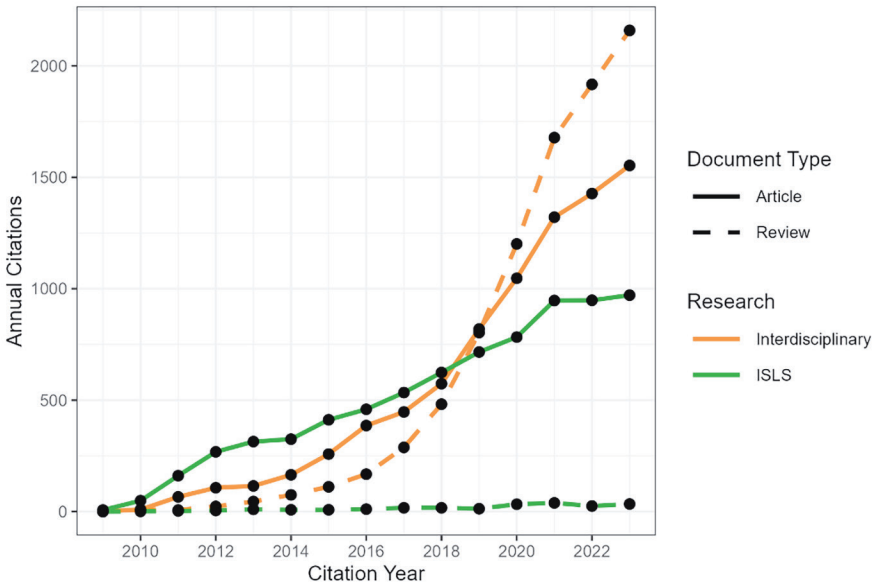

Figure 7. Citation Trends for Academic Libraries Research Publications.

Analysis of Journals

Choosing a journal for publication is a complicated decision for authors, and journal citation metrics can be helpful. Such metrics are available from many sources, including WoS. As an analysis of journal citation rates for this dataset will be valuable, citation data were grouped by journal, and summary statistics were determined. Unlike the overall citation data, "Articles" and "Reviews" were not separated because it was found that the incorrect classification of some "Reviews" as "Articles" distorted the results for some journals. The WoS quartile ranking is also included for ISLS journals. Table 5 shows the statistics for 35 journals that had 10 or more publications in the current dataset.

Most of the journals are ISLS journals, but six journals in other disciplines met the threshold of 10 or more publications. Given that the median citation rate for articles in ISLS journals is four (see Table 4), journals in Table 5 with median citation greater than four can be considered good publication platforms for academic librarian research. The WoS quartile ranking does not appear to be a strong predictor for journal citations, at least for the current dataset. This underscores the fact that quartile rankings apply to the journal and not to the individual articles.

Limitations

There are two major limitations on this study. First, the study was limited to 12 libraries that are not typical academic libraries. There are only 71 AAU member universities, and only a minority have librarians as tenure-track faculty. The sample was chosen to maximize the number of research publications from academic libraries while also maintaining a manageable sample size. The second limitation is the use of WoS as the only bibliometric database. This decision was made because WoS has good coverage of many disciplines and, critically, AAU publication metrics rely on WoS data. In terms of the study goals, the publication sample from WoS is sufficient to support the results. Including other databases, while informative, would complicate the study and would be unlikely to change the observed trends.

TABLE 6
Summary Statistics for the Top Journals

Journal	Research Category	Quartile[a]	Count	Citations (Total)	Citations (Median)
Journal of the Medical Library Association	ISLS	Q1	102	1,354	5.0
Portal-Libraries and the Academy	ISLS	Q3	92	632	4.0
College and Research Libraries	ISLS	Q2	88	905	6.5
Journal of Academic Librarianship	ISLS	Q2	87	674	6.0
Journal of Library Administration	ISLS	Q3	59	484	6.0
Reference Services Review	ISLS	Q2	48	392	5.5
College and Undergraduate Libraries	ISLS	Q3	43	223	4.0
Evidence Based Library and Information Practice	ISLS	Q4	41	156	1.0
Library Resources and Technical Services	ISLS	Q3	41	220	3.0
Cataloging and Classification Quarterly	ISLS	Q3	38	123	2.0
Journal of Consumer Health on the Internet	Interdisciplinary	-	38	68	1.0
Collection Management	ISLS	Q4	35	281	5.0
Reference and User Services Quarterly	ISLS	-	35	266	3.0
Information Technology and Libraries	ISLS	Q2	34	322	8.5
Law Library Journal	ISLS	Q4	32	172	2.0
Communications in Information Literacy	ISLS	Q3	30	266	6.5
Journal of Business and Finance Librarianship	ISLS	Q3	30	140	4.0
Technical Services Quarterly	ISLS	Q3	25	53	1.0
Journal of Agriculture and Food Information	Interdisciplinary	-	23	100	2.0
Library Trends	ISLS	Q4	22	155	6.0
BMJ Open	Interdisciplinary	-	21	459	5.0
Art Documentation	Interdisciplinary	-	20	35	1.0
PLOS One	Interdisciplinary	-	20	380	13.0
Journal of Map and Geography Libraries	ISLS	Q4	19	70	2.0
Journal of Web Librarianship	ISLS	Q3	19	183	9.0
Qualitative and Quantitative Methods in Libraries	ISLS	Q4	17	10	0.0
IFLA Journal-International Federation of Library Associations	ISLS	Q3	14	102	4.0
Library Journal	ISLS	Q2	14	59	4.0
Library Hi Tech	ISLS	-[b]	13	116	3.0
Journal of Scholarly Publishing	ISLS	Q3	12	37	3.0
Library Management	ISLS	Q2	12	42	3.5
Notes	Interdisciplinary	-	11	24	1.0
Publishing Research Quarterly	ISLS	Q3	11	20	2.0
Serials Review	ISLS	Q3	11	33	1.0
Bottom Line	ISLS	Q1	10	28	1.0
Interlending and Document Supply	ISLS	-	10	81	8.0

[a]Quartile rankings are only shown for ISLS journals.
[b]*Library Hi Tech* was de-listed from the Web of Science Core Collection, so no quartile ranking is available.

In support of this decision, Borrego et al. (2018) utilized only Scopus data when they noted the decline in ISLS publications and an increase in interdisciplinary research. Similarly, the results of Chang (2018) are based only on WoS.

Conclusions and Future Directions

Previous studies have suggested that academic librarians are shifting their research publications from top tier ISLS journals to other publishing opportunities (Wiberley et al., 2023), whereas other studies have revealed an increased involvement of librarians in interdisciplinary research (Borrego et al., 2018; Chang, 2018). At the same time, ACRL has recommended that academic libraries should seek ways to impact faculty research productivity (Oakleaf, 2010), and evidence synthesis research has shown tremendous growth (Slebodnik et al., 2022). The current study provides data that links these phenomena. The 12 libraries examined show a clear decline of ISLS publications, starting in 2017, as well as an increase in interdisciplinary research, which started earlier. By 2020, interdisciplinary publications outnumbered ISLS publications. This interdisciplinary research encompassed a broad range of disciplines; however, research in the medical sciences, especially reviews, is a major contributor to the increase.

The decline in ISLS research from academic libraries might seem alarming, but, if viewed through the lens of the ACRL report titled "The Value of Academic Libraries" (Oakleaf, 2010), this result has a positive interpretation. The ACRL report, in addition to including recommendations, concludes that academic libraries should align with the priorities of their institutions. Several recommendations involve collaborating with faculty in other disciplines to increase their success in research, grant writing, and teaching. The present study provides strong evidence, through co-authorship on interdisciplinary research publications, that academic librarians have successfully implemented at least some of these recommendations. The obvious example is the sheer number of reviews in the medical sciences, and there are similar publications in other disciplines. Academic libraries often hire subject specialists with training in data management, geographic information systems, bioinformatics, instructional design, and other areas, and these specialists can collaborate on research in a broad range of disciplines. The publications in biological sciences, engineering, and geosciences appear to be outcomes of such collaborations. The publications in education are also likely the result of successful collaborations between librarians—who have expertise in information literacy—and other faculty. Thus, the decline in ISLS research may be caused by the increase in interdisciplinary research as academic libraries' priorities evolve to align with their university. Academic libraries have a long history of evolving to meet new challenges such as digital libraries, open access publishing, research data management, and the COVID-19 pandemic. Each of these challenges ultimately strengthen academic libraries, and the evolving trend toward more interdisciplinary research is no different.

Oakleaf (2010) also recommends that academic libraries adopt systems to assess their progress in aligning with their institution. The present study's assessment suggests that at least some academic libraries have succeeded in shifting their research priorities. Given the increase in interdisciplinary research by academic librarians, it is critical that research productivity assessment not be limited to a small subset of journals, but that it instead embraces a broad range of journals across disciplines; the present study provides an example of how this can be done. Future studies should embrace a wider range of academic libraries and databases

despite such studies being laborious and time-consuming, even with computational methods. If academic libraries are to flourish, assessments that follow the principles of evidence synthesis must be implemented.

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Data Sharing Statement

The data that supports the findings of this study are available at Open Science Framework (https://osf.io/8u6bz/overview). The following supplemental data files are shared:

Supplemental File 1. A tab-delimited text file with author names, bylines, ORCID iDs, university and campus (https://osf.io/8u6bz/files/r4nxm).

Supplemental File 2. A tab-delimited text file with select bibliometric data for WoS documents analyzed for this research. Variables include university, WoS accession number, full authors, title, source, and publication year (https://osf.io/8u6bz/files/fuvwm).

Supplemental File 3. A tab-delimited text file with the scheme to simplify WoS research categories (https://osf.io/8u6bz/files/a6q8p).

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Teaching Source Evaluation to Undergraduate Nursing Students: Comparing the CRAAP Test and the Source + Beyond the Source Framework

Caitlin Ratcliffe*

Given the drawbacks of checklist approaches to source evaluation, this study compared a networked method, the Source + Beyond the Source framework, with the CRAAP Test in a one-shot library class for undergraduate nursing students. In one pre-test and two post-tests, participants evaluated websites promoting misinformation and disinformation, reliable consumer health websites, and peer-reviewed articles. The results showed no significant differences between the groups, although both groups improved following training. The open-ended responses indicated that few participants retained specific details from either evaluation tool. These findings highlight how the one-shot format limits the efficacy of academic librarians' information literacy instruction.

Introduction

In the contemporary landscape of information literacy, source evaluation remains a cornerstone. The modern information ecosystem is composed of an astonishing wealth of information—causing a subsequent "poverty of attention" (Simon, 1971)—and is further shaped by the pervasive effects of algorithmic personalization (Bull et al., 2021). From this environment, a global "infodemic" of health-related misinformation has emerged (Zarocostas, 2020). In the face of these challenges, undergraduate students struggle to critically evaluate online information, despite claims they are "digital natives" (Breakstone et al., 2021; Hargittai, 2010; Kirschner & van Merriënboer, 2013; McGrew et al., 2018; Wineburg et al., 2016). It is necessary for undergraduate students to cultivate an ability to identify health-related misinformation and disinformation; this is especially true for nursing students as they develop their professional identity and practice. Academic librarians are encouraged by the Association of College and Research Libraries' (ACRL) *Framework for Information Literacy for Higher Education* (ACRL Framework) (2016) to meet this need by teaching source evaluation at the undergraduate level.

This study compared two methods for teaching source evaluation to undergraduate nursing students: the CRAAP (Currency, Relevance, Authority, Accuracy, and Purpose) Test and the Source + Beyond the Source framework. CRAAP is a popular acronym used by academic librarians to introduce source evaluation to undergraduate students. As a *checklist* approach to source evaluation, there are many inherent limitations to the CRAAP Test, including the

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inefficiency, ineffectiveness, and impracticality of its use in real-world scenarios (Benjes-Small et al., 2013; Bull et al., 2021; Faix, 2021; Fielding, 2019; Kimmel, 2005; Lenker, 2017; Meola, 2004; Ostenson, 2014; Ziv & Bene, 2022). An alternative to checklists is *networked* approaches, which are more suitable for the present-day algorithm-driven information ecosystem (Ziv & Bene, 2022). The Source + Beyond the Source framework is a networked approach recently developed by librarians at DePaul University Library (Rismiller et al., 2023). There are few studies that quantify the effectiveness of networked approaches when directly compared with checklist approaches, and no studies examining the Source + Beyond the Source framework. This study seeks to fill this gap by assessing the effectiveness of the Source + Beyond the Source framework compared to the CRAAP Test in the context of one-shot library instruction teaching first-semester Bachelor of Science in Nursing (BScN) students to identify websites promoting misinformation and disinformation, reliable consumer health websites, and peer-reviewed articles. This study finds that, although students show a significant improvement following instruction in both methods, there are few differences between the efficacy of the two methods, and neither method produces ideal results. These findings emphasize the limitations of the one-shot format for academic librarians teaching source evaluation.

Background

The CRAAP Test

CRAAP is an acronym developed by Sarah Blakeslee (2004) at California State University, Chico, as a mnemonic tool for source evaluation. In the original articulation of the CRAAP Test, Blakeslee notes that these criteria—currency, relevance, authority, accuracy, purpose—were already widely used to teach source evaluation: only the mnemonic acronym itself was new. Caulfield (2018) further traced the origin of the CRAAP Test criteria to 1978, when it was originally developed as a tool for collection development. The five criteria of the CRAAP Test have been used by librarians to teach source evaluation for nearly two decades.

The effectiveness of the CRAAP Test is a topic of much interest to library and information studies (LIS) scholars. Several studies have found the CRAAP Test to be an effective method for teaching source evaluation when compared with no intervention (Esparrago-Kalidas, 2021; Myhre, 2012; Muis et al., 2022). However, the impact of the CRAAP Test is often inconclusive when compared with other source evaluation techniques, such as "prebunking," and/or the six journalistic question words (6QW). Caramancion (2022) compared the CRAAP Test with the prebunking method—a technique that pre-emptively teaches participants about rhetorical techniques and information manipulation—to identify misinformation and disinformation and found that the CRAAP Test was slightly more accurate, but also slower, than prebunking; notably, neither method was significantly more effective than the control group. Lowe et al. (2021) compared the CRAAP Test with the 6QW (Who, What, When, Where, Why, and How) method and found both groups scored about equally well on evaluation skill quizzes, although students who received the 6QW training produced papers with higher quality sources. The efficacy and limitations of the CRAAP Test often stem from its format as a checklist.

Checklist Approaches

The CRAAP Test is a checklist approach to source evaluation. Checklists are, at their core, a carryover from the strategies used to analyze analog resources (Caulfield, 2018). There are dozens of alternative checklists for source evaluation, including but not limited to the

ABCs (Authority, Bias, Citations) of web evaluation (Schrock, 1998, as cited in Sye & Statton Thompson, 2023); RADAR (Relevance, Authority, Date, Appearance, Reason) (Mandalios, 2013); the Five Ws (Who, What, When, Where, Why, and How) (Radom & Gammons, 2014); ACT UP (Author, Currency, Truth, Unbiased, Privilege) (Stahura, 2018); DIG (Digital Image Guide) (Thompson, 2019); and CARS (Credibility, Accuracy, Reasonableness, Support) (Harris, 2020). Checklists are often employed by librarians when teaching source evaluation. In a study of college and university websites, Ziv and Bene (2022) found that nearly every institutional website in the random sample featured checklist approaches. One reason for the popularity of checklist approaches is that they are easy to teach compared to other methods (Faix & Daniels, 2023) and can be useful for students who are new to research (Ostenson, 2014; Wichowski & Kohl, 2013).

Despite their ubiquity, checklist approaches also garner many critiques. Even in the early days of the internet, it was clear checklists do not serve learners in practice. There is an unrealistic number of criteria to remember and consider (Caramancion, 2022; Lenker, 2017; Meola, 2004; Radom & Gammons, 2014), and the mechanical application of checklist criteria does not promote critical thinking (Meola, 2004) or encourage meaningful learning (Lenker, 2017). Although checklists can provide useful scaffolding for students in the early stages of learning about source evaluation (Ostenson, 2014), they oversimplify the evaluation process (Kimmel, 2005; Ostenson, 2014) and tend to promote dualistic thinking of sources as "good" or "bad" (Benjes-Small et al., 2013; Lenker, 2017; Meola, 2004).

The emergence of Web 2.0 and the evolution of the online information environment have revealed more significant issues with checklist approaches to source evaluation. Although Wichowski and Kohl (2013) argue that the CRAAP Test can be effectively applied to blogs and microblogs, it is easy for misinformation and disinformation to meet a checklist's criteria (Breakstone et al., 2018; Caulfield, 2018). In a survey of 263 post-secondary students, Wineburg et al. (2020) found that an alarming majority of students could not identify a satirical news site as such or that a "nonpartisan" group was funded by industry lobbyists, even when they used strategies like the CRAAP Test. Because checklists focus on a website's internal features, they do not capture important contextual elements (Fielding, 2019; Ziv & Bene, 2022). Additionally, checklists do not factor in the impact of personalized search results (Bull et al., 2021; Faix, 2021; Fielding, 2019). Bull et al. (2021) observe that "CRAAP developed in a time when *you found information*, before the dramatic shift to *information finding you*" (Section 2; emphasis in original). Bull et al. argue that reactive approaches to source evaluation, including but not limited to checklists, do not address the pervasive effects of algorithmic personalization. Overall, checklist approaches appear increasingly inadequate in an algorithm-driven information ecosystem.

Networked Approaches

In contrast to the CRAAP Test, networked approaches to source evaluation are designed for the modern information environment. Ziv and Bene (2022) describe networked approaches as follows:

> Each source is part of a network of information. To understand a single node in the network, one must place it in the context of other networked sources. On the internet, an individual website—a node—is best understood in relation to what other internet sources have to say about it. (p. 907)

Examples of networked approaches to source evaluation include SIFT (Stop, Investigate, Find, Trace) (Caulfield, 2019); proactive evaluation (Bull et al., 2021); and CCOW (Credentials, Claims, Objectives, Worldview) (Tardiff, 2022). The best-known networked approach is SIFT, a method developed by Mike Caulfield. It consists of four "moves," which Caulfield (2019) defines as "*things to do* when looking at a source" (emphasis in original). SIFT emphasizes lateral reading to contextualize the information found in a source. Recent studies have found that lateral reading is an effective technique to improve college students' fact-checking strategies (Breakstone et al., 2021; Brodsky, Brooks, Scimeca, Galati, et al., 2021; Brodsky, Brooks, Scimeca, Todorova, et al., 2021; Fielding, 2019; McGrew et al., 2019). These findings demonstrate that networked approaches, such as SIFT, have the potential to significantly improve students' source evaluation skills.

Despite these benefits, networked approaches are difficult for many academic librarians to implement. Although Faix and Fyn (2023) argue that SIFT is compatible with the ACRL Framework, there are several practical barriers to adopting networked approaches in information literacy instruction. Faix and Daniels (2023) compared SIFT with the CRAAP Test in two asynchronous information literacy courses; they found that, although SIFT improved the quality of source selection, students required practice to apply SIFT correctly. Kaufman (2023) also compared SIFT with the CRAAP Test in an information literacy course and found that SIFT was more effective when used correctly; however, there were notable barriers for students to apply it correctly, including the time required for users to implement strategies such as lateral reading, as well as the amount and complexity of instruction required. Given the necessary investment of instructional time and practice, existing networked approaches are not well-suited to the context of one-shot information literacy instruction for undergraduate students in their first year.

The Source + Beyond the Source Framework

The Source + Beyond the Source framework is an alternative networked approach to source evaluation. It was developed by a committee of instruction librarians at DePaul University Library as part of the information literacy program for a required first-year writing course (Rismiller et al., 2023). Like many other educators (including the author), Rismiller et al. observed that "the CRAAP Test wasn't meeting students' needs in our increasingly complex information landscape" (p. 286). Rismiller et al. reviewed other approaches to source evaluation, including SIFT, ACT UP, and proactive evaluation; they noted that, while each method had useful elements, none met their needs for a one-shot library instruction session at a first-year level. Rismiller et al. developed an alternative source evaluation framework that incorporates the strengths of other networked approaches—such as lateral reading and introspective reflection—that could be used in a one-shot session with first-year students. The Source + Beyond the Source framework consists of two layers of questions: the first layer examines the source itself, and the second layer requires users to conduct additional research and reflect on the context of how the information was created and shared (see Figures 1 and 2 for the full framework).

As an academic librarian with many years of experience conducting one-shot source evaluation sessions with first-year nursing students, the author of this paper posited that the visual design of the two circles (see Figure 1) would be more memorable than an acronym. The author also hypothesized that this visualization would be an accessible representation for

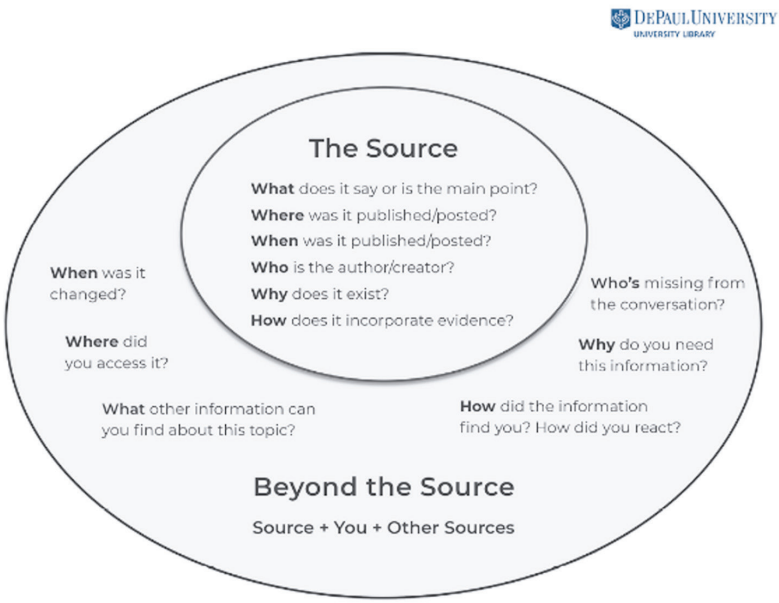

Figure 1. The Source + Beyond the Source Framework Graphic.
Note. From "Going beyond the source: A revised curriculum for source evaluation," by F. Rismiller, H. Cerney, S. Shultz, G. Spiewak, and S. Stoytcheva, 2023, *College & Research Libraries News, 84*(8), p. 287. Copyright 2023 by Firouzeh Rismiller, Holly Cerney, Susan Shultz, Grace Spiewak, and Sveta Stoytcheva. Reproduced with permission.

The Source

DePaul University
University Library

What...	Where...	When ...	Who ...	Why ...	How ...
does it say or is the main point?	was it published/posted?	was it published/ posted?	is the author/creator?	does it exist?	does it incorporate evidence?
• *relevance to your topic*	• *a scholarly journal* • *a website* • *news source* • *social media*	• *current events* • *historical context*	• *expert* • *scholar* • *journalist* • *advertiser/influencer* • *non-profit* • *corporation* • *government*	• *sell* • *persuade* • *politicize* • *research* • *educate* • *entertain*	• *references (cited works)* • *quotes* • *charts/ graphs* • *methodology* • *original research* • *anecdote/personal experience*

Beyond the Source

What ...	Where...	When ...	Who ...	Why ...	How ...
other information can you find about this topic?	did you access it?	was the information changed?	is missing from the conversation?	do you need this information?	did the information find you? How did you react?
• *Wikipedia* • *search engines* • *fact checker sites* • *your library*	• *blog* • *library database* • *book* • *webpage* • *tweet* • *press release*	• *updated* • *revised* • *redacted* • *altered*	• *marginalized groups* • *opposing viewpoints* • *subject experts* • *global perspectives*	• *academic assignment* • *work presentation* • *share on social media* • *personal understanding* • *decision making* • *activism*	• *filter bubbles* • *bots* • *algorithms on search engines* • *cookies* • *advertising* • *shared on social*

Figure 2. The Source + Beyond the Source Framework Chart.
Note. From "Going beyond the source: A revised curriculum for source evaluation," by F. Rismiller, H. Cerney, S. Shultz, G. Spiewak, and S. Stoytcheva, 2023, *College & Research Libraries News, 84*(8), p. 288. Copyright 2023 by Firouzeh Rismiller, Holly Cerney, Susan Shultz, Grace Spiewak, and Sveta Stoytcheva. Reproduced with permission.

first-year undergraduate students of sources as nodes within a larger information ecosystem, addressing the issues with complexity reported with other networked approaches.

Methods

To assess the effectiveness of the Source + Beyond the Source framework compared to the CRAAP Test, the author collected data through one pre-test and two post-tests. These tests were administered throughout the author's course-integrated information literacy instruction in a mandatory first-term course for BScN students. As the Health Sciences Librarian, the author teaches two labs in this course. The first, "Evidence Lab #1," takes place on week six and focuses on source evaluation; the second, "Evidence Lab #2," occurs in week 10 and introduces search strategies and the CINAHL database. As the information literacy instruction takes place in the lab component (rather than the lecture component) of the course, the sessions are 110 minutes and include a significant amount of active learning. There were 144 students enrolled in the course in the 2023–24 academic year—96 in Fall 2023 and an additional 48 in Winter 2024—split between 12 sections with approximately 12 students in each section.

At the start of Evidence Lab #1, the author introduced the study and verbally reviewed the informed consent information. Students were then given a shortened link to the pre-test prior to any other instruction from the librarian. The pre-test included three sources (see Appendix A) that students were prompted to evaluate for reliability. After completion of the pre-test, the author introduced the evaluation tool with a brief lecture. Half the sections received the Source + Beyond the Source training, and half received the CRAAP Test training. To explore the evaluation tool, students were divided into small groups of two or three and asked to analyze the same three sources from the pre-test using a handout with a series of prompts based on the evaluation tool (see Appendices B and C for handouts). Following the small group discussion, the author facilitated a discussion with the whole class about each of the sources using the evaluation tool's prompts to guide this discussion. After the large group discussion, students had the opportunity to reflect, via an anonymous Kahoot poll, on the extent to which they trusted each source after examining it with the tool. At the conclusion of the activity, the author revealed (if it had not become apparent in the large group discussion) that the first source in the pre-test was actively promoting misinformation. This revelation prompted a short discussion about the prevalence of health-related misinformation and its impact on nursing practice, as well as an introduction to the peer-review process. At the end of Evidence Lab #1, students completed the first post-test, which included seven sources. Five weeks later, at the Start of Evidence Lab #2, students completed the second post-test, which included six sources, to assess retention.

The tests were created as three "quizzes" in LibWizard, a Springshare product for creating surveys, forms, quizzes, and tutorials. All three quizzes had the same structure but included different sources for evaluation (see Appendix A). In each LibWizard quiz, the first page contained the informed consent letter, and students used radio buttons to indicate their ongoing consent. Students who did not consent could still choose to interact with the quiz, including the links to explore each source, but their results were not included in the study's analysis. As participation in the study was optional, the second page of each quiz required students to select whether they wanted their responses to be included in the study's analysis. Consequently, the study's response rate is lower than the total number of potential participants and varies among the three tests. Although inclusion in the study was optional, every

student was asked to complete the pre-test as it was part of the in-class active learning exercise in Evidence Lab #1.

On the subsequent pages of the LibWizard quiz, participants were guided through a series of sources (see Appendix A), with the same questions about each source. Each source was represented on a separate page, which included a link to the source, radio buttons to rank reliability, a text box for open-ended responses, and a reminder to spend approximately three minutes evaluating each source. Each source opened in a new tab to encourage participants to move between tabs and engage in lateral reading, rather than remaining within the LibWizard quiz. For each source, participants were asked to rank its reliability on a three-point scale: "(1) Not reliable. Contains false information;" "(2) Somewhat reliable. Contains some true and some false information;" "(3) Very reliable. Contains true information." Participants could also select "I'm not sure" for each source. Participants had the option to write a short description of their reasoning.

There were 16 sources in total: six reliable consumer health websites; six websites promoting health-related misinformation and disinformation (e.g., leaky gut syndrome, colloidal silver, Wilson's Temperature Syndrome, etc.); three peer-reviewed articles; and one withdrawn article (see Appendix A for the complete list of sources). For the six websites promoting health-related misinformation and disinformation, lateral reading reveals multiple sources debunking the health claims. The pre-test contained only three sources: a website promoting misinformation, a reliable consumer health website, and a peer-reviewed article. These sources, as well as the shorter length of the pre-test, were selected to facilitate the active learning exercise in Evidence Lab #1.

Results

Of 144 potential participants, 115 students opted in for their results to be included in the pre-test, 101 in the first post-test, and 89 in the second post-test (see Table 1 for complete participant numbers).

TABLE 1
Number of Participants by Test and Group

Pre-Test		Post-Test 1		Post-Test 2	
Total	115	**Total**	101	**Total**	89
CRAAP	52	**CRAAP**	47	**CRAAP**	40
S+BtS	63	**S+BtS**	54	**S+BtS**	49

Quantitative Scores

Participants were asked to rank the reliability of each source as either: "(1) Not reliable. Contains false information;" "(2) Somewhat reliable. Contains some true and some false information;" "(3) Very reliable. Contains true information;" or "I'm not sure." For this analysis, websites promoting misinformation and disinformation were considered "(1) Not reliable. Contains false information." The reliable consumer health websites and peer-reviewed articles were considered "(3) Very reliable. Contains true information." Sources were carefully selected to unequivocally match the description "Contains false information" or "Contains true information," so every source should have been ranked as (1) or (3). Responses with the ranking "(2) Somewhat reliable. Contains some true and some false information," "I'm not sure," and responses with no ranking were analyzed to illustrate overall confidence. T-tests—a type of statistical analysis used to determine if the difference between two groups along a continuous outcome variable is statistically significant (Brown & Melamed, 1990)—were performed to compare the percentage of average correct responses between the CRAAP Test group and the Source + Beyond the Source group, as well as within each group over time (see Figure 3 and Table 2).

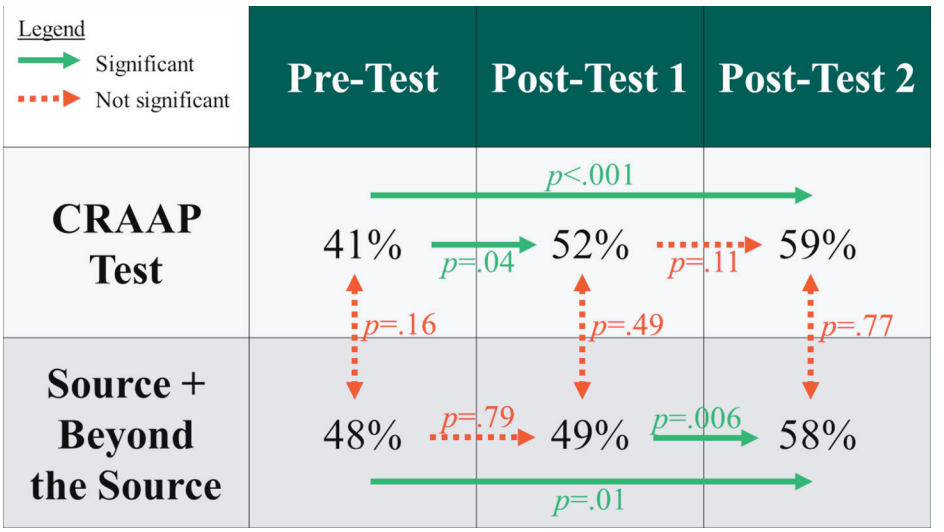

Figure 3. Comparison of Correct Responses by Test and Group with Significance.
Note. The correct responses are represented by the average percentage of correct responses for all the sources within the test.

TABLE 2
P-Value Comparison of Correct Responses between Tests by Group

	Pre-Test to Post-Test 1	Post-Test 1 to Post-Test 2	Pre-Test to Post-Test 2
CRAAP Test	.04	.11	<.001
S+BtS	.79	.006	.01

For the CRAAP Test group, mean scores improved from 41% in the pre-test to 52% in post-test 1 and 59% in post-test 2. The difference between the pre-test and post-test 2 is statistically significant ($p < .001$), demonstrating that the participants improved following instruction. Although the difference between the pre-test and post-test 1 is statistically significant ($p = .04$), the difference between post-test 1 and post-test 2 is not statistically significant ($p = .11$). These scores show that participants in the CRAAP Test group significantly improved immediately following training; however, their continued improvement, although slight, after five weeks was not statistically significant.

For the Source + Beyond the Source group, mean scores improved from 48% in the pre-test to 49% in post-test 1 and 58% in post-test 2. The difference between the pre-test and post-test 2 is statistically significant ($p = .01$), indicating these participants also improved following training. Although the difference between the pre-test and post-test 1 is not significant ($p = .79$), the difference between post-test 1 and post-test 2 is statistically significant ($p = .006$). These scores show that participants in the Source + Beyond the Source group did not improve significantly immediately following training; however, their continued improvement after five weeks was statistically significant.

When examining the scores from the CRAAP Test and Source + Beyond the Source groups, the difference between the groups is not statistically significant in the pre-test ($p = .16$), post-test 1 ($p = .49$), or post-test 2 ($p = .77$). This demonstrates there is no significant difference between the effectiveness of the two methods. However, there is a significant difference between the pre-test and the second post-test for both groups. These scores demonstrate that both the CRAAP Test and Source + Beyond the Source training are more effective

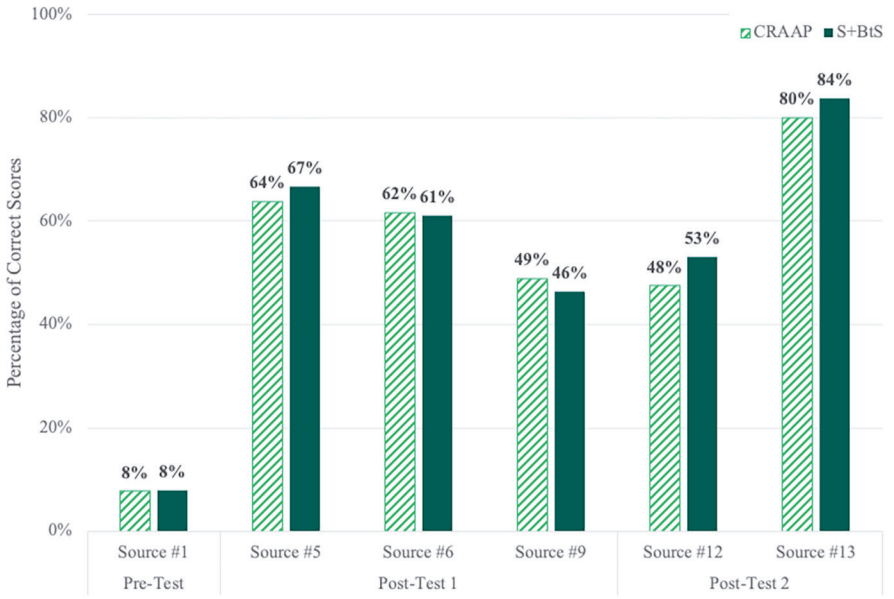

Figure 4. Percentage of Correct Responses for Sources Promoting Misinformation by Test and Group.

than no training. This difference is especially clear when considering the sources promoting misinformation (see Figure 4).

Uncertain responses—including "(2) Somewhat reliable. Contains some true and some false information," "I'm not sure," and responses with no ranking—can be used to illustrate the group's overall confidence in their assessments. T-tests were performed to compare the percentage of uncertain responses between the CRAAP Test group and the Source + Beyond the Source group, as well as within each group over time (see Figure 5 and Table 3).

For the CRAAP Test group, the average number of uncertain responses was 40% in the pre-test, 44% in post-test 1, and 31% in post-test 2. While the difference between post-test 1

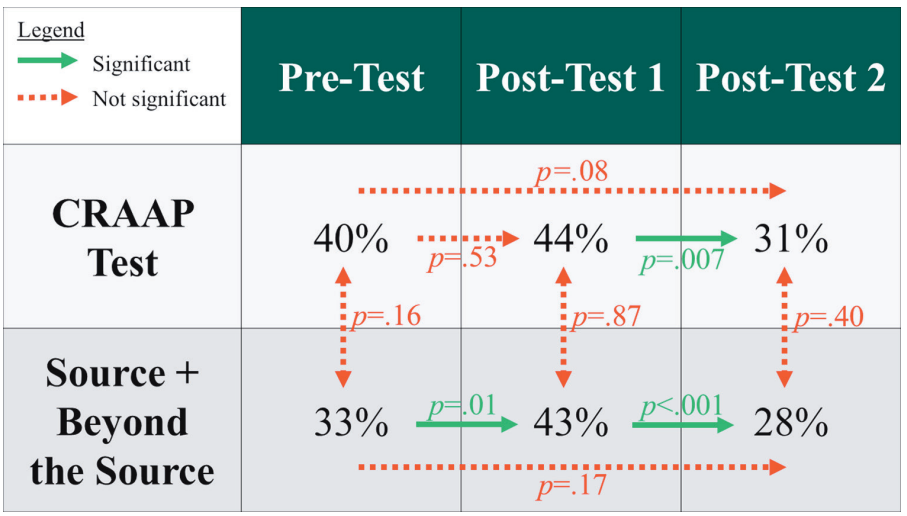

Figure 5. Comparison of Uncertain Responses by Test and Group with Significance.
Note. The uncertain responses are represented by the average percentage of uncertain responses for all the sources within the test.

and 2 ($p = .007$) is significant, the difference between the pre-test and post-test 1 ($p = .53$) and the overall difference between the pre-test and post-test 2 ($p = .08$) is not statistically significant. These scores show that participants in the CRAAP Test group experienced a small increase in uncertainty between the pre-test and post-test 1, but their uncertainty decreased again five weeks later in post-test 2. Overall, the CRAAP Test group did not experience a significant change in their uncertainty following training.

TABLE 3
P-Value Comparison of Uncertain Responses between Tests by Group

	Pre-Test to Post-Test 1	Post-Test 1 to Post-Test 2	Pre-Test to Post-Test 2
CRAAP Test	.53	.007	.08
S+BtS	.01	<.001	.17

The Source + Beyond the Source group demonstrates a similar pattern of uncertainty. For this group, the average number of uncertain responses was 33% in the pre-test, 43% in post-test 1, and 28% in post-test 2 (see Figure 5). While the difference between the pre-test and post-test 1 ($p = .01$) and post-test 1 and 2 ($p < .001$) are significant, the overall difference between the pre-test and post-test 2 ($p = .17$) is not statistically significant. These scores show that participants in the Source + Beyond the Source group experienced a small significant increase in uncertainty between the pre-test and first post-test, but their uncertainty significantly decreased again five weeks later in post-test 2. Overall, the Source + Beyond the Source group also did not experience a significant change in their uncertainty following training.

There is no significant difference in the number of uncertain responses between the groups in the pre-test ($p = .16$), post-test 1 ($p = .87$), or post-test 2 ($p = .40$), as noted in Table 3. These scores demonstrate that there was no notable difference in overall confidence between the two groups. The increased percentage of uncertain responses in post-test 1 for both groups is likely due to this test's close proximity to the large group discussion of the pre-test sources; as illustrated by Figure 4, 92% of all participants did not correctly identify Source #1 as misinformation, and it is likely that the in-class discussion of their earlier mistake temporarily decreased their confidence. However, the results from post-test 2 reveals that training did not significantly affect either group's confidence in the long term.

Qualitative Responses

For each source, participants had the option to write a short description of the reasoning for their score. These open-ended responses offer insights into the strategies participants used to evaluate the sources. The responses were coded inductively by the author to compare the use of specific strategies. To account for the different number of sources in each test, the frequency of the strategy used in the open-ended responses is divided by number of sources. For example, the *authority* strategy (that the source is reliable/not reliable because of the authority of the author/website/database) was described 255 times in the post-tests: Source + Beyond the Source; divided between 13 sources in the post-tests, this strategy was used 19.62 times per source (see Figure 6 and Table 4). While there are few differences between the CRAAP Test and Source + Beyond the Source groups, there are noteworthy changes between the pre-test and the post-test. It is worth noting that the frequency of most strategies decreased slightly in the post-tests as many participants wrote shorter, less detailed responses, despite reminders to spend approximately three minutes per source.

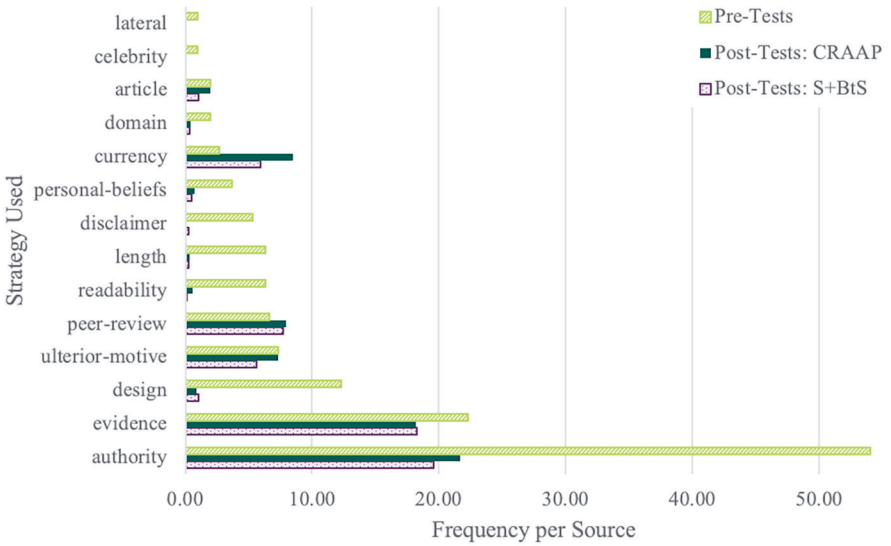

Figure 6. Frequency of Strategy Used in the Open-Ended Responses by Test and Group.
Note. To compare tests, the frequency of the strategy used in the open-ended responses is divided by number of sources in each test.

The open-ended responses show that, overall, students utilized few specific strategies from either the CRAAP Test or the Source + Beyond the Source framework in the post-tests. A notable exception is *currency*; participants highlighted the currency of sources more often after training, particularly participants who received the CRAAP Test training with "currency" included in the "CRAAP" acronym. However, *lateral reading* strategies were not described in the Source + Beyond the Source group's post-test responses, even through the Source + Beyond the Source training emphasized lateral reading. Although the CRAAP Test did not discuss lateral reading, one participant from the CRAAP Test group described using a lateral reading strategy by looking up other information about the health condition described in a source. Three participants in the pre-test described lateral reading strategies, such as "using other backup sources," when considering Source #1, a website promoting misinformation. Interestingly, these three participants selected "(2) Somewhat Reliable. Contains some true and some false information" and "I'm not sure" for this source, indicating that, prior to training, lateral reading was only one strategy influencing their score, with other factors counterbalancing their opinions.

The open-ended responses also reveal which strategies participants used to inaccurately evaluate sources promoting misinformation and disinformation. In the pre-test, only 8% of participants (four participants in the CRAAP Test group and five participants in the Source + Beyond the Source group) correctly identified that Source #1 was promoting misinformation (see Figure 4). Participants who scored Source #1 as "(3) Very reliable. Contains true information" primarily justified this score using the *authority, celebrity,* and heuristic (i.e., *design, domain, readability, length,* and *disclaimer*) strategies. One participant, who rated Source #1 as "(3) Very reliable. Contains true information," succinctly captures these strategies in a single comment: "There weren't any constant [advertisement] pop-ups, there was a medical information disclaimer at the bottom of the page, and the doctor's profile seemed legit, and he seems well know [*sic*]. Information was also consice [*sic*] and clearly explained." As seen in Figure 6 and Table 4, the use of these strategies decreased following training with either tool.

TABLE 4
Frequency of Strategy Used per Source by Test and Group

Strategy	Frequency of Use per Source		
	Pre-Test	Post-Tests: CRAAP	Post-Tests: S+BtS
Authority: Source is reliable/not reliable because of the authority of the author/website/database.	54.00	21.69	19.62
Evidence: Source is reliable/not reliable because it cites evidence/ lacks evidence.	22.33	18.15	18.31
Design: Source is reliable/not reliable because of the high-quality web design (including multimedia elements)/poor-quality web design.	12.33	0.92	1.08
Ulterior Motive: Source is reliable/not reliable because the author does not have/has an ulterior motive (e.g., selling product, website ads).	7.33	7.31	5.62
Peer Review: Source is reliable/not reliable because it is peer-reviewed/is not peer-reviewed, including the presence/absence of multiple authors.	6.67	7.92	7.69
Readability: Source is reliable/not reliable because it is easy to read/hard to read.	6.33	0.62	0.15
Length: Source is reliable/not reliable because it is too short/too long.	6.33	0.38	0.31
Disclaimer: Source is reliable/not reliable because it has/does not have a medical disclaimer.	5.33	0.08	0.31
Personal Beliefs: Source is reliable/not reliable because it aligns/ does not align with my personal beliefs or existing knowledge.	3.67	0.77	0.54
Currency: Source is reliable/not reliable because it is current/not current.	2.67	8.46	5.92
Domain: Source is reliable/not reliable because of the site domain.	2.00	0.46	0.38
Article: Source is reliable because it is a scholarly/academic/peer-reviewed article in a scholarly journal.	2.00	2.00	1.08
Celebrity: Source is reliable/not reliable because the author has many followers or is well-known/not heard of before.	1.00	0	0
Lateral: Specific reference to lateral reading strategy.	1.00	0	0
CRAAP: Specific reference to the CRAAP Test.	0	0.23	0

Prior to training, participants struggled to accurately identify reliable authority. Fifty-one participants wrote that the author of Source #1 (a website promoting misinformation), Dr. Josh Axe, was a credible authority:

- "I trust the resource as it's a doctor"
- "the website includes the word Dr [which] means the person talking about the topic has a high level of education and will provide correct information"
- "What made me trust this source is that it is written by a medical professional and contained relavent [*sic*] information such as how it is caused and how to fix it."

Three participants highlighted that Dr. Axe was a reliable authority due to his *celebrity*, or high follower count on social media. For example, one respondent shared their reasoning: "Because of how credible the author of the article is, considering at the very bottom. He has quite a number of followers in his social media page." Following training, most participants could more accurately gauge authority. Only three participants described a similar author in Source #12, Dr. Lauren Love, as a credible authority. While 12 participants noted the author referenced in Source #9 (a website promoting misinformation), Dr. Nina Pierpont, might be a credible authority, 11 of these participants qualified that observation with other considerations. For example, one participant who scored Source #9 as "(2) Somewhat Reliable. Contains some true and some false information" wrote:

> The Dr/ author is a true MD and PhD are a real university, so the knowelge [*sic*] is there, it just seems that the 'wind turbine syndrome' isn't even a real thing, and alot [*sic*] of the links take you to her book, and her 'studies' seems [*sic*] like its more of an opinion from a political view that [*sic*] a legit issue medically.

This skepticism highlights how participants' scrutiny of authority increased after receiving training in either method.

Similarly, participants' use of heuristics decreased after the training. In the pre-test, many participants relied on heuristics such as *design, domain, readability, length,* and *disclaimer*. Participants who scored Source #1, a source promoting misinformation (see Figure 7), as "(3) Very reliable. Contains true information," emphasized the professional design of the website, including the clear organization, the "Evidence Based" icon at the top of the page, and the presence of multimedia elements such as short videos:

- "I chose this rating as the source appears to be very reliable. There is a green box in the top lefthand corner that says evidence based, and the source has valid information."
- "This source was very well organized and put together, to me it is clear that a lot of time and effort was put into this source and so I trust the information that was given."
- "There are videos and pictures to backup what is said within the source."
- "broken down sections, there are pictures & or diagrams that help show what they are talking about"

Several participants highlighted the *readability* of Source #1 in their rationale. For example, one participant wrote: "This source did a good job of writing all the symptoms and causes, and also what people can do to prevent leaky gut syndrome. It is also easy to read and understand." Participants who scored Source #3, a peer-reviewed article on PubMed (see Figure 8), as "(1) Not reliable. Contains false information" also noted the *design* of the website:

- "the website doesn't look official there is not much information and little description of the author"
- "doesn't have big headlines, doesn't show any pictures & there is not a lot of information posted about the concept."
- "It's a sketchy website, barely has any information that a person searching this topic would find useful."

However, four participants scored Source #3 as more reliable due to the ".gov" domain. After training, participants used these heuristics less often but still referenced these strategies occasionally.

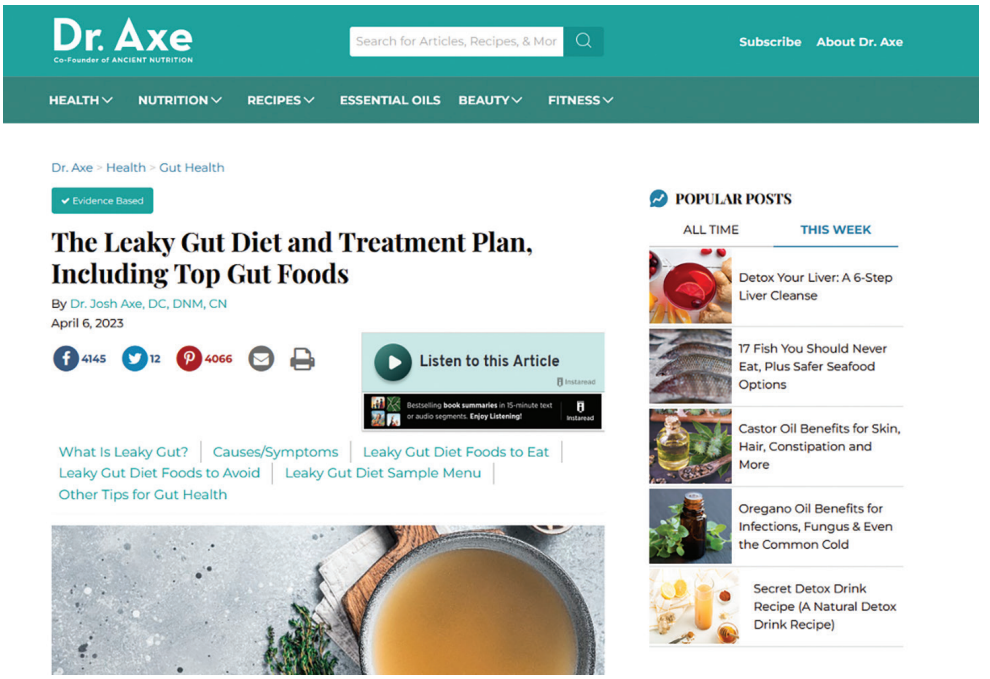

Figure 7. Screenshot of Source #1.
Note. From "The leaky gut diet and treatment plan, including top gut foods," by J. Axe, https://draxe.com/health/leaky-gut-diet-treatment/

Figure 8. Screenshot of Source #3.
Note. From "Leaky gut – concept or clinical entity?," by E. M. M. Quigley, 2016, *Current Opinion in Gastroenterology, 32*(2), 74–79. https://doi.org/10.1097/MOG.0000000000000243

Additionally, participants struggled to accurately identify journal articles prior to training. In the pre-test, 39 comments included the word "article" when describing Sources #1 and #2, both of which are consumer health websites. Conversely, 36 participants expressed skepticism about Source #3, a peer-reviewed article on PubMed (see Figure 8). Although the full text of the article was available to the participants, most participants did not see or open the full text. Limited to only the abstract and other preview information on PubMed (such as "Similar Articles" and "Cited By"), 13 participants who scored Source #3 as "(1) Not reliable. Contains false information" criticized the *length* and *readability* of this source.

- "Too short and brief. I would not bother reading it"
- "Lots of big terms used however there is barely any information given"
- "Does not provide enough information about leaky gut and in terms the general public will understand."
- "The article does not use language that the average person would understand, therefore it does not educate the individual on the information present in the source."

Participants' tendencies to conflate accessible text (including the text's length and readability) and reliability noticeably reduced in the post-tests, and participants could more consistently identify peer-reviewed articles after training. However, no participants identified that Source #16 was a withdrawn article.

One notable trend from the open-ended responses was the use of *personal beliefs* as a strategy, that is, that the source was/was not reliable because it aligned/did not align with the participants' personal beliefs or existing knowledge. In the pre-test, several participants reported using personal beliefs to justify their scores. For example, one participant scored Source #1, a source promoting misinformation, as "(2) Somewhat reliable. Contains some true and some false information" and wrote:

> Because I just personally agree with some of the food choices in regard to eating whole food, the basics (meat, vegetable, carbs) and food that are not GMO. So i [*sic*] trust a few of the choices just from doing [my] own research on whole foods and not eating refined sugars and dyes. But there wasn't any really [*sic*] sources or citing from books or proven research that [I've] seen.

Participants reported less reliance on personal beliefs after receiving training, which suggests the training helped participants articulate judgments they were already making.

Discussion

Findings

There were no significant differences between the participants who received the CRAAP Test training and the Source + Beyond the Source training. In the context of this study, the CRAAP Test and the networked method were similarly effective at enabling students to correctly identify reliable sources of information. Other studies comparing the CRAAP Test with an alternate method for source evaluation produced similar results (Caramancion, 2022; Kaufman, 2023; Lowe et al., 2021). Despite the widely recognized drawbacks of checklist approaches to source evaluation, the CRAAP Test consistently demonstrates efficacy on par with the other available methods when compared directly. These findings reveal a significant difference between the pre-test and the post-tests. Following training in either method, participants were

able to identify reliable sources of information compared to misinformation more accurately. This is consistent with other studies of the CRAAP Test, which found that the CRAAP Test was more effective than no intervention (Esparrago-Kalidas, 2021; Muis et al., 2022; Myhre, 2012). Regardless of the method taught, undergraduate students' source evaluation skills significantly improve with training.

Following training in either method, participants evaluated sources of authority more closely and demonstrated less use of heuristics. Both groups demonstrated a more critical understanding of authority after training. Previous research has shown that, without intervention, students rarely spend time to critically evaluate sources, including scrutinizing an author's credentials (Hargittai et al., 2010; Walraven et al., 2009). Following training in either method, participants demonstrated more skepticism toward the authority of the source. Similarly, participants' use of heuristics such as such as graphic design, readability, length, and site domain decreased after receiving training in either method. Young adults' tendencies to use heuristics such as site design to evaluate credibility is well-documented (Agosto, 2002; Barzilai & Zohar, 2012; Coiro et al., 2015; Iding et al., 2008; Julien & Barker, 2009; McGeough & Rudick, 2018; McGrew et al., 2018; Metzger et al., 2010; Olushola, 2021; Walraven et all, 2009). While participants described these heuristics less often following training, it is worth noting that participants still used these strategies occasionally in the post-tests. The continued use of these strategies highlights that one-shot instruction may influence participants' existing source evaluation habits but does not completely alter them.

One noteworthy observation is that participants were able to recognize journal articles more consistently after instruction. Prior to instruction, approximately half the participants expressed skepticism about a journal article on PubMed; without opening the full text of the article, these participants described the abstract as too short and too complex to be considered reliable. In the post-tests, nearly every participant was able to recognize journal articles on PubMed, Science Direct, and ProQuest. This finding highlights the importance of teaching undergraduate students about peer-review and academic databases. Post-secondary educators should not assume that undergraduate students will recognize or trust journal articles without explicit instruction.

An analysis of the open-ended responses reveals that participants retained few specific details from either evaluation tool, except the *currency* criteria from the CRAAP Test training. This finding is corroborated by Lowe et al. (2021), who observed that first-year students did not retain the actual language from either the CRAAP Test or the six question words (6QW) methods in the long term. These results contribute to the large body of literature demonstrating that the mechanical application of checklist criteria is not a realistic or practical method for conducting source evaluation. Notably, no participants who received the Source + Beyond the Source training described the use of lateral reading strategies in the post-tests. This contradicted the author's hypothesis that the visual design of two circles would be an accessible representation of sources as nodes within a larger information ecosystem, consequently promoting lateral reading strategies. It is possible that, at least in the context of the study, participants were unwilling to spend the time required to use strategies like lateral reading. Kaufman (2023) observed that although the SIFT Method enabled students to correctly identify reliable sources of information more often than the CRAAP Test, it is time-intensive for students to conduct evaluation using lateral reading. Alternatively, participants may require more practice with lateral reading techniques than the one-shot instruction session allowed.

Faix and Daniels (2023) found that students required practice to effectively use the strategies associated with SIFT. These findings impact how academic librarians plan information literacy instruction.

Implications for Practice

As an academic librarian, it is easy to feel as though we have wasted our time, or even misled our students, by teaching source evaluation using the CRAAP Test. In an oft-cited blog post about the history of the CRAAP Test, Caulfield (2018) wrote: "we taught [the CRAAP Test] and its variations *for almost twenty years* even though it did not work, and most librarians I've talked to realized it didn't work many years back but didn't know what else to do" (We brought a can opener to a gunfight section, para. 27). However, the findings from this study might reassure librarians; in the context of a one-shot session with first-year undergraduate students, the CRAAP Test was as effective as a networked method of source evaluation. Furthermore, it is clear that some instruction is more effective than no instruction, regardless of the method taught.

However, neither method produces ideal results; as demonstrated by the percentage of correct responses in the first and second post-tests (see Figure 3), nearly half the participants could not identify sources of accurate information following instruction in either method. It is evident that one-shot instruction in both the CRAAP Test and the Source + Beyond the Source framework falls short in adequately preparing undergraduate students to critically evaluate sources in the present information ecosystem.

This study contributes to the growing body of literature demonstrating that if networked approaches to source evaluation are to be successfully taught to undergraduate students, they require a time investment that one-shot instruction sessions cannot accommodate. Given this study's findings, it is worth considering how the one-shot format impacts the efficacy of teaching source evaluation. Pagowsky (2021) describes the one-shot—a standalone lecture or workshop taught by a librarian within an existing course—as "the dominating force of how [academic librarians] engage in library instruction" (p. 300). The inherent limitations of one-shot instruction are well-known among academic librarians (Almeida, 2022). The one-shot is temporally compressed, often only superficially related to course content or narrowly targeted toward assignments and emphasizes rote skills rather than critical thinking (Nicholson, 2016; Pagowsky, 2021; Zvyagintseva & Blechinger, 2023). In the context of source evaluation, Caulfield (2017) observes that affective habits are a key component of fact checking. It is not reasonable to expect students to change their habits after a single lecture or workshop; indeed, Nicholson and Seale (2022) argue that "transactional one-shots can never truly be transformational" (p. 765). There is no evaluation tool or model, no matter how effective, that can overcome the confines of one-shot instruction.

Given the constraints of the one-shot format, academic librarians should consider alternate venues to deliver information literacy instruction that may create a greater impact on students' source evaluation habits. There are several examples of successful interventions in the literature. In an asynchronous college course, Breakstone et al. (2021) found that four one-hour modules embedded in the course resulted in significant improvement to students' abilities to evaluate credible online sources. Similarly, Faix and Daniels (2023) observed an improvement by incorporating the SIFT Method throughout asynchronous information literacy courses, including formative and summative assessments targeting

the source evaluation outcomes. Brodsky, Brooks, Scimeca, Todorova, et al. (2021) saw improvements in the use of lateral reading and accurate source evaluation when using the Digital Polarization Initiative (DPI) curriculum instead of the typical curriculum within a general education civics course. Notably, each of these successful interventions feature greater integration within courses than the one-shot format. These findings align with the calls across librarianship to move away from one-shots and toward more collaborative approaches (Moeller, 2020; Santamaria & Schomberg, 2022; Schlesselman-Tarango & Becerra, 2022) built on relational, rather than transactional, models of instruction (Arellano Douglas & Gadsby, 2022; Pho et al., 2022). Academic librarians must work closely with instructors and with programs to ensure information literacy, including source evaluation, is integrated throughout curriculums.

Limitations

The number of sources (16 in total) in this study was selected to facilitate nuanced comparisons between the groups following the training. However, the number and distribution of the sources may have affected the results. The shorter length of the pre-test (three sources), which was designed to facilitate the active learning exercise in the author's course-integrated instruction, limits the validity of the comparison between the pre-test and the post-tests. By contrast, the longer length of the post-tests (seven sources in post-test 1 and six sources in post-test 2) may have influenced participants' engagement. At the start of each test, participants were directed to spend approximately three minutes per source, which was ample time for participants to explore the source and employ basic lateral reading strategies. However, the author observed that most participants spent far less time on each source, completing the tests very quickly. A fewer number of sources may have encouraged participants to spend more time on each source. It is worth noting that although more time for each source may have improved the accuracy of participants' responses in the context of the study, this is likely an accurate representation of how participants are conducting source evaluation in their daily lives. In addition, the open-ended responses provided limited insights into the participants' reasoning, as participants wrote shorter, less detailed responses throughout the post-tests. Future research could incorporate usability testing or semi-structured interviews to address this gap. Finally, although the author strove to teach consistently, there may have been slight natural variations in content and delivery between the 12 sections of the course.

Future Research

This study focused on consumer health websites and peer-reviewed articles; it did not include other forms for health information, such as social media. The "agency of information," when information finds users through algorithmic personalization (Bull et al., 2022), was discussed in the context of the Source + Beyond the Source framework but was not apparent when examining pre-selected websites. Further research should expand the types of sources included for review. Rismiller et al. (2023) used a tweet in their lesson plans when developing the Source + Beyond the Source framework. Given the prominence of medical misinformation on TikTok, this platform, or other short-form video content, is a valuable avenue to consider. Students interact with consumer health information in a variety of forms in their everyday lives, and additional research in this area would provide a more robust understanding of the efficacy of library instruction.

Conclusion

This study assessed the effectiveness of the CRAAP Test compared to a networked approach, the Source + Beyond the Source framework, when training first-term Bachelor of Science in Nursing (BScN) students to identify websites promoting misinformation and disinformation, reliable consumer health websites, and peer-reviewed articles. Given the increase of health-related misinformation and disinformation, it is vital that undergraduate students be able to critically evaluate online sources, including the ability to identify peer-reviewed articles. This study demonstrates that undergraduate students' source evaluation skills significantly improve following training, regardless of the method taught. Although the limitations of checklist approaches to source evaluation are well-documented, this study found that the CRAAP Test was as effective as the networked method in the context of one-shot library instruction. This study contributes to the growing body of literature illustrating how the one-shot format limits the efficacy of information literacy instruction. Academic librarians should seek opportunities for information literacy, including source evaluation, to be integrated within courses and throughout curriculums.

Acknowledgments

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Appendix A

List of Sources

Pre-Test

Source #1:

Axe, J. (2023, April 6). *The leaky gut diet and treatment plan, including top gut foods.* Dr. Axe. https://draxe.com/health/leaky-gut-diet-treatment/

Source #2:

Campos, M. (2023, September 12). *Leaky gut: What is it, and what does it mean for you?* Harvard Health Publishing. https://www.health.harvard.edu/blog/leaky-gut-what-is-it-and-what-does-it-mean-for-you-2017092212451

Source #3:

Quigley, E. M. M. (2016). Leaky gut – Concept or clinical entity? *Current Opinion in Gastroenterology, 32*(2), 74–79. https://pubmed.ncbi.nlm.nih.gov/26760399/

Post-Test 1

Source #4:

Li, Y., Shan, Z., & Teng, W. (2021). The iodine status and prevalence of thyroid disorders among women of childbearing age in China: National cross-sectional study. *Endocrine Practice, 27*(10), 1028–1033. https://www.sciencedirect.com/science/article/pii/S1530891X21001245

Source #5:

Wilson, D. (n.d.). *WTS overview.* Wilson's Temperature Syndrome. https://www.wilsonssyndrome.com/identify/wts-overview/

Source #6:

IGenX. (n.d.). *What are the symptoms of Chronic Lyme disease?* https://igenex.com/tick-talk/what-are-the-symptoms-of-chronic-lyme-disease/

Source #7:

National Institute of Arthritis and Musculoskeletal and Skin Diseases. (2021, June). *Fibromyalgia.* https://www.niams.nih.gov/health-topics/fibromyalgia

Source #8:

University Health Network Newsroom. (2014, October 30). *What is white matter disease? It might be the cause of vascular dementia.* https://www.uhn.ca/corporate/News/Pages/what_is_white_matter_disease.aspx

Source #9:
Waubra Foundation. (n.d.). *Symptoms of wind turbine syndrome.* https://waubrafoundation.org.au/information/residents/symptoms/[1]

Source #10:
Johns Hopkins Medicine. (n.d.). *West Nile virus.* https://www.hopkinsmedicine.org/health/conditions-and-diseases/west-nile-virus

Post-Test 2

Source #11:
Cafasso, J. (2018, September 17). *Weil's disease.* Healthline. https://www.healthline.com/health/weils-disease

Source #12:
Love, L. (2018, August 30). *The benefits and uses of colloidal silver.* Love & Chiropractic. https://www.drlaurenlove.com/the-benefits-and-uses-of-colloidal-silver/

Source #13:
Mayo, J. D. (n.d.). *Do you suffer from magnetic field deficiency syndrome?* Access Possibilities. https://accesspossibilities.com/blogs/news/do-you-suffer-from-magnetic-field-deficiency-syndrome

Source #14:
Berman, J., & Dugdale, D. C. (2023, June 19). *Calcium supplements.* MedlinePlus. https://medlineplus.gov/ency/article/007477.htm

Source #15:
Di Donato, V., Caruso, G., Petrillo, M., Kontopantelis, E., Palaia, I., Perniola, G., Plotti, F., Angioli, R., Muzii, L., Benedetti Panici, P., & Bogani, G. (2021). Adjuvant HPV vaccination to prevent recurrent cervical dysplasia after surgical treatment: A meta-analysis. *Vaccines, 9*(5), 410. https://pubmed.ncbi.nlm.nih.gov/33919003/

Source #16:
Han, Y., Yang, Z., Fang, S., Zhang, M., Xie, Z., Fan, Y., & Zhao, T. (2021). A data-mining based analysis of traditional Chinese medicine in diagnosing and treating COVID-19. *The Anatomical Record.* https://www.proquest.com/docview/2544759745?parentSessionId=LYPHcduO0Qpq%2B6c2H6u2Zqq6rbxkdL%2FQmTGuRTUDSao%3D

[1]Since data collection for this study was completed, the Waubra Foundation's website is no longer available.

Appendix B

Handout: The CRAAP Test

Red Deer Polytechnic

Red Deer Polytechnic Library
100 College Boulevard | Box 5005
Red Deer | AB | Canada | T4N 5H5

T 403 342 3344
W guides.rdpolytech.ca

The CRAAP Test

Currency: When is the information from?

- When was the information published, posted, or last updated?
- Is the information current for your topic and field of study?

Relevance: Is this information appropriate for your needs?

- Is it suitable for your purpose or assignment/project?
- Is there not enough, or too much, detail for your purpose?

Authority: Who created this content?

- Who is the author? Why is the author (or authors) qualified to write on the topic?
- Who published, posted, or communicated the information? What are their qualifications?

Accuracy: Does it seem right?

- Have the author's sources been given so that you can easily find or verify them?
- Are there spelling, grammar, or typographical errors?

Purpose: Why does the information exist?

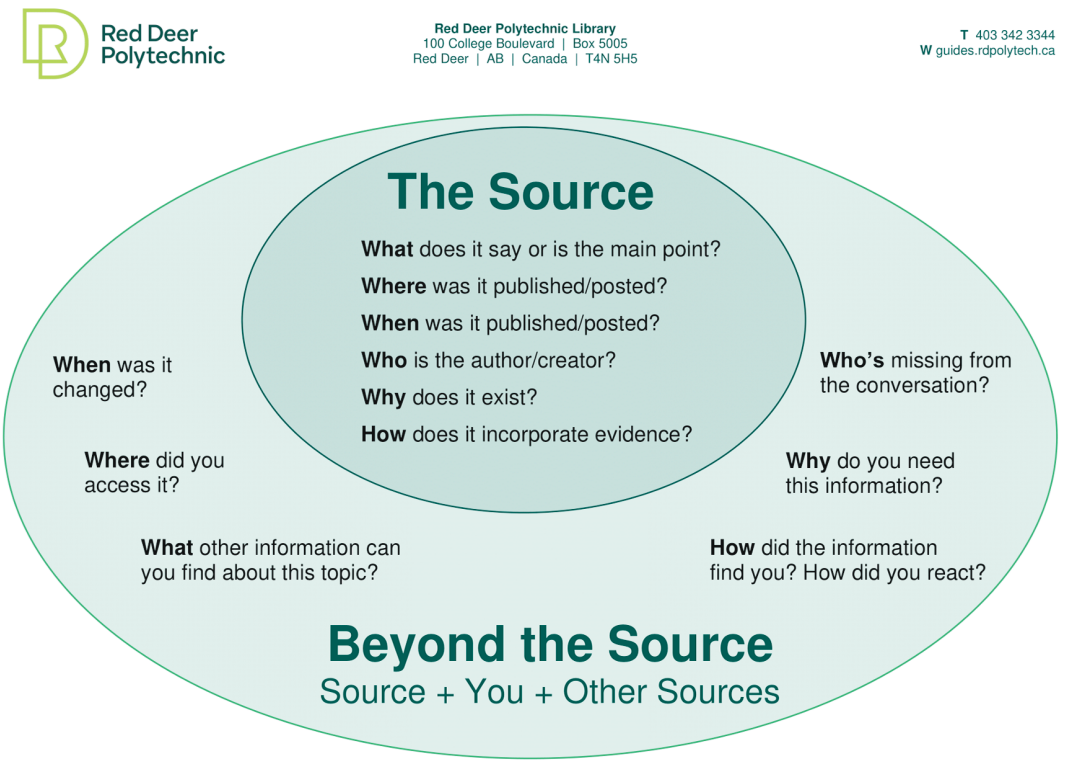
- Why was this information created? Who is the audience?
- Does the point of view appear objective, balanced, and unbiased? Are alternative points of view considered?

Learn more: https://guides.rdpolytech.ca/nursing/evaluating

Appendix C

Handout: Source 1 Beyond the Source Framework

Front



Adapted from:
Rismiller, F., Cerney, H., Shultz, S., Spiewak, G., & Stoytcheva, S. (2023). Going beyond the source: A revised curriculum for source evaluation. *College & Research Libraries News*, *84*(8), 286. https://doi.org/10.5860/crln.84.8.286

Back

Red Deer Polytechnic

Red Deer Polytechnic Library
100 College Boulevard | Box 5005
Red Deer | AB | Canada | T4N 5H5

T 403 342 3344
W guides.rdpolytech.ca

The Source

What…	Where…	When…	Who…	Why…	How…
does it say or is the main point? • *relevance to your topic*	was it published/posted? • *a scholarly journal* • *a website* • *news source* • *social media*	was it published/posted? • *current events* • *historical context*	is the author/creator? • *expert* • *scholar* • *journalist* • *advertiser/influencer* • *non-profit* • *corporation* • *government*	does it exist? • *sell* • *persuade* • *politicize* • *research* • *educate* • *entertain*	does it incorporate evidence? • *references (cited works)* • *quotes* • *charts/graphs* • *methodology* • *original research* • *anecdote/personal experience*

Beyond the Source

What…	Where…	When…	Who…	Why…	How…
other information can you find about this topic? • *Wikipedia* • *search engines* • *fact checker sites* • *your library*	did you access it? • *blog* • *library database* • *book* • *webpage* • *tweet* • *press release*	was the information changed? • *updated* • *revised* • *redacted* • *altered*	is missing from the conversation? • *marginalized groups* • *opposing viewpoints* • *subject experts* • *global perspectives*	do you need this information? • *academic assignment* • *work presentation* • *share on social media* • *personal understanding* • *decision making*	did the information find you? How did you react? • *filter bubbles* • *bots* • *algorithms on search engines* • *cookies* • *advertising* • *shared on social*

Adapted from:
Rismiller, F., Cerney, H., Shultz, S., Spiewak, G., & Stoytcheva, S. (2023). Going beyond the source: A revised curriculum for source evaluation. *College & Research Libraries News, 84*(8), 286. https://doi.org/10.5860/crln.84.8.286

Passing Rates, Course Grades, and Research Instruction: An Eight-Year Study of Community College Students

Stephanie C. Gillespie*

This study investigates the impact of targeted one-shot research instruction (RI) on course grades and passing rates of 50,901 community college students across various research-based courses over eight years. It examines RI's impact on different student status types, whether RI is associated with higher outcomes of both college-ready (CR) and not-college-ready (NCR) students, if RI is still correlated with higher outcomes when chronically absent students are removed from all groups, and whether factoring in RI attendance significantly clarifies results. In each case, the findings indicate that RI is correlated with higher grades and passing rates. Taking attendance during RI is a crucial factor in accurately measuring results.

Introduction

Instruction librarians face an impasse: the prevailing model of offering information literacy (IL) instruction once per semester to a class (i.e., one-shot sessions), although widely practiced, has not consistently demonstrated a positive impact on student success outcomes. Nevertheless, structural constraints, such as course instructors having limited time to devote to IL, impede abandoning the one-shot model. However, ample anecdotal evidence suggests librarians make a meaningful difference, as students frequently express gratitude, and instructors routinely request their return. This creates a tension between the perceived effectiveness of IL instruction and the difficulty in capturing empirical evidence of its impact on student success. This study seeks to (1) examine why some studies succeeded in demonstrating a positive correlation between IL instruction and passing rates and/or grades while others failed, (2) to contribute a large dataset to the literature, and (3) to document our methodology and evaluation strategies for future exploration and improvement.

Pellissippi State Community College is the largest community college in Tennessee, with an average full-time equivalent of 6,000 students in the fall. Pellissippi State offers 79 university parallel programs and career pathways. Almost half of the students (47%) are enrolled in university parallel programs, followed by undeclared (29%) and career pathways (22%). Undeclared status is often used by students whose major is not offered at the college but plan to transfer their credits. The student body is largely 18 to 24 years old, White, and

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first-generation, with significant populations of academically underprepared and financially insecure students. Fall-to-spring persistence rates average 77%, and fall-to-fall retention rates average 52%. Pellissippi State is teaching-focused and accepts all students, while providing corequisites for underprepared students, which comprises around 55% of the student body.

In 2017, the Pellissippi Libraries partnered with the college's department of Institutional Effectiveness, Assessment, and Planning (IEAP) to evaluate the impact of research instruction (RI) on grades and passing rates. Our study focuses specifically on RI rather than all types of instruction because RI lessons address a research assignment that accounts for 10%–15% of the course grade, whereas other IL is not necessarily tied to any graded assignment. Thus, RI could reasonably affect the course grade and passing rates. RI lessons are scheduled at students' point-of-need (i.e., when the project is assigned or just after), and both live sessions and tutorials use the same hands-on lesson plans and teaching materials (e.g., ENGL 1010 Argument Essay, PSYC 2100 Lifespan Project). While lessons are tailored to the subject area and project, the content still addresses the same IL concepts.

We sought to determine whether RI lessons help students achieve their academic goals, to evaluate our instructional materials and methods, and to perhaps demonstrate our value to our college community. We collaborated with IEAP statisticians from the outset to design the study, analyze results, and obtain IRB approval. They helped us define valid study questions to effectively use institutional data, establish appropriate parameters, align our study to institutional goals, complete the IRB process, learn to use Statistical Package for the Social Sciences (SPSS), and analyze the data properly.

The analyses include an intervention group, two control groups, sample sizes, standard deviations, pairwise comparisons for categorical data, z-tests (three or more groups) or t-tests (two groups) for numerical data, and student demographics as context. All reported IL and RI numbers reflect students who participated either through attending a live session or by completing a tutorial. Additional questions are addressed by examining the student outcomes from various angles, such as by semester, student status, college readiness, and without chronically absent students. Finally, the data is reanalyzed without factoring in RI attendance to demonstrate whether its inclusion is significant to the findings.

IL Program Overview

During the study, our librarian team consisted of eight tenure-track librarians, the library dean, and two part-time librarians. Due to the nature of their positions, the eight full-time librarians (including the author) teach the majority of classes, including live sessions across five physical campuses, various high schools, and online. Classes are assigned based on librarian availability and campus rather than by subject liaison.

As the instructor coordinator, I guide the library instruction program. I send personal emails twice a semester to instructors of research-based classes, indicating how we can help their students complete specific course projects, and offer relevant library resources and tutorials. I schedule instruction, create lesson plans and teaching materials, develop tutorials, train new librarian instructors, coordinate co-teaching and peer-observation for ongoing professional development, and assess our instruction efforts. I also advise instructors on the optimal timing of RI sessions to reflect students' point-of-need. Upon instructors' request, I co-create research assignments, gather tutorial submissions, and answer student questions at the end of tutorials.

While some course instructors routinely invite us into their classes or require their students to complete tutorials, the librarians do not consistently provide IL to every section in a course. No course is required to have IL instruction, so students typically only participate at the behest of their instructor, even though tutorials are accessible on the libraries' website. Table 1 shows the prevalence of RI and IL instruction relative to the total fall headcount. All instruction data has been deduplicated. Because students sometimes participate in both RI and other IL, total IL numbers are lower than RI and other IL combined.

On average, 27% of the total student population participates in RI and other IL instruction (see Figure 1). One in five students typically participate in RI, excluding fall 2020, when

TABLE 1
Prevalence of RI and Other IL Deduplicated

	#Headcount	#RI	%RI	#Other IL	%Other IL	#Total IL	%Total IL
FA17	11,168	2,753	25%	713	6%	3,298	30%
FA18	10,893	2,462	23%	803	7%	2,896	27%
FA19	10,693	2,475	23%	789	7%	2,771	26%
FA20	9,334	976	10%	771	8%	1,534	16%
FA21	8,835	1,683	19%	1,205	14%	2,313	26%
FA22	8,452	1,434	17%	1,281	15%	2,229	26%
FA23	8,710	1,639	19%	1,374	16%	2,429	28%
FA24	9,312	1,489	16%	2,085	22%	3,184	34%
Average	**9,675**	**1,864**	**19%**	**1,128**	**12%**	**2,582**	**27%**

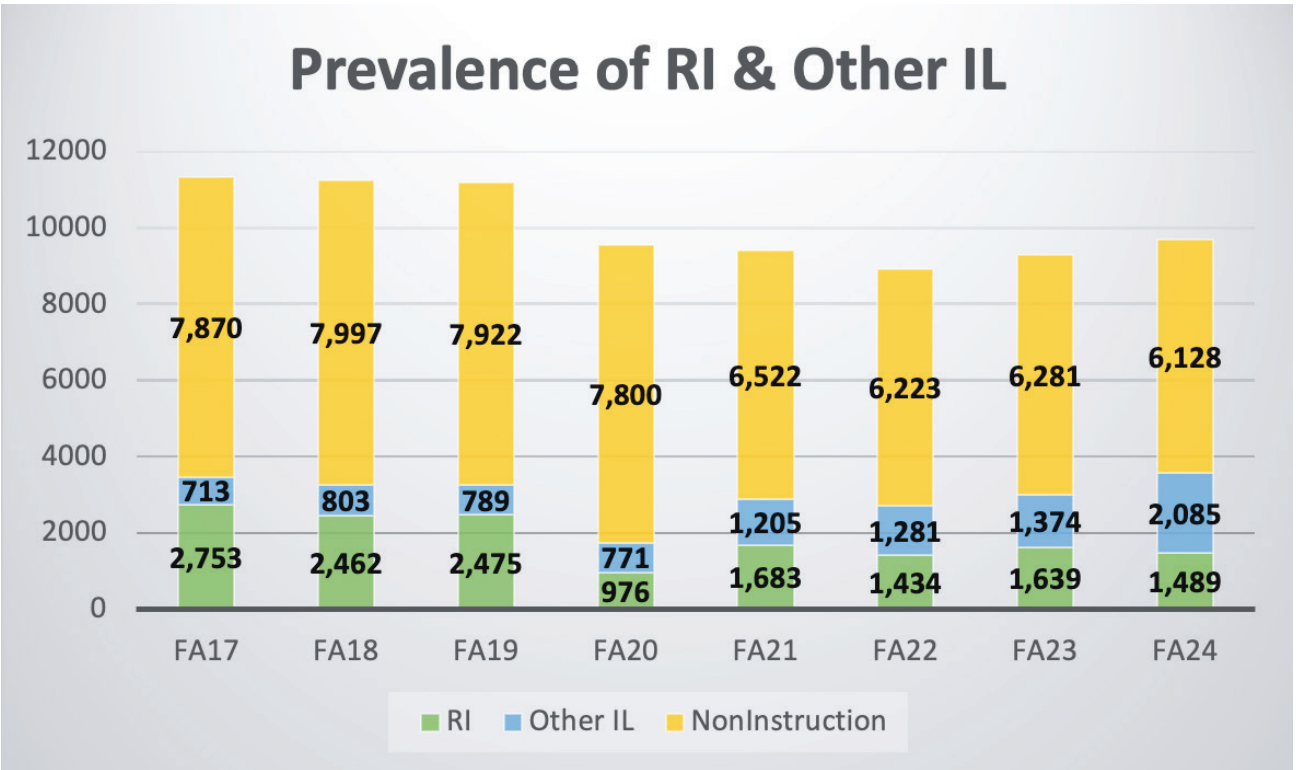

Figure 1. Prevalence of RI and Other IL Deduplicated.

it dropped to 10%. This anomaly is likely due to COVID-19, when instructors struggled to keep students on track in fully online classes and might not have had enough room in their course content for RI instruction.

Other IL instruction trends upward during the time studied, likely due to adding tutorials that teach IL skills, such as crediting sources, library orientation, MLA and APA citation, and evaluating sources. Other IL participation averages 12% of the total headcount. These lessons are omitted from RI, because it is not known whether students apply the concepts to a particular assignment as a part of the course grade.

Conversely, RI lessons are tailored to a specific research assignment and teach students only relevant IL skills. In the 50-minute live RI session, a librarian helps students understand how to choose a topic, use different resource types, evaluate credibility, identify keywords, navigate OneSearch (discovery system) or relevant databases, easily read scholarly articles, use citation tools, check those citations with our citation guide, and get help with researching and writing. Librarians lead two class activities for students to practice identifying appropriate resource types for different information needs and evaluating credibility. Otherwise, students can take an interactive RI tutorial that derives from our lesson plans and teaching materials, providing a comparable lesson and offering practice at every step.

The students often have limited library knowledge or experience, so the librarians teach the basics and provide rules of thumb that can be immediately implemented in their current assignment. The librarians' IL philosophy focuses on teaching a scaffold that students can develop and refine as they continue along their academic path. While students tend to have basic googling skills, they often feel overwhelmed conducting college-level research. They need a game plan for the project at hand, to feel like they grasp basic college-level research, and to know how to seek help if they encounter problems.

Literature Review

The connection between IL and course grades and passing rates seems logical: IL aims to improve student research skills, which should boost student performance on research assignments, and—as these assignments are large portions of student grades—better performance should raise course grades and passing rates. While an early systematic review found IL instruction was associated with only marginally better outcomes compared to no instruction, the authors acknowledged that these studies often suffered from flaws in their methodology, reporting, and/or analysis (Koufogiannakis & Wiebe, 2006). In the 2010 *Value of Academic Libraries* report, ACRL described earlier studies as "sporadic, disconnected, and focused on limited case studies" and urged librarians to join the broader movement in academia to systematically demonstrate their contributions to student success through outcomes-based data that align with institutional goals (p. 14). Since then, studies focusing on course grades and passing rates have shown inconsistent results.

A persistent issue plaguing studies is the failure to take attendance during IL instruction, which would allow researchers to assess student-level data. Studies that assume full attendance have shown mixed results, either finding a mild benefit (Asher, 2016; ACRL, 2016) or no benefit (Coulter et al., 2007; Lundstrom et al., 2016; Squibb & Mikkelsen, 2016; Krieb, 2018). However, studies that take attendance find more positive results, likely due to removing absent students, who lower the average outcome. When IL was embedded into an English composition course at a community college, Burgoyne and Chuppa-Cornell (2015) found a

positive correlation to retention and course completion among 1,273 students. However, the study lacked a control group. Despite their encouraging results, semester-long courses may not be scalable or feasible at many institutions. Chodock (2018) also tracked attendance at a community college and found a positive correlation between IL instruction and higher course grades when the lesson focused on researching rather than general information. Nevertheless, the sample sizes were not provided for this outcome, and the results were weak, leading him to speculate that the slightly higher grades resulted from mere class attendance. Shao and Purpur (2016) found a positive correlation between IL and grades among 398 students, but without a control group, the connection remained unclear. Conversely, Rowe et al. (2021) included a control group in a sample size of 10,000 students and found that students who participated in IL instruction were almost three times as likely to pass than those who did not. However, this study's control group combined students who were absent with those not offered instruction, merging two distinct populations, which likely impacted the results. Even with some small issues, these studies demonstrate the potential of IL instruction to increase student success and highlight the importance of tracking attendance during the IL intervention.

Another consistent issue in study design is the failure to factor in demographic information when analyzing results. While a couple of studies (Burgoyne & Chuppa-Cornell, 2015; Rowe et al., 2021) offer demographic information, they neither analyze it to establish a key factor for success nor account for it when analyzing student outcomes.

Due to issues in study design and reporting of many IL studies, even those few that showed positive results do little to persuade others of the effectiveness of IL instruction. Robertshaw and Asher (2019) conclude that, "because of the myriad of factors that affect grade, retention, and attainment outcomes, library use or instruction is unlikely to be able to statistically demonstrate a meaningful real-world impact on these outcomes" (pp. 94–95). After more than a decade of concentrated effort to measure IL's impact on students with little to show for it, Robertshaw and Asher's skepticism is reasonable. However, while other factors undeniably influence student outcomes, this study seeks to demonstrate how these factors can be accounted for or isolated to provide meaningful results.

One-shot sessions, in particular, have garnered most of the blame for the failure to demonstrate positive results. Much of the literature disavows one-shot sessions as unsustainable and ineffective (Carlozzi, 2018; Pagowsky, 2021; Bowles-Terry & Donovan, 2016; Coulter et al., 2007; Gandhi, 2004; Vossler et al., 2023). Even when demonstrating positive results of one-shot sessions, Rowe et al. (2021) do not endorse them. While their concerns about one-shots are valid and librarians should continue to explore new instruction methods and models, these sessions can be useful to teach IL at students' point-of-need and can have a measurable influence on student outcomes, as shown by previous studies that factored in attendance during the IL intervention.

Methodology

Study Design

This study focuses on RI rather than all types of library instruction because it directly addresses a research assignment usually worth 10%–15% of the overall course grade. The study excluded instruction that targets academic skills (e.g., citation or crediting sources) because its direct impact on course success is uncertain. Also, focusing on one specific intervention increased the validity of the outcomes. Lesson types were coded in the instruction schedule

to easily identify relevant events (e.g., RI for research instruction, CW for citation workshop, RW for research workdays, CA for career research).

The primary objectives of this study are to determine how likely students are to (1) pass their courses and (2) earn a higher course grade. To analyze outcomes, the students (N = 50,901) are divided into three statistically valid groups:

- RI: 14,911 (29%) students participate in one or more live session(s) or tutorial(s)
- Abs: 6,316 (12%) students do not participate in any RI opportunities offered
- NoRI: 29,674 (58%) students are in other sections of these courses not offered RI

These groups apply to a single course per semester, so students could belong to a different group for another course. If a student belongs to different groups in the same course (e.g., absent from the live session but completes a tutorial), they are categorized as an RI participant. If a student was neither absent nor an RI participant for a course, they are considered no research instruction (NoRI). As a point of interest, 51% of absent students failed to take a tutorial rather than missed a class, meaning they have comparable attendance to RI students, whereas 49% missed an in-person session.

The study used various methods to accurately compare groups, including pairwise comparison, z-tests, and t-tests. For categorical variables (e.g., college readiness and passing rates), averages were compared pairwise with the Bonferroni correction to reduce the likelihood of false correlation. For numerical variables (course grade), the study conducted one-way ANOVA tests and performed z-tests (three or more groups) or t-tests (two groups), which helped better compare averages of different-sized groups and to indicate how significantly different they are from each other. Groups with similar results (i.e., p-value is more than 0.000) are indicated by letters in the tables.

Finally, the study includes the standard deviation score for grades. Averages of large groups can hide significant variation in student outcomes. Thus, the standard deviation offers a transparent look into how closely individual students align with their group average. Because grades are often skewed to each end, the standard deviations are higher than if the grades had a normal distribution.

Data Collection

This large-scale study (N = 50,901) assesses the effect of RI on student grades and passing rates over several years. The study collected eight years of attendance and tutorial submissions from students in many different research-based courses. Table 2 shows the course composition of the dataset, which is largely students taking English composition courses (43%). Other disciplines include English literature (13%), communication (12%), history (6%), college success (6%), sociology (5%), biology (5%), psychology (5%), philosophy (2%), engineering (1%), and business (1%) among others.

To ensure the study's quality and validity, attendance had to be recorded. As the instruction coordinator, I was permitted to access limited student information (e.g., preferred name, college identification number, email) tied to research-based course enrollment (e.g., subject, course, course reference number, section, term code, instructor, total enrollment) via Evisions Argos Enterprise Reporting system. Each week, I sent attendance sheets to librarian instructors and gathered attendance. At the end of the semester, I collected RI tutorial submissions and ensured the student-submitted data matched enrollment records in Argos. Both attendance and tutorial submissions were compiled into one spreadsheet per semester, with additional columns to mark the tutorial and semester. The study compared fall-to-fall data, assuming

TABLE 2
Course Composition

Classes	Students	Percent	Abs	RI	NoRI
English Composition	21,928	43.1%	2,893	6,684	12,351
English Literature	6,417	12.6%	834	1,144	4,439
Communication	6,241	12.3%	376	1,621	4,244
History	3,009	5.9%	107	346	2,556
College Success	2,829	5.6%	449	1,656	724
Sociology	2,685	5.3%	548	1,087	1,050
Biology	2,684	5.3%	437	328	1,919
Psychology	2,319	4.6%	298	1,170	851
Philosophy	1,141	2.2%	112	66	963
Engineering	469	0.9%	48	255	166
Business	357	0.7%	36	76	245
Early Childhood Edu	247	0.5%	64	132	51
Photography	164	0.3%	14	74	76
Criminal Justice	133	0.3%	25	86	22
Architecture	92	0.2%	5	87	0
Political Science	62	0.1%	36	26	0
Physical Education	59	0.1%	28	14	17
Welding	41	0.1%	5	36	0
Computer Graphic Tech	24	0.0%	1	23	0
TOTAL	50,901	100%	6,316	14,911	29,674

consistency in student makeup. Comparing fall data is a common IEAP practice. However, this may not be necessary if the key factor is used to help interpret results.

Dataset Creation

IEAP removed student names from the library dataset and added relevant demographic information that may affect student outcomes, including student status (e.g., first-time freshman, freshman, other freshman, sophomore, undergraduate special), ever Pell-eligible, college-ready, and first-generation status.

Pellissippi State designates students as "not college ready" if they score below certain thresholds on the ACT, SAT, ACCUPLACER, SAILS, and/or high school GPA. Not-college-ready students are required to take a corequisite course in the discipline (e.g., English composition or math) that they scored below the threshold. Students are considered "first generation" if they self-report that neither of their parents graduated from a four-year institution.

The study did not use ACT information, because not all students took it, and college readiness accounted for this factor. IEAP also added letter grades and credits earned to the spreadsheet. Then, they created a separate dataset of all students enrolled in these research courses with all relevant demographic and outcome information for each semester to identify NoRI students enrolled in the course but not offered RI. These NoRI students also completed similar research assignments.

The library dataset was combined with the enrollment dataset, creating one file for each semester. The files were sorted by student college identification number, and rows were combined if the student appeared more than once per course in the semester (ascending levels: NoRI, Abs, and RI). Thus, the dataset had one row per student per course per semester. Additional columns totaled the number of tutorials, live sessions, and total RI sessions.

Other columns coded the number of RI sessions (0, 1, 2+), RI Type (RI, Abs, and NoRI), student status (first-time freshman, freshman, and other freshman were combined into group 1, sophomore in group 2, and undergraduate special in group 3), and semester/year. All freshmen are degree-seeking but lack enough credit hours to qualify as sophomores. Sophomores have earned at least 27 credit hours. Undergraduate special students are nondegree seeking, dual enrollment, or earning certification.

Initially, IEAP and I analyzed results with two RI groups (1 RI and 2+ RI); however, t-tests and pairwise comparisons found no significant difference between them for college readiness rates, passing rates, and course grade. Therefore, in these analyses, these groups are combined into the RI group.

Letter grades were transformed into a numerical grade based on the grade distributions found in the course syllabi, which may have slight differences among academic departments (e.g., A = 90-100 or A = 93-100). Because each is a range, we averaged them (e.g., A = 95 or A = 96.5). To not skew passing rates, 2,787 students who had withdrawn (2,776 with W grade), audited (six with AU grade), or did not complete (five with I grade) the class were excluded. Most who withdrew are a part of the NoRI and Absent groups, likely due to RI instruction being held later in the semester at the students' point of need. That is, students have likely already withdrawn from the class before RI instruction occurs. Had withdrawn students been included, passing rates for NoRI and Absent groups would be lower, because they earned no credit, having failed to complete the course.

Finally, for each dataset, the study compiled all fall semesters to analyze them simultaneously.

Results

Key Factor Analysis

To properly interpret results, it is necessary to first identify which key factor(s) is most strongly associated with student success and then to use this as a predictor to estimate expected outcomes. Beyond describing the population studied, a key factor analysis of demographics can identify what makes students more likely to be successful. Analyzing this factor among intervention and nonintervention groups provides a valuable benchmark for accurately assessing their results, particularly when groups are not equally likely to succeed. Considering the key factor when reporting outcomes can also help normalize results among studies of different institution types and student populations.

Identifying and considering this factor is particularly important when comparing groups that differ in their likelihood of success. Rather than comparing groups solely to each other—and attributing success just to group membership—the study first compared observed outcomes to their expected outcomes and then assessed the differences between observed and expected results. By comparing these differences across groups, the study could more accurately interpret whether disparities are due to underlying factors or reflect additional, unaccounted-for influences.

Under the guidance of IEAP statisticians, I used SPSS to analyze the data. Based on Schilling and Applegate (2012), students' demographics were examined as a constellation to identify the key factor for both passing rates and average course grade. Although Pell-eligibility was initially considered, it proved to be insignificant and was therefore excluded from the final key factor analysis to simplify groups. Because only college readiness and first-generation status are influential, students are arranged into one of four groups: Group 1 is not college ready (NCR) and first generation (FG), Group 2 is NCR and not first generation (NFG), Group 3 is college ready (CR) and FG, and Group 4 is CR and NFG.

TABLE 3
Key Factor Analysis

Multifactor	Group	#Students	#Pass	Pass%[1]	Grade%[2]	Std Dev
NCR, FG	1	14,394	10,574	73%	66%	31.8
NCR, NFG	2	9,206	7,142	78%	69%	29.5
CR, FG	3	11,237	9,389	84%	75%	28.0
CR, NFG	4	16,064	14,088	88%	79%	25.1

[1]Letters indicate groups have similar outcomes, as determined by pairwise comparisons.
[2]Letters indicate groups have similar outcomes, as determined by z-tests. Otherwise, sig is 0.000.

As depicted in Table 3, the two largest groups are demographically opposite each other. Group 4 (16,064 students) is college ready (CR) and not first-generation (NFG). They have the best outcomes: 88% passing rate, 79% average course grade, and the lowest grade variation (25.1 SD). Group 1 (14,394 students) is not college ready (NCR) and first-generation (FG). They have the worst outcomes: 73% passing rate; 66% average course grade; and the widest variation in grades (31.8 SD). Group 2 (NCR, NFG), with 9,206 students, performs only a little better than Group 1, with a 78% passing rate, 69% average grade, and a little lower grade variation (29.5 SD). Though much better than Group 2, Group 3 (CR, FG) performs slightly worse than Group 4, with an 84% passing rate, 75% average grade, and slightly wider grade variation (28.0 SD). Z-tests and pairwise comparisons confirm that all groups have different outcomes (0.000 sig).

The analysis reveals that, while first-generation students have slightly lower passing rates and course grades, college readiness is the most significant factor affecting these outcomes. CR students consistently have higher passing rates and course grades compared to NCR students. This finding shows that the college readiness rate is a good indicator for expected passing rates and establishes a useful benchmark to properly interpret grades.

Initial Analysis

College Readiness

NoRI students (56% CR) are more college ready than other groups, so they should have the highest passing rates and course grades. Pairwise comparisons confirm that RI participants (50% CR) are as college ready as Abs students (49% CR), so they should perform similarly. Why are RI and Abs students less likely to be college ready? NCR students are required to take corequisite courses, such as college success (COLL 1500) and reading (READ 0900), and many of these classes participate in RI because there is course time allotted to skill-building, such as research instruction. To better compare groups with different college readiness levels, the difference between college readiness and passing rates was calculated.

Passing Rates

Passing rates capture course completion, which is a primary goal for some students rather than high grades. Even though RI and Abs students have similar college readiness rates (as indicated by letters in Table 4) and should have similar outcomes, pairwise comparisons indicate that all groups have distinct passing rates. RI students pass more often than any other group, at 88%. Despite their low college readiness rate, they exceed expectations with a 38% difference from their college readiness rate. NoRI students, who are the most college ready at 56%, pass 82% of the time, a modest 25% difference. Abs students pass 62% of the time, a mere 13% difference.

Though college readiness rates indicate that RI and Abs students should pass at similar rates, RI students are over four times ($OR = 4.37$) as likely to pass as Abs students. Even when compared to the more college ready NoRI students, they are a little over half again more likely ($OR = 1.57$) to pass. Therefore, RI is positively correlated with passing rates.

Do instructors of Absent and RI (AbsRI) students grade more leniently than those of NoRI, causing AbsRI students to pass at higher rates? The plurality of the dataset is students taking English composition (43%) or English literature (13%), and these courses are taught by many different English instructors. To promote consistency in assessment, all English instructors adhere to a common set of grading standards and participate in grade-norming sessions (adjuncts annually and full-time faculty semiannually). During these sessions, instructors review an anonymized student paper and engage in collaborative discussion to justify and calibrate their grading decisions to ensure fairness and uniformity. Consequently, both instructors of NoRI and AbsRI grade similarly, and passing rates must be attributed to another factor.

TABLE 4
College Readiness, Passing Rates, and Course Grade

	#Students	#CR	CR%[1]	#Pass	Pass%[2]	Diff CR & Pass	Grade%[3]	Std Dev	Diff CR & Grade
ABS	6316	3086	49%[a]	3895	62%	13%	56%	36.9	7%
No RI	29674	16762	56%	24244	82%	25%	73%	28.5	17%
RI	14911	7453	50%[a]	13054	88%	38%	79%	23.1	29%

[1]Letters indicate groups are similar per pairwise comparisons.
[2]Letters indicate groups have similar outcomes per pairwise comparisons.
[3]Letters indicate groups have similar outcomes per z-tests. Otherwise, sig is 0.000.

Course Grades

Grades reflect the quality of students' performance. RI participants earn the highest grades at 79%, which is modestly better than expected, even outperforming the most college ready NoRI students (73%). Accounting for their college readiness, NoRI students perform slightly better than expected. Abs students are similarly college ready to RI students yet earn the lowest grades (56%), which aligns with their expected outcome (see Figure 2). Z-tests indicate each group's outcomes are significantly different (0.000 sig). Thus, RI is positively correlated with grades: RI students earn the highest grades, even surpassing those of the most college-ready group.

The standard deviation (SD) measures grade variation among individual students in a group. SD scores in our study are high overall, which points to the grade distribution not

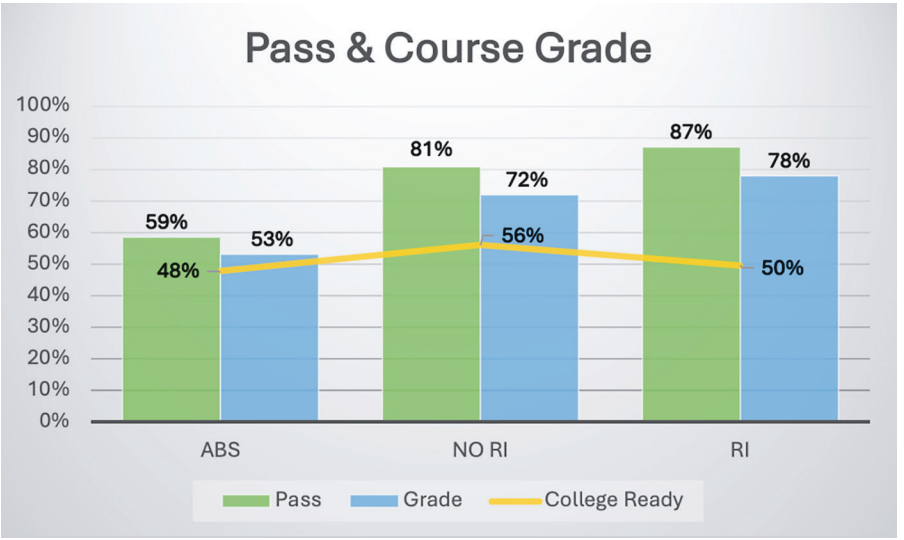

Figure 2. College Readiness, Passing Rates, and Course Grade.

having a normal bell-curve distribution. RI students earn grades at or near 79% more consistently, indicated by the lowest SD of any group (23.1 SD). NoRI students show wider variation from their 73% average (28.5 SD), but Abs students vary the most (36.9 SD) from their 56% average. Hence, RI is associated with not just a higher group grade but also consistently higher grades for individuals in the group.

Semester Analysis

Admittedly, condensing eight years of data into one average flattens results and may obscure inconsistencies. A semester analysis provides a more detailed view of the data and reveals much the same pattern each semester.

College Readiness

Though college readiness varies slightly each semester, distinct patterns emerge. NoRI students (52%–59% CR) are often the most college ready, followed by RI (42%–57% CR) and Abs (40%–55% CR) students. Pairwise comparisons show groups are similar for NoRI and RI in 2021; RI and Abs in 2017, 2018, 2022, and 2024; NoRI and Abs in 2022; and for all groups in 2020 and 2023. Therefore, NoRI students should generally have the highest outcomes, followed by RI, and then Abs students.

Passing Rates

Each fall, RI participants pass their classes the most of any group (83%–92%), surpassing the most college ready NoRI group (74%–86%). They also consistently outperform what their college readiness forecasts by 32%–41%, the best of any group. NoRI students pass modestly more than their college readiness indicates (19%–29% higher). Abs students (48%–75%) have the lowest passing rates and tend to perform slightly better than expected (5%–22% higher). Aside from 2017, when RI (83%) and NoRI (82%) students passed at similar rates, pairwise comparisons confirm that passing rates are distinct for each semester.

Overall, RI students are three to over seven times as likely as Abs students (OR = 2.99-7.21) to pass. As for NoRI students, except for fall 2017 when NoRI students were almost half

TABLE 5
College Readiness, Passing Rates, and Course Grade by Semester

	#Students	#CR	CR%[1]	#Pass	Pass%[2]	Diff CR & Pass	Grade%[3]	Std Dev	Diff CR & Grade
FA17									
ABS	826	328	40%[a]	468	57%	17%	51%	38.1	11%
No RI	3,179	1,754	55%	2,593	82%[a]	26%	73%[a]	28.8	18%
RI	2,753	1,163	42%[a]	2,293	83%[a]	41%	75%[a]	25.9	33%
FA18									
ABS	781	340	44%[a]	415	53%	10%	49%	38.0	5%
No RI	3,284	1,704	52%	2,641	80%	29%	71%	28.9	19%
RI	2,462	1,169	47%[a]	2,112	86%	38%	77%	24.2	30%
FA19									
ABS	627	272	43%	301	48%	5%	45%	38.4	2%
No RI	5,551	3,270	59%	4,563	82%	23%	72%	27.2	13%
RI	2,475	1,251	51%	2,146	87%	36%	78%	22.8	27%
FA20									
ABS	851	472	55%[a]	515	61%	5%	55%	37.0	0%
No RI	3,687	2,012	55%[a]	2,712	74%	19%	67%	33.3	12%
RI	976	517	53%[a]	895	92%	39%	81%	21.2	28%
FA21									
ABS	738	341	46%	420	57%	11%	52%	36.1	6%
No RI	3,964	2,140	54%[a]	3,181	80%	26%	72%	29.0	18%
RI	1,683	876	52%[a]	1,495	89%	37%	80%	22.8	28%
FA22									
ABS	973	521	54%[a,b]	698	72%	18%	65%	33.9	11%
No RI	3,040	1,753	58%[a]	2,578	85%	27%	76%	26.3	18%
RI	1,434	738	51%[b]	1,287	90%	38%	80%	21.0	29%
FA23									
ABS	378	199	53%[a]	217	57%	5%	53%	37.1	0%
No RI	2,624	1,551	59%[a]	2,232	85%	26%	76%	26.5	17%
RI	1,639	939	57%[a]	1,463	89%	32%	80%	21.4	23%
FA24									
ABS	1,142	613	54%[a]	861	75%	22%	69%	32.3	15%
No RI	4,345	2,578	59%	3,744	86%	27%	77%	25.9	18%
RI	1,489	800	54%[a]	1,363	92%	38%	83%	20.3	29%

[1]Letters indicate groups are similar per pairwise comparisons.
[2]Letters indicate groups have similar outcomes per pairwise comparisons.
[3]Letters indicate groups have similar outcomes per z-tests. Otherwise, sig is 0.000.

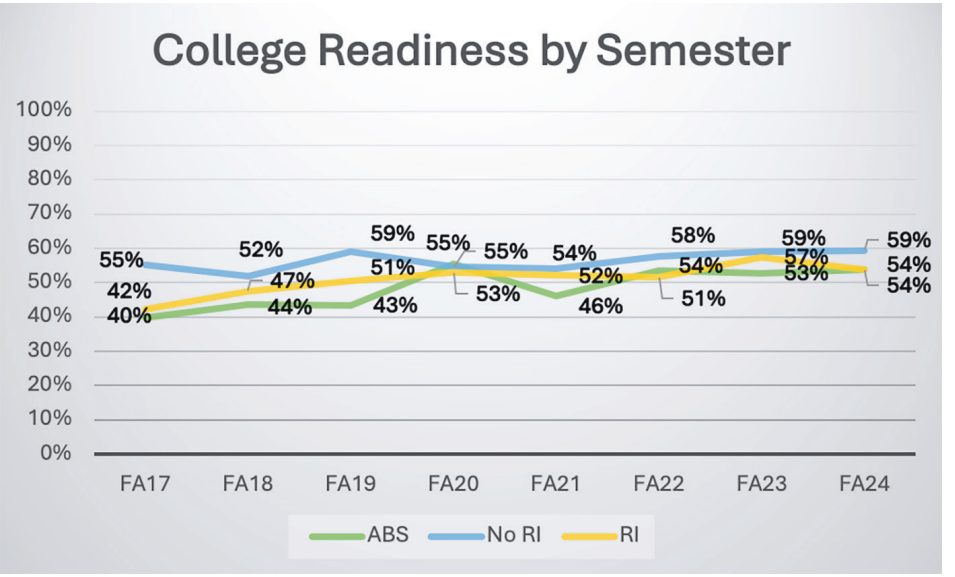

Figure 3. College Readiness by Semester.

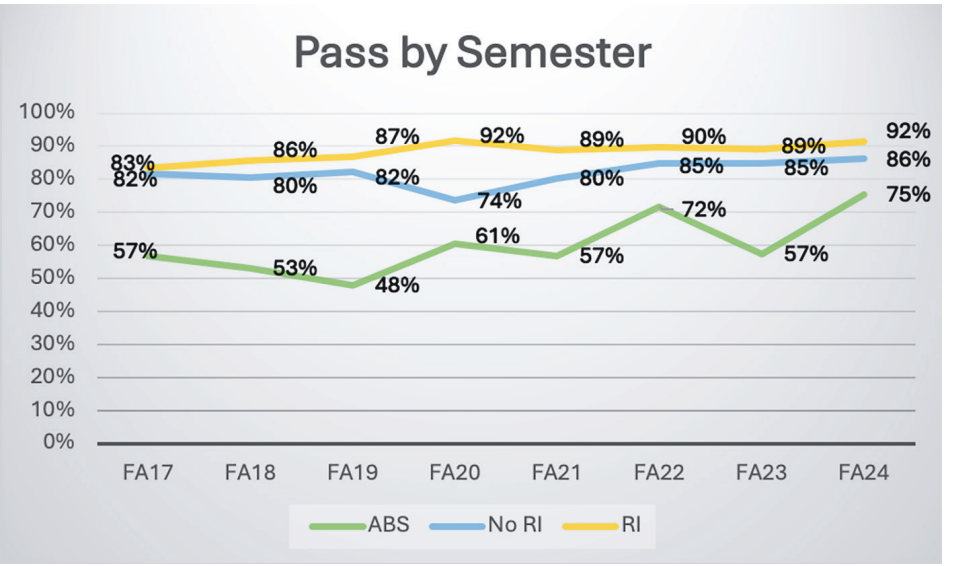

Figure 4. Passing Rates by Semester.

again more likely (*OR* = 1.44) to pass, RI students are up to four times as likely (*OR* = 1.41-3.97) as NoRI students to pass.

Course Grade

Each semester, RI participants (75%–83%) earn the highest grades, moderately outpacing their college readiness. Z-tests indicate that, in 2017, RI (75%) and NoRI (73%) students earn somewhat similar grades, although the significance is not high at 0.007. Nevertheless, RI students (42% CR) are far less college ready than NoRI students (55% CR), so RI participants still outperform NoRI students. Every semester, NoRI students (67%–77%) are second best, slightly above their college readiness. Abs students (45%–69%) earn the lowest grades, performing either as well as, or a little better, than expected.

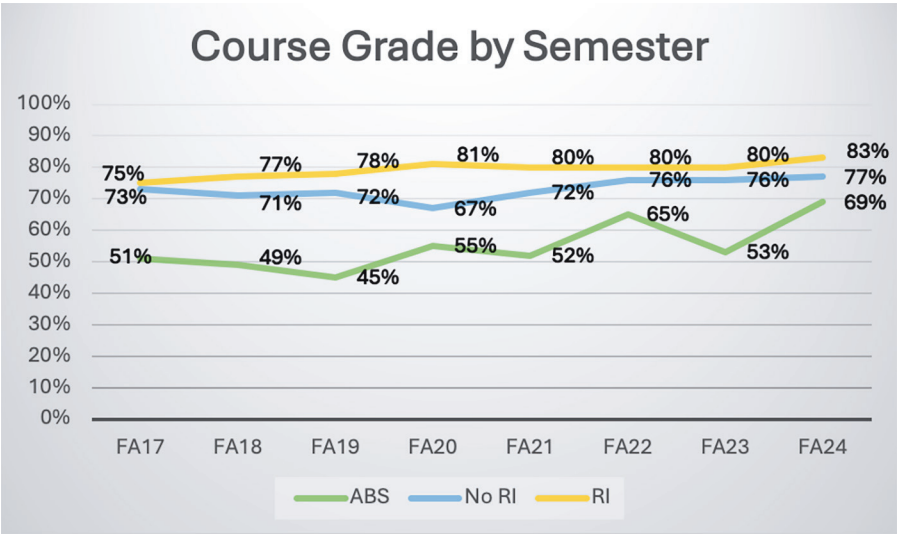

Figure 5. Course Grade by Semester.

Each semester, RI students show the least variation in grades (20.3–25.9 SD). NoRI students' grades vary more widely than their group average (25.9–33.3 SD). Finally, the grades of Abs students range the most from their group average (32.3–38.4 SD).

Even with more granular semester data, the same pattern emerges: RI students consistently have the highest passing rates and grades, especially given their low college readiness rates, and have the least variability in their grades. Even though NoRI students are much more college ready, their outcomes are still second best, performing modestly better than expected. Also, their grades vary more from the group average than those of RI participants. Abs students have the worst passing rates and grades, aligning with their low-college-readiness rates. Their grades differ the most from their group average. Thus, even in a detailed semester analysis of eight years, RI is confirmed as positively correlated with both passing and grades.

Student Status

The above analyses offer only college readiness for context. However, student status (e.g., freshman, sophomore, and undergraduate special) also influences outcomes. Freshmen (Fresh) are degree-seeking but lack enough credit hours to qualify as sophomores. Sophomores (Soph) have earned at least 27 credit hours. Undergraduate special (US) students are nondegree seeking, dual enrollment, or earning certification. Analyzing the data by student status brings greater clarity to how RI affects each, because variations in demographics and outcomes can obscure results when student status types are in different proportions among groups. For example, sophomores are more likely to be college ready and are more experienced than freshmen; both factors increase their likelihood of success in their classes. Undergraduate special students are often dual-enrollment high school students who are much more college ready than other groups. Do certain student status types benefit from RI more than others?

Proportions

The NoRI group benefits from having the most sophomores (21%) and fewest freshmen (59%), whereas the Abs group is overwhelmingly freshmen (69%). In other words, freshmen are at the highest risk of absenteeism or nonengagement. The RI group is also mostly composed of

freshmen (66%) and has the fewest sophomores (15%) of any group. Both RI and NoRI groups have equal proportions of undergraduate special students (19%).

TABLE 6
Student Status Type Proportions

	#Students	#Fresh	Fresh%[1]	#Soph	Soph%[1]	#US	US%[1]
ABS	6,316	4,375	69%	1,049	17%	892	14%
No RI	29,674	17,571	59%	6,320	21%	5,783	19%[a]
RI	14,911	9,882	66%	2,172	15%	2,857	19%[a]

[1]Letters indicate groups are similar, as determined by pairwise comparisons.

Freshman

Freshman students are the least college ready, pass less often, and earn lower course grades than any other student status. Pairwise comparisons show Abs (41% CR) and RI (39% CR) freshmen are equally college ready, so they should have similar outcomes. NoRI freshmen (47% CR) are much more college ready, highlighting that college-ready freshmen are often not offered RI.

TABLE 7
Freshman: College Readiness, Passing Rates, and Course Grade

	#Students	#CR	CR%[1]	#Pass	Pass%[2]	Diff CR & Pass	Grade%[3]	Std Dev	Diff CR & Grade
ABS	4,375	1,775	41%[a]	2,254	52%	11%	48%	37.5	7%
No RI	17,571	8,318	47%	13,124	75%	27%	67%	31.2	20%
RI	9,882	3,893	39%[a]	8,234	83%	44%	75%	25.3	36%

[1]Letters indicate groups are similar per pairwise comparisons.
[2]Letters indicate groups have similar outcomes per pairwise comparisons.
[3]Letters indicate groups have similar outcomes per z-tests. Otherwise, sig is 0.000.

Despite their clear advantage, only 75% of NoRI freshmen pass (27% difference), while 83% of RI freshmen do, greatly exceeding expectations (44% difference). Abs freshmen, who should perform similarly to RI, pass only 52% of the time, a little more than expected (11% difference). RI freshmen are nearly five times as likely to pass as Abs freshmen ($OR = 4.70$), even though they are equally college ready, and almost twice as likely as NoRI freshmen ($OR = 1.69$), who are much more college ready.

RI freshmen also earn higher grades (75%) than the NoRI freshmen (67%), despite NoRI students' college readiness advantage. RI freshmen exceed expectations while NoRI students perform marginally better than expected. Abs freshmen (48%) earn grades as expected. Z-tests indicate each group has different outcomes (0.000 sig). Freshmen have the widest grade variation than other student status types, but RI freshmen (25.3 SD) vary less than either NoRI (31.2 SD) or Abs (37.5 SD) freshmen.

Being the least college ready, freshmen have the most to gain from RI, as evidenced by having the highest differences between college readiness, passing rates, and grades of any student status type. RI freshmen also have the most consistently high grades of any of their peers.

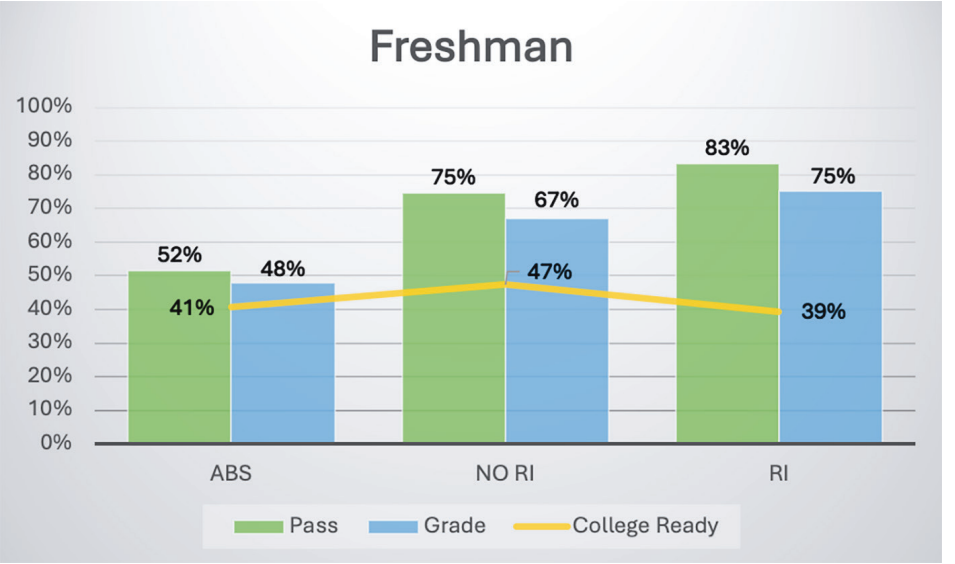

Figure 6. Freshman: College Readiness, Passing Rates, and Course Grade.

Sophomore

Sophomores have higher college readiness, passing rates, and course grades than freshmen. Pairwise comparisons show sophomore groups (54%–57% CR) are similarly college ready, so they should perform likewise.

TABLE 8
Sophomore: College Readiness, Passing Rates, and Course Grade

	#Students	#CR	CR%[1]	#Pass	Pass%[2]	Diff CR & Pass	Grade%[3]	Std Dev	Diff CR & Grade
ABS	1,049	576	55%[a]	869	83%	28%	74%	28.2	19%
No RI	6,320	3,578	57%[a]	5,654	89%	33%	79%	23.2	22%
RI	2,172	1,177	54%[a]	2,044	94%	40%	85%	18.0	31%

[1]Letters indicate groups are similar per pairwise comparisons.
[2]Letters indicate groups have similar outcomes per pairwise comparisons.
[3]Letters indicate groups have similar outcomes per z-tests. Otherwise, sig is 0.000.

Nevertheless, RI sophomores pass the most (94%) and remarkably more than expected (40% difference). NoRI sophomores pass 89% of the time, much more than expected (33% difference). They are followed by Abs sophomores (83%), who pass moderately more than expected (28% difference). Passing rates were different for each group, according to pairwise comparisons. RI sophomores are over three times as likely to pass ($OR = 3.31$) as Abs sophomores and nearly twice as likely as NoRI sophomores ($OR = 1.88$).

RI sophomores earn the highest grades (85%), performing much better than expected. Despite being as college ready as RI sophomores, NoRI sophomores average a 79% grade, only moderately better than expected, and Abs sophomores perform slightly above expectations, with an average of 74%. Z-tests show that grades are different for each group (0.000 sig). RI sophomores also earn grades closest to their group average (18.0 SD) compared to NoRI (23.2 SD) or Abs (28.2 SD) sophomores.

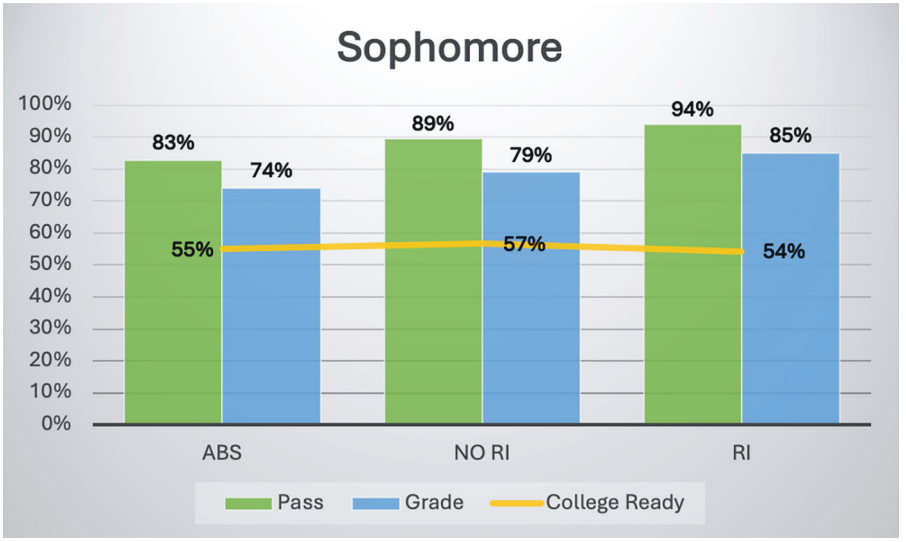

Figure 7. Sophomore: College Readiness, Passing Rates, and Course Grade.

While not as pronounced a difference as freshmen, sophomores who participate in RI still have much higher passing rates and grades than nonparticipants. Like freshmen, RI sophomores also have consistently higher grades than their peers.

Undergraduate Special

Undergraduate special students are the most college ready, have the highest passing rates, and earn the highest course grades. Pairwise comparisons indicate they (82%–84% CR) are equally college ready and should perform similarly.

RI undergraduate special students pass more often (97%) than the NoRI (95%) and Abs (87%) groups, although the difference in their expected outcome (14%) is less conspicuous than other student status types due to their high college readiness. NoRI students perform slightly better than expected (10% difference), and Abs students as expected (4% difference). Pairwise comparisons show passing rates are different for each group. RI undergraduate special students are over five times as likely ($OR = 5.33$) to pass as Abs students and twice as likely ($OR = 1.99$) as NoRI students.

TABLE 9
Undergraduate Special: College Readiness, Passing Rates, and Course Grade

	#Students	#CR	CR%[1]	#Pass	Pass%[2]	Diff CR & Pass	Grade%[3]	Std Dev	Diff CR & Grade
ABS	892	735	82%[a]	772	87%	4%	76%	27.2	-6%
No RI	5,783	4,866	84%[a]	5,466	95%	10%	84%	18.2	0%
RI	2,857	2,383	83%[a]	2,776	97%	14%	87%	13.6	4%

[1]Letters indicate groups are similar per pairwise comparisons.
[2]Letters indicate groups have similar outcomes per pairwise comparisons.
[3]Letters indicate groups have similar outcomes per z-tests. Otherwise, sig is 0.000.

RI undergraduate special students earn the highest grades, with an average of 87%, followed by NoRI (84%) and Abs (76%) students. Z-tests confirm all outcomes are distinct (0.000 sig).

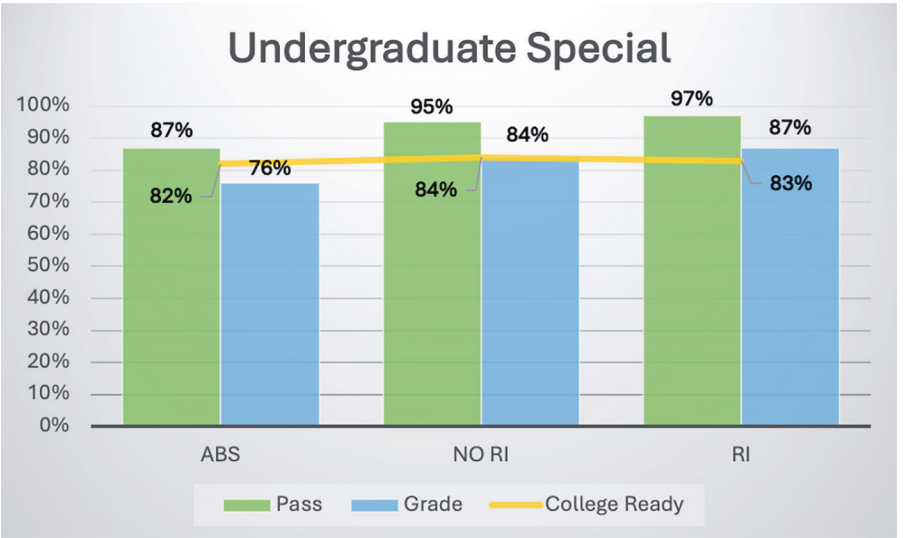

Figure 8. Undergraduate Special: College Readiness, Passing Rates, and Course Grade.

RI and NoRI students perform as expected, whereas Abs students do slightly worse. RI students (13.6 SD) have the least grade variation from their group average, followed by NoRI (18.2 SD) and Abs (27.2 SD) groups.

Undergraduate special students have remarkable passing rates and grades overall, but those who participate in RI have the best. Nearly all RI students pass, and though they earn only a slightly higher grade than NoRI students, their grades cluster more closely around the group average than those of NoRI students.

For all student status types, RI is positively associated with both passing rates and course grades. Freshmen and sophomores particularly benefit, with significant differences in outcomes. Undergraduate special students also benefit, although the differences are less dramatic due to their higher college readiness rates. Among all student status groups, RI participants earn more consistently high grades, closer to their average group grade than non-participants.

College Ready Versus Not College Ready

So far, the findings might seem to suggest that RI benefits NCR students the most, and we could reasonably argue that RI should target them. But do CR students benefit from RI? If so, how much compared to NCR students?

Passing Rates

Among both NCR and CR students, RI groups pass more often than nonparticipants. Pairwise comparisons indicate all results are distinct within their peer groups. Both NCR (53%) and CR (71%) Abs students have the lowest passing rates, followed by NoRI-NCR students (76%). When NCR students participate in RI, they pass slightly less (83%) than CR students in the NoRI group (86%). When CR students participate, 92% pass, the highest rate of any group.

For NCR students, the RI group is over four times as likely ($OR = 4.35$) to pass as the Abs group and more than half again as likely ($OR = 1.56$) as the NoRI group. For CR students, the RI group is almost five times as likely ($OR = 4.76$) to pass as the Abs group and almost twice as likely ($OR = 1.84$) as the NoRI group. These results indicate that both CR and NCR students benefit from RI.

TABLE 10
Passing Rates: Not College Ready Versus College Ready

	#NCR Students	#Pass	Pass%[1]	#CR Students	#Pass	Pass%[1]
ABS	3,230	1,715	53%	3,086	2,180	71%
No RI	12,912	9,801	76%	16,762	14,443	86%
RI	7,458	6,200	83%	7,453	6,854	92%

[1]Letters indicate groups have similar outcomes per pairwise comparisons.

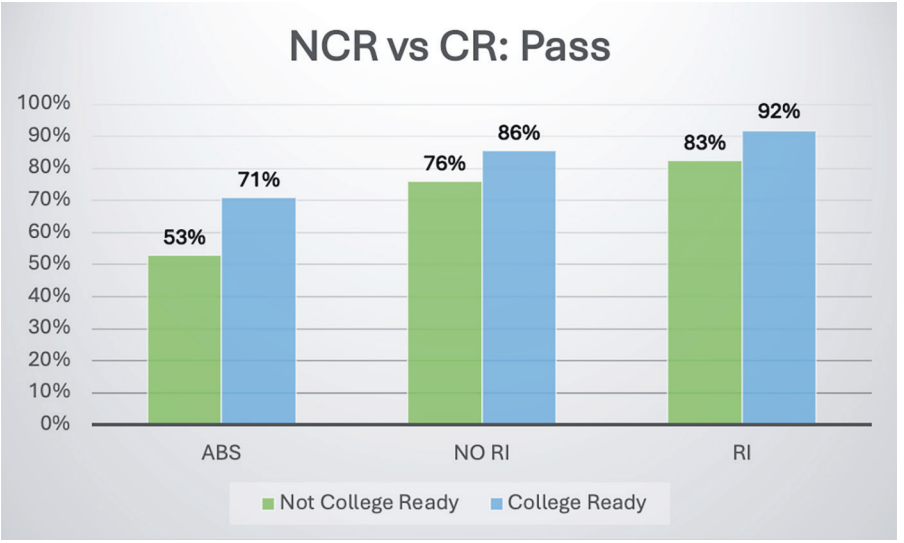

Figure 9. Passing Rates: Not College Ready Versus College Ready.

Course Grade

For both NCR and CR students, RI participants earn higher grades than nonparticipants. Outcomes are distinct for each group, according to z-tests (0.000 sig). Abs students earn the lowest grades, whether NCR (49%) or CR (64%). NoRI-NCR students follow, with an average of 68%. Like with passing rates, the grades of NCR participants (75%) resemble those of CR students in the NoRI group (77%). CR participants earn the highest grades, with an average of 82%.

TABLE 11
Course Grade: Not College Ready Versus College Ready

	#NCR Students	Grade%[1]	Std Dev	#CR Students	Grade%[1]	Std Dev
ABS	3,230	49%	37.3	3,086	64%	35.1
No RI	12,912	68%	30.5	16,762	77%	26.1
RI	7,458	75%	25.1	7,453	82%	20.3

[1]Letters indicate groups have similar outcomes, as determined by z-tests. Otherwise, sig is 0.000.

For NCR groups, RI students (25.1 SD) earn grades closer to the group average more consistently than either the NoRI (30.5 SD) or Abs (37.3 SD). As for CR groups, RI students (20.3 SD) are even more consistent, more so than either of their NoRI (26.1 SD) or Abs (35.1 SD) counterparts.

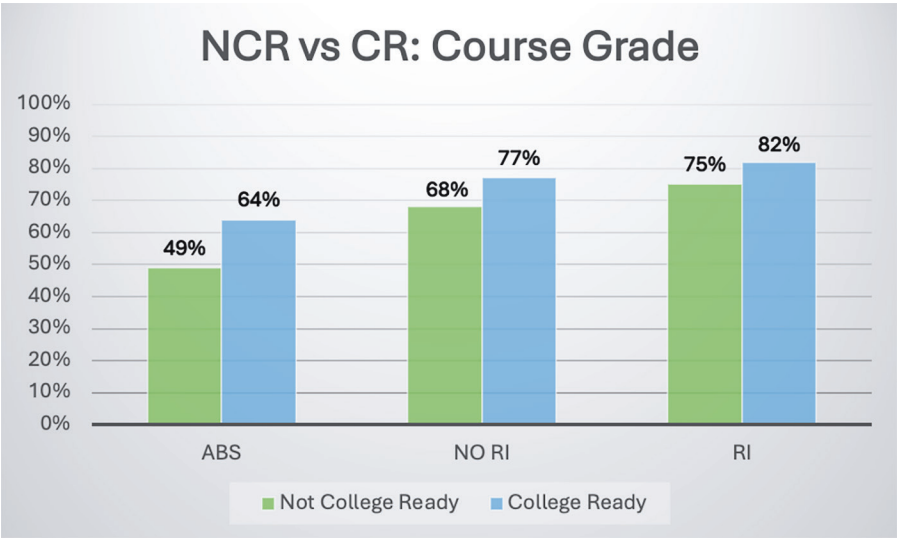

Figure 10. Course Grade: Not College Ready Versus College Ready.

A 2019 meta-analysis by Robertshaw and Asher concluded that high-performing students (i.e., CR students) are more likely to use library services, potentially skewing results. To address their concerns, this study separated groups by college readiness and found that *both* CR and NCR participants have higher passing rates and grades compared to their nonparticipant peers. These results invite us to consider RI as a standard pedagogical practice that helps all students, whether college ready or not college ready.

Course Attendance

Course attendance is strongly correlated with course grade (Credé et al., 2010; Gaftandzhieva et al., 2022), and RI student outcomes may just be benefiting from general class attendance, which is what Chodock (2018) concluded from his study. Chronically absent students may be lowering NoRI and Absent groups' grades and passing rates, because they not only receive no credit from not passing but also a fail to attend (FA) grade, which results in 0%. This FA grade is lower than a failing (F) grade, which is calculated as 29.5% (the mean of 0%–59%). If FA students are removed from all groups, is RI still correlated with higher passing rates and grades?

At Pellissippi State, if students stop attending classes at any point in the semester, do not withdraw, and their instructors mark a last date of attendance, they receive an FA grade at the end of the semester. Removing these chronically absent students, who receive an FA grade, from each group, leaves students who participated similarly. Chronically absent students comprise 23% (1,446 students) of the Abs group, 8% (2,257 students) of the NoRI group, and 3% (407 students) of the RI group. Combining the Absent and RI students (1,853) who are in the same class puts these percentages into perspective relative to NoRI students, as they are at 9% and 8%, respectively. As a point of interest, FA grades are inversely correlated with college readiness. That is, NCR students are almost twice as likely ($OR = 1.78$) to receive FA grades than CR students.

College Readiness

When chronically absent students are removed, both NoRI students (57% CR) and Abs students (53% CR) are more college ready than RI students (50% CR), which suggests they

should have better outcomes than RI students. Pairwise comparisons confirm that all groups have different CR levels. As a point of interest, students in the Abs group are almost twice as likely (*OR* = 1.71) to have failed to take a tutorial than they are to have skipped a live class. Also, Abs students who skip the tutorial are a little more likely (*OR* = 1.29) to be college ready.

TABLE 12
No Chronically Absent: College Readiness, Passing Rates, and Course Grade

	#Students	#CR	CR%[1]	#Pass	Pass%[2]	Diff CR & Pass	Grade%[3]	Std Dev	Diff CR & Grade
ABS	4,870	2,557	53%	3,895	80%	27%	73%	23.5	20%
No RI	27,417	15,784	58%	24,244	88%	31%	79%	20.0	21%
RI	14,504	7,293	50%	13,054	90%	40%	81%	19.3	31%

[1]Letters indicate groups are similar per pairwise comparisons.
[2]Letters indicate groups have similar outcomes per pairwise comparisons.
[3]Letters indicate groups have similar outcomes per z-tests. Otherwise, sig is 0.000.

Passing Rates

Even though Abs (80%) and NoRI (88%) students should have higher passing rates due to their higher college readiness rates, RI students (90%) continue to pass more often than any other group. Pairwise comparisons confirm that these outcomes are distinct. While Abs (27% difference) and NoRI (31% difference) students do much better than expected, RI students (40% difference) perform exceptionally well. In fact, RI students pass more than twice as often (*OR* = 2.25) as Abs students and a little more often (*OR* = 1.18) than NoRI students, even though NoRI students are much more CR. Therefore, RI is still positively correlated with higher passing rates.

Course Grades

Though RI students are the least CR, they exceed expectations and earn the highest grades of any group, with an average of 81%. While NoRI students earn higher course grades (79%) than Abs students (73%), their performance is almost identical relative to their college readiness rates. Z-tests indicate each group's outcomes are significantly different (0.000 sig). RI students earn grades at or near 81% more consistently, indicated by the lowest SD of any group (19.3 SD). NoRI students' grades vary slightly more from their 79% average (20.0 SD), and Abs students vary the most (23.5 SD) from their 73% average. Thus, RI is correlated with the highest grades and most consistently high grades for individuals in the group.

Even when chronically absent students are removed from each group, and the RI group is the least college ready, RI students still outperform all other groups, including the most college ready NoRI group. Even Abs students should perform better than RI students, given their higher college readiness rate and similar course attendance. However, RI students continue to have the highest passing rate and grades, while Abs students have the lowest. RI students also consistently earn grades closer to the group average. When considering college readiness, RI students earn much higher grades than expected, whereas NoRI and Abs students earn only modestly higher grades. These findings demonstrate a positive correlation between RI, passing rates, and grades, even when controlling for course attendance.

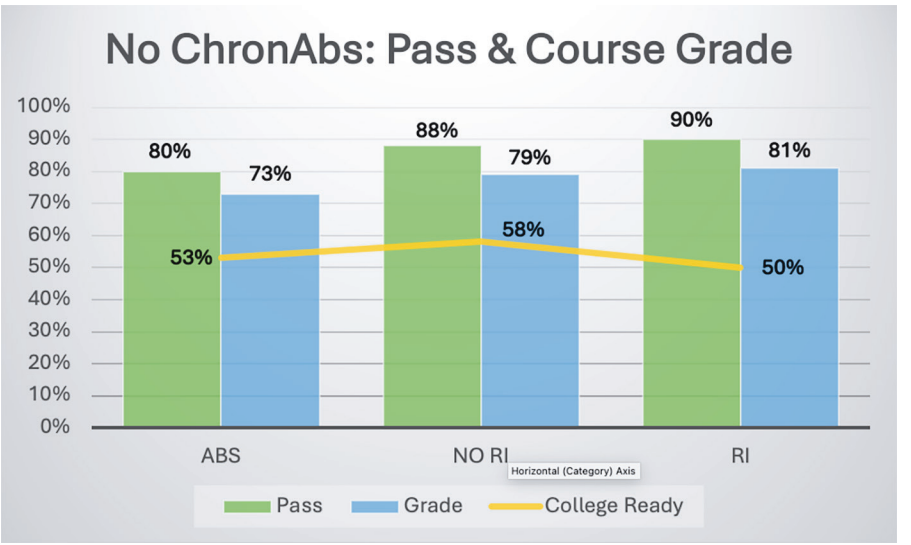

Figure 11. No Chronically Absent: College Readiness, Passing Rates, and Course Grade.

Taking Attendance

"Typical one-shot instruction sessions, as provided for community college introductory-level courses, had not been shown to have a measurable impact on academic success," noted Chodock (2018), "We wondered what factors might be important to make library instruction more effective" (p. 119). This study shows that one-shot sessions can have a measurable positive impact on both passing rates and course grades of community college students. Why are these results different? Many studies focusing on one-shot sessions may have shown similar positive outcomes if they had accounted for attendance and student demographics. Attendance was not taken, often assuming absent students would not impact the results.

This study found that 30% of students enrolled in classes offering RI are in the absent group. This population is large enough to significantly dampen the RI group's results, particularly when their outcomes are consistently the lowest of any group. Also, including absent students in the NoRI group artificially lowers the NoRI group results. Therefore, absent students must be considered separately. AbsRI Combined Group (N = 21,227) proportions:

- RI: 14,911 (70%) students have one or more live session(s) or tutorial(s)
- Abs: 6,316 (30%) students do not participate in any RI opportunities offered

College Readiness

As mentioned, most studies did not include demographic information, and those that did overlooked tying it to outcomes. AbsRI students (50% CR) are much less college ready than NoRI students (56% CR). Therefore, we expect NoRI students to outperform AbsRI students.

Passing Rates

AbsRI students' passing rate (80%) is lower than the NoRI group (82%). These results are statistically distinct according to pairwise comparisons. AbsRI students are slightly less likely (*OR* = 0.89) to pass than NoRI students. Calculating the difference between college readiness and passing rates, AbsRI students (30% difference) are slightly more successful than NoRI students (25% difference), but these results are still lackluster.

For comparison, this study's initial analysis found that, when attendance is taken, 62% of Abs students and 88% of RI students pass (see Table 3). Therefore, combining these students flattens the passing rate to 80%, which is lower than the NoRI group at 82%. These results align with studies that assumed full attendance and found lower passing rates for students who have IL instruction.

TABLE 13
Abs and RI Combined: Passing Rates and Course Grade

	#Students	#CR	CR%[1]	#Pass	Pass%[2]	Diff CR & Pass	Grade%[3]	Std Dev	Diff CR & Grade
No RI	29,674	16,762	56%	24,244	82%	25%	73%	28.5	17%
ABS RI	21,227	10,539	50%	16,949	80%	30%	72%	29.7	22%

[1]Letters indicate groups are similar per pairwise comparisons.
[2]Letters indicate groups have similar outcomes per pairwise comparisons.
[3]Letters indicate groups have similar outcomes per t-tests. Otherwise, sig is 0.000.

Course Grade

Grades are similarly disappointing, with NoRI averaging slightly higher (73%) than AbsRI students (72%). T-tests show their outcomes are distinct (0.000 sig). When considering college readiness, AbsRI students (22% difference) are slightly more successful than NoRI students (17% difference). However, the grade variability for AbsRI (29.7 SD) and NoRI (28.5 SD) groups are analogous. These results confirm studies that assumed full attendance and found no benefit from IL instruction.

Again, this study's initial analysis found that when attendance is taken, Abs students earn a 56% course grade, and RI students earn 79% (see Table 3). Also, absent students had a much wider grade range (36.9 SD) than RI students (23.1 SD). When these groups are combined, their average course grade flattens to 72%, slightly lower than the NoRI group (73%), and their grade variability is slightly higher than the NoRI group.

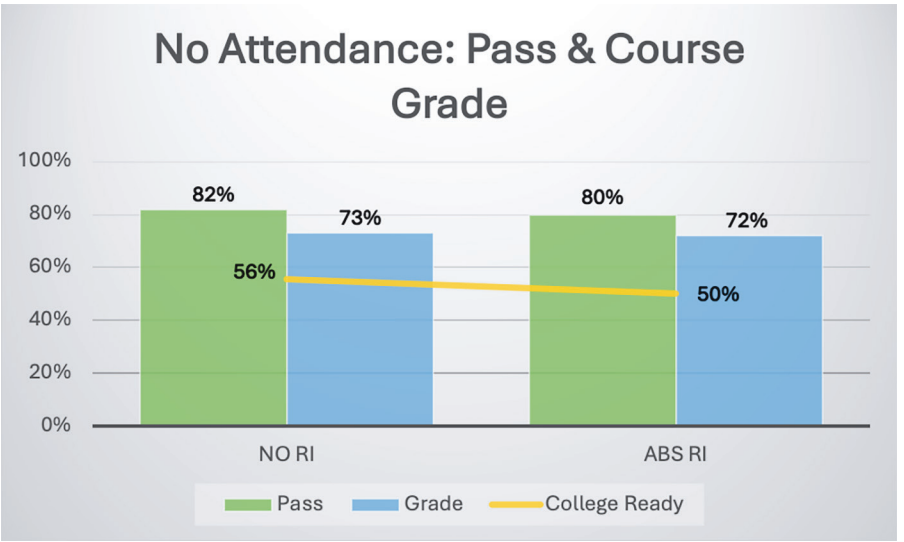

Figure 12. Abs and RI Combined: Passing Rates and Course Grade.

When the Abs group is combined with the RI group, as if attendance was not taken, the results are identical to many other studies that assumed full attendance and showed IL instruction has no benefit. These results demonstrate that gathering attendance during the intervention is crucial to measuring its impact on academic success. Addressing Chodock's (2018) observation, targeted one-shot RI instruction is likely already effective, and the critical factor in measuring success is factoring in participation in the intervention (i.e., attendance or tutorial submission).

Discussion

Through multiple analyses, this study repeatedly demonstrates a positive association between targeted RI within a one-shot model and higher passing rates and course grades. Even without considering their college readiness, RI students consistently achieve the highest passing rates and grades. When factoring in college readiness, RI students have the highest difference between expected outcome and actual outcome, whereas nonparticipants tend to perform either as expected from their college readiness rate or marginally better. RI students also consistently earn course grades at or near the group average, suggesting RI fills a critical skill gap and reduces variability in outcomes.

Even when analyzed by semester, these results remain consistent across all student cohorts, with RI participants achieving the highest outcomes despite their low college readiness. Further examination of student status types reveals much the same pattern. While the predominately college ready undergraduate special participants experience slightly higher passing rates and more reliably higher grades, freshmen and sophomores (who are generally less college ready) have remarkably higher outcomes. Overall, each student type has consistently higher passing rates and grades when participating in RI.

From these findings, one could reasonably conclude that RI should target NCR students. However, viewing RI as remediation ignores its benefit to CR students, as the results indicate that both NCR and CR students who participate in RI have the highest outcomes of their respective peers. These findings highlight IL as a gap in students' skill set, even among CR students. Therefore, RI should be integrated into the pedagogical approach for teaching college-level research to all students.

To account for course attendance generally, this study removed chronically absent students from each group and re-examined results only to find a similar pattern. Despite RI students having the lowest college readiness rate, even lower than Abs students, they still outperform every other group. Therefore, general course attendance cannot be the sole cause of higher passing rates and grades for RI students.

These results appear contradictory to those of previous studies that assumed full attendance to measure the impact of IL on student success. However, combining the Abs and RI groups to simulate forgoing attendance yields outcomes consistent with these prior studies. This finding underscores the importance of attendance tracking. Also, understanding the composition of student cohorts when reporting outcomes is essential for contextualizing success and comparing studies across different populations. Accurately measuring efforts is critical to understanding our role in student success, prioritizing our efforts, and effectively communicating value to stakeholders.

Limitations

This study uses only fall data to help ensure that similar student mixes were compared. However, this method provides only snapshots of students' progression and does not account for prior semesters or other courses in the same semester when students may have had RI. Consequently, graduation rates were not analyzed, as this would require examining data from all semesters to provide a comprehensive view of RI's influence. Likewise, GPA analysis would benefit from including data from all semesters, offering greater context for evaluating RI's impact.

At Pellissippi State, students have numerous opportunities to seek academic support, which are not included in this study. Besides RI, the librarians offer research appointments and chat services for one-on-one help. Students can also use our online guides and academic skills tutorials that address IL topics relevant to their projects. Librarians collaborate with instructors to create research assignments that have step-by-step directions that include relevant IL topics. Additionally, students are encouraged to seek support from the Academic Support Center, which offers tutoring and writing help to all students, or from TRIO, which focuses on tutoring disadvantaged students.

Finally, though this study is controlled, it is not randomized. Instructors decide when to invite librarians or assign tutorials, so students are not randomly assigned RI. While the library's tutorials are available to any student at any time from our homepage, students do not typically take them unless required by their instructor. Even when an instructor offers extra credit for taking the tutorials, generally, very few students complete them for the extra points.

Further Research

Further research should replicate this large-scale study with attendance tracking and key factor analysis to evaluate if this method is fruitful at other institutions. Another study at the same institution could compile data from all semesters to follow students through their time at Pellissippi State and address RI's effect on graduation, GPA, persistence, and retention. This type of study could consider RI's influence over time. This data might also be used to examine how different formats of instruction impact student outcomes. Another study might explore the influence of IL reference help, tutoring, and RI on student outcomes. This study would require gathering accurate student data and class information via chat and in-person, which presents many challenges. Lastly, the ways in which student outcomes are affected by research assignments that integrate IL instruction could be studied. The challenge would be ethically creating a control group.

Conclusion

This study's results indicate that targeted one-shot RI is positively correlated with higher passing rates and course grades. RI students are over four times as likely to pass as Abs students, even though they are similarly college ready, and more than half again as likely to pass than NoRI students, despite being much less college ready than they are. RI students also earn the highest, most consistent grades of any group, even outperforming the much more college ready NoRI group. Whether a freshman, sophomore, or undergraduate special student, RI participants pass the most often and earn the highest, most consistent grades among their peers. Notably, freshman and sophomore RI participants show the biggest differences between

expected and actual outcomes, although undergraduate special participants also experience higher outcomes. Both NCR and CR participants have the highest passing rates and grades among their nonparticipant peers, suggesting that RI should be considered a standard pedagogical practice for all students conducting research rather than a remediation for some. When accounting for general course attendance and removing chronically absent students from all groups, RI students continue to see the highest passing rates and grades despite having the lowest college readiness rates of any group, including Abs students. Finally, combining the Abs and RI groups and comparing them to NoRI students, as done in previous studies that assumed full attendance, confirms that factoring in attendance is likely the decisive factor in demonstrating positive results.

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On the Ranking of University Libraries

Sami Cuhadar and Coskun Polat*

This study aims to compensate for the absence of a system for ranking university libraries. It contains detailed research, including the compilation and analysis of opinions, interviews with 13 librarians in six countries, and the identification of fundamental metrics for ranking university libraries. The primary goal is to develop concrete criteria for ranking university libraries in Türkiye, which can serve as a valuable resource for scientists, researchers, and library professionals in the field. By providing a concrete framework, we seek to enhance the effectiveness and transparency of the ranking process, and to ultimately improve university library services in Türkiye.

Introduction

Ranking is the process of arranging a set of elements based on their degree of success, achievement, or competitive outcomes based on specific criteria. Ranking contributes to the identification of areas for improvement in institutions, fosters continual improvement, and facilitates the development of a competitive environment. Furthermore, it enables institutions to enhance their visibility, and allows for the periodic renewal and update of the criteria for evaluation and ranking according to contemporary conditions. Within this context, various rankings are conducted in numerous fields. A few examples are as follows:

- Since the 1970s, countries have been ranked as developed, developing, or underdeveloped based on such criteria as their gross domestic product (GDP), labor force, trade, production, consumption, and economic power (UN, 2014).
- The Organization for Economic Cooperation and Development (OECD) evaluates the knowledge and skills acquired by 15-year-old students attending formal educational institutions, within the scope of the Program for International Student Assessment (PISA), and ranks countries according to the level of education offered by them (OECD, 2020).
- More than 100 national and international institutions, including the Webometrics Ranking of World Universities, Times Higher Education, QS World University Rankings, Academic Ranking of World Universities (ARWU), and University Ranking by Academic Performance (URAP), rank universities according to basic criteria, such as academic performance, core areas of activity, and teaching and research environments.
- Scientific journals are ranked as Q1, Q2, Q3, and Q4, or gold, silver, bronze, honorary, and quality-compliant journals (SCImago, 2020) based on such criteria as the number

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of articles they publish, the number of citations of these articles, and their impact value.

Just as various countries, economies, journals, and universities are subjected to ranking procedures based on a variety of criteria, rankings related to universities are also important. Engaging with systems of ranking of international universities yields important results that allow these institutions to enhance their visibility and academic success and to improve their competitiveness and quality. Moreover, the data collected for such an evaluation covers a wide range of information, including but not limited to international collaborations, entrepreneurial activities, the number of scientific publications, frequency of citations, patent records, student enrollment figures, faculty composition, measurements of satisfaction with teaching, and expenditure on research and development (Aydın, 2019). Such versatile information can significantly influence the strategic planning, collaborative initiatives, and financial allocations of universities, and in turn influences the decision-making processes of students and academics regarding their choice of institution. Also, the creation and implementation of rankings will prevent duplicate data collection by different institutions.

Despite this, university rankings have been criticized for their methodological inconsistencies and limited scope in evaluating higher education institutions. Many ranking systems prioritize research output through citation counts, faculty qualifications, and reputation surveys, leading to biased and often misleading comparisons (Saisana et al., 2011). The similarity and redundancy of ranking indicators raise concerns about their reliability and highlight how major rankings, such as ARWU, NTU, and URAP, use overlapping criteria, making them susceptible to manipulation (Doğan & Al, 2019). The statistical volatility of rankings further undermines their validity, as small methodological changes can significantly alter a university's position, questioning its credibility as an objective measure of institutional quality (Saisana et al., 2011). Beyond methodological flaws, university rankings create perverse incentives that can distort institutional priorities. Universities often allocate resources toward improving ranking positions rather than enhancing student-centered learning and community engagement (Muller, 2018). Performance-based funding models, such as those examined by Beach and Milne (2019) in Ontario, demonstrate how institutions increasingly prioritize metrics that influence rankings rather than addressing fundamental educational responsibilities. Furthermore, rankings reinforce hierarchical structures within academia, commodifying education, and justifying austerity-driven policies that do little to improve accessibility or quality (Welsh, 2021).

In addition to critics of university rankings, there are also critics of library assessments. These issues extend to library assessment models, where traditional evaluation methods fail to capture the true impact of library services on student learning. Didin Sonmez et al. (2021) argue that simplistic usage metrics, such as book circulation and database searches, are insufficient for assessing library effectiveness and advocate for outcome-based assessment models aligned with accreditation standards. As higher education institutions navigate these challenges, scholars emphasize the need for alternative evaluation frameworks that incorporate qualitative measures, multidimensional ranking systems, and mission-driven assessments to more accurately reflect the diverse contributions of universities and libraries to academic and societal advancement (Millot, 2015).

In contemporary societies characterized by heightened competition, the capacity of organizations to not only endure within a competitive milieu, but also to advance within the sectors in which they operate requires the formulation of strategic policies grounded in a comprehensive understanding of both their internal strengths and weaknesses, as well as

the external landscape constituted by other entities in the sector. The assimilation of such information plays a pivotal role in effecting organizational change and transformation; it serves as a catalyst for engendering and fortifying the competitive volition and power of these organizations. As current organizational structuring is prominently predicated upon the production, acquisition, and dissemination of knowledge, the entities within universities, which are recognized as central hubs for the generation of sophisticated knowledge, are expected to spearhead the competitive milieu. Within this framework, the establishment of a hierarchical assessment of university libraries—distinguished by their facilitation of the production of scientific knowledge through contemporary and high-quality information services—can not only enhance the importance and prominence of libraries, but can also foster a competitive atmosphere through access to library-related data and the cultivation of sophisticated services.

In this context, this study comprehensively investigated the rankings of university libraries by compiling and analyzing various opinions and suggestions regarding the rankings of university libraries. Moreover, the study solicited the viewpoints and insights of university librarians to enrich discourse on the subject and reinforce its significance. A crucial aspect of this research involves the identification and delineation of fundamental criteria for ranking university libraries. The concrete and ultimate aim of this study is to formulate a comprehensive guideline that delineates the criteria for ranking university libraries, specifically within the context of Türkiye.

Literature Review

Library rankings are important in helping libraries assess their position, identify areas for improvement, and enhance their services. Research on library rankings has primarily gained momentum since the 2000s. In addition, other evaluation tools, such as standards, satisfaction surveys and statistical analyses that measure, evaluate and compare library resources and services at regional or national levels, also serve as important references in determining ranking criteria. Studies in this domain date back to the 1960s. The American Association of Research Libraries (ARL) has been publishing statistics on collections, expenditures, staffing, and service activities since 1961 under the title ARL Statistics (Piternick, 1977). The National Center for Education Statistics (NCES) and the Association of College and Research Libraries (ACRL) also play an important role in gathering data on library collections, services, information literacy, staff, expenses, and usage across libraries in the United States (ACRL, 2025; NCES, 2025). Similarly, the American Association of College and Research Libraries (ACRL) introduced standards for higher education libraries in 1979 (ACRL, 2018). The International Federation of Library Associations and Institutions (IFLA) included university library standards in its medium-term plans from 1981 to 1985 (Lynch, 1987). The Society of College, National and University Libraries (SCONUL)—which represents all universities in the United Kingdom and Ireland, as well as major higher education institutions, the National Libraries of Britain, Ireland, Scotland, and Wales, and select private research libraries—has been active in this area since 1987 (Creaser, 2009). Meanwhile, the Canadian Association of Research Libraries (CARL) has been compiling annual statistics on staffing, expenditures, collections, and facility usage since 1976 (CARL, 2025).

In addition to statistical sources, the *LibQUAL* study, initiated in 1999, evaluates library user satisfaction across various dimensions, including reliability, responsiveness, physical infrastructure, trust, enthusiasm, access to collections, and available space (Akbayrak, 2005).

Also, the National University Library of Australia conducts the Library Client Survey in collaboration with Insync Surveys Pty Limited to identify user priorities, enhance satisfaction levels, support quality improvement initiatives, monitor library performance, and benchmark with other libraries (Insync, 2025; Australian National University Library, 2021). Moreover, the ISO 11620 Information and Documentation-Library Performance Indicators Standard, published by the International Organization for Standardization (ISO), provides a framework for comparing libraries and assessing their services and activities since 1998 (Akbayrak, 2005).

To enhance the quality of services, increase visibility, and actively contribute to the advancement of universities, libraries must establish a ranking system that is aligned with fundamental criteria encompassing such aspects as their infrastructure, budget, staffing, user engagement, technological integration, diversity of collections, and societal impact. The establishment of such a system is crucial for the development and dissemination of standards within the domain of the academic library. In this context, this study provides a comprehensive literature review focusing on the criteria according to which university libraries are ranked, by drawing upon national and international scholarly sources available in both print and electronic formats.

There is a lack of publications dedicated to the ranking of university libraries in the literature. The few articles that have addressed this subject have not provided a detailed examination of the issue. Studies use different methodologies to collect data and to rank university libraries, such as Webometrics university ranking (Verma & Singh, 2023), Higher Education Commission ranking (Jan & Hussain, 2021), Multi Attribute Decision Making (Javad et al., 2020), the VIKOR (ManĊev, 2014) and a composite index (Kao et al., 1998). This study focuses on determining a wide range of criteria and providing a guideline for university library ranking. The ranking methodology and indexation are out of the scope of this study.

The current academic landscape lacks a comprehensive and up-to-date examination of university libraries in terms of their facilities and services to subsequently provide national or international rankings. Prevalent studies in this context are often insufficient in their scope. For instance, the study titled "Top universities, top libraries: Do research services in academic libraries contribute to university output?" (Fernandez Marcial et al., 2016) lacks the requisite qualifications for ranking university libraries. A seminal study in this field is "Ranking university libraries: The Taiwan case." This study, conducted in 1997, involved 10 directors of university libraries in Taiwan; it ranked 24 university libraries based on such criteria as collections, staff, expenditures, buildings, and library services (Kao et al., 1998).

Der Bibliotheksindex (BIX) was launched by the Bertelsmann Foundation and the German Library Association in October 1999 as a project to measure and benchmark the performance of public and academic libraries. This project initially focused on public libraries, and was subsequently expanded to include academic libraries in 2004 (Wimmer, 2009). The BIX study lasted until 2015 (Berndtson & Öström, 2020).

A recent study titled "University libraries ranking in Khyber Pakhtunkhwa Pakistan: A proposal" aims to rank the university libraries of Khyber Pakhtunkhwa-Pakistan. Nineteen public sector university libraries were ranked based on the parameters, such as library services, resources, budget, user visits, automation, and application of emerging technologies (Jan & Hussain, 2021). Verme and Singh (2023) conducted a study aiming to examine the library websites of the Top 10 Universities that have been ranked by the National Institutional Ranking Framework for the year 2020 in India. The study focused on the efficiency of library

websites using webometric indicators that rank the websites on the basis of their internal and external web impact factors and domain authority.

Although the subject of this study is the ranking of university libraries, it examines the "ranking of public libraries" developed in the United States of America (U.S.) as a suitable example to determine the relevant criteria of evaluation and understand this method, owing to a lack of sufficient resources in the literature. The ranking of public libraries in the U.S. first started in 1999 as "Hennen's American public library ratings." Since 2008, it has continued as "America's Star Libraries: The LJ Index of Public Library Service" (Lance, 2020).

Another study on the ranking of public libraries is the European Library Ranking. Maija Berndtson from Finland and Mats Öström from Sweden, who have extensive experience in the field of librarianship, founded the European Library Ranking in 2014 as an independent organization to create a tool to help improve the quality of service in public libraries (Berndtson & Öström, 2022).

In 2018, 67 public libraries in the East Azerbaijan Province of Iran were ranked according to their services (Zandiyin et al., 2018). In 2016, 10 juries—consisting of literary scholars, historians, researchers, and writers—ranked the 10 best libraries in Türkiye (Onat, 2016). This ranking covered all types of libraries; however, the basic criteria on which this ranking was based remain unclear. In a study titled "Foundation Higher Education Institutions," published by the Turkish Council of Higher Education in 2020, libraries were ranked according to the library space per student, total number of printed books in libraries, and library-related expenditures (Koçak Tufan & Güran, 2020). This ranking is incomplete in terms of the basic elements that constitute libraries and covers only Foundation Higher Education Institutions[1] but not public universities.

Only a few studies have been published on the rankings of university libraries, most of them since the 2000s. All these studies have certain shortcomings, which suggests that more research might be devoted to the subject in the future so that its importance is recognized.

Methodology

This study uses the descriptive method to explain the concepts, events, and institutions related to the subject at hand. This method seeks to explain events, assets, institutions, groups, and various fields. Descriptive research explains the interactions between situations by considering the relationship between current and past events, and conditions (Kaptan, 1998).

The study also uses the survey technique, which is defined as "the preparation of a list of questions to be read and answered directly by the people to be informed" (Seyidoğlu, 2009), for data collection. The survey was conducted to gather the opinions of university library directors in Istanbul regarding the necessity of ranking university libraries.

Content analysis was used to examine research on library rankings, forms of data collection, reports, criteria for the performance of libraries, and standards. Content analysis is a technique in which certain words in a given text are coded and summarized into categories within the scope of certain rules (Karadeniz et al., 2020). The general purpose is to simplify complex texts, make them manageable, and classify and code the information to make it more understandable (Celebi, 2021).

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[1]Foundation Higher Education Institutions: In addition to public universities in Türkiye, there are also foundation universities that are nonprofit, fee-paying institutions (Saglamer, 2013).

Furthermore, semi-structured interviews were used to investigate the criteria to be used for the ranking. An important advantage of this technique is that the questions and topics are prepared in advance, and different questions can be asked during the interview (Güngör, 2022). The interview was conducted with librarians working in university libraries to gather their perspectives on university library ranking criteria.

Findings

This study examined the formulation of criteria for the ranking of university libraries through a tripartite investigation encompassing a questionnaire survey, a comprehensive literature review, and in-depth interviews.

Survey

As of 2020, there were 207 universities in Türkiye, including 129 state universities, 73 foundation universities, and five foundation vocational schools (Council of Higher Education, 2020). A total of 30% of the universities in Türkiye (61) are located in Istanbul, of which 12 are state universities and 49 are foundation universities. Therefore, this study focused on a representative sample of universities in Istanbul and conducted a survey to obtain the opinions of the directors of university libraries in Istanbul regarding the necessity of university library ranking system.

The survey (Cuhadar, 2023) was sent via email to the directors of university libraries in Istanbul; 40 of 61 university libraries participated. A total of 58% of libraries of public universities and 67% of libraries of foundation universities participated in the survey, for an overall average participation of 63%. Some of the findings of the survey were as follows:

- In response to the question "Should university libraries be ranked according to certain key criteria?" 85% of the participants agreed.
- In response to the question "Should the ranking of university libraries within the scope of key criteria contribute positively to education at the university?" 83% of the respondents expressed a positive opinion.
- Another question was designed to measure whether the ranking of university libraries in terms of key criteria would contribute positively to improving library services and practices. A total of 90% of the respondents indicated such a ranking of university libraries would do so.
- The participants were also asked whether the ranking of university libraries in terms of key criteria would contribute positively to the visibility of libraries and would increase competition among libraries. A total of 83% of the participants agreed.

In summary, the directors of university libraries in Istanbul agreed that university libraries should be ranked, and that such a ranking would positively influence the services, activities, and research of the library and enhance the visibility of the university library.

Evaluation: Quality Assurance Reports and Practices of Libraries

To the best of our knowledge, no active system is available to rank only university libraries at the international level. Some country-based studies have been conducted on ranking university libraries over a certain period, but have not been continually maintained. We first provide information on these studies. Given that these studies are insufficient in their scope, we determine the criteria according to which university libraries collect data. We thus include

some data collection surveys and reports for university libraries, in addition to national and international standards.

The library rankings and data that were reviewed are as follows:

- studies on library rankings in general,
- reports on university libraries published in higher education, library reports, and forms of data collection from university libraries in the field,
- performance measures for libraries and university libraries,
- standards for university libraries,
- the contribution of the libraries to the accreditation of programs at their respective universities or colleges,
- the consideration of the visibility of libraries on the web in their ranking,
- the consideration of the contribution of the libraries to society in their ranking, and
- the consideration of the level of satisfaction with the libraries in their ranking.

Table 1 shows general topics considered in the studies that were reviewed. Certain topics that were considered unimportant for ranking university libraries are not included in Table 1. They include topics that were pertinent to public libraries, such as the location of the library, information on the library in tourist guides, and access to it through public transportation. Table 1 presents the criteria for ranking libraries under 11 categories: collection, space, expenditures, users, staff, technology, services/reference, usage, satisfaction, visibility on the web, and contribution to society.

TABLE 1
Summary of Data Used to Rank University Libraries

	Criteria										
Data Used for Library Rankings	**Collection**	**Space**	**Expenditures**	**Users**	**Staff**	**Technology**	**Services/Reference**	**Usage**	**Satisfaction**	**Web Visibility**	**Contribution to Society**
Studies on Ranking Libraries											
America's Star Libraries (A)						X	X	X			
Library Ranking Europe (B)	X	X				X	X				X
Iran, Ranking of Public Libraries in East Azerbaijan Province (C)	X			X		X	X	X			X
Bibliotheksindex, Germany (D)	X	X	X		X	X	X	X	X		
Taiwanese university libraries (E)	X	X	X		X	X	X	X			X
Top universities, top libraries (F)						X	X				X
Ten best libraries of Türkiye (G)											
University Libraries—Reports and Forms											
Foundation higher education institutions report (H)	X	X	X								
Council of Higher Education (CoHE) Monitoring and Assessment Report (İ)	X		X								

TABLE 1
Summary of Data Used to Rank University Libraries

	Criteria										
Data Used for Library Rankings	**Collection**	**Space**	**Expenditures**	**Users**	**Staff**	**Technology**	**Services/Reference**	**Usage**	**Satisfaction**	**Web Visibility**	**Contribution to Society**
Council of Higher Education data collection form for university libraries (J)	X	X	X	X	X	X	X	X			
The Turkish Statistical Institute's (TurkStat) university library statistics form (K)	X	X		X	X	X	X	X			
Association of Research Libraries Statistics (L)	X		X	X	X		X	X			
Society of College, National, and University Libraries (SCONUL) statistics (M)	X	X	X	X	X		X	X			
University Libraries—Performance Indicators											
ISO 11620 library performance indicators (N)	X	X	X		X	X	X	X	X		
IFLA library performance indicators (O)	X	X	X		X	X	X	X	X		
University Libraries—Standards											
Association of College & Research Libraries (ACRL) Standards for Libraries in Higher Education (P)	X	X	X		X	X	X	X	X		X
CoHE standards for university libraries (R)	X	X	X	X	X	X					
University Libraries—Accreditation											
MÜDEK (S)	X	X	X	X	X						
FEDEK (T)	X	X	X	X	X						
WASC (U)	X	X				X	X				
AACSB (V)	X	X	X		X	X	X	X			
University Libraries—Additional Indicators											
Web visibility (Y)										X	
Contribution to society (Z)											X
Satisfaction survey (W)									X		
Total	**18**	**15**	**14**	**8**	**13**	**14**	**15**	**12**	**5**	**1**	**6**

Table 1 shows that studies on ranking libraries have been conducted in Türkiye, U.S., Taiwan, Germany, Iran, and Europe. America's Star Libraries (Lance, 2020), Library Ranking Europe (Berndtson & Öström, 2022), and the ranking of Iranian public libraries pertained to public libraries (Zandiyin et al., 2018), while Bibliotheksindex (Der Bibliotheksindex, 2022), Taiwanese university libraries' rankings (Kao & Hung, 2003), top university rankings, and the ranking of the 10 best libraries of Türkiye (Fernandez Marcial et al., 2016; Onat, 2016) were related to the ranking of university libraries.

Regularly published reports and statistics on university libraries are important sources of data. Determining the kind of data requested on university libraries and the areas that were assessed constitute valuable information for studies on ranking university libraries. The data requested from libraries and the statistics on university libraries can be seen in Table 1. It includes studies by the Council of Higher Education (Council of Higher Education, 2021a, 2021b; Koçak & Günay, 2021; TÜİK, 2022) and the Turkish Statistical Institute, which are state institutions that regularly collect data on university libraries. Moreover, the Association of Research Libraries (Mian & Roebuck, 2022), which has been working in this field for many years in the U.S., and SCONUL (SCONUL, 2022), which conducts studies on university libraries in the U.K., were included. The table shows that similar kinds of data were collected by these institutions, such as information on expenditures, services, staff, collection, and users.

The extent to which services provided by libraries meet the needs of users, as well as the criteria used to measure library performance are both important issues. As ISO 11620: 214–"Information and Documentation Library Indicator" (ISO, 2014) and IFLA's work on the subject (Poll & Te Boekhorst, 2007) are internationally recognized and accepted, this study examined them. Table 1 presents the criteria used to assess the performance of libraries.

Standards serve as guidance documents for establishing the general characteristics of libraries according to certain rules. They are used to compare libraries, determine the criteria for their evaluation, and improve their services. We considered the study published by CoHE, titled "University libraries in Türkiye towards 2023: Current situation, problems, standards, and solution suggestions" (Akbaytürk Çanak et al., 2014), as well as the ACRL standards for libraries in higher education (ACRL, 2018), in order to determine the basic standards for university libraries. The main topics considered in these studies are presented in Table 1.

Accreditation in higher education contributes to the achievement of the goals of a university in many areas, including effective management, participation, innovation, sustainability, student orientation, and continual improvement. The importance of accreditation has grown progressively because students' education continues outside the classroom, and because the library makes an important contribution to the accreditation of the university and its programs. It is typical to see libraries being mentioned either in a sentence or under infrastructure headings, rather than being a criterion for accreditation. As an example, in the MÜDEK accreditation process, the library amenities provided to students must be of adequate quality to fulfil the educational goals and program outcomes. From this sentence, it appears that the library should have a sufficiently large working space, a collection, a budget, staff, and technical infrastructure. The criteria for university libraries during accreditation are presented in Table 1. It shows the MÜDEK (MÜDEK, 2020) and FEDEK (FEDEK, 2020) accreditations at the national level, and the WASC (WSCUC, 2021) and AACSB (Guth & Stonebraker, 2022) accreditations at the international level. These accreditations require libraries to provide adequate incentives for studying and research and to have a budget, staff, collection, and reference services. University libraries support the quality of education and training as this is among their basic purposes.

It has become increasingly important to monitor, research, analyze, and manage the discussions and posts on the web pages and social media accounts of libraries. For instance, data concerning library usage, including the number of views, likes, dislikes, and shares of videos, can be obtained from these forums. Table 1 shows that the visibility of libraries on

the web can be measured by the impact of their websites as well as their internal and external links (Brahma et al., 2019). The utilization of social media tools has the potential to extend the reach of library services and applications, thereby facilitating more efficient access to a broader spectrum of content, including text, audio, and video materials, irrespective of temporal and geographical constraints. Research indicates that social media tools, which employ a multifaceted approach to communication with users, are utilized in 70% of libraries, and that 30% of librarians share at least one post per day (Eroğlu & Çakmak, 2021). Conversely, factors such as posting frequency, content quality, and user engagement are crucial in the utilization of social media tools (Mufadhol et al., 2024). According to social media experts and platform data, the ideal posting frequency for institutions is three to five times a week on Instagram, one to two times a day on Facebook, two to three times a day on X (formerly Twitter), and one to two times a day on LinkedIn (Tufan, 2025). In this context, the quantity of social media tools, the number of posts, and interaction are significant factors in determining the ranking of university libraries.

University libraries need to not only serve their own users but also to contribute to society in order to meet quality-related criteria (KalDer, 2002). The library should strive for the development of professional ethics and standards, share its thoughts by participating in events and activities, and open its facilities to all users. Table 1 shows that the contribution of libraries to society can be measured through their participation in NGOs, use of their space, their events, activities, social and economic support, and awards (Council of Higher Education, 2022; Nureña, 2019; Cuhadar, 2020). University rankings, such as QS (QS, 2021) and URAP (URAP, 2023), generally use data for the preceding five years. We follow this practice in this study. The number and types of criteria can be adjusted accordingly.

The Turkish University Satisfaction Survey (TÜMA) investigates user satisfaction with universities in the country, including university libraries. Table 1 shows that satisfaction is evaluated at six levels. TÜMA (Karadağ & Yücel, 2022) asks the same questions of all universities for an objective evaluation. Some of these questions pertain to students' satisfaction with the library (Karadağ & Yücel, 2022).

Table 1 shows that the collections of libraries (18) have been considered as a criterion in almost all studies on the subject. Buildings (15) and services/reference (15) are the second most frequently cited criteria, followed by technology (14) and expenditures (14). As new additions to the literature, visibility on the web (1), contribution to the community (6), and level of satisfaction (5) have been less frequently included in the rankings of university libraries.

Based on these studies, we propose that university libraries be ranked according to 11 criteria: collection, building, expenditures, users, staff, technology, services/reference, usage, satisfaction, visibility on the web, and contribution to society. We interviewed 13 officials, each with at least 10 years of experience in university libraries, from six countries over four continents and 13 institutions. We used semi-structured interviews to finalize the basic criteria for our ranking.

Interviews

Semi-structured interviews were conducted with people working in university libraries from Türkiye, Azerbaijan, the United Kingdom, the United States, Norway, and Australia. The semi-structured interviews made a significant contribution because they were flexible, and allowed the interviewees to share their experiences, knowledge, and insights in detail.

The interviewees were selected on the basis of having a degree in librarianship, having worked in a university library for at least 10 years, and having experience in librarianship in different countries to obtain different perspectives. We denote the interviewees by G1–G13 instead of using their names to ensure their confidentiality. Their demographic and other characteristics are presented in Table 2.

TABLE 2
General Information About the Interviewees

Interviewee	Title	Library Experience	Education	Country
G1	Library Director	28 Years	Master's Degree	Türkiye
G2	Library Director	34 Years	Master's Degree	Türkiye
G3	Library Director	34 Years	Master's Degree	Türkiye
G4	Library Director	27 Years	PhD Candidate	Türkiye
G5	Library Director	22 Years	Master's Degree	Türkiye
G6	Collection Analysis and Planning Specialist	24 Years	Master's Degree	U.S.
G7	Library Management Consultant	43 Years	Master's Degree	Australia
G8	Library Director	18 Years	Assoc. Prof. Dr.	Türkiye
G9	Library Director	33 Years	Bachelor's degree	Türkiye
G10	Law Library Director	30 Years	Master's Degree	U.S.
G11	Manager	18 Years	Master's Degree	Norway
G12	Scholarly Communication Lead	24 Years	Master's Degree	U.K.
G13	Library Director	18 Years	PhD	Azerbaijan

Table 2 shows that 13 librarians from six countries in four continents (Asia, Europe, North America, and Australia) participated in the interviews. Each participant had at least 18 years of experience working in university libraries, with an average of 27 years. A majority had a master's degree in library science.

In order to collect the data, the interviewees were first contacted by email. General information about the subject was shared via email, and an appointment was requested for the interview via Zoom. Then, the ranking criteria and interview questions were sent to the librarians who were willing to be involved in the interview. The interview was conducted online in a quiet environment during the time period that the participants made an appointment. Audio and video recordings were made with the permission of the participants.

The questions (Cuhadar, 2023) for the interviews were prepared in advance. Additional questions were posed according to the participants' responses during the interview when it was seen necessary. The same questions were asked of each participant. All interviews spanned a total of 819 minutes, with the shortest interview lasting 39 minutes and the longest interview lasting 90 minutes. The average duration of the interviews was 63 minutes. In addition to making audio recordings, the interviewers took notes during the interviews when necessary. The interviewees were also asked for a copy of the written and visual documents that they wished to share on the subject.

Before the interview, we had identified 11 basic criteria and 67 sub-criteria by reviewing literature, reports, and some basic statistics used in this field. Following the interviews,

we maintained the 11 main criteria which were agreed on. According to participants' suggestions a sub-criteron listed in the questionnaire, namely "number of library staff memberships in non-governmental organizations in the year under review" was eliminated. The main reason for removing this sub-criterion is that voluntary and individual NGO membership is not considered appropriate when ranking the institutions. They also suggested two more criteria; "Number of full-text resources in the open access system of the institution until the year of evaluation," and "Is there information about the protection of personal data and the conditions of use of library resources on the library website?" be added. Using these suggestions, the guideline was revised, and also the descriptions of 12 sub-criteria were updated.

While 92.3% of the interviewees stated that their libraries should be ranked according to certain criteria, one participant was undecided on the issue.

The final version of the guidelines that delineates the criteria for ranking university libraries was developed based on the literature review, questionnaires, and interviews. The ranking of university libraries and criteria for Türkiye constructed in this study consists of 11 main criteria—namely, collection, building, expenditures, users, staff, technology, services/reference, usage, satisfaction, visibility on the web, and contribution to society—and 68 sub-criteria, each of which are explained in Appendix I.

Conclusions and Recommendations

Our findings offer important insights for librarians, university administrations, and library users. Instead of the traditional evaluation of university libraries according to building, budget, staff, users, and criteria for collections, it is important to evaluate and rank them by using a larger number of more varied criteria that are continually updated according to the needs of the contemporary educational environment. This study was conducted with the assumption that ranking university libraries according to certain criteria can help them to identify their weaknesses, strengths, and areas in which there is room for improvement, increase their visibility, enhance their capacity to adapt to changes, strengthen communication between the libraries and the university administration, and contribute to the collection, analysis, and sharing of data of good quality relating to libraries.

Previous studies on the ranking of university libraries have traditionally focused on five main criteria: collections, space, expenditures, staff, and users. However, this study goes beyond those main criteria by including additional criteria that are crucial in a contemporary information environment, such as technology, services/reference, usage, satisfaction, web visibility, and contribution to society, all of which are examined in detail.

We contribute to the literature through our insights into the academic community, administrators, researchers, and university libraries. Interdisciplinary studies can be conducted to enrich the literature on the ranking of university libraries and obtain more comprehensive results. Such studies can help libraries, librarians, users, researchers, and anyone else interested in this field.

The proposed criterion list to be used in a possible ranking system in the study not only provides a structured approach for evaluating libraries, but also promises to make positive contributions to various facets of academic life. The anticipated benefits include heightened visibility of the library, increased adaptability to change, and strengthened communication between the library and the university administration. This, in turn, can make libraries more

effective in their roles within the academic ecosystem. Another noteworthy contribution of this study is the creation of a ranking guide tailored to Türkiye, which encompasses such criteria as the collection, budget, and societal contribution. The guide, when put into practice, empowers institutions to determine their standing across these parameters, and offers valuable insights into areas of strength and facets that need improvement.

This study's literature review underscores the scarcity of active and up-to-date ranking systems for university libraries and positions the proposed criteria as a pioneering effort in the field. As libraries increasingly become the focal points of academic discourse, the implementation of ranking systems promises to render library data richer, more transparent, and readily accessible. This, in turn, is expected to inform the formulation of library budgets, bolster scientific work, enhance user satisfaction, and contribute to various other dimensions of library services.

The anticipated impact on university administrations is substantial, with the ranking of libraries set to feature prominently on their agendas. This shift can fortify the channels of communication between libraries and administrations and can foster an environment in which libraries play an integral role in supporting the overarching goals of academic institutions. In the context of education and research, a detailed ranking system, aligned with key criteria, can be a positive force. Libraries are presented with the opportunity to assess and monitor themselves to promote a culture of continual improvement. This is anticipated to have a cascading effect, such that it will improve the quality of service, and will contribute to the broader educational and research-related goals of universities.

A significant advancement affected by this study is the use of computer technologies to enhance the accuracy of the data used for ranking, where this ensures their integrity, and facilitates seamless archiving and sharing. This technological integration is expected to enhance the credibility and reliability of the ranking system. Moreover, we anticipate that the proposed criteria for the ranking system will naturally contribute to the expansion of library services. This, in turn, may catalyze wider opportunities for research, increase the number of publications, enhance their academic impact, and lead to greater international collaboration to ultimately result in a more vibrant and globally interconnected academic landscape. The potential of the library ranking system would significantly impact the visibility of institutions on the internet. This shows the need for the regular reporting and sharing of rankings, to not only facilitate comparisons with meaningful data, but also to encourage cooperative activities within the academic community.

The results of studies on the university library ranking should be disseminated widely through various media channels, including print and electronic formats. Similar to the rankings of international universities, this approach can enhance the visibility of libraries and make valuable information accessible to a diverse audience, including students, parents, academics, politicians, funders, and companies. The dissemination of such information can lead to a better-informed community and stakeholders, and in turn, stimulate informed decision-making processes.

In addition, the ranking system developed for university libraries here can serve as a model for ranking other types of libraries, including public, school, and research libraries. This expansion can help develop a standardized and systematic approach to evaluating libraries across diverse sectors, thus enhancing the overall quality of library services and their contributions to their communities.

The dynamic nature of information technologies suggests the need for scheduling an international conference on the rankings of university libraries every two years. Such a conference can provide a forum for discussing evolving criteria, addressing technological challenges, and exchanging best practices. Moreover, organizing seminars, workshops, and training sessions focused on data collection, report generation, and system integration is recommended. This approach can motivate the development of a community of practice and ensure the ongoing enhancement of ranking systems. Given the rapid pace of academic advancement, the publication of an annual electronic newsletter or magazine to announce and discuss the latest results of the rankings of university libraries is also recommended. This consistent dissemination of information can help develop a sense of continuity and engagement within the academic community.

Another suggestion is to address deficiencies in the technological infrastructure of library automation systems and customer relationship management. Studies with the aim of identifying and eliminating these deficiencies can not only enhance the accuracy of the data used in the rankings, but can also contribute to the overall efficiency of library services.

This study also highlights the role of the library staff and emphasizes the need for an appropriate number of skilled personnel to effectively rank university libraries. The motivation of the staff, particularly those in libraries at the forefront of the rankings, is a key factor influencing their efficiency and satisfaction. Supporting and incentivizing the library staff can be instrumental in ensuring the success of ranking initiatives.

Furthermore, the ranking system can serve as a compelling factor in shaping the preferences of universities by emphasizing the influence of this information in institutional decisions. To maximize the impact of the rankings, universities should make these outcomes prominent on their websites, library portals, and entrances to their buildings. This can have a positive effect on users, and can enhance the reputation of the library and the institution as a whole.

Inspired by the rankings of international universities, we also propose categorizing university libraries by region (e.g., World, North America, Latin/South America, Europe, Asia, Africa, Arab World). This regional categorization can provide a more nuanced understanding of the performance of libraries in different contexts.

The limitations of this article present avenues for future research. First the survey conducted in this paper includes the view of directors; further studies could broaden the survey by including librarians, managers and stakeholders. Second, further research is needed for index creation by considering weighted average of basic criteria provided in this study. The continued exploration of ranking methodologies, criteria, and their implications, can significantly contribute to the academic literature, and can provide a deeper understanding of the evolving landscape of library services.

Finally, collaborations with existing surveys, such as the Turkish University Satisfaction Survey (TÜMA), should be expanded. Increasing the number of questions related to the criteria for satisfaction in the ranking of university libraries within these surveys can provide a more comprehensive and holistic understanding of user perceptions and satisfaction.

In conclusion, this study's recommendations offer a comprehensive and forward-looking approach to the evaluation and ranking of university libraries. Emphasizing the importance of disseminating information widely, leveraging technology, addressing deficiencies in infrastructure, and fostering a collaborative academic community have the potential to enhance the credibility, transparency, and global impact of the rankings of university libraries. The

proposed framework, which is rooted in contemporary criteria and technological integration, represents a transformative effort to improve the effectiveness of library services in supporting education and research. The implementation of these suggestions can usher in an era of informed, dynamic, and collaborative scholarly pursuits that not only benefit individual libraries, but also contribute to the broader academic community. This integrated approach can lead to the continual improvement of library services worldwide, and can have a meaningful impact on the academic landscape.

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Appendix I – The Criteria for Ranking University Libraries and Their Definitions

Criteria for Collections and Their Definitions

C	Collection Criteria
C.1	Total number of unique titles in the print collection until the year under review
C.2	Total number of titles in the print collection until the year under review
C.3	Total number of unique titles in electronic format owned until the year under review
C.4	Total number of titles in electronic format owned until the year under review
C.5	Total number of unique titles in electronic format subscribed to in the year under review
C.6	Total number of titles in electronic format subscribed to in the year under review
C.7	Number of full-text resources in the open access system of the institution until the year of evaluation
C.8	Number of unique titles (C1+C3+C5) in the collection until the year under review
C.9	Number of titles (C2+C4+C6) in the collection until the year under review
C	**Collection Criteria–Definitions**
C.1	The total number of unique books, bound journals, theses, musical scores, audiovisual resources, rare materials, and manuscripts in printed format that were added to the library collection. New editions were considered to be new publications.
C.2	The total number of books, bound journals, theses, e-musical scores, audiovisual resources, rare books, and manuscripts in printed format that were added to the library collection. New editions were considered to be new publications. The number of full-text resources in the open access system of the institution were not added to this.
C.3	The total number of unique e-books, e-journals, e-theses, e-musical scores, e-audiovisual resources, and digitized rare and manuscript works in electronic format that were added to the library collection. The number of full-text resources in the open access system of the institution were not added to this.
C.4	The total number of e-books, e-journals, e-theses, e-musical scores, e-audiovisual resources, and digitized rare and manuscript works in electronic format added to the library collection. The number of full-text resources in the open access system of the institution were not added to this.
C.5	The total number of unique e-books, e-journals, e-theses, e-musical notes, e-audiovisual resources, and digitized rare and manuscript works that were made available electronically through subscription in the year under review. Publications made available under such models as patron-driven acquisition (PDA) and demand-driven acquisition (DDA) were not included.
C.6	The total number of e-books, e-journals, e-theses, e-musical scores, e-audiovisual resources, and digitized rare and manuscript works that were made available electronically through subscription in the year under review. Publications made available under such models as user-oriented provision (PDA) and demand-driven provision (DDA) were not included.
C.7	Number of full-text resources in the open access system of the institution until the year under review
C.8	The sum C1+C3+C5 was taken as the total number of unique titles in all formats.
C.9	The sum C2+C4+C6 was taken as the total number of titles in all formats.

Criteria for Library Space and Their Definitions

B	Space Criteria
B.1	The total physical area of the library (m^2).
B.2	Total seating capacity of the library.
B.3	Is the library accessible for people with disabilities? Yes/No
B	**Criteria for Space–Definitions**
B.1	The gross (m^2) indoor area allocated to and managed by the library.
B.2	The total number of seats available for each user in the indoor spaces allocated to and managed by the library. For example, a seat for three people was counted as three seats.
B.3	This was ascertained by considering the criteria specified by the Turkish Higher Education Council's Barrier-free University "accessibility to space" award (Council of Higher Education, 2025).

Criteria for Expenditures and Their Definitions

H	Criteria for Expenditures
H.1	Total expenditure on print and electronic publications provided through the ownership method in the year under review.
H.2	Total expenditure on electronic publications provided through subscription in the year under review
H.3	Total expenditure on print and electronic publications (H1 + H2) in the year under review.
H.4	The total expenditure, other than H3, including the preservation and maintenance of collections, resource sharing, article processing fees, etc., in the year under review
H.5	Total expenditure on development of library staff, events, and memberships in the year under review
H.6	Total (H3 + H4) expenditure by the library in the year under review
H.7	Percentage of total (H6) expenditure for the library in the university's budget in the year under review
H	**Criteria for Expenditures–Definition**
H.1	Total expenditure on print and electronic publications provided through the ownership method in the year under review.
H.2	Total expenditure on electronic publications provided through subscription in the year under review
H.3	H1 + H2 was used for print and electronic publications in the year under review
H.4	The total expenditure, other than H3, including the preservation and maintenance of collections, resource sharing, article processing fees, etc., in the year under review. Expenses on elevators, building maintenance, and repair were not added to this amount.
H.5	The total expenditures from the library budget on activities such as seminars, meetings, conferences, training for the development of library staff, and the library's membership of NGOs in the year under review.
H.6	The sum H3 + H4 was used as the total expenditure by the library for the year under review.
H.7	Calculated as (H6/university budget) × 100 in the year under review.

User Criteria and Definitions

U	User Criteria
U.1	Number of students enrolled in associate and undergraduate programs in the year under review.
U.2	Number of students enrolled in master's and doctoral programs in the year under review.
U.3	Number of full-time academics in the year under review.
U.4	Total number of users in the year under review (U1+U2+U3).
U	**User Criteria–Definitions**
U.1	The number of students enrolled in undergraduate and associate degree programs, based on data in CoHE's Higher Education Information Management System.
U.2	The number of students enrolled in master's and doctoral programs, based on data in CoHE's Higher Education Information Management System.
U.3	The number of full-time academics, based on the data in CoHE's Higher Education Information Management System.
U.4	The sum U1+U2+U3 was taken as the total number of users.

Criteria for Staff and Their Definitions.

P	Staff Criteria
P.1	Number of full-time staff with a degree in librarianship, working in the library in the year under review.
P.2	The number of full-time staff with a bachelor's or graduate degree, who did not have a degree in librarianship, working full-time in the library in the year under review.
P.3	The number of other full-time staff who did not have a degree in librarianship, but worked in the library in the year under review.
P.4	Number of part-time staff in the library in the year under review.
P.5	Total number of staff in the year under review (P1+P2+P3+P4).
P	**Staff Criteria–Definitions**
P.1	Number of personnel with a bachelor's or graduate degree in information and document management/librarianship.
P.2	The number of full-time staff with a bachelor's or graduate degree, who did not have a degree in librarianship but were working full time in the library
P.3	The number of other full-time staff who did not have a degree in librarianship but worked in the library. Cleaning and security staff were not included.
P.4	The total number of working hours of students, consultants, etc., who worked in the library on a per-project basis, or as hourly employees, were added over the course of a year. On average, a full-time staff member worked 2,080 hours per year (40 hours per week × 52 weeks). In this context, the total number of hours worked by part-time employees in a year was divided by 2,080 to determine the number of employees. If this process resulted in a fraction, and the fractional part was 0.5 or larger, the number was rounded up; if the fractional part was smaller than 0.5, the number was rounded down.
P.5	The sum P1+P2+P3+P4 is taken as the total number of staff.

Criteria for Technology and Their Definitions

T	Technology Criteria
T.1	The number of Internet-connected computers and devices available to users.
T.2	The number of social media platforms used by the library.
T.3	Is there a library automation system? Yes/No
T.4	Can the library automation system be integrated with other systems/portals? Yes/No
T.5	Is the library webpage mobile compatible? Yes/No
T.6	Is the library webpage suitable for disabled use? Yes/No
T.7	Is there a discovery tool in the library? Yes/No
T.8	Is there off-campus access to the library's electronic resources? Yes/No
T.9	Is there a system used for open access in the library? Yes/No
T.10	Is there a research information system managed by the library? Yes/No
T.11	Is there an "ask a librarian" system for online communication with users? Yes/No
T.12	Is there a system for the security and inventory of library resources, and the number of people entering the library? Yes/No
T.13	Is there information about the protection of personal data and the conditions of use of library resources on the library website? Yes/No
T	**Technology Criteria–Definitions**
T.1	The total number of desktop and laptop computers, tablets, and electronic book readers available to users.
T.2	The total number of social media platforms, such as Twitter/X, YouTube, Instagram, Facebook, and LinkedIn, and communication platforms, such as WhatsApp, Telegram, and Messenger, used to communicate with users.
T.3	Availability of the automation system used to manage library processes and transactions.
T.4	Integration of systems/portals, such as directory access protocol (LDAP), single sign-on (SSO), etc., that provide easy and secure access to library resources and services for users in the library automation system.
T.5	Compatibility and accessibility of the library webpage with mobile devices.
T.6	Compatibility of the library webpage for disabled users. The compatibility of web pages for users with disabilities will be assessed as either "Yes" or "No" according to the Web Content Accessibility Guidelines (WCAG) 2.1 standards. (W3.org, 2025)
T.7	Availability of a discovery tool that allows library users to search online catalogs, databases, e-journals, e-books, and other resources from a single access point.
T.8	The ability of off-campus users to access electronic resources subscribed to or purchased by the library.
T.9	Availability of open access systems that bring together the institution's publications, and make information available to more people quickly, easily, and free of charge.
T.10	Availability of an integrated research information management system that has been developed, purchased, or subscribed to by the institution that collects, organizes, reports, and shares all academic output and researchers of the institution.
T.11	Availability of an "ask a librarian" system for online communication with users.
T.12	Availability of a system for the security and inventory of library resources and the number of people entering the library.

T.13	The availability of information regarding personal data protection and usage conditions on library websites demonstrates the library's transparency and commitment to legal and ethical standards. Is information about the protection of personal data and the use of library resources under copyrights and license agreements available on the library website? (Yes/No)

Criteria for Reference/Services and Their Definitions

R	Reference/Services Criteria
R.1	Total number of reference questions answered in the year under review.
R.2	Total number of instructions for users in the year under review.
R.3	Total number of people who participated in user instructions in the year under review.
R.4	Total number of hours for which the library was open in the year under review.
R.5	Number of printed and online guides and documents on the use and promotion of the library and its resources in the year under review.
R	**Reference/Services Criteria–Definitions**
R.1	The total number of questions answered by the library via online communication channels, such as phone, e-mail, ask a librarian, and face-to-face in the year under review. Questions answered on social media platforms, such as Instagram and Twitter/X, were added to the social media interaction field.
R.2	The number of instructions given by library staff that lasted at least 30 minutes in the year under review. The instructions were on such topics as research, library, information literacy, etc. Instructions may have been offered as elective/required courses at the university, as part of a course, or as seminars organized by the library. Online courses were based on the calculated number of hours in face-to-face courses. Library presentations at university-wide general orientations were not included in this number.
R.3	The number of people who participated in instructions in the year under review was the total number of people who attended each elective or compulsory course taught by library staff, including research, library, information literacy, and other instructions. This number did not include those who attended library presentations at university-wide orientations.
R.4	Total number of hours for which the library was open in the year under review. If there was more than one university library, the number of hours for which the library that was open for more hours was taken as the basis. The number of hours for which study halls were open was not included. Public holidays were not included either.
R.5	Number of print and online guides and documents on the use and promotion of the library and its resources in the year under review. Updated documents were not included in this number. Documents with multiple copies were counted as a single document.

Usage Criteria and Definitions

K	Usage Criteria
K.1	Number of print resources borrowed in the year under review.
K.2	Number of electronic resources borrowed in the year under review.
K.3	Number of resources downloaded online in the year under review.
K.4	Number of searches performed from databases in the year under review.
K.5	Total number of resources sent to other libraries in the year under review.
K.6	Total number of resources obtained from other libraries in the year under review.

K.7	Number of online uses of library guides in the year under review.
K.8	Number of interactions on the library's social media accounts in the year under review.
K.9	Number of online accesses to the library webpage in the year under review.
K.10	Number of people physically entering the library in the year under review.
K	**Usage Criteria–Definitions**
K.1	Total number of books, bound journals, theses, musical scores, audiovisual materials, etc., in print format in the library's collection in the year under review.
K.2	The number of borrowed resources in electronic format in the library collection through devices such as tablets, book readers, desktop computers, etc., for a certain period of time in the year under review.
K.3	Number of downloads of e-resources available from the library in the year under review according to COUNTER (Calculating Online Usage of Electronic Resources on the Web; https://www.projectcounter.org/).
K.4	Number of searches of e-resources available from the library in the year under review according to COUNTER.
K.5	Total number of print or electronic resources sent to other libraries in the year under review.
K.6	Total number of print or electronic resources obtained from other libraries in the year under review.
K.7	Number of users of online guides on the library's webpage in the year under review.
K.8	The total number of interactions, such as likes, views, etc., with posts on the library's social media accounts in the year under review.
K.9	Total number of accesses to webpages on the library website in the year under review.
K.10	The total number of people who physically entered the library in the year under review. If the systems that keep track of the number of people entering the library separately kept the number of entrances and exits, the total number was divided by two.

Satisfaction Criteria and Definitions

M	**Satisfaction Criteria**
M.1	Level of Satisfaction A+, B, C, D, FF
M	**Satisfaction Criteria–Definitions**
M.1	The Turkish University Satisfaction Survey (TÜMA) conducts an annual survey of university students in Türkiye. Under the section on the "richness of learning opportunities and resources" in this survey, the level of satisfaction of students with the library is one of A+ (very high satisfaction), A (high satisfaction), B (satisfaction), C (not fully satisfied), D (low satisfaction), and FF (lowest satisfaction).

Criteria for Visibility on the Web and Definitions

G	**Web Visibility Criteria**
G.1	Overall Web Impact Factor (WIF): the ratio of all links to the number of pages.
G.2	On-site Web Influence Factor (WIF): the ratio of internal links on a webpage to the number of pages.
G.3	External link Web Impact Factor (WIF): The ratio of links from external webpages to the target webpage, to the number of pages on the website.

G	Web Visibility Criteria–Definitions
G.1	Data were taken from https://moz.com/link-explorer, which measures the impact factor of webpages to determine the overall WIF of the library webpage.
G.2	Data were taken from https://moz.com/link-explorer, which measures the on-site WIF of webpages to determine the on-site WIF of the library webpage.
G.3	Data were taken from as https://moz.com/link-explorer, which measures the external link impact factor of webpages to determine the external link WIF of the library webpage.

Criteria for Contribution to Society and Their Definitions

S	Criteria for Contribution to Society
S.1	Number of memberships of the library with non-governmental organizations in the year under review.
S.2	Number of external visitors to the library in the year under review.
S.3	Number of library staff participating in events and activities in the year under review.
S.4	Number of publications by library staff in the year under review.
S.5	Number of presentations made by library staff at events and activities in the year under review.
S.6	The number of events and activities organized by the library for the community in the year under review.
S.7	Number of social responsibility projects carried out by the library in the year under review.
S.8	Number of awards received by the library in the last five years.
S	**Criteria for Contribution to Society–Definitions**
S.1	The number of memberships of the library with national or international non-governmental organizations related to librarianship in the year under review.
S.2	Total number of people physically entering the library from outside the institution in the year under review.
S.3	The number of people who participated in national or international events and activities related to librarianship with the support of the library staff in the year under review.
S.4	The number of publications by library staff in the year under review. If a publication had more than one author from the same institution, it was counted as a single publication.
S.5	The number of presentations and sessions moderated by library staff at national or international library-related events and activities in the year under review.
S.6	The total number of workshops, seminars, conferences, exhibitions, etc., organized by the library for the participation of people outside the institution in the year under review.
S.7	The number of social responsibility projects related to librarianship that the library organized or participated in during the year under review.
S.8	Number of national or international awards received by the library or library staff in the last five years.

Investing in the Future of International Studies Librarianship: Building an Internship Program

Barbara Alvarez, Leigh Billings, Fe Susan Go, Jeffrey Martin, Kamala Nautiyal, Sujira Prayoonhong, and Beth E. Snyder*

Academic libraries face a scarcity of qualified candidates necessary to enrich and sustain the field of international studies librarianship. Factors contributing to the problem include general limited awareness of this specialty as an occupation, and a lack of professional training opportunities focused on cultivating and blending technical skills with the linguistic and cultural knowledge essential for the job. This case study describes the effort of the University of Michigan Library to boost interest, competency, and ultimately recruitment, in this line of work through an internship designed to introduce international studies librarianship as a compelling career path for students with non-Western language expertise.

Introduction

International studies, also known as global or area studies, is a specialized domain in many large academic libraries, which is devoted to developing and describing multidisciplinary collections focused on world regions, including Africa, Asia, Europe, Latin America, the Caribbean, Australia, and the Pacific. To provide successful and effective international studies services, libraries must depend on a staff with multifaceted skill sets, composed of subject librarians, catalogers, and acquisitions specialists with diverse linguistic and cultural knowledge. Vernacular language and non-Latin script expertise in every one of these roles is vital to make international collections discoverable and accessible to the research community. Yet, recent reports in the field conclude that international collections face challenges that will affect their future growth and integrity (Center for Research Libraries, 2021; South Asia Cooperative Collection Development [SACOOP], 2021; University of Minnesota Libraries Area Studies Collections Task Force, 2021). The most concerning of these are: a diminishing

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pool of cataloging specialists with advanced non-Latin script language skills, and a lack of institutional investment in both professional development and recruitment aimed at drawing new librarians to the field and ensuring healthy succession in stewardship of international collections (SACOOP, 2021).

To address these acute needs affecting many libraries across the country, the University of Michigan (U-M) Library International Studies Department decided to create a new internship program that would attract students with advanced knowledge of a non-Latin script language who may be interested in exploring a career in international studies librarianship. We were fortunate to secure support from the library administration for this initiative and obtained funding through the library's Strategic Opportunities Fund.

This article describes our process of developing and conducting a paid summer internship program, which may be used as a model should other institutions want to consider offering similar programs.

Literature Review

The challenges facing international studies recruitment, training, and succession have been a source of concern for some time. A trio of publications all issued in 2021 expressed the seriousness of the situation on a national level and prompted the U-M Library International Studies Department to envision solutions to these problems. In its report, the University of Minnesota Libraries Area Studies Collections Task Force outlined the specialized skill set necessary to perform this type of work:

> Area studies collections work generally requires specialized language and area expertise. ... In the past, area studies librarians at research universities were often required to have a second subject master's in the area. ... Language expertise is also vital for acquisitions and cataloging work in area studies, and more labor hours are often required due to language and cultural barriers, differences in vendor processes, working with small vendors, and making the materials available in our systems (2021, p. 5).

The Center for Research Libraries identified how a lack of intentionality in promoting and retaining staff with language specialization has been severely hindering international research endeavors:

> Our community is founded on the linguistic competence needed to accurately identify, procure, and describe our collections and to serve them to a broad community. A diminished investment in these skills and competencies is having a significant negative impact on discovery and access to global publishing and knowledge production (2021, p. 8).

Participants of the South Asia Cooperative Collection Development Workshops urged:

> library administrators to seek solutions to the current troubling decline in specialized metadata experts, including the examination of realistic personnel budgets, the encouragement of professional and linguistic training, the examination of

> systemic intellectual and linguistic discrimination in libraries, and the possibilities of shared solutions (2021, p. 1).

Taken together, these reports and our own experience compelled us to develop an internship to begin reinvesting our skills and expertise into training a future cohort of international studies librarians.

Even though library and information studies (LIS) programs offer a wide range of internship opportunities, there are relatively few that focus on technical services (e.g., ordering, cataloging, and metadata maintenance) and even fewer where the focus is on international studies. Several studies have examined the role of internships in training new librarians. Most of these studies examined subject-based internships. Largely, the research has focused on LIS students with scant attention paid to students from other disciplines or undergraduate students. For example, a study by Sargent et al. (2011) focused on LIS students working in subject teams with a particular emphasis on collection development and reference services. Additionally, there have been some thought-provoking articles, such as "Internship in LIS Education: An International Perspective on Experiential Learning," which broaden the scope of internships, but there is no suggestion that this sort of program could be implemented for non-LIS students (Bird et al., 2015).

There have been, however, a few papers that considered undergraduate students who were not necessarily engaged with library science. Harwood and McCormack (2008) pointed to the ongoing need to develop more business librarians. To this end, they created a program in which they mentored interested undergraduates. Thanks to the close mentor/mentee relationships developed during the program, the authors were able to both help the students create several online resources for the library and pique the students' interest in the profession. In a similar vein, the U-M Library international studies internship program was specifically created to be a "spark" experience for students from different backgrounds who did not necessarily have experience working in a library.

The program that most closely matches the U-M Library's internship has been jointly administered for several years by the Library of Congress (LC) and the Council on East Asian Libraries (CEAL), a standing Committee of the Association for Asian Studies (Council on East Asian Libraries Committee on Technical Processing, n.d.). Participants in the LC-CEAL Cataloging Internship Program receive instruction in East Asian language materials cataloging when their home institutions lack the ability to provide such specialized training (Council on East Asian Libraries Committee on Technical Processing, 2016). However, it differs from our project as it targets individuals who are already professional librarians, whereas we intended to focus on "enticing" students into the profession, specifically international studies librarianship. In that sense, our internship was a new venture.

Method

Institutional Context

International, global, or area studies in libraries comprise both public and technical functions. Public services responsibilities often include collection development, materials selection, reference, instruction, and outreach, while technical services encompass such activities as ordering, receiving, and cataloging. No matter which specific duties someone performs, international studies work is best served by employees who have appropriate language, cultural, and subject competencies in the regions they cover.

Organizational models may differ among institutions. Some libraries are arranged primarily by function and group similar roles into either a public or technical service unit, regardless of language or regional expertise. Other libraries, such as the U-M Library, are organized with international studies as a single department that contains both subject specialist and technical roles under a common reporting structure. In this model, the U-M Library is able to pool language and cultural expertise to more cohesively provide appropriate descriptive and subject access to the library's distinctive international collections.

It is within this context that we at the U-M Library witnessed a growing need for a new generation of international studies librarians in general, but most especially for candidates with language expertise trained to understand the special and unique requirements for non-English language and non-Latin script cataloging. With this in mind, we attempted to remedy this shortfall of qualified candidates and to create an internship that would introduce the fundamentals of international studies librarianship and non-Latin script cataloging to students holding specific language skills. The languages we recruited for corresponded to areas where we had the most acute needs for cataloging and existing staff expertise from which to provide qualified training and guidance.

Pedagogical Framework

To meet these needs, we set out to design an engaging and compelling program to attract people to this kind of work as a career and to teach them essential skills they would not readily find elsewhere. Consequently, we chose to focus the internship training primarily on cataloging and other technical services activities. Our secondary focus was on teaching the broader fundamentals of non-Western European language librarianship, including materials selection, collection development, reference, and instruction. This broad approach to training was important because international studies librarians may be called upon to perform both public and technical services roles.

We envisioned the internship program as a combination of classroom sessions, individual training with metadata specialists, self-directed study, and hands-on work experience. The following "Technical Services Learning and Work Project Goals," that we developed early on for the official internship announcement became the touchstone that kept us on task throughout the design of the program:

> Through a combination of one-on-one training with those currently active in the field, self-directed study time with real-world examples, and actual work experience, the intern in this position will gain a basic understanding of non-Western language cataloging by learning:
> - the structures and purpose of library catalogs
> - Machine Readable Cataloging (MARC) formatting for catalog descriptions
> - subject headings and classification of library materials
> - how to search databases (OCLC WorldCat and Alma) to find bibliographic records by author, title, or standard numbers
> - the use of Romanization tables for non-Latin script materials
> - how publication practices differ across countries and impact cataloging policies
>
> The intern in this position will apply skills learned through one-on-one training and self-directed study to the processing of a non-Western language technical services workflow. Processing tasks will include pre-catalog searching and basic

copy cataloging with some original cataloging as time permits (personal communication, July 22, 2022).

Recruitment Process

Given the expertise, capacity, and needs of our department, as well as the available funding, we decided to focus our first iteration of the program on providing training in cataloging to one intern for either South Asian or Southeast Asian languages. Our requirements for potential candidates were centered around high language competency, attention to detail, and good interpersonal and communication skills. Aside from that, we welcomed applicants from any academic background. Additionally, we wanted to attract candidates who demonstrated an interest in a library career and an aptitude for cataloging. We hoped to show them that librarianship as a career is intellectually interesting and rewarding, as well as a good fit for people with language skills.

With those requirements in mind, we chose to recruit nationally and to consider both graduate and undergraduate students (junior standing or higher). The decision to recruit beyond our university was made to ensure the broadest possible pool of candidates and language expertise. We posted the position in January 2023 and advertised it via our regular posting channels, as well as to the listservs for the Committee on South Asian Libraries and Documentation (CONSALD) and the Committee on Research Materials on Southeast Asia (CORMOSEA). The response to the posting greatly exceeded our initial expectations. We anticipated less than a dozen candidates, but received 26 qualified applications, and many more expressions of interest from across the United States and abroad. Given the high quality of the candidates and the necessary choice of one target language, the final selection proved very difficult. Thus, we approached our Development Office and obtained additional funding to accept one more intern so that we could host two parallel internships in both the South Asian and the Southeast Asian units. After a series of Zoom interviews, we selected a graduate student from a different institution with a native knowledge of Burmese and a local undergraduate student with advanced coursework in Hindi. There were also three other U-M University students who had worked in our department with Slavic, Jewish, and Modern Greek languages and expressed great interest in the program. They joined the internship cohort as affiliate interns; thus, what had been planned for one student expanded to five.

Practical Notes on the Internship Program

The internship was an eight-week full-time program of 40 hours per week, offered in the summer. The two full-time interns who were recruited to the program were paid $20 per hour. The university also covered their tax duty of 7.85 percent, and no benefits were paid. As this program was not offered in collaboration with an academic department or school, and the U-M Library is not a credit-granting unit, no academic credit was awarded. For the out-of-town intern, we covered travel expenses and facilitated a housing arrangement at International House, a nonprofit living learning community that houses international and U.S. students and scholars. Our unit does not have any base-funding for internships, thus funding for this program came from one-time monies. Continuity of the program will rely on working with the Library Administration and the Development Office to secure necessary funds.

The affiliate interns were graduate students already volunteering or employed as temporary student library assistants in our department. They took part in classroom learning

activities, readings, and seminar discussions to enhance their understanding of their jobs and library work in general. However, they were not employed through the internship, did not receive work assignments related to the internship, and were not expected to complete the same deliverables as the full-time interns.

Class Development and Implementation

Having completed the intern selection, we proceeded to refine the internship learning objectives we had developed at the conception of the project by creating a weekly outline of core topics that could be covered within eight weeks. The group recognized from the outset that the internship demanded a lot of training time for the participants to process the information and gain the skills they would need to do their assigned work responsibilities. To get participants to the point of being able to catalog, we chose to build toward that goal with a daily mix of guided self-study, group lecture, discussion, in-class exercises, and hands-on practice. Because we needed to account for multiple target languages, it became clear that we had to provide examples in a shared language (i.e., English). This original training outline formed the basis for building content modules in Canvas, U-M's online learning management system.

For the first four weeks of the internship, cataloging instructors held classroom sessions almost every day for two hours (see Appendix A). This class time spanned a total of 32 hours across 18 days. Students were assigned modules to work through and quizzes to take one day in advance of a session. The next day, instructors presented the main points of the previous day's assignments in an informal lecture and interactive discussion format.

The classes concluded when participants had been given enough general baseline information and had reached the point where they were introduced to specific language cataloging standards and processes. At that stage, the two full-time interns were ready to start processing materials in specific languages and proceeded to work with their assigned language trainers. The affiliate interns returned to their regular duties outside of the internship.

Hands-On Experience

The scope of the projects and materials the two full-time interns would work with were planned and ready before the start of the internship program. As early as the first week of the program, the interns began working in earnest with their individual trainers and were introduced in stages to their assigned collection materials and processes. This incremental approach allowed the trainers to synchronize and reinforce—with hands-on experiences and real materials—what was learned in each class.

The shared internship experience became completely individualized and diverged into different paths for each intern when they began working with their respective languages: Burmese and Hindi. To be able to search or catalog these non-Latin script materials, each intern had to know how to Romanize the script of their assigned materials using the appropriate *ALA-LC Romanization Table* (Library of Congress, n.d.a). Romanization standards are frequently unintuitive and often deficient in representing certain languages; therefore, both interns required time to learn, absorb, and practice Romanization. Becoming adept with transliteration is typically easier and quicker for those with more expertise in a non-Latin script, which proved true for our interns. We knew that four weeks were not enough to teach someone all the nuances of non-Latin script cataloging and that, from time to time, we would need to adjust our hands-on experiences to meet the individual needs of the interns.

The Southeast Asia internship work project goal was to catalog Burmese language materials. The successful applicant had native proficiency in the Burmese language and a familiarity with the ALA-LC Romanization Tables gained before joining the internship program. This was advantageous in several ways. Not only did it allow the intern to spend less time learning the Romanization scheme and more time on hands-on work with the language materials, it also meant that the intern could read and understand the books easily enough to recognize appropriately (or inappropriately) assigned subject headings and classification numbers. Additionally, this pre-existing language expertise freed the intern and the trainer to delve into more advanced topics, such as learning the differences between Library of Congress cataloging and local cataloging practices, assigning Library of Congress Subject Headings, deriving MAchine-Readable Cataloging (MARC) records in the OCLC database, and creating new original MARC records from scratch. At the end of the internship, the Southeast Asia intern successfully completed their personal goal of learning to perform original cataloging.

The incumbent for the South Asia internship was hired to work with publications primarily in the Hindi language. As the intern had an intermediate proficiency in Hindi, the trainer concentrated on building the intern's skills for searching non-Latin script books in OCLC and the local catalog, noting that it is very difficult and complex to search books in non-Latin script, sometimes even for experienced non-Latin script catalogers. Yet, being able to search accurately is an essential skill for any competent cataloger. The intern spent some quality time unpacking and receiving new South Asian language materials, discovering the breadth of the collection, and enjoying seeing such a variety of books in so many languages and scripts. Additionally, the intern learned about our primary South Asian materials acquisitions arrangement. Through our membership in the Cooperative Acquisitions Program (CAP) the Library of Congress overseas offices in New Delhi, India, and Islamabad, Pakistan, acquire and distribute collection materials directly from their countries of origin to our library (Library of Congress, n.d.b). By the end of the internship, the South Asia intern learned key elements of copy cataloging that included searching books using OCLC and Alma, using the ALA-LC Romanization Table for Hindi (in Devanagari script), and using the Cutter table for shelflisting in our local Alma database.

Overall, we felt that eight weeks was too short for an intern to fully learn what had been taught in the classroom and gain enough hands-on practical experience to achieve a minimal level of independence in cataloging. Despite this shortcoming, the interns can continue to use and apply any knowledge gained during the internship to their studies and research in the future when they need it.

Subject Librarian Training

While the technical services training was of paramount importance for this internship program, we wanted the interns to understand the full spectrum of responsibilities an International Studies librarian could encounter. Further influencing this choice was our recognition that South and Southeast Asian Studies librarians are often hired primarily as subject specialists, where job duties may include collection development, materials selection, instruction, and outreach. With this in mind, we devoted a portion of the internship to these other key facets of the job and where they fit within an academic library system.

To do this, we arranged several tours of different library departments and independent libraries on campus. The interns also toured the Conservation Lab in the Preservation Services

Department to get a better idea of efforts aimed at ensuring the longevity of our materials, especially those requiring special treatment. Lastly, to get a more complete picture of technical services operations within the U-M Library, the group was introduced to the Technical Services Department in the Collections Division and the Asia Library Technical Services Department where they were able to learn about print and electronic resource acquisition, as well as cataloging workflows for other language materials.

Another important component of the interns' training involved selected readings followed by discussion sessions that would give the interns a more in-depth analysis of what international studies departments do. Weekly readings of chapters from *Supporting Research in Area Studies: A Guide for Academic Libraries* were assigned and discussed in a seminar style, eliciting many lively exchanges of thoughts and opinions (Pitman, 2015). The librarians guiding the group specifically illustrated how different concepts in the readings played out in real life in the library environment. The discussions encompassed both essential public-facing functions, such as reference and outreach, and technical services processes.

Probably the most interactive component of the subject librarian training (and the most fun for the interns) was their introduction to the material selection process. First, they learned about the philosophy of selection work and were shown how materials were ordered by the library through different bibliographic tools. Working with the corresponding subject librarian, the interns discussed the collection priorities for their area and delved into the vendor and publisher catalogs. They very much enjoyed the actual selection work, particularly weighing whether to purchase something. Some orders were placed on the strength of the interns' recommendations.

Interns' Feedback

As this was our first time conducting such an internship program, we were eager to assess the undertaking by gathering feedback in a variety of ways. First, we created a form to survey the two full-time interns about the many thematic and structural components of the program and their level of satisfaction with the amount of time and types of activities devoted to each topic (see Appendix B). We also asked for ideas to improve the program, its various components, and the format of delivery. Another valuable piece of feedback came from the assigned program deliverables: a weekly journal containing reflections on the learning experience, interesting issues, challenges, and victories; a portfolio of materials processed during the internship; and a capstone presentation to the International Studies Team in the final week of the internship. One intern also contributed a personalized account of the internship experience and learning milestones as a post to the U-M Library's "Student Stories" blog (Kyaw, 2023).

From the survey, we learned that the interns felt that they spent enough classroom time on the various topics covered by the program curriculum. They also appreciated the opportunity to review the content of a module one-on-one with their trainer for the second time. They wished for some more hands-on exercises, either integrated into the classroom sessions or as pre-class assignments. One participant proposed an idea of creating a MARC record for an English language title together in class and being able to discuss as a group the process and the decisions that would go into creating it. They all enjoyed having a larger cohort of interns to attend classroom sessions, reading discussions, weekly debriefing, and tours of library departments together. It was apparent that they learned a lot from each other's questions posed during instruction sessions, which in turn helped our instructors to adjust the class content to

their needs. The interns found our Canvas modules "well organized, easy to navigate" and the reading load "manageable." They asked for a list of comprehensive definitions and liked the approach we had taken within the training of presenting common mistakes or problems that frequently occur in any given area.

The weekly journals gave us a glimpse into more intellectual aspects of the interns' learning and what they found memorable or surprising. From the beginning, they noted a tension among library science standards and principles, one's background knowledge, and the geopolitical situation of the day. They commented on the role of personal judgment and subjective interpretation in catalogers' work, as well as the bias concealed in controlled vocabularies that results from value judgments and specific worldviews. An intern who had previous experience cataloging for a commercial company felt slightly alarmed, in retrospect, at the lack of training offered in that environment. The interns came to regard cataloging as both art and science, organic and iterative and a practice that benefits from a critical approach. While performing some of the receiving tasks—such as unpacking freshly arrived materials—they were delighted by their great variety of languages, formats, and topics. At times they were surprised to see some unlikely suspects—such as board games, movies, and musical scores—being collected by the library. A particularly illuminating point from the journals concerned the interns' assessment of their own research skills. Having received a thorough orientation to catalog searching and metadata in the public interface, the interns noted that prior to the internship they really did not know how to do library research. They acknowledged that the internship experience considerably sharpened their research skills and made them feel much more confident in their findings.

As we had talked at length about the candidates' interests in a library career in our recruitment interviews, we did not address this point in our survey. We felt that it was too soon to ask because, given the circumstances, the interns would likely offer a similar answer to the one they gave at the interview. However, we know that (at the point of writing this article) one of the interns was looking into various LIS programs, and that arrangements were made for him to spend another two months in our department to continue his cataloging project the following summer. The other intern obtained a job as a reference assistant in one of our branch libraries and was exploring a range of graduate programs.

Conclusion

Overall, this was a very rewarding experience both for the interns, as well as for the members of the internship team. We really enjoyed the challenge of creating a new program that would attempt to respond to an acute need in our field and inspire students to consider international studies librarianship as a career choice. Nevertheless, starting from scratch and working through every component of the program was a huge undertaking for the entire team, as well as a continuous learning and adapting experience. Although we regularly hire and train students of all levels to perform aspects of technical services work, including cataloging, it is rare that we give them intensive training in such a compressed time frame. Throughout this experience, we found that conducting an effective program in which participants can learn enough to get a true taste of the library profession, while also acquiring specific skills that allow them to perform real life cataloging duties, is a monumental and impactful effort for everyone involved.

One clear lesson that our team took from this experience was the need to manage and reduce unnecessary details in parts of the interns' training to focus on concepts that get participants thinking about and working with the materials more quickly and effectively. Teaching

both "why" and "how" international studies professionals do things was an important goal for this internship. Unfortunately, the internship schedule left little time to thoroughly teach both concepts in their complexity and also allow adequate time for the interns to become comfortable using their new skill sets. By the time in-class lessons got past the "why" and interns were shown how to put methods into practice, there were too many different workflows to parse and remember for work to become truly smooth, efficient, and independent. Next time, for example, rather than teach how to enter metadata into both a local and national database, we will spend less time on our local integrated library system (ILS) because this adds another layer of procedures that are specific only to our institution. Instead, we will provide a more universal training for cataloging in the OCLC Connexion online cataloging tool so that only one system needs to be mastered. We learned that simplifying and streamlining the training activities will free up the interns' time and mental energy to focus on working through more concrete examples and exercises, and to ultimately feel more confident in their ability to successfully complete their assigned projects.

Notwithstanding the considerable investment of time and energy, the internship was also an experience of joy and satisfaction. We loved the time spent with our interns in the classroom and on their individual projects. We appreciated their feedback and their insightful questions that allowed us to look at the seemingly obvious (for us) from a different and critical perspective. They helped us see with fresh eyes the day-to-day activities that we usually take for granted. They inspired us to further improve our program and continue our efforts of recruitment to the profession. We hope that we were able to inspire them to explore further the path to international studies librarianship.

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Appendix A
Class Timeline & Topics by Week

Week 1: Five sessions: nine hours total
1. Orientation & Onboarding
2. Technical Services Work & Workflows Collection development & technical services life-cycle (International Studies focus) Acquisitions—selecting, ordering, receiving Management of backlogs and processing queues Cataloging workflow steps (general overview)
3. Cataloging—General Overview Philosophy of cataloging Structures of library catalogs (bibliographic, holdings, and item records) What is cataloging and classification? What are controlled vocabularies?
4. Bibliographic Elements & Searching the Library Catalog Identifying bibliographic elements for acquisitions purposes (from a catalog) Identifying elements as they appear on your physical items Identifying elements: Monographs or continuing resource? Pre-order searching in the U-M Library catalog Quizzes
5. Searching in Alma & OCLC Searching vs. browsing Searching in Alma Quizzes
Week 2: Five sessions: eight hours total
1. MAchine Readable Cataloging (MARC) Introduction to MARC21 Transcription vs. recording data Core/Key MARC fields for monographs Different MARC views: System display differences
2. Pre-catalog searching Searching in OCLC Record evaluation: Did you find what you searched for?
3. Copy Cataloging Basics Bibliographic record evaluation: Copy cataloging or original cataloging? Bibliographic record review & cataloging rules (AACR2, RDA, and so forth)
4. Non-Latin Search & Descriptive Cataloging Practice Transliteration Non-Latin script cataloging (basics) Non-Latin script cataloging: Southeast Asia; South Asia; Hebrew; Modern Greek; Cyrillic, Armenian, and Georgian

5. Copy Cataloging Instructions (continued) Copy cataloging in OCLC Connexion Client Copy cataloging—Basic steps
Week 3: Four sessions: eight hours total
1. Non-Latin Script Cataloging (continued)
2. Cataloging in Connexion (continued)
3. Intro to Controlled Vocabulary & Authority Control Introduction to subjects (LCSH): MARC fields and subfields Introduction to ClassWeb (LCSH) Authority records & controlled vocabulary
4. Intro to Classification & Call Numbers Introduction to Library of Congress Classification (LCC) Introduction to ClassWeb (LCC) Call numbers and cutters Quizzes
Week 4: Three sessions: five hours total
1. Copy Cataloging Review
2. Cataloging with Alma Overview of Alma searching, record display, and Metadata Editor Exporting bibliographic records from OCLC to Alma; creating holdings & item records
3. Shelflisting Review of cutters (author vs. subject) Shelflisting in Alma
Week 7: One session: two hours total
1. Advanced Cataloging Topics Intermediate LCSH: Introduction to subdivisions: Free-floating and chronological Geographic headings (651) and subdivisions ($z) Form/Genre headings (655) and subdivisions ($v) Intermediate LCC—using tables, and so forth Quizzes (PLUS: Optional advanced topics: Reading and resources provided, but not discussed in class) Advanced LCSH: Assigning LCSH from scratch Advanced LCC: Finding an LCC number when none is provided; individual works of literature

Appendix B
International Studies Internship 2023 Feedback Form

International Studies Internship 2023—Feedback

Please be candid! Your comments will help us modify our content for the next interns! Thank you!

Did we spend enough time on these topics during the technical services "class" sessions?			
	Not enough information provided	**It was just enough**	**Too much information provided**
Acquisitions workflows	○	○	○
Why we catalog / Philosophies	○	○	○
Identifying bibliographic elements on physical materials	○	○	○
Transcription vs. Recording Data	○	○	○
MARC fields	○	○	○
Non-Latin scripts	○	○	○
How to search in Alma	○	○	○
How to search in OCLC Connexion	○	○	○
How to identify correct records / what is a full record	○	○	○
Controlled vocabularies & authority records	○	○	○
Library of Congress Subject Headings	○	○	○
Library of Congress Classification	○	○	○
Cuttering & Shelflisting	○	○	○

I wish I had more hands-on-practice *or* one-on-one guidance in (check all that apply):

- ▢ Acquisitions work (Unboxing, checking off invoices)
- ▢ Identifying bibliographically significant elements on physical materials
- ▢ Searching in Alma
- ▢ Searching in OCLC Connexion
- ▢ Understanding MARC fields, indicators, and subfields
- ▢ Transliteration
- ▢ Inserting script data/Creating paired fields into MARC records
- ▢ Understanding LC subject headings
- ▢ Understanding LC Classification
- ▢ Creating Cutters and shelflisting
- ▢ Copy cataloging in Connexion
- ▢ Cataloging in Alma
- ▢ Creating holdings and item records
- ▢ Other:

_____

I had enough time to do my technical services work (reading and cataloging) and learn about other aspects of the profession.

- ○ No
- ○ Sometimes
- ○ Yes
- ○ Other:

Was there anything about the technical services training format (first reading, then class, then hands-on activity), that you would change? (For example: the classes were not helpful; the reading took too much time; the order the information was presented in was unhelpful)
Your answer

How would you suggest we improve the Canvas modules? (For example: More quizzes; too much text or information per sections; more examples; too much to read in one day)
Your answer

How would you suggest we can improve the technical services related aspects of the course overall?
Your answer

How would you suggest we can improve the program of subject librarian training, tours, and general library activities?
Your answer

What other comments about the program would you like to share?
Your answer

Discovering Fat Studies Literature: A Bibliometric Analysis

Emily Gilbert and Paula R. Dempsey*

This study engages with information literacy with respect to the marginalizing experience of fat oppression. The aim is to illuminate assumptions underlying research and scholarship into the lives of people living in larger bodies and to investigate how researchers can discover studies founded on either a medicalization or fat studies paradigm. A bibliometric analysis reveals where fat studies literature is published and indexed, as well as how keywords differ among authors and indexes. The study is important not only for courses in fat studies, but also as a valuable exemplar for critical thinking in information literacy instruction across disciplines.

Introduction

In recent years, more scholarly and popular discourse has begun to address the treatment of people in larger bodies. Instead of linking body size to moral values (e.g., self-control, vigor, industriousness, health consciousness), this discourse makes space for diversity of body sizes with an understanding that fat people deserve respect and dignity, and that their societal treatment is due to systematic oppression and exclusion. Among other social dynamics, this work shows that medical concerns about body weight are often accepted as neutral scientific discourse, which is not always justified. As Chastain notes, "There are people of the same weight who have vastly different health statuses, and there are people of vastly different weights who have the same health statuses" (2021). Recognizing studies founded on anti-fat bias and distinguishing them from weight-neutral studies can serve as an important exercise, whether students are researching fat lives or building critical thinking skills in general.

This study provides evidence to support academic librarians who seek to provide information literacy (IL) instruction and inform collections decisions in weight-neutral ways. *Fat Studies* is the only academic journal that declares its commitment to academic inquiry concerning the lived experiences of fat people and the obstacles society constructs to marginalize and exclude them (*Fat Studies*, n.d.). In addition to the lack of specialized periodicals, inconsistent terminology and limited indexing make it difficult for researchers to identify this work. As Brunskill (2021) shows, this set of challenges is shared by other interdisciplinary and

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cross-disciplinary fields such as disability studies. However, no study has yet investigated fruitful search strategies to discover fat studies research or developed IL approaches with respect to the marginalizing experience of fat oppression.

This study uses a bibliometric analysis method to fill a gap in the IL literature for fat studies. The findings will illuminate the strategies for discovering and evaluating information sources that depart from the dominant discourse around fatness and anti-fatness.

Note on Language

Like many other scholars of fat studies, we use the term *fat* as a neutral adjective to describe bodies (Wann, 2009). When we discuss other terms from the medical community, such as *ob*sity* and *overw*ight*, we mark them to highlight their inherent bias. What is more, we acknowledge that these terms are implicated in anti-Black racism and white supremacy (Strings, 2019; Harrison, 2021), and we find them inappropriate in a scholarly conversation about a marginalized population. When these words fall in titles of works or direct quotations, they will not be altered.

Literature Review

This study is situated in two scholarly conversations, one centered on the interdisciplinary field of fat studies and its criticism of the dominant medical discourse around fatness and health, and the other centered on how information literacy pedagogy can invite students to recognize and interrogate the underlying assumptions of information sources in their relationship to social power.

Paradigms in the Literature

Fatness and fat people appear in academic literature largely under one of two paradigms. The dominant paradigm is *medicalization*, which frames fat people as diseased, unhealthy, or otherwise a problem to be solved. Alternatively, the *fat studies* paradigm assumes that fatness is part of normal body diversity, and that fat people are systemically oppressed and excluded across many facets of society (Cooper, 2010).

The medicalization paradigm appears in the bulk of biomedical literature, especially ob*sity research (Bacon & Aphramor, 2011). The so-called *ob*sity epidemic* was defined in a report by the World Health Organization (2000), which warned of global health implications leading to overly strained health systems and a subsequent financial burden. Works under this paradigm study how ob*sity can be treated and prevented, often leaving fat people out of the conversation entirely (Cooper, 2010). This view of fat people and fatness originated in the nineteenth century (Levy Navarro, 2010). In *The Birth of the Clinic*, first published in 1963, Foucault noted that the goal of medicine shifted during that time from health to normality, and subsequently organized itself around the binary of "healthy" versus "morbid" (Foucault, 1994).

Stoll and Egner (2021) demonstrate that the medicalization of fatness is strongly tied to the medicalization of disability, as some (but not all) fat people are disabled, and some (but not all) people with disabilities are fat. This synchronous medicalization dates to medieval Europe where body differences were viewed as divine punishment for one's sins. Fat people were also perceived as lazy and out of control; therefore, fat people and disabled people were similarly maligned. As society became more industrial and capitalist, a person's perceived worth

became tied to their productivity, which upheld moral ideas tied to strength and health (Stoll & Egner, 2021). Disability studies scholars have argued for a more holistic view that considers the built environment and social barriers, framing disability as a social construct (Herndon, 2002). Goldberg (2014) argues that "the problem is not so much with impaired bodies but with social structures (or lack thereof) that disable persons with diverse functionings and body types" (p. 118). In the case of fatness, this can also falsely imply that people are fat because they choose to be, or because they lack the discipline to make their bodies smaller. Discourse on disciplinary medicine is pervasive in Western society, promoting the idea that it is one's responsibility to cultivate oneself and one's body (Murray, 2008). This adds to societal views that fat people are lazy or weak-willed for visibly existing outside this ideal.

The fat studies paradigm approaches the subject of fatness through a sociological lens, seeing fatness as a neutral fact of body diversity. However, societal treatment and exclusion of fat bodies is rooted in the medicalization paradigm, and much of the fat studies literature seeks to highlight the stigma and discrimination therein. As noted by one of the first people to use the term *fat studies*, Wann (2009), "fat studies is defined in part by what it is not" (p. ix). Cooper (2010) also notes that *fat studies* as a term is "an inherent critique of the medicalised concept obesity" (p. 1021). Furthermore, people in larger bodies dislike being called *ob*se*, even if they are less aware of fat studies or anti-fatness as areas of study (Robbins et al., 2025).

In opposition to the medicalization paradigm, fat studies takes a neutral stance on the diversity of human bodies and examines why fat people are excluded and oppressed by society (Rothblum, 2012). Works concerning fat embodiment tend to be produced by those who have experienced it firsthand (Cooper, 2010).

It is important for information seekers to understand that all research has a perspective and a point of view. No research is neutral; however, medical science is particularly able to frame itself as neutral when in fact it has many specific perspectives. One such perspective is that fat people should not exist, and medical researchers may have financial interest in perpetuating this harmful paradigm (Stoll, 2019).

Critical Information Literacy and Fat Pedagogy

Teaching students how to think about information in light of social power and privilege is known as critical information literacy (CIL) (Crilly, 2024; Tewell, 2015). CIL is part of a larger pedagogical approach that favors inquiry-driven, learner-centered activities that interrogate how systems of oppression constrain the production and dissemination of information outside the dominant discourse (Cuevas-Cerveró et al., 2023). Research and scholarship on CIL tend to address dominant discourse around race, gender, and class.

There are a few studies in CIL that incorporate the social dynamics of anti-fatness, and there is a rich literature in fat pedagogy outside of CIL. A seminal study by Angell and Price (2012) addresses information bias around fatness not only in scholarly, peer reviewed literature itself, but also in how the counter-paradigm fat studies research is classified in academic libraries. They find that Library of Congress classification has no subject heading for *fat studies* and tends to class work in the field of medicine, "a decidedly problematic move, as this specific act of classification essentially medicalizes a social and political movement, as well as cements the common stigma of inferiority associated with all things fat" (Angell & Price, 2012, p. 159). A more recent presentation by Chenevey suggests liberatory ways to address this

problem in the IL classroom (2022). A study of library research guides that share information about anti-fat bias found 36 relevant guides, primarily in the context of social justice rather than health and medicine. Resources presented on the guides tended to be popular articles, books, podcasts, and blogs rather than academic (Silkotch et al., 2025).

The fat pedagogy movement in education also signals the importance of critical thinking. Cameron and Russell suggest that "Fat pedagogy helps educators and learners build skills and competencies needed to recognize dominant obesity discourse and to develop and maintain alternative discourses" (2021). Regardless of students' ultimate conclusions about fatness, they will benefit from recognizing anti-fat assumptions in research and considering counter-paradigms. As Bhagat and Teegarden state, "Educators do not need to tell students what to think, but rather offer guidance so that they can learn *how* to think and develop their own understandings regarding weight and health" (2020, p. 12).

This current study fills a gap in both these streams of research by investigating how and where fat studies research may be identified. The findings will be useful not only in fat studies curricula, but also in the context of health literacy and health communications in service of social justice around anti-fatness.

Methods

With the aim of learning where fat studies literature is to be found and what discovery strategies are effective, we started with techniques drawn from bibliometrics, namely tracing citations. However, this study is unlike most bibliometric studies, which evaluate the impact of articles, journals or researchers (Bornmann, 2020). Rather, we developed our approach to identify which journals, databases, and keywords are most likely to lead to discovery of literature in the fat studies paradigm. To ensure that we were not missing relevant information literacy approaches, we also analyzed research guides compiled by other librarians on fat studies resources.

In was appropriate to start our investigation with *Fat Studies*, because it is the first and only academic journal with the stated goal of publishing literature in this paradigm. We reasoned that work in the fat studies paradigm published in other journals is likely to cite this key journal. Thus, we set about locating any article that had cited *Fat Studies*. We used the Scopus database, which has broad coverage across subject domains, to harvest citing articles. Scholars in the arts and humanities frequently publish in monographs or edited volumes rather than in journals. Since 2014, Scopus has added 292,000 book titles, of which 55% cover the arts, humanities, and social sciences (Elsevier, 2023).

We searched for articles in the Scopus database that cited *Fat Studies* from 2009 through May 2024 and downloaded a report listing 6,878 articles. From the list of citing sources, we identified eight journals that had cited *Fat Studies* more than 10 times (see Appendix A).

To identify relevant databases, we used the UlrichsWeb Periodicals Directory. UlrichsWeb shows which bibliographic databases index each journal in the directory. We looked up each journal in which at least 10 citations referred to *Fat Studies* to learn where researchers can find the referring articles. Each author searched UlrichsWeb for half the list of 84 journals. This analysis resulted in a list of 414 databases, from which we omitted three groups of databases: 328 databases that indexed fewer than 10 of the journals that cited *Fat Studies* more than 10 times; 21 agricultural and veterinary databases that indexed 13–25 of the citing journals; and six databases designated only for alumni use (see Appendix B).

To identify relevant keywords, we downloaded reports of the author keywords and Scopus subject headings for each of the 6,878 articles citing *Fat Studies* from January 2009 to May 2024. The aggregate of keywords and subject terms were then compared and analyzed. We compiled a table of terms that included fat studies and medical terms together and the number of instances we found in both keywords and subject headings. Related terms like *body positive/body positivity* and terms with spelling variations like *fat phobia/fatphobia* were combined in the table.

To identify library research guides, we searched Google in July 2024, using the keyword *library* and one of the following terms: *fat studies; fat liberation; fatmisia; sizeism; weight stigma;* or *weight bias*. The search was also limited to the .edu domain as research guides are usually linked to university or college websites.

Findings

Appendix A lists the 84 sources that cited *Fat Studies* more than 10 times from 2009 to May 2024. Note that one title on this list is actually an edited volume: *Thickening Fat: Fat Bodies, Intersectionality, and Social Justice* (Friedman et al., 2019). Journals with more than 50 citations in that period were *Body Image* (210 citations), *Fat Studies* (114), *International Journal of Environmental Research and Public Health* (87), *Social Science and Medicine* (74), *Frontiers in Psychology* (57), *Appetite* (55), and *Nutrients* (54).

Appendix B lists the 59 databases that index at least 10 of these journals. Only three databases indexed more than 50 of them: Web of Science (74), Scopus (73), and PubMed (51).

Appendix C lists 18 library research guides covering fat studies. None of them addresses information literacy around the fat studies and medicalization paradigms in depth; in addition, research strategies for identifying resources in the fat studies paradigm were limited. All but three guides listed books and videos in the library collections that affirm and celebrate the fat-identifying community and/or call out anti-fat bias. The remaining three research guides provided access to relevant primary resources. Three named databases for research in fat studies, and three listed the key journals—*Fat Studies* and *Body Image*—and provided relevant subject headings. However, none of the guides explains how to distinguish articles from the fat studies perspective and the medical (ob*sity) perspective; at least one resource listed on the guides adopted the medicalization perspective suggesting that in an ideally healthy world, fat people would not exist.

Table 1 presents the results of our analysis of metadata for 6,878 articles that cite at least one article in *Fat Studies*, comparing keywords provided by the authors to index terms provided by Scopus.

TABLE 1
Incidence of Terms as Author Keywords and/or Scopus Index Terms

Term	Author Keywords	Scopus Index Terms
Fat Studies Paradigm		
Fat	442	225
Fatness	44	0
Fatphobia	26	5
Anti-fat	22	0
Fat stigma	16	1
Fat acceptance	14	1
Medicalization Paradigm		
Ob*se	17	70
Ob*sity	1066	2475
Overw*ight	129	256
Adipose tissue	8	28
Adiposity	3	11
Both Paradigms		
Weight bias	176	199
Weight stigma	269	192

There were 2,475 total author keywords and 5,695 total Scopus keywords assigned to these 6,878 articles. *Ob*sity* and *overw*ight* are present in articles on both sides, though more so in the Scopus index terms. *Weight bias* and *weight stigma* are highly represented in both types of articles. However, terms such as *fat, fatness, body positive/positivity, anti-fat,* and *fat stigma* were much more (and sometimes exclusively) present in author keywords.

Discussion

Given that *Body Image* cites *Fat Studies* more than *Fat Studies* cites its own literature, it should be considered a key journal in the field of fat studies. *Body Image* does not focus specifically on fat studies literature, but it does "have a weight-inclusive focus rather than a weight-normative or weight-centric focus" (*Body Image*, n.d.).

We were surprised by the finding that so few databases index literature central to fat studies as a discipline. Findings from our analysis of research guides show that this fact may be unknown to other reference librarians, as the research guides generally listed databases that one would reasonably assume would cover fat studies research (e.g., Anthropology Plus, APA PsycINFO, GenderWatch, Sociology Source Ultimate). However, the databases suggested in the fat studies research guides do not cover *Fat Studies,* and some do not cover *Body Image*. Institutions without access to Web of Science and/or Scopus will be less able to provide discovery options for fat studies literature. Google Scholar, used skillfully, may be able to serve researchers at institutions without one of these expensive databases, and PubMed is freely available.

Language is one of the main methods of determining which paradigm an article belongs to; therefore, we suspected that there would be a large disparity between the author keywords and Scopus index terms. Discrepancies between keywords and subject headings mean that researchers will have to use stigmatizing language in their searches if they want a thorough representation of fat studies literature. While some authors did use *ob*sity* as a keyword, many more articles were indexed with *ob*sity* by Scopus. This means that articles which do not belong in the medicalization paradigm are being indexed as though they do, and fat studies researchers (who often identify as fat themselves) cannot avoid stigmatizing and potentially triggering terms as they conduct their research.

Downey (2016) argues that critical information literacy theory shows us the importance of highlighting the power structures inherent in information systems. In the case of fat studies literature, the power structure is apparent by its absence when compared to other population characteristics such as race, religion, sexual orientation, and gender. If the politics of body size were considered a true concern, there would be more literature and more than two journals focusing on the fat studies paradigm.

Building Inclusive Critical Information Literacy

Learning to recognize the governing paradigm of an academic study is an important critical thinking skill. This can serve as a central lesson in a fat studies course, as well as a useful example in a general CIL session or course. One model of such a lesson would start with a mini-lecture to introduce the idea that scientific discourse may rest on biased assumptions, such as the idea that thinness is equivalent to overall health.

Students would then participate in an active learning exercise with a set of article abstracts provided by the instructor about fatness or fat people. Students would have time individually

to compare the abstracts and then discuss one-on-one or in small groups. After a discussion of what students noticed about the articles, the instructor can summarize features common to the medicalization paradigm:

- Stigmatizing language such as "ob*se" and "overw*ight"
- Uncritical reliance on Body Mass Index (BMI) as a measure of health
- Implied goal of a world without any fat people

In contrast, articles in the fat studies paradigm tend to:

- Acknowledge body diversity
- Acknowledge systemic and structural harms against fat people
- Treat body differences neutrally

Next, students can be challenged to find articles on their own that fit into each paradigm. In guiding this experience, it is important to acknowledge that researchers will need to use stigmatizing terms to retrieve all relevant materials, regardless of the paradigm.

In preparing for the session, instructors should check whether the institution subscribes to *Fat Studies* or *Body Image*, as well as Scopus or Web of Science databases, which give the most access to these two core journals and to the journals that frequently cite them. For institutions without access to Scopus or Web of Science, PubMed or Google Scholar can be useful free options. PubMed indexes *Body Image*, but not *Fat Studies*, so Google Scholar is preferred. However, students will need instruction on advanced Google Scholar strategies, such as the following to get beyond the algorithm's reliance on citations as a measure of relevance:

- Use quotation marks to stipulate that terms are included in the search (e.g., "body positive," "anti-fatness," "fat stigma")
- To indicate a Boolean OR, use the | operator (also known as a vertical bar or pipe, located above the Enter key) (e.g., "anti-fatness"|"fat stigma" "weight neutral"|"weight inclusive"|"body positive")
- Use the Advanced search from the menu to the left of the Google Scholar logo to limit to specific journals (e.g., "Return articles published in" Fat Studies)

Another important learning outcome for Google Scholar is the concept of citation chaining as a means of following scholarly conversations back in time through references and forward in time through citing articles. Demonstrate the concept using the "cited by" feature in Google Scholar. It is possible to further search keywords within the citing articles to narrow the search to relevant concepts.

Finally, instructors may consider creating a research guide to support fat studies. The analysis by Silkotch et al. (2025) had similar findings to our study: most existing guides lean toward popular sources on social justice, rather than academic resources or information literacy guidelines. A comprehensive guide should (1) spell out the medicalization and fat studies paradigms, with clues on how to recognize each one, (2) provide keyword suggestions (both stigmatizing and inclusive), (3) identify *Fat Studies* and *Body Image* as key journals in fat studies, (4) point out that Scopus and Web of Science are the only subscription databases that index both of them, and (5) provide tips on Google Scholar as a free alternative. In our review, the guides from The Chicago School, Simmons University, and Widener University provided both keywords and identified core journals and thus represent good starting points (see Appendix C).

Limitations and Future Research

While this study focused on citations of *Fat Studies* as a marker of fat studies articles, that choice limited our scope of analyzed literature. It is possible that there are articles related to fat studies that do not cite the titular journal; in that case, we would not have captured them in this study.

There is a critical need for more literature examining anti-fat bias in libraries and library and information science, including critical information literacy and reference. Due to the countercultural aspects of fat studies as a discipline, it would be illuminating to see how many librarians are aware of this problem and know how they are empowered to work against the pervasiveness of these oppressive structures. It is also important that additional research is conducted on critical information literacy and fatness/anti-fatness. Only when fatness is seen as much in library literature as other population characteristics will it be regarded as a valid concern for patron and employee treatment.

Conclusion

Fat people continue to move through a society in which they routinely face anti-fat bias and stigma. This oppression will take time to dismantle; however, one way to start is to make the next generation aware of how a large subset of the population is mistreated and excluded through use of disparaging terminology and medicalization of their identity. The findings of this study will be useful not only in fat studies curricula, but also in the context of health literacy or health communications more generally, as well as in service to social justice around anti-fatness. This study contributes to critical information literacy by identifying pathways to discovering literature in the fat studies paradigm. Similarly to other hegemonic discourse, the medical model of ob*sity is difficult to dismantle because the link between fatness and moral shortcomings is pervasive and internalized. Unpacking the underlying assumptions of anti-fatness is relevant to any social justice issue, as all forms of oppression are connected. Providing a guide to discovering alternative paradigms is a way of inviting students to think critically about power, privilege and prejudice embedded in scholarly research on any topic, which contributes to the creation of the better world we all deserve.

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Appendix A
Journals Citing *Fat Studies* More Than 10 Times (2009–May 2024)

Source Title	Citations to *Fat Studies* 2009–May 2024
Body Image	210
Fat Studies	114
International Journal of Environmental Research and Public Health	87
Social Science and Medicine	74
Frontiers in Psychology	57
Appetite	55
Nutrients	54
BMC Public Health	50
New Media and Society	47
PLoS ONE	47
Qualitative Health Research	40
International Journal of Eating Disorders	37
Journal of Eating Disorders	37
Sociology of Health and Illness	35
Obesity Reviews	35
Eating Behaviors	34
Eating and Weight Disorders	33
Health Communication	33
Critical Public Health	32
Social Media and Society	31
Feminist Media Studies	31
Journal of Health Psychology	28
Sport, Education and Society	27
Archives of Sexual Behavior	27
Obesity Science and Practice	27
Feminism and Psychology	26
Conference on Human Factors in Computing Systems—Proceedings	25
Health Promotion International	25
Proceedings of the ACM on Human-Computer Interaction	25
BMJ Open	24
Journal of Medical Internet Research	24
Stigma and Health	23
Clinical Obesity	22
Eating Disorders	22
Computers in Human Behavior	20
Qualitative Research in Sport, Exercise and Health	20

Source Title	Citations to *Fat Studies* 2009–May 2024
Frontiers in Public Health	19
Journal of Sex Research	19
Current Psychology	18
Obesity	18
International Journal of Obesity	18
Food, Culture and Society	17
Health (United Kingdom)	17
Gender and Education	16
Social Sciences	15
The Routledge International Handbook of Fat Studies	15
Frontiers in Psychiatry	15
Childhood Obesity	15
Frontiers in Nutrition	14
American Journal of Human Biology	14
Social Theory and Health	14
BMC Health Services Research	14
Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	14
Psychology and Health	14
Geoforum	14
Social and Cultural Geography	14
Gender, Place and Culture	13
First Monday	13
The Contemporary Reader of Gender and Fat Studies	13
Canadian Journal of Public Health	13
SSM—Qualitative Research in Health	13
Disability and Society	13
Nutrition and Dietetics	13
Psychology of Sport and Exercise	12
Applied Mathematics and Nonlinear Sciences	12
Medical Anthropology Quarterly	12
Thickening Fat: Fat Bodies, Intersectionality, and Social Justice	12
Journal of Applied Social Psychology	12
Sexualities	12
Journal of Social Issues	12
ACM International Conference Proceeding Series	12
Obesity Surgery	12
Women's Studies International Forum	12
Patient Education and Counseling	12
Midwifery	12

Source Title	Citations to *Fat Studies* 2009–May 2024
Journal of Nutrition Education and Behavior	12
Healthcare (Switzerland)	12
Sustainability (Switzerland)	11
Current Obesity Reports	11
Media, Culture and Society	11
Psychology and Sexuality	11
Journal of Lesbian Studies	11
Health Promotion Journal of Australia	11
Digital Health	11

Appendix B
Databases Indexing More Than 10 Journals Citing *Fat Studies*

Database	Total Citing Journals Indexed
Web of Science	74
Scopus	73
PubMed	51
Essential Science Indicators	44
Current Contents	38
TOC Premier	34
Academic Search Complete	32
Current Abstracts (EBSCO)	32
APA PsycINFO	31
EMBASE	28
ProQuest Central	28
Academic Search Elite / Academic Search Premier	27
MEDLINE	26
Gale Academic OneFile	25
Global Health	24
ArticleFirst (OCLC)	23
Ovid MEDLINE	23
CINAHL Complete / CINAHL Plus with Full Text	22
Leisure Tourism	22
Nutrition and Food Science Database	22
PsycFIRST (OCLC)	22
Rural Development Abstracts	22

Database	Total Citing Journals Indexed
InfoTrac Custom	21
Nutrition Abstracts and Reviews, Series A: Human and Experimental	21
ProQuest Health Research Premium Collection	21
Abstracts on Hygiene and Communicable Diseases	20
Environmental Impact	20
ProQuest Hospital Premium Collection	20
Reactions Weekly	20
SocINDEX	20
ProQuest Health & Medical Collection	19
Social Science Premium Collection	19
Academic Search Ultimate	18
Electronic Collections Online (OCLC)	18
Sociological Abstracts	18
Tropical Diseases Bulletin	18
Environmental Sciences and Pollution Management	17
Professional ProQuest Central	17
SocINDEX with full text	17
STM Source	17
Biotechnology Source	16
Food Science and Technology (FSTA) Abstracts	16
Biomedical Reference Collection, Corporate Edition	15
E-psyche	14
Biological Sciences	13
Food Science Source	13
Health Reference Center Academic	13
ProQuest 5000 International	13
Public Affairs Index	13
Research Library (ProQuest)	13
Europe PubMed Central	12
Health and Safety Science Abstracts	12
Risk Abstracts	12
SciTech Premium Collection	12
Sociology Collection	12
GALE Literature: Book Review Index	11
ProQuest 5000	11
Social Services Abstracts	11
Studies on Women and Gender Abstracts	11

Appendix C
Library Research Guides Relevant to Fat Studies

- Boise State University: https://guides.boisestate.edu/c.php?g=939889&p=6807549
- Carroll Community College: https://library.carrollcc.edu/explorebodyliberation/history
- Chicago School (includes relevant journals and subject headings): https://library.thechicagoschool.edu/c.php?g=1244933&p=9109000
- Cornell University (undergraduate course guide suggesting databases): https://guides.library.cornell.edu/english2880mo/background
- DeVry University: https://libguides.devry.edu/c.php?g=1337823
- Duke University (primary resources): https://archives.lib.duke.edu/catalog/allisondorothy_aspace_ref197_avn
- Florida Atlantic University (suggests one healthcare database, includes video from medicalization paradigm): https://libguides.fau.edu/Healthcare-for-All-Weight/
- Harvard Kennedy School: https://guides.library.harvard.edu/hks/book-displays/equality-at-every-size
- Harvard University (primary resources): https://hollisarchives.lib.harvard.edu/repositories/8/archival_objects/3386079
- Indiana University Bloomington: https://guides.libraries.indiana.edu/c.php?g=1041095&p=9723430#s-lg-box-32185432
- Northern Virginia Community College: https://libguides.nvcc.edu/confidenceandjoy/antifatbias
- Pratt University: https://libguides.pratt.edu/fatstudies
- Simmons University (includes relevant journals and subject headings): https://simmons.libguides.com/anti-oppression/anti-fatmisia
- University of Connecticut (primary resources): https://archivessearch.lib.uconn.edu/repositories/2/resources/522
- University of Nebraska Omaha: https://libguides.unomaha.edu/c.php?g=1049744&p=7986294
- University of Washington: https://guides.lib.uw.edu/FatActivism
- Valdosta State University (suggests three databases): https://libguides.valdosta.edu/anti-oppression/sizeism
- Widener University (includes relevant journals and subject headings): https://widener.libguides.com/sizeism

Investigating International Academic Librarian Attitudes on Copyright Reform in Support of Open Access

Stephanie Savage and John Willinsky*

This paper reports on the results of a survey of academic librarians from 19 countries on their attitudes toward copyright reform in relation to open access to research. In addition to querying general attitudes toward the advancement of sustainable open access, the survey asks respondents about their level of agreement for three current copyright reform proposals in support of open access. The results of this research demonstrate endorsement from the academic librarian community for professional associations, in particular, to continue to advocate for the advancement of open access and to consider whether there are copyright reforms that are likely to encourage and support this objective. Survey responses also identify the need for any reform to address respondents' distrust of publishers' "exploitative" open access models.

Introduction

Now that open access has established itself as the ideal publishing model—from the perspective of researchers, publishers, librarians, and funders—for the digital-era circulation of research and scholarship, the question of how to best achieve open access on a universal and sustainable basis has become one of the academy's principal and pressing concerns.[1] That copyright law might have a role to play in the achievement of open access on that scale seems a reasonable point of inquiry, given how influential this area of law has proven for the distribution of knowledge in the age of print. Academic librarians have long been involved in copyright compliance and user rights and are therefore worth studying in connection with copyright reform's potential role in bringing about universal open access. This motivated the design and dissemination of a survey whose results are reported here. This study's goal is to

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[1]While questions can be raised about the levels of commitment to open access among these stakeholders, a typical example of the current open access consensus is Taylor & Francis' "How Can Librarians Support Open Research?" and Elsevier's "Open Access Essentials for Librarians." In addition, Willinsky (2023, pp. 29–58) documents the consensus among libraries, publishers, researchers, and funders in support of the open access model of scholarly publishing.

share a small sample of librarians' current stances on (1) the role of copyright in open access and (2) the potential for legislative reform in advancing this model for scholarly publishing. It is intended to further motivate and sustain the conversation needed to advance a sustainable future for open access.

Literature Review

Research shows that academic librarians possess a basic knowledge of copyright. For example, Olaka and Adkins (2012) surveyed academic librarians in Kenya, finding that librarians were "only moderately knowledgeable about copyright issues" (p. 46). Similar studies done by Carbonneau and Priehs (2014) in the United States, Oppenheim and Woodward (2004) in the United Kingdom, and Fernández-Molina et. al (2017) in Brazil come to similar conclusions and further note the need for increased training opportunities for librarians to improve their copyright literacy. In a study on an international scale, Todorova et al. (2017) surveyed 1,926 library professionals across 13 countries and found that "the level of knowledge and the awareness of respondents ... regarding copyright issues is far from satisfactory" (p. 336). However, they also note that familiarity "is highest for national level copyright-related laws and institutions (around 50 percent familiarity rate), and for the knowledge of limitations and exceptions in national copyright laws" (p. 336). Moreover, they found that knowledge level was unevenly distributed across countries, with the U.K. and U.S. emerging as leaders.

While copyright literacy may not be high among academic librarians, the literature does reflect a growing interest in and sense of responsibility for copyright within the profession. Research conducted by Kawooya et al. (2015) demonstrates an increase in the mention of copyright knowledge in American Library Association (ALA) job board postings from 2006 to 2013, suggesting that "copyright is a prerequisite for current and future needs of academic libraries and academic institutions in general" (p. 341). Complementary work done first by Horvara (2010), and revisited by Graham and Winter (2017), further shows that in Canadian academic institutions, "the library is the primary locus for most matters related to copyright" (p. 150).

An interest in copyright goes beyond the librarian's institutional responsibilities, as librarian professional associations have also exhibited a commitment to advocating for copyright reforms. In a 2022 study on the 2017 Copyright Act Review in Canada, Zerkee et al. found that, as a community, higher education institutions (most of which were represented by their libraries), not only made more contributions to the review than any other stakeholder group, but also represented the largest voice for the protection and advancement of fair dealing, a central user right in Canadian copyright law. An earlier history of the role of the Association of Research Libraries (ARL) in the development of the United States' Copyright Act of 1976 demonstrates that, since at least the 1960s, academic library associations have been consciously engaging in lobbying activities to advance their copyright policy positions (Miller, 2009). Evidence of ongoing interest in copyright reform can be found in the public policy briefings and position statements put forward by librarian organizing bodies, including the International Federation of Library Associations (IFLA's position: https://www.ifla.org/g/clm/the-ifla-position-on-copyright-in-the-digital-environment/), the Canadian Association of Research Libraries (CARL's position: https://www.carl-abrc.ca/influencing-policy/copyright/), Ligue des Bibliothèques Européennes de Recherche–Association of European Research

Libraries (LIBER's position: https://libereurope.eu/liber-position-statement-copyright-in-the-digital-age/), and the U.S.-based Library Copyright Alliance (LCA's principles: https://www.librarycopyrightalliance.org/principles/).

While research has been conducted on librarian understanding of, interest in, and activism around copyright as it bears on academic libraries, there has yet to be a study of librarian attitudes around issues of copyright reform generally, let alone in relation to furthering open access. This study seeks to fill the gap in the literature by surveying academic librarians directly on their attitudes toward copyright reform in relation to the goal of open access for research, which has attracted much librarian support.

Methods

Research Design

The survey "Copyright and Open Access to Research: An International Survey of Academic Librarians" presented participants with an initial set of four statements on a web-based survey platform (Qualtrics) about the state of copyright and open access (see Appendix A). These statements were intended to measure librarian interest in copyright reform directed toward open access with a Likert scale from strongly disagree to strongly agree. A fifth question asked participants to similarly respond to three existing proposals for legislative reform intended to achieve open access. Each of these three proposals is accompanied by a brief description and links out to further information, should a participant require more information before completing the survey.

An initial draft survey was distributed to a selection of academic librarians from across different specializations and areas of expertise. In response to their feedback, the survey was refined, and additional introductory information about copyright and open access basics was included to provide necessary context. The completed survey was translated into French to respect principles of bilingualism in Canada, as well as to increase its accessibility and reach to French speakers in Canada and abroad.

Participants

Invitations to participate in the survey were posted to listservs that belonged to associations known to represent the target audience, including library and librarian associations in Canada, the United States, and the United Kingdom, along with the International Federation of Library Associations. Recipients of the study announcement were also encouraged to share it within their networks. The survey was initially available for one month but was later extended for an additional two months to maximize the response rate. While a response rate cannot be established for survey participation, it seems very low, suggesting that respondents who took the survey are among those academic librarians with a special interest in the intersection of copyright and open access. The participants also reflect the overrepresentation of both Canadian and scholarly communications or copyright-focused organizations among the survey announcement venues.

Results

The survey received a total of 196 responses with 176 in English and 20 in French. Respondents were asked two demographic questions, including the country where their institution is located and their primary area of responsibility within the library. Importantly, respondents were

not asked to provide any identifying information about themselves or the institution they are affiliated with.

Beginning with the geographical distribution of respondents, 59% of participants identified themselves as being affiliated with a library in North America, with the largest percentage (37%) coming from Canada. Outside of North America, 39 respondents (20%) came from Australia and an additional 11 (5%) from the United Kingdom. The final 23 respondents (12%) who identified their country of affiliation came from a total of 15 countries across Europe, Africa, and the Middle East. The distribution of responses largely correlates with the dissemination strategies employed by the authors. However, the large number of responses coming out of Australia—a country that was not directly targeted for participation—suggests that some respondents redistributed the survey through their own collegial networks.

TABLE 1
Respondents' Library by Country

Country	Respondents (%)
Canada	72 (37%)
United States	44 (22%)
Australia	39 (20%)
United Kingdom	11 (5%)
Other	7 (4%)
Blank	23 (12%)
Total	196 (100%)

TABLE 2
Respondents' Primary Role in Library

Librarian Role	Respondents (%)
Scholarly Communications	45 (23%)
Subject Specialist	40 (20%)
Copyright Specialist	37 (19%)
Other	74 (38%)
Total	196 (100%)

Respondents were also asked to identify their area of primary responsibility within their library. Answers were evenly split with the largest identified group coming from a scholarly communications role (n = 45, 23%), followed closely by librarians with a subject specialization (n = 40, 20%) and those specializing in copyright (n = 37, 19%). The remaining 74 respondents (38%) represent a wide variety of specializations from across the spectrum of academic library positions and range from administrative roles to those that are technology or instruction focused. The breadth of responses we received from librarians with diverse professional responsibilities is a positive indication of the relevance of copyright to the broader academic librarian community. The paper includes quotations from 49 of the participants, which are identified by an "L" for librarian followed by an assigned number (L01–49).

Survey Results

Open Access

The first survey question asked respondents to assess the growth of open access within the scholarly publication ecosystem (see Figure 1). Many felt that it was progressing at a "satisfactory" (48%) pace; however, most of that support fell into the "somewhat agree" category, and those who did not agree (including neutral) made up a slight majority (52%), which suggests both that the results were mixed on open access' progress, and that it's worth considering changing approaches to open access.

These mixed reactions are reflected in the respondents' comments. The strong affirmations were specific. For example, "Read and Publish, and Transformative agreements are making great strides in Australia" (L27), and "the academic community is making great strides at the university level" (L13). On the other hand, a general sense of less than satisfactory gains was more common, with responses such as, "I would characterize it as glacial progress" (L40).

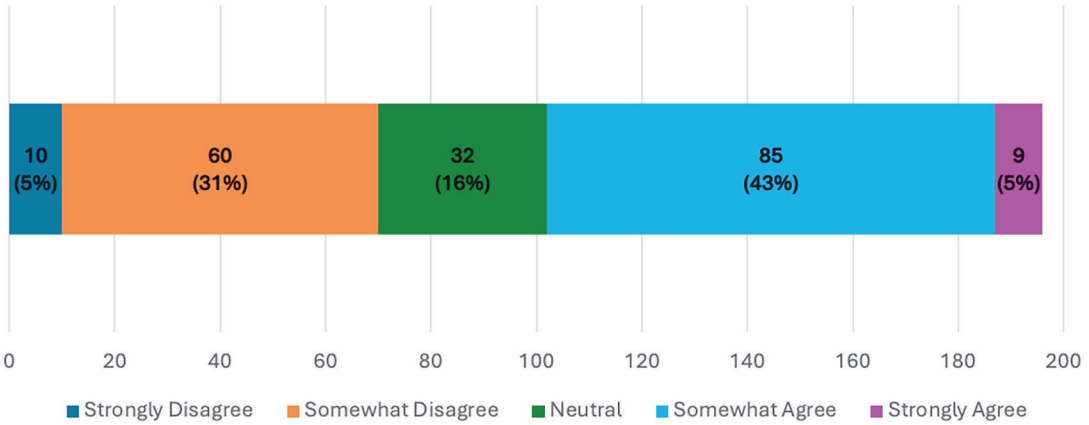

Figure 1. Statement: "The academic community is making satisfactory progress in bringing about open access for research publications" (n = 196).

Article Processing Charges (APCs) were identified as the main culprit for the slowness by eight librarians: "I think the APC trend has slowed our progress towards OA [open access]" (L10). More broadly, concerns about the financial sustainability of this "progress" were also raised: "We are making progress but in financially unsustainable ways" (L39). Or more pointedly: "I feel the movement is failing. It's been hijacked by vendors" (L32). This pervasive distrust of publishers—"We are being fooled by publishers with transformative agreements" (L29, translated)—was also reflected by six respondents referring to publishers unduly *exploiting* open access: "We need to leverage our collective power and push back against publishers' rent-seeking, exploitative practices" (L28). The lack of support for open access from the universities' tenure and promotion committees were also identified by four of the librarians as another impediment: "Tenure and promotion committees aren't always on the same page about the legitimacy (not quite the right word) of OA publications, unfortunately" (L35).

Copyright and Open Access

The second statement concerns whether copyright matters to open access (see Figure 2). For this question, most respondents (n = 127, 65%) indicated that copyright is indeed implicated

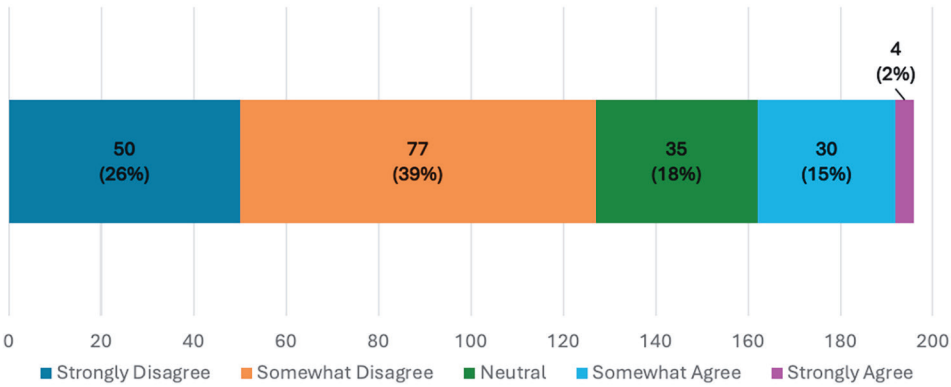

Figure 2. Statement: "When it comes to the academic community's progress with open access, copyright is not proving to be an issue" (n = 196).

in open access' progress. The proportion that felt that copyright was not involved was low (n = 34, 17 %) and comparable in size to those who were neutral on the question.

More than one respondent felt that copyright was not just an issue, but that "it is THE issue" (L43) and a "huge issue!" (L21 and L03). More than one respondent mentioned the lack of trust between publishers and the academic librarian community with comments such as, "Academic publishers are weaponizing copyright to slow progress of open access initiatives" (L19), and "the publishing sector obstructs [secondary rights] in every way it can" (L01). At least one librarian saw value in copyright change in response to this statement: "Some reforms (like secondary publishing rights) and new practices (like author rights retention) would definitely accelerate progress" (L17). Another noted copyright's datedness: "Copyright legislation in Australia is fairly out-of-date" (L44). At least four of the librarians added comments on how "'copyright' is not the issue," with two of them pointing to the sheer absence of "knowledge about" copyright as the problem (L30). Others pointed to specific misapprehensions, such as "the great myths of open access—that it cannot work nicely with copyright" (L06). One pointed to faculty "who do not effectively manage their rights" (L36) and another, in a related point, referred to how it is "almost impossible to get authors to be interested ... [in] their copyright" (L03). A third noted the irony that "researchers hate copyright laws, but they love their own intellectual property" (L11), which is protected by those laws.

Library Associations

This statement aimed to measure librarians' interest in seeing whether copyright could do more to support open access to research (see Figure 3). It introduced the library association as a means of exploring copyright's possibilities, on the grounds that many such associations have copyright committees. This statement received the most extensive "strongly agree" support of any statement presented. This suggests, above all, the willingness and interest among respondents to see more inquiry into what copyright might do for open access. The strong level of support could be attributed, in part, to the fact that those who were willing to complete the survey had an existing interest in this question of copyright's role in open access. Given the much higher level of support for this statement (n = 174, 89%) compared to the response to statement two (i.e., the idea that copyright is proving to be an open access issue at the moment; n = 34, 17%), the data might also indicate a hope for copyright reform in the future.

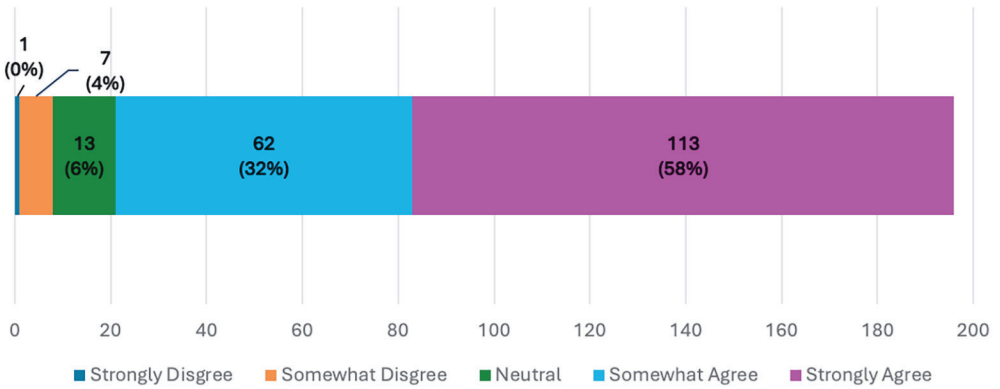

Figure 3. Statement: "Academic librarians and library associations should consider whether there are copyright reforms that are likely to encourage and support sustainable open access to research" (n = 196).

Written responses clearly supported this third statement. For example, one respondent wrote, "All library organizations should have this conversation as top priority" (L33). Yet, there were also concerns: "I'm ... pessimistic about seeing our legislator make revisions in copyright law for the good of open access" (L26). One respondent was intrigued—"interesting and clever solution" (L23)—but also joined others in expressing skepticism about this strategy with comments such as, "Corporate rights holders have much more lobbying power" (L19) and "you open up the chance for it to be worse" (L43). There were doubts, as well, about professional library associations: "I have never had faith in the American Library Association in relation to copyright" (L40). Some were more targeted in their concerns about what legislative reform needed to encompass, even as they were leery of government action: "We all got bamboozled by the Nelson memo in the U.S. ... It is going to cost us more overall to comply unless publisher profits go on the chopping block" (L22). Related to this sense of limited impact was a sense that reforms would be limited to "those with federal grants, which is not the majority of research" (L02). The question of whether librarians had a part to play in such reform came up: "Legal change is not something that library staff will (be able to) bring about" (L41). Then there was the sense of not knowing what can be done: "Honestly though, I don't know what those reforms would be" (L09). This was reflected, as well, by how there were fewer comments on this statement compared to the others.

Copyright Reform

This statement identified a specific challenge that one of this study's authors frequently heard librarians mention as the principal deterrent to seeking copyright reform. This statement's goals were to assess apprehension over publishers' lobbying power, and to gain greater insight into its basis. Most respondents (n = 131, 67%) did not agree that publishers were "likely to strengthen their position" through copyright reform. The perception of this threat was not absent but was held by a minority (n = 25, 13%), while the proportion who chose a "neutral" response, such as "I don't know enough to comment" (L11), was among the highest for these initial four statements on the survey (n = 40, 20%) by a few percentage points. Remaining neutral on this statement may also minimize the threat from publishers.

Respondents bluntly rejected the proposition that copyright reforms will only advance the publishers' position (e.g., "doesn't matter what publishers want" L33), while some respondents

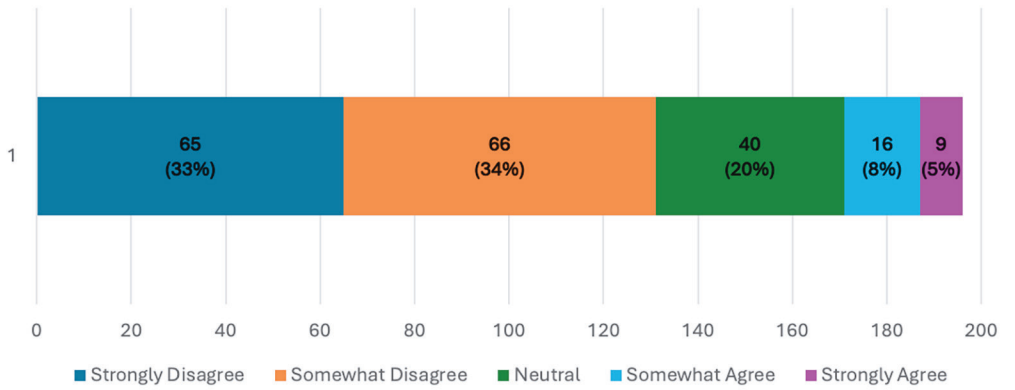

Figure 4. Statement: "Academic librarian and library associations should not pursue open access copyright changes because publishers are likely to strengthen their position over libraries through any legislative changes" (n = 196).

saw the statement as setting out a challenge: "We have a lot of educating and campaigning ahead" (L26). Some respondents pushed back against the idea of fearing publisher lobbying power: "We shouldn't walk across the street because we might be run down" (L08) and "if we don't challenge the publishers on this issue, who will?" (L13). Yet the recognition of publisher power was present in the librarians' comments: "Elsevier has the time, money, and interest to pay their lobbyists to live on Capitol Hill" (L40) and "publishers ... have already co-opted open access with various schemes" (L07). There was also a call for a different approach to the publishers: "We should stop framing publishers as enemies in this discussion" (L41). And some were optimistic about librarians' pursuit of copyright: "Libraries will improve things through changing the law, not hard-nosed dealmaking" (L05).

Three Proposals for Copyright Reform

In addition to the statements about librarians and copyright, survey participants were presented with three examples of active copyright reform proposals designed to address access to research (see Figure 5). While the other survey statements were intended to probe attitudes and beliefs around copyright, the responses to these three proposals were to provide a sense of where librarians stood on current reform proposals coming from different contexts.

User Exceptions. A strengthening of exceptions to the application of copyright, which give users additional rights, received the second highest level of support (see Figure 6). Exceptions, such as fair use and fair dealing, have been the subject of global copyright reform initiatives affecting libraries, enabling them, beginning in the United States in the 1970s, to make single photocopies of materials, such as research articles. More recently, many countries have begun to enact new legislation to protect uses of works necessary for machine learning. In terms of current initiatives, Sean Flynn leads a Washington College of Law "Right to Research" project on "text and data mining and of more 'open' exceptions for research uses" that has been examining this approach on a global scale (Flynn et al., 2022).

Respondents were in favor of this approach to copyright reform (n = 140, 77%), with only a handful strongly disagreeing (n = 7, 4%). Supportive statements ranged from "I would support almost ANY possible expansion of user exceptions" (L45) and "absolutely should" (L18), to less firmly stated support: "The law certainly needs to be more favorable to fair use

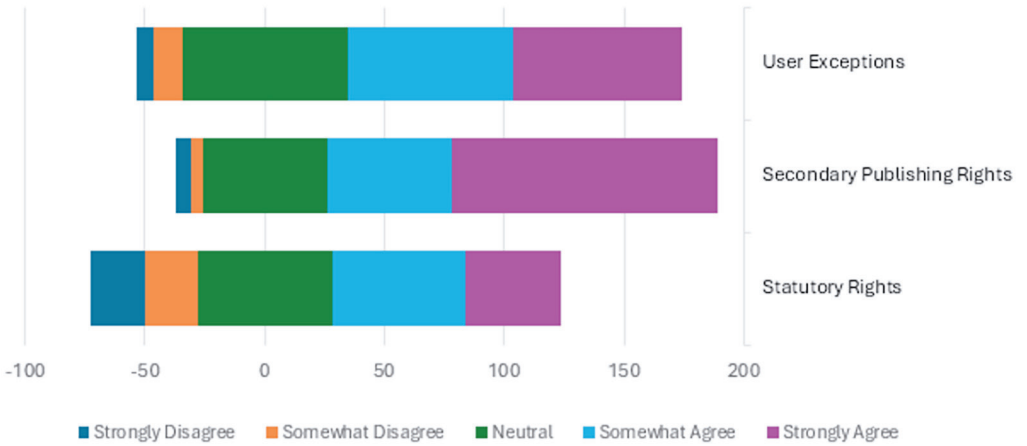

Figure 5. Three Copyright Reforms by Level of (Dis)agreement (n = 184).

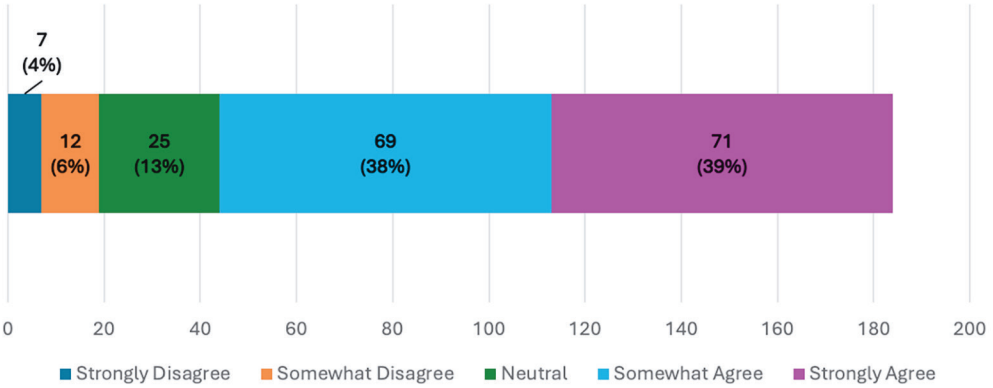

Figure 6. Statement: "User exceptions (e.g., fair dealing, fair use, etc.) should be strengthened to support a wider use of research and other texts for research in the legislation governing copyright. This would extend copyright's exceptions to protect users' access to research publications, and to other works (e.g., for AI) for research purposes" (n = 184).

for research purposes" (L14, translated). One librarian stated that: "Exceptions should become rights" without "loopholes" (L04). Some saw the strengthening as a matter of responding to publishing changes: "Legislature needs to evolve alongside technology and ethos" (L15) and "the law either needs to be future proofed or we need to come up with something better" (L25). Challenges were raised, with comments such as, "it is difficult to reconcile such an expansion of end user rights with the Berne three-step test" (L01) and "what about feeding data to large language models" (L37). This latter response falls, in fact, within the proposed text-mining exception of this reform effort, if for research purposes (a difficult distinction to make in the flow between research and commercial large language models).

Secondary Publishing Rights. Respondents most strongly agreed with secondary publishing rights among the three copyright reforms proposed.[2] A substantial majority (n = 163, 88%) agreed with this approach to reform (see Figure 7). That this statement also received the least commentary of any survey component might further reflect its level of acceptance among participants (see Table 3). The positive response to this proposal may reflect growing support for secondary rights among academic library associations. For example, the Canadian Federation of Library Associations recently issued a public call to the government of Canada, urging the government to "introduce an amendment to the Copyright Act recognizing the academic authors' Secondary Publishing Rights in support of immediate access to publicly funded research published in research periodicals" (2023). This call echoes an earlier

[2]One librarian in the survey helpfully pointed out that there is a distinction between "secondary publishing rights" and "rights retention strategy" that we did not make clear in our survey. Secondary publishing rights refer to legal provisions that are enshrined into law and grant authors the right to self-archive their work, regardless of publication agreements they may have entered into. Secondary Publishing Rights have been codified in the national laws of several countries, including the Netherlands and Spain. A Rights Retention strategy, on the other hand, is not a legislative solution. It may be imposed by a funder, implemented by an institution, or negotiated directly between an individual author and publisher through the use of an author addendum (see Electronic Information for Libraries, 2024). Although both approaches concern an author's secondary publishing rights, we regret not retaining the distinction in the survey when we referred to "secondary publishing rights (also known as a rights retention strategy)."

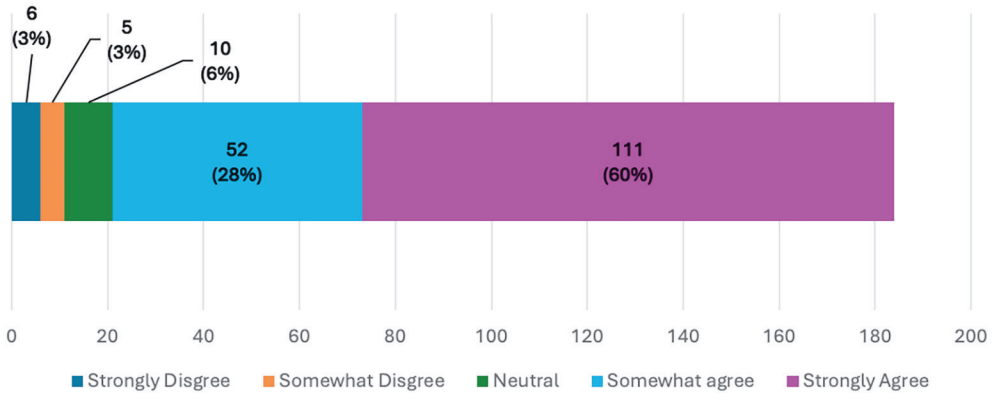

Figure 7. Statement: "Secondary publishing rights (also known as a rights retention strategy) should be introduced into the legislation governing copyright. Authors of publicly funded research will be granted an irrevocable right to make their work open after publication, possibly following an embargo period after a publisher's initial publication" (n =184).

appeal by LIBER, which went so far as to propose a model law for secondary publishing rights in EU countries (2021). The movement around secondary publishing rights has been particularly strong in Europe (e.g., Knowledge Rights 21 (https://knowledgerights21.org/)) leading to it becoming law, if in slightly different forms, in France, Germany, Belgium, Italy, the Netherlands, and Spain.

Among survey participants, support for secondary publishing rights could be outright and unequivocal: "Absolutely yes" (L31). Another librarian also noted how "the Nelson Memo does this already" (L40), referring to how that 2022 White House directive asked U.S. federal agencies to develop policies for making funded research immediately available (Nelson, 2022).

TABLE 3
Survey Commentary Word Counts

Survey Component	Commentary (number of words)
1. Open Access	2,232
2. Copyright and Open Access	1,774
3. Library Associations	1,139
4. Copyright Reform	1,238
5. User Exceptions	1,286
6. Secondary Rights	802
7. Statutory Licensing	1,454
Total	9,925

One reason for supporting legislative reform was to avoid "the lobbying power of the big publishers" (L38), a comment that other respondents raised as a concern with any reform. Those respondents who qualified their support for this reform acknowledged, for example, that "our researchers do not give much thought to licensing" (L09), and thus "are likely to still give rights away to publishers with easy one-click consent" (L34).

Several respondents who indicated that rights retention "is not good enough" connected this to how this approach commonly includes "embargoes, which are terrible and set science back" (L33). Nine respondents stated in one form or another that "embargos are not acceptable" (L22). Steps have been taken, such as with the Nelson Memo, to end the embargoes that

[3]At the time of writing, for example, the "National Institutes of Health Draft Public Access Policy" includes "a statement granting NIH make Manuscripts publicly available in PubMed Central upon the Official Date of Publication" (NIH, 2024).

keep research from being made open access for a fixed period after publication.[3] A second limitation of rights retention was clearly identified by a respondent, namely that "the majority of research isn't federally funded, so this only helps the minority" (L02) of studies.

Statutory Licensing. The third copyright reform presented to survey participants is the most recent, having been introduced in 2023 (see Figure 8). It was devised by one of the authors of this paper (Willinsky, 2023) and draws on the Music Modernization Act of 2018 in the U.S. as an inspiration for statutory licensing agreements that can apply to entire domains of intellectual property while including judicial review of pricing. Of the three reforms, statutory licensing is the most legislatively demanding, given that it calls for (a) introducing "research publications" as a category of work into copyright law, (b) setting up a means of determining the body of works to be included in that category, and (c) establishing owner collectives that will participate, along with librarians, in determining fair publisher compensation before a judicial body.

While statutory licensing attracted the highest level of opposition (n = 45, 24%) of the three reform proposals, it also had the highest number of librarians selecting "neutral" as their response (n = 43, 24%). This may suggest that it was the least familiar of the three copyright reforms presented. Nevertheless, a slight majority of participants agreed with statutory licensing as a viable copyright reform (n = 96, 52%); still, this was considerably less support than the other two copyright reform proposals gained, with a high proportion of librarians *strongly* agreeing with secondary publishing rights (n = 111, 60%).

Of those who supported statutory licensing, one survey participant noted how this reform could alter the economics involved—"I would like to see scholarly publishing removed from market forces"—even if that participant did not "see this level of government control happening in the U.S." (L26). Another librarian imagined that a "statutory license would probably make negotiations for OA less onerous" (L39). One librarian found it "the most likely scenario that would have agreement from the publishers and would successfully make research pubs openly available," while still being hesitant over what was perceived to be "the principle of paying twice" (L16). Another took the opposite view in stating that

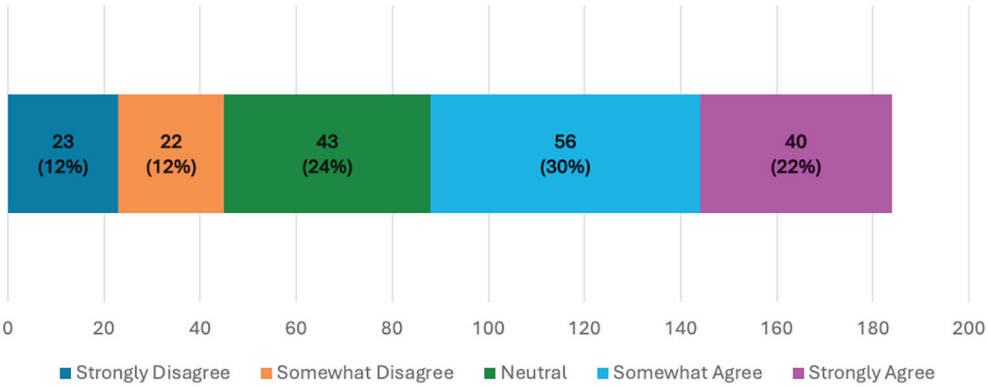

Figure 8. Statement: "Statutory licensing that requires open access to research publications should be included in the legislation governing copyright. Research publications will be subject to immediate open access with publishers compensated by the institutional users and funders of research at rates set in consultation with all parties by the Copyright Board" (n = 184).

"it would also help underfunding of academic libraries" (L24, translated). There were more questions around statutory licensing than with the other two reforms, such as, "How would this work?" (L40); "Who defines what a 'research publication' is?" (L46); "the copyright board could be a somewhat neutral party in setting rates??" (L47) and "lots of questions on this one" (L48).

On the other hand, the responses to statutory licensing could also be sharply opposed—"oh boy no thank you; this is a recipe for disaster"—because it was seen to "solidify the positions of the major publishers" (L02) or because the reform could "be hijacked by" them (L01). At least one librarian knew a great deal about music copyright, which is the original cultural industry subject to statutory licensing, noting that with music it is "an abysmal failure at helping creators retain and manage their rights" (L19), pointing to its third-party expenses, lack of transparency, and start-up costs.

Statutory licensing again evinced comments about the lack of trust around publishers, who were seen fighting it because "publishers are not willing to be reasonable about their profit margins" (L38). In related concerns, a respondent objected to how it would be "maintaining the profit margins of publishers" (L22), and another held that "publishers don't need compensation" (L30). The general distrust of publisher finances was also reflected in respondents' responses to the statutory licensing's regulation of fee-setting, with one librarian holding that "there should be no compulsory fees paid to publishers ... the copyright board should not retain this power" (L31), while two others foresaw "endless legal wrangling over the terms of compensation" (L20) and (L13).

When it came to considering all three copyright reforms, one librarian offered overarching support: "I chose 'strongly agree' for all 3 reforms, since I think for any true reform to be successful, there will need to be a multi-pronged approach" (L35). Another found in the three proposals reasons for thinking that "it really could be time to have a complete rethink around where and how taxpayers' money is being spent!" (L37). And one felt compelled to move beyond the three, leading the librarian to speculate about flipping a major copyright infringement case around: "What if ... people could just legally use Sci Hub" (L18).

Discussion

The 196 librarians who participated in this study from 19 countries, provided almost 10,000 words in commentary to the survey, which suggests that the respondents are fully engaged in the topic of copyright and open access. Although the survey invitation was widely distributed and redistributed (preventing us from providing a survey participation rate), it is fair to conclude that this is a small nonrepresentative sampling of academic librarians—representing copyright, scholarly communication, and subject specialties—with an existing interest in copyright and open access.

That said, respondents felt quite differently about both copyright and open access. The participants were divided, for example, on the progress being made in open access to research and scholarship. If less than half saw open access' progress as satisfactory, a more substantial proportion (65%) felt that copyright was playing a significant role in that progress. The differences, on the other hand, were related, at times, to working in a variety of jurisdictions. Rights retention, for example, was recognized as "already the case in France (Law for a digital republic)" (L49), and "I don't have a lot of faith in [measures to strengthen exceptions] getting past in Australia where our Fair Dealing is so narrow" (L18).

Respondents agreed most (90%) on how their professional associations should be considering copyright reform in support of open access. In addition, a common thread throughout the respondent comments was a distrust of publishers, whether in terms of what were felt to be exploitative business models or undue influence through government lobbying. It was a rare voice among the participants who called for an end to this perception of publishers as "enemies." However, most librarians (67%) did not see the publishers' economic power as a reason to back away from seeking copyright reform. It seems fair to conclude that respondents are interested in what copyright reform might do for open access. While such interest might seem unsurprising for scholarly communication and copyright librarians, most respondents (58%) were serving in other roles, suggesting that the topic has currency within the profession. Clearly, professional associations—as they heed this call for copyright reform to advance open access—should include in such reform some form of check on what are felt to be publishers' monopoly pricing practices.

Librarians' interest in copyright reform speaks as well to how scholarly communication has been left out of the digital-era copyright legislative changes resulting from the advocacy of other culture industries, including music, gaming, television, and video. While five countries have, as noted, passed secondary publishing rights provisions, copyright has not been otherwise updated "to promote the progress of science" for this new age, to cite one of the principal purposes of copyright in the U.S. Constitution. In the U.S., for example, the last significant copyright changes affecting scholarly materials date back to the Copyright Act of 1976, which made concessions to the age of photocopying in an era that might be said to have previewed open access, given how much more freely research circulated thanks to the photocopier.

When it comes to the respondents' consideration of the three specific copyright reforms presented to them in the survey, secondary publishing rights won the most support. This reflects the gains secondary publishing rights have made legislatively, as well as the related author rights retention have made contractually with publishers and funding agencies. As some respondents noted, the ability to achieve such rights directly with publishers rather than through legislation is an advantage. Many funding agencies have supported this approach through open access policies; more recently, moves by funding agencies and advocacy groups (e.g., Knowledge Rights 21) have sought to eliminate what librarians objected to most about this approach, namely, the embargoes that publishers were allowed to impose after publication (typically six to 12 months) before a work was made open. Part of secondary publishing rights' appeal to librarians may be its incrementalism (in which it can be seen to be making progress) and for its restriction of publisher rights (given librarian distrust of publishers); however, it remains attached to earlier efforts, in providing for open access to the authors' final drafts (rather than the publisher's version of record) of government-sponsored research. It does not take advantage of more recent developments in publisher support for open access nor offer any checks on publisher pricing, which was otherwise a concern among several respondents.

Respondents placed strengthening user exceptions second among the three copyright reform options. Certainly, "fair dealing" (or "fair use") is an exception to copyright that forms part of the day-to-day life of the library. Thus, extending fair dealing to new areas of research and scholarly publishing would work well in this environment. Treating researchers' use of research and other texts for generative AI makes sense in operating outside of copyrights commercial protections. It may also appeal to librarian interests in limiting publisher rights.

However, some respondents considered treating research as an "exception" to copyright as diminishing its standing, as well as people's right to it as a public good. Copyright exceptions typically apply to the *uses* of a copyrighted work—for purposes of research—rather than applying to research as a body of work to which one has a right. Exceptions are also typically qualified not only by purpose, but by the amount of access and by the loss of business opportunities; this complicates extending research's exception into the commercial publishers' domain.

There was notably less support for introducing statutory rights which would incorporate open access to research publications into copyright law, with a bare majority supporting this approach ($n = 96$, 52%). While there was less familiarity with statutory licensing, as reflected in the questions raised in the comments, this topic also faced pointed opposition for giving publishers a statutory place at the table. Although this reform introduces a means of adjudicating the price of open access through courts or boards (which was credited by a few), this was insufficient in addressing participant interests in restricting publisher rights, as the other two measures would do. Generally, statutory licensing's radical copyright makeover for research publications offered undue complexity compared to secondary publishing rights' incrementalism. Its considerable borrowing from recent revisions to music copyright also made it liable for the shortcomings of that legislation. There may still be interest in a more encompassing legal remedy; however, at this point, responses show that librarians stand most strongly behind the more modest approach's gains.

Conclusion

The 196 academic librarians who participated in this survey differed in their thinking on many points about copyright and open access. However, respondents made one point very clear: their interest in seeing professional associations, across various jurisdictions, continue or amplify their efforts in exploring how copyright reform might better serve the spread of open access to research. Moreover, participants demonstrated a level of awareness of copyright issues that should inspire these association's copyright committees to continue reaching out to their memberships on these matters, knowing that the committees are being heard and are doing appreciated work.

The survey results also surface librarian preferences for incrementalism, which suggests that associations and their copyright committees should consider the steps—beyond secondary publishing rights—that show promise for achieving universal and sustainable open access to research within a reasonable time frame. Such steps would need to address concerns that publishers are unduly exploiting their research publication monopolies in ways that threaten the sustainability and universality of open access. Given the scale of digital-era transformation underway, copyright reform for research publications is overdue, and academic librarians, who have long demonstrated their expertise as stewards of the scholarly record, should be part of the necessary deliberative process to ensure that copyright continues to promote scientific progress.

Data Availability Statement

The librarian participants' comments, as well as the raw data for the survey responses, is available in Harvard Dataverse (https://dataverse.harvard.edu/dataset.xhtml?persistentId5doi%3A10.7910%2FDVN%2FRP8HSF&version5DRAFT)

Conflict of Interest Statement

As noted in the paper, John Willinsky is the author of a work advocating statutory licensing as the open access path for copyright reform, one of three current reform initiatives that librarians were asked to consider in this study.

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Appendix A: Survey Instrument

Copyright and Open Access to Research: An International Survey of Academic Librarians

Thank you for your interest in this study. The aim of this research is to explore academic librarian attitudes toward copyright reform, particularly as it relates to changes that may help support open access to research. This survey consists of 7 items and, with the background information provided, should take approximately 15 minutes to complete.

No personal identifying information will be requested or captured, including your IP address. Only general information about your professional role and country of residence will be recorded. As data is collected anonymously, once submitted, it cannot be withdrawn. The responses you provide will be stored in a restricted-access electronic file on secure servers and may be used in academic publications, conference presentations, and reports for external organizations and websites.

Please note that researchers may be required by granting agencies or journals to make their findings or de-identified data available at the time of publication in order to comply with principles of open access, which serve to foster the broad dissemination of research findings to the public. Because survey responses are collected anonymously, the open distribution of survey data does not have any additional impact on respondents.

The co-investigators on this project are Stephanie Savage, Scholarly Communications and Copyright Services Librarian, University of British Columbia and John Willinsky, Khosla Family Professor Emeritus, Stanford University. If you have questions you can contact the researchers at stephanie.savage@ubc.ca, or willinsk@stanford.edu.

Who can you contact if you have complaints or concerns about the study?

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the Office of Research Ethics.

- ▢ Yes, I consent to participating in this survey.
- ▢ No, I do not consent to participating in this survey.

Closest position title to your primary library role:

- ▢ Copyright Librarian (1)
- ▢ Scholarly Communications Librarian (2)
- ▢ Subject Specialist Librarian (3)
- ▢ Other (4) _____

The country in which your library is located:

- ▢ Canada
- ▢ United States
- ▢ United Kingdom
- ▢ Other

BACKGROUND

Copyright basics for research libraries

Copyright legislation is generally intended to grant creators or copyright holders exclusive rights over their works for a limited period as a financial incentive that will lead to societal benefits. As copyright law applies to many different kinds of works, ranging from literary works to sound recordings and musical performances, different categories of works are often afforded unique protections. Importantly, research publications are placed within the broad category of literary works, rather than having their own copyright terms. Fair dealing (or fair use) in copyright is a user's right meant to balance out the protection granted to creators. Among other purposes, it exempts the use of works for research or private study so long as certain conditions are met, including whether it can be said not to interfere with the works' business model.

Open Access basics

Open access enables readers everywhere to read research publications without restrictions, although this access may have involved payments by authors or institutions to publishers. Open access is thought to benefit research, as it circulates the work more widely. It is supported, at least in principle, by funders, publishers, societies, researchers, and librarians. This survey refers to "sustainable" open access in the sense that this model needs to be affordable for libraries, institutions, and authors over the long term. There are three current ideas about how to change copyright to better serve open access presented on the next page. You may wish to see what some people are considering before responding to statements #1–4 below.

1: OPEN ACCESS

Statement: The academic community is making satisfactory progress in bringing about open access for research publications.

Strongly disagree Somewhat disagree Neutral Somewhat agree Strongly agree

2: COPYRIGHT AND OPEN ACCESS

Statement: When it comes to the academic community's progress with open access, copyright is not proving to be an issue.

Strongly disagree Somewhat disagree Neutral Somewhat agree Strongly agree

3: LIBRARY ASSOCIATIONS

Statement: Academic librarian and library associations should consider whether there are copyright reforms that are likely to encourage and support sustainable open access to research.

Strongly disagree Somewhat disagree Neutral Somewhat agree Strongly agree

4: COPYRIGHT REFORM

Statement: Academic librarian and library associations should not pursue open access copyright changes because publishers are likely to strengthen their position over libraries through any legislative changes

Strongly disagree Somewhat disagree Neutral Somewhat agree Strongly agree

5: CURRENT PROPOSALS FOR COPYRIGHT REFORM

There are currently three copyright reform initiatives in support of open access under discussion in various countries. Each proposal is briefly introduced below. Based on the information provided and/or your previous understanding of these initiatives, please indicate your level of support for each initiative.

USER EXCEPTIONS

User exceptions (e.g., fair dealing, fair use, etc.) should be strengthened to support a wider use of research and other texts for research in the legislation governing copyright. This would extend copyright's exceptions to protect users' access to research publications, and to other works (e.g., for AI) for research purposes.

Statement: User exception reform should be pursued in support of open access to research.

Strongly disagree Somewhat disagree Neutral Somewhat agree Strongly agree

AUTHOR RIGHTS

Secondary publishing rights (also known as a rights retention strategy) should be introduced into the legislation governing copyright. Authors of publicly funded research will be granted an irrevocable right to make their work open after publication, possibly following an embargo period after publisher's initial publication.

Statement: Author rights reform should be pursued in support of open access to research.

Strongly disagree Somewhat disagree Neutral Somewhat agree Strongly agree

STATUTORY LICENSING

Statutory licensing that requires open access to research publications should be included in the legislation governing copyright. Research publications will be subject to immediate open access with publishers compensated by the institutional users and funders of research at rates set in consultation with all parties by the Copyright Board.

Statement: Statutory licensing reform should be pursued in support of open access to research.

Strongly disagree Somewhat disagree Neutral Somewhat agree Strongly agree

Critical Data Storytelling for Libraries: Crafting Ethical Narratives for Advocacy and Impact, Kate McDowell, ALA Neal-Schuman, 2025. 192pp. Softcover, $54.99. 9798892552806.

In *Critical Data Storytelling for Libraries: Crafting Ethical Narratives for Advocacy and Impact*, Kate McDowell offers a timely and necessary examination of how library workers conceptualize, interpret, and communicate data. Framed explicitly for practitioners, McDowell writes, "In this book, I adapt my data storytelling instruction for the audience of information professionals" (p. xvi), later expanding that audience to include, "library data analysts, librarians, advocates for libraries, or anyone tasked with gathering, making sense of, and making arguments about what to do based on data" (p. xxiv). This clarity of the audience grounds the text firmly in professional practice, positioning it as both a theoretical and practical guide.

McDowell identifies a critical gap in the existing literature where storytelling has been acknowledged in data practices but not sufficiently examined through an analytical lens. As the author notes, "prior research, however, lacks a critical approach; it does not engage story in depth, and it ignores the history, use, and power of storytelling to represent (or misrepresent) communities" (p. xvi). This is the key and is central to the book's primary thesis. Drawing in Kimberlé Crenshaw's framework of intersectionality, the work of Michel Foucault, and traditions in critical race theory and feminist theory, McDowell situates data within systems of power, knowledge production, and representation. In doing so, she challenges the assumption that data is neutral.

Chapter 1 establishes the conceptual foundation of critical data storytelling, emphasizing that, "Most of all, it is a story about digging deeper" (p. 1). This framing underscores the book's central premise: that data, in isolation, is insufficient for understanding complex social realities. McDowell makes this explicit in her assertion that "Data—numbers, statistics, charts, graphs, visuals, interactive dashboards—alone can't tell the story" (p. 1). This critique resonates strongly within library contexts, where quantitative metrics have long been privileged as indicators of value and impact. By contrast, McDowell advocates for a "both/and" approach that integrates quantitative and qualitative forms of knowledge, encouraging practitioners to tend to the narratives, contexts, and lived experiences that underlie numerical data.

Equally important is McDowell's emphasis on ethics and relationality in data practices. She argues that "Respect is a precursor to the trust necessary for listening" (p. 3), foregrounding the importance of care and accountability in how

stories—and by extension, data—are gathered, interpreted, and presented. This perspective challenges extractive models of research that have historically marginalized or misrepresented communities. Instead, McDowell calls for approaches that are attentive to power dynamics and grounded in mutual respect. This is further reinforced in her assertion that "the teller must understand the relationship to the story" (p. 4), a statement that underlines the importance of positionality and reflexivity in data work. For library practitioners, this has direct implications for how data is collected, analyzed, and presented.

The structure of the book supports its dual emphasis on theory and practice. Chapter 3 outlines elements of storytelling, offering practical guidance on crafting narratives that are both engaging and logically sound. Chapter 4 extends this discussion by emphasizing audience awareness, encouraging readers to adapt their storytelling strategies to different contexts and stakeholders. These chapters are particularly useful for practitioners seeking to translate critical theory into actionable approaches within their institutions.

Chapter 5 brings the book together by situating critical data storytelling within broader sociopolitical contexts. McDowell addresses the role of libraries in confronting misinformation and advocating for both institutional and democratic values. In doing so, the author expands the scope of data storytelling beyond internal assessment, positioning it as a tool for public engagement and advocacy. This is especially relevant in a contemporary landscape where libraries are increasingly called upon to justify their existence and defend their role in supporting informed, equitable communities.

One of the book's notable strengths is its accessibility. Despite being grounded in complex theoretical traditions, McDowell's writing is clear, well-organized, and supported by effective visual aids, including tables and charts that enhance reader comprehension. These elements make the text approachable for a wide range of library employees, including those who may not have formal training in critical theory or data analysis.

At the same time, the book's emphasis on flexibility and reflection may leave some readers seeking more prescriptive guidance. McDowell resists offering a rigid methodological framework, instead presenting critical data storytelling as an evolving, context-dependent practice. This openness allows for adaptation across diverse settings and may require readers to engage more deeply in the work of translation and application.

Ultimately, *Critical Data Storytelling for Libraries: Crafting Ethical Narratives for Advocacy and Impact*, makes a significant contribution to library and information science by reframing data as inherently narrative, relational, and political. For practitioners engaged in outreach, community-based work, or equity-focused initiatives, the book offers both validation and direction. It affirms that data can emerge from a range of practices, including those that are experimental or non-traditional. Research and assessment do not require formalized, extractive research designs.

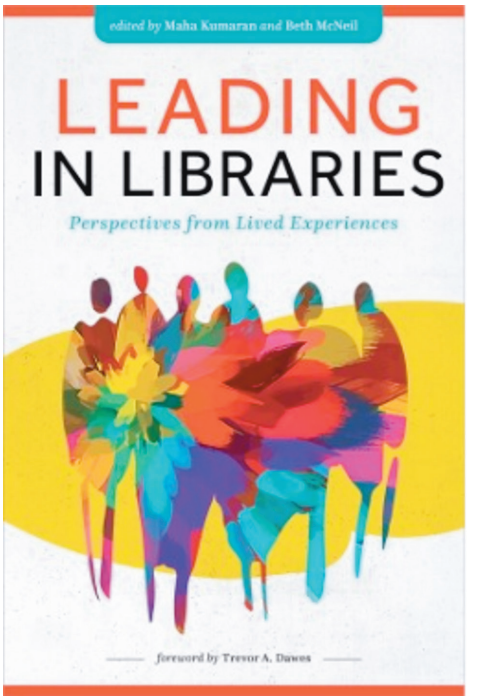
By centering storytelling as a critical method, McDowell challenges library workers to move beyond surface-level interpretations of data and to engage more deeply with the human experiences those statistics represent. In doing so, she provides a framework that is not only analytically rigorous, but also aligned with values of social justice, care, and accountability. For a profession navigating increasing demands for assessment and advocacy, this shift is timely and necessary. — *Jessica T. Zubia, Outreach and Ethnic Studies Librarian, New Mexico State University*

Leading in Libraries: Perspectives from Lived Experiences, Maha Kumaran and Beth McNeil (eds.), American Library Association, 2025. 232pp. Softcover, $64.99. 9798892552677.

Libraries are among the institutions most consistently shaped by systemic social, political, and economical issues that arise. As such, they must continually strive to rise to the occasion of examining, addressing, and offering progressive solutions to inequities. Libraries remain key spaces for observing how changemakers adapt within shifting institutional landscapes. In *Leading in Libraries: Perspectives from Lived Experiences*, editors Maha Kumaran, a librarian focused on equity, diversity, and inclusion in libraries, and Beth McNeil, a leader in library management, present a collaborative and timely volume that helps LIS students and faculty, librarians, and library administrators learn how to engage in and support transformative library leadership.

This collection is anchored by a central premise that effective leadership must be informed by diverse perspectives, grounded in social justice, and sustained through ongoing intentional, reflective practices. Through a combination of case studies and essays, *Leading in Libraries* examines leadership evaluation, practices, and emerging approaches through a social justice lens. Its 19 contributors represent a wide spectrum of professional roles, including library administrators, faculty, archivists, and practitioners in library adjacent fields. They also notably represent a range of geographic regions, as the editors state in the introduction, "to let you travel in and out of Canada, the United States, Australia, and the Philippines" (p. xix). Structurally, the text is organized into eight accessible article-style chapters that address leadership and hiring practices, strategic planning, scholarly communication, policy review, and organizational changes. Several chapters stand out for their practical and theoretical contributions that aim to disrupt systemic injustices in librarianship and offer motivation and guidance through clear calls to action and execution strategies.

For example, Chapter 1, "Practicing Slow Dwelling as an Approach to Anti-Oppressive Journal Editorship," investigates how reflective and intentional leadership among editorial board members can challenge long-standing barriers for contributors and readers in scholarly publishing. Building on the premise that authority is constructed and contextual, the contributors emphasize that scholarly publishing is shaped by culture, identity, lived experience, and institutional power structures, ultimately challenging traditional notions of expertise in scholarly communication. Broadening this assessment of institutional norms, Chapter 4, "Reframing with Abundance," demonstrates how library professionals can adopt an abundance mindset approach that prioritizes relationship-building, shared goals, and collective growth over deficit-based thinking and metrics-centered outcomes. The chapter reflects on the experiences of three librarians at different career stages and how they successfully implemented an abundance mindset within their respective areas of librarianship.



Similarly centered on collective practice and organizational transformation, in "A Blueprint for Belonging," Jeehyun Davis offers a compelling model for inclusive strategic planning within academic libraries by cultivating a "shared sense of purpose and a renewed appreciation for collective learning" (123). Davis further highlights how meaningful it was for the library community to develop and publish an inclusive and accessible strategic plan for American University, a first of its kind. This emphasis on collective well-being and institutional healing is especially relevant in the aftermath of the COVID-19 pandemic and ongoing burnout across academic library environments.

Shifting to questions of institutional accountability, Chapter 6, "Assessing Library Guiding Documents Through the Symbolic Frame," critiques performative DEI language in strategic plans and policies, drawing on Sara Ahmed's warning that "such statements may hinder progress by implying that equity and diversity issues have already been addressed" (127). This chapter emphasizes the importance of ensuring policies are not merely well written but also translate into meaningful guidance with the ability to adjust as needed over time.

Together, these chapters challenge traditional models of leadership grounded in hierarchy and neutrality and instead advocate for approaches rooted in reflection, accountability, and care, promoting leadership practices based on lived experiences as scholarly knowledge. These contributions also reveal the collection's broader argument: emerging leadership in libraries is deeply ethical and interpersonal. Thus, Kumaran and McNeil make the case for more communication, mentorship, advocacy, and community engagement. To further advance these ideals, the editors employed the "Anti-Racist Scholarly Reviewing Practices: A Heuristic for Editors, Reviewers, and Authors"[1] as a guide throughout the editorial process, underscoring their commitment to collaborative and more equitable approaches to scholarly publishing.[1] What the contributors ultimately ask of readers is that they challenge the status quo by considering and implementing responsive and not reactive problem-solving frameworks within library leadership.

As with many edited volumes, the collection may appear to lack cohesion. Its distinct stories, while a strength, may create uneven engagement across chapters. The collection is most effective when approached as a series of complementary perspectives rather than a linear resource. One benefit of this approach is that faculty can assign individual readings. This pedagogical flexibility makes it particularly useful as a primary or supplemental resource in instruction on academic librarianship or scholarly communication. The book concludes with an appendix, brief professional and personal biographies of the authors, and a comprehensive index.

Ultimately, *Leading in Libraries: Perspectives from Lived Experiences* represents a significant contribution to the literature on library leadership and evolving professional norms while amplifying credible voices that have historically been underrepresented in leadership discourse. It offers both encouragement and practical guidance for those seeking to engage in transformative, inclusive leadership. This book is highly recommended for faculty and students of LIS programs because of its emphasis on diversity, equity, and inclusion, which resonates strongly with current curricular priorities, however contentious that may be at the moment. It also serves as an effective bridge between theory and practice—an ongoing challenge in LIS curricula. The book invites critical reflection of what library leadership can look like when established systems and new thinking are in conversation. — *Allison McFarlane, Manager of User Services, Adelphi University*

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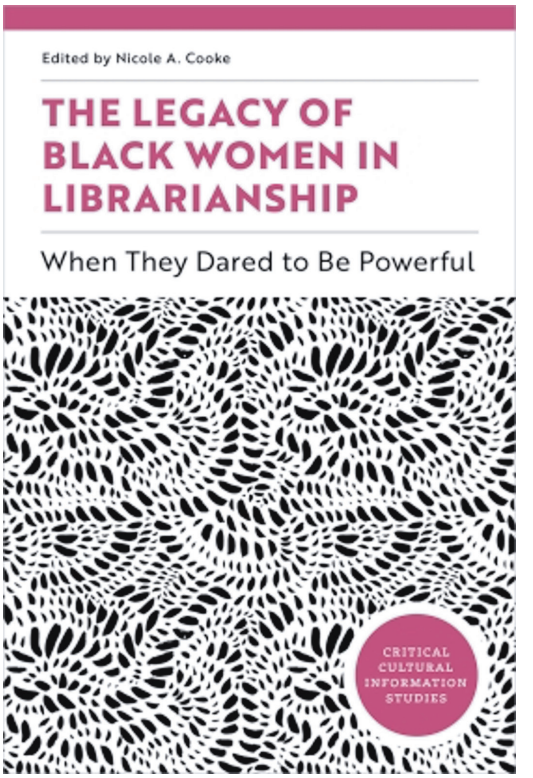
[1]Anti-racist scholarly reviewing practices: A heuristic for editors, reviewers, and authors. (2021). Retrieved from https://tinyurl.com/reviewheuristic.

The Legacy of Black Women in Librarianship: When They Dared to Be Powerful, Nicole A. Cooke (ed.), ALA Neal-Schuman, 2025. 232pp. Softcover, $59.99, 9798892553261.

This book grew out of Nicole A. Cooke's reflections on the Black librarians of the past, whom she calls her "Black library ancestors," whose labor, resilience, and persistence paved the way for her and other librarians in the profession. In exploring this history, Cooke examines the experiences of 30 students of color who attended the University of Illinois's library school between 1970 and 1972 and went on to make significant contributions to the profession.

When Cooke became the 2019 Augusta Baker Endowed Chair at the University of South Carolina, she continued researching people of color whose work shaped the library profession and, through this work, came across 16 trailblazing Black women librarians. Recognizing their contributions, she felt a responsibility to bring greater visibility to these women who paved the way for her and other professionals. The result is a collection of chapters written by librarians, educators, archivists, and other information professionals, each highlighting the historical significance and professional impact of the 16 Black women at the center of this volume.

The prologue and opening chapter focus on Augusta Baker, a pioneering Black librarian whose work shaped children's literature and representation for decades. Baker became one of the earliest advocates for positive and authentic depictions of Black children in books and played a crucial role in building the James Weldon Johnson Memorial Collection at the New York Public Library during the 1960s. She challenged publishers who perpetuated stereotypes of Black children and created a bibliography highlighting Pan-African perspectives, Black history, and affirming representation.



The prologue features a poem by Jennifer Bartell Boykin, Poet Laureate of the City of Columbia, South Carolina, who reflects Baker's advocacy, powerful storytelling, and lasting influence. Through Boykin's words, readers can feel the deep appreciation for Baker and recognize the profound impact Black women librarians have on children, shaping their imaginations, identities, and sense of belonging.

One of the book's greatest strengths is its multifaceted storytelling. Each contributor presents the lives of these 16 librarians; many came from humble beginnings and faced systemic adversity, yet they developed creative solutions that benefited both the library profession and the African American communities they served. Chapter 15, which focuses on Lucille C. Thomas, offers a compelling example. Thomas's journey begins in her childhood in Dunn, North Carolina, and extends to her becoming the first African American president of the New York City School Librarians Association from 1970 to 1972, as

well as holding leadership roles in other local organizations. Her 1983 petition to the National Commission on Libraries and Information Science, calling for more diverse and culturally reflective library materials, illustrates her forward-thinking leadership style. Thomas's story, like many in this volume, shows how these librarians pushed against racism while uplifting their communities, and advocating for equitable representations in library collections.

Throughout the book, recurring themes of emotional labor, resilience, and resistance reveal the challenges Black women navigated in librarianship from the 1920s through the 1990s. Their stories show not only their determination to enter and remain in the profession, but also their efforts to challenge racist narratives embedded in library materials and media. Several contributors connect these historical struggles to their own experiences, emphasizing how the legacy of these women continues to inspire today's information professionals.

As a Black woman entering a growing area of librarianship that intersects cataloging and publishing library data on the web through linked data, I felt especially connected to Chapter 4, "Doris Hargrett Clark: Pioneer, Activist, and Educator." Clark transformed cataloging practices during a pivotal period of change, advocating for updated Library of Congress Subject Headings in Black studies and championing accessible authority control practices. Her 1990 book, *Authority Control: Principles, Applications, and Instructions*, became foundational for catalogers. Clark also served on committees that shaped cataloging standards, including the development of AACR2 (Anglo-American Cataloging Rules, Second Edition), which many catalogers still recognize today, even as the field has shifted toward RDA (Resource Description and Access) and MARC (Machine-Readable Cataloging)-based systems. Her pioneering contributions inspire me as I navigate linked data and work to expand cataloging beyond traditional databases into the broader web.

If this book has a limitation, it is that readers are left wanting more. The lives of the 16 women featured here represent only a portion of the many Black women whose contributions remain underrepresented in library and information scholarship. Future volumes could highlight additional historical figures or incorporate the voices of Black women shaping the field today, helping to address longstanding gaps in documentation.

Overall, the book offers a thoughtful balance of storytelling, historical context, and scholarly reflection. By situating these women's lives within major events such as the Great Depression and the Civil Rights Movement, the authors illuminate not only the oppression these librarians faced but also the broader systems that shaped the lives of African Americans. The volume also connects past struggles to ongoing efforts toward diversity, inclusion, and equitable representation in collections. Reading this book will inspire library workers and leaders to advocate for social justice, advance inclusive materials, and engage in meaningful community outreach across local, state, and national platforms.

This book is essential reading for library professionals, scholars, and archivists, especially women in leadership, as it highlights the emotional labor, resilience, and resistance required to navigate the profession and effect meaningful change. — *Tomeka Jackson, Linked Data Librarian, Middle Tennessee State University*