Association of College and Research Libraries

Book Reviews (continued)

Editorial

Professional Service: A Few Perspectives

An ongoing topic I continue to think about is what professional service means to others and to myself. Considering many facets of professional service, such as internally to the library, university-wide, to service in professional organizations on local, regional, national, international levels, I'm sure there are other types of professional service I haven't even thought about. I have found professional service essential to understanding how to do my job, developing new skills, to making lasting connections with colleagues that have become close friends and collaborators. As Editor and one of many stewards of *C&RL*, I see the work and time put in by peer reviewers, the authors, the Editorial Board and ACRL staff who all work together to generate each issue. Recognizing how professional service is interpreted can vary within individuals, but also within their institutional cultures, I mentioned this in a conversation with former *C&RL* Editor Wendi Arant-Kaspar. She had the insightful idea of asking for viewpoints from the Editorial Board members to write an editorial—so here we are! It was a marvelous idea. As a result, three Board members, Sarah Fitzgerald, Brad Warren and Christopher Cox responded to the following prompt:

> *For the past couple of years, I've been thinking about in the academic library world what service means and how philosophies and cultures around service vary among organizations, institutions, groups and individuals. What does professional service mean to you as an academic librarian? What does it mean for your respective institutions, your experiences and/or your other perceptions about professional service? Why do you participate in professional service?*

Sarah Fitzgerald[*]

Service on the Library Personnel Committee has become central to my thinking about my role in the library since I became the chair. As an Assessment Librarian and a scholar of faculty work, I have been considering the quality of the assessment tools the librarians use to evaluate one another for promotion and raises. I see the personnel committee as a defense against growing pressure across academia to conform to administrative rather than peer goals. Peer review of our work ensures that library services reflect the values of librarianship.

An important role for service in my library has been the work of creating a more diverse and inclusive environment. The librarians who created and work on the diversity and equity committee have been doing essential work that wasn't addressed by the official structure of

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the library. This work has predictably and lamentably been a burden to librarians with mi-noritized identities who bear the brunt of the consequences of a lack of diversity and equity and the brunt of the labor to correct the problems.

Librarians with a strong research focus tend to contribute service through peer review, editorial boards, and scholarly conference planning. A strong publication record creates de-mand for these librarians in professional association service. These service roles can be either in the professional associations of the discipline the librarian serves or in library professional associations. Professional service in peer review, editorial work, and conference planning improves the state of research and professional development in the field of library science and the fields librarians serve. Librarian perspectives can particularly improve the quality of literature reviews due to our expertise in that area. Experience with peer review can also improve a librarian's instruction about the publication cycle.

Librarians who are less focused on research sometimes have fewer requests for external service and sometimes resent those whose service is externally focused for not participating as much in internally focused needs for service. Because of the understaffing and overwork of librarians that is common across higher education, it is a struggle to fill library service positions. As for other faculty, it is important for pre-tenure librarians not to let service com-mitments monopolize time they need to spend on librarianship and scholarship.

Service at the university level is a good opportunity for librarians to make connections with faculty outside the libraries. This is an opportunity for faculty to learn about library services and for librarians to get to know faculty. This is especially important for librarians who do not have liaison roles but need to form relationships that can supply recommendation letters for promotion and tenure evaluations. Participation from librarians in university governance can lighten the university service burden for other faculty members and help contribute library perspectives to decisions about academic programs, technology, and budgets.

Bradley Warren*

In wrestling with an answer to these questions, I see this as an explanation of my personal commitment to professional service and how that translates in my career both through my direct responsibilities and personal service to the profession. I have found that my personal thoughts on service and the profession have evolved and matured as I too have evolved and matured in my career. I was extraordinarily lucky to have experiences and mentors that matched my interests, learning, and ability to grow and make an impact at each stage of my career as a fellow, individual contributor, department head, associate dean, and dean. I will confess to being quite confused and a bit lost initially in what professional service looked like in Access Services, which is my area of expertise. This confusion, combined with a dose of imposter syndrome and a deep desire to help others in similar situations has fueled my approach to professional service. Once I realized that any of us has the power to lead change, I decided to partner with others to create the change we desired. This drive has led to the creation of the ACRL Access Services Interest Group, the 2020 Framework for Access Services Librarianship, and a continued commitment to serve our library community by ensuring the voices of frontline academic library service providers are heard in our profession and various institutions.

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In thinking of how my own approach to professional service is demonstrated within my institution, I am committed to creating a learning organization in which all library employees are given agency, empowered with the ability to make decisions and take risks, and are coached with the premise that good ideas are worth pursuing regardless of the limitations that may exist. I try to help my organization think about the creative ways in which it can approach solutions as well as be comfortable with shedding unnecessary self-imposed barriers to successfully reach those aspirations. As a Dean, I am fortunate in that this work can happen within our libraries, through our partnerships with the communities we serve, or even more broadly with the mission of a very ambitious and collaborative comprehensive research university. I suppose that a simple way to explain this is that my professional service approach is to create and be the change that you want rather than wait for someone else to do it! I participate in professional service to ensure that others are given the opportunities to speak their truth and create the libraries, careers, and profession that they want to see.

Christopher Cox*

Service has helped me grow as a librarian and a professional. Early in my career, I sought out opportunities that allowed me to learn more about topics connected with my job or that I wanted to learn more about. At the time, that meant instruction and, later, marketing. I started by serving in regional organizations like the New England Library Instruction Group (NELIG) and later in national organizations like ACRL University Libraries Section (ULS) and ACRL. As time went on, I went from evaluating conference presentation proposals and working on projects to chairing the meetings and planning conferences. I gained leadership skills and learned how to work with others when I did not have a position of authority. I was proud to represent my university. I also brought back new ideas that I could implement to innovate my work and improve the library. Serving on committees also allowed me to connect with colleagues from other institutions with similar jobs or interests. Many of the people I met on these committees have become lifelong friends whom I communicate with regularly or meet at conferences.

The skills I learned in professional service helped me gain confidence as a leader and transition from a librarian to an administrator. As Assistant Director at Eau Claire, I oversaw marketing and didn't know much about it when I was hired. The connections I made and knowledge I gained in marketing ULS came in handy as I learned how to "sell" the library. Knowing the value service has provided me, I encourage my employees to seek our service opportunities at the regional and national levels. I want them to learn and grow, gain leadership skills, and participate in conversations to improve the profession. Professional service allows not only for the development of connections but the sharing of ideas.

As a dean, service looks different. It's more about giving back or exercising influence than on learning and growth. Most recently, I have served as President of the Association of Southeast Research Libraries (ASERL) . In this role, I have had the opportunity to work collaboratively with my peers to develop new services to share collections, share expertise, and, most recently, to increase diversity in our profession. I find I can impact the direction of the organization in positive ways. I also serve on the Scholarly Publishing and Academic Resources Coalition (SPARC) Steering Committee. Being able to participate in conversations about and

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influence legislation on open access, ensuring scientific data is freely available, provides me with great satisfaction as the benefits are immediately apparent.

I realize that service is something many of us are expected to do as part of our roles as faculty/librarians, but I'd do it even if it weren't required. Not participating wastes your potential and is the equivalent of keeping your head in the sand. Service allows us to grow, learn, and gain influence, so we can be better individuals, improve the profession, and improve the lives of those we serve.

Kristen Totleben

Professional service has always been a priority to me. A persistent theme throughout my years of professional service has been the benefit of connecting with other colleagues and community members to better understand their work, my work, that there are many ways to approach projects and, frankly, to give me the feeling of hope and connectivity in the profession. Working with others to, as my colleague Justina Elmore says, "leave it better than how you found it," helps all of us grow, learn and progress. In my organization, I value working with colleagues because it helps me more deeply understand what they do and how to work together in a more deliberate, thoughtful way. Service in ACRL and other professional organizations has been valuable in not only the work produced in groups, committees or other teams to share with others, but in the people I meet. Service is professional development and a deeper sense of commitment to the profession, for learning, practice, scholarly inquiry and growth.

In my institution, it is not required to publish but published work can be considered for promotional purposes. Librarian faculty and staff statuses in colleges and universities is an ongoing discussion, but as a staff member, there is an advantage to not having any requirement to publish. In my experience, it takes the pressure off and helps me decide how I wish to professionally develop and contribute to the profession. This is always a balancing act, in terms of job responsibilities, initiatives, professional development, all around professional service, and "other duties as assigned." As a personal priority, all elements of service must be done in concert, so it informs and helps others and myself in our professional work, while maintaining values of integrity, honesty and kindness.

After reading Sarah's, Brad's and Chris's viewpoints, I learned more about their careers and values, and am feeling inspired and grateful to work with them. While many of their reflections resonated with me, some challenged me to think more about what changes I wish to see in the profession and what I might do to help make that happen. Thinking about the new year and what it will bring, how do you perceive professional service and what does it mean to you? How does it affect your professional goals and everyday work?

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Christopher Cox, Sarah Rose Fitzgerald, Kristen Totleben and Bradley Warren
College & Research Libraries Editorial Board

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The Effect of Information Literacy Training on Graduate Students' Ability to Use Library Resources

Shuzhen Zhao, Rong Luo, Christine Sabina, and Karen Pillon

This study assessed the influence of information literacy training on graduate students' self-rated ability to search using academic databases and the internet to find information, as well as their objective information literacy skills through a survey in 2017 at the University of Windsor. After controlling for a comprehensive set of covariates, there was not a statistically significant difference in self-rated searching ability between students with training and those without any training. However, the trained students' average objective assessment scores in the five dimensions of information literacy were significantly higher than those of students without any training at the significant level α=0.05.

Introduction

Over the past few decades, the methods and effects of information literacy training have become a primary focus for academic librarians and other educators in the field of information literacy. Information literacy training aims to help students improve their research skills, particularly in the context of library sources and strategies. The focus on information literacy instruction in library literature and practice indicates a growing interest in improving teaching methods so that students can more effectively learn the academic skills they need. In keeping with the trend of information literacy training in academic libraries, the Association of College and Research Libraries (ACRL) released their "Framework for Information Literacy for Higher Education" in 2015,[1] which provides a useful and adaptable guide for librarians developing information literacy training using different methods and in a variety of disciplinary fields.[2]

Information literacy training can take many different forms depending on the library, the librarian, and the wider educational and institutional environment. Often, information literacy training methods must align with institutional context, faculty members' requests, and students' needs. Primary information literacy training methods include library orientation activities (exhibition booths, library tours, scavenger hunts), library instruction sessions in classrooms

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(usually providing an introduction to library research, databases, and information literacy concepts), and one-on-one intensive instruction with a librarian (often about a specific assignment or issues like citation and copyright).

However, information literacy instruction efforts are only useful if they are effective. Does information literacy training actually teach students the skills they need? Through assessment, academic librarians can demonstrate how information literacy training contributes to student learning and development. Consequently, the study of training assessment results has been an important concept motivating academic libraries to provide widespread and efficient training to students. To leverage the full power of assessment, librarians need to adopt conceptual frameworks of assessment that will enable them to facilitate learning, increase instructional quality, and answer calls for accountability. One such framework is the 2005 Beile Test of Information Literacy for Education (B-TILED).[3] The survey's questions capture demographic information, measure self-rated ability for searching databases and the internet, and assess participants' information literacy skills and knowledge.

While librarians might assume that information literacy training is working, this is not enough. It is important for librarians to more closely investigate the relationship between information literacy training and skills through quantitative research. Understanding the impact of training is essential if librarians and other educators wish to improve their information literacy training methods and help students. The purpose of this study is to explore the relationship between information literacy training and information literacy skill. Using a modified version of the B-TILED questionnaire, this study measured the information literacy skills and self-perceived research ability of graduate students studying in the Faculty of Arts, Humanities, and Social Sciences (FAHSS) at the University of Windsor. The aim of this study is to examine students' self-perception of information literacy skills and objective assessment of information literacy skills and to identify the effect of information literacy training. Given these objectives, our research questions are:

1. How do students perceive their ability to search library databases and the internet to find the information they need?
2. Is there any gap in information literacy skills as assessed through knowledge test questions between students with training and those without training?

The first research question seeks to determine students' subjective assessments of their research skills. The second research question objectively examines five dimensions of information literacy: search strategy skills, knowledge of electronic resources, knowledge of academic databases, citation, and ethical considerations and copyright.

Literature Review
Methods of Information Literacy Training
Information literacy training is present in almost all academic libraries, but the specifics can vary widely. One type of information literacy training common at colleges and universities is library orientation. Library orientation events usually aim to acquaint students (especially new students) with the library and librarians. They are meant to ease library anxiety and familiarize students with information literacy and how the library fits within university life.[4] Library orientation activities can take a variety of forms. At the University of California, the library orientation section of a first-year class included a brief in-class presentation about research concepts and library services, an online interactive library scavenger hunt given as an

in-class activity, and a homework assignment.[5] According to Manuwa, Agboola, and Aduku, library orientation is a core activity of academic libraries that "entails educating, enlightening, guiding and helping the users to identify, understand and utilize the library information resources and services effectively."[6] Library orientation activities can thus serve as an important introduction to academic library services.

Classroom training, one of the main methods for information literacy training in academic libraries, involves librarians visiting classes on campus to teach students about library resources and research skills. While library orientation is about familiarizing students with librarians, library services, and the library as place, information literacy training in the classroom can go beyond introductory lessons to offer something more. The "service learning" information literacy training model described by Young and Maley "presents opportunities for deeper library engagement in the curriculum and the teaching of critical information literacy."[7] Instructional design and pedagogical approach can vary widely. The information literacy training described by librarians at the University of California, Berkley incorporated a "flipped instruction model" that utilized "pre-class assignments" and "active learning techniques" for students at both the undergraduate and graduate level.[8] The researchers found this model to be successful in increasing student engagement and allowing more class time for "higher-order learning exercises and discussions."[9] The training described by Whitver and Riesen was focused around "reiterative reflection" as a pedagogical approach to library instruction.[10] The librarians at the University of Colorado, Colorado Springs decided to tailor information literacy lesson content to their students' needs by assessing students' ability to use ProQuest's Summon to see if students would need training and altered instruction plans accordingly.[11]

Information literacy training can also take the form of one-on-one instruction with a librarian. One survey of academic librarians found that one-on-one instruction was the most common method for information literacy training.[12] Individual information literacy training has unique benefits not shared by the other methods of instruction. In group information literacy training, for example, academic librarians have reported challenges in trying to motivate and engage all students.[13] Koelling and Townsend found that one-on-one information literacy training at the University of Mexico was successful, with "students and librarians reporting high levels of satisfaction."[14]

Students' Attendance at Information Literacy Training
Students cannot benefit from information literacy training if they do not attend. A survey of PhD students found that attendance at library training sessions was high but that among students who did not attend, there was "the perception of not needing further training, an unawareness of library-facilitated training and reliance on their supervisor's help."[15] Zhang, Goodman, and Xie found that attendance of first-year engineering students at in-person information literacy training sessions was low.[16] Low attendance could be attributed to timing issues as well as students' unfamiliarity with the sessions and lack of awareness of their value.[17] Attending information literacy training can have benefits beyond improving research skills; Blake et al. found that attendance at library training sessions was associated with student retention.[18]

Assessment of Information Literacy
Assessing information literacy has increasingly become an area of focus in academic librarianship, both in the literature and in practice. Assessment of information literacy training provides

insight into students' skills and the impact of instruction that is valuable to both students and instructors; assessment also provides evidence of the value of information literacy training to the institution and other stakeholders.[19] Assessment can take a variety of forms. Erlinger's systematic review of assessment in information literacy instruction found that assessment could fall into one of seven categories: "surveys, focus groups, objective tests (locally developed), classroom assessment techniques (CATs)/performance measures, authentic assessment, rubrics, and standardized tests."[20] Assessment methods might be standardized or developed by the researchers, and their results might be objectively or subjectively determined.

Self-assessment of information literacy skills is a subjective method of assessment that seeks to determine students' perceptions of their abilities. However, studies have shown that students are not always accurate in assessing their research skills. Geffert and Christensen examined the information literacy skills of incoming college students and found "no significant correlation …between students' test scores and their levels of self-confidence, comfort in libraries, or self-assessment of library skills."[21] The results of Maughan's survey at the University of California, Berkeley library show "that students think they know more about accessing information and conducting library research than they are able to demonstrate when put to the test."[22] Similarly, Gross and Latham found that "students who score as below proficient in information literacy (IL) skills have a miscalibrated self-view of their ability."[23]

Since, as these studies suggest, self-assessments of information literacy skills are not always accurate, it is important for information literacy skills to be assessed objectively. One common method of assessing information literacy is using "pre-tests" and "post-tests." Librarians and researchers using this method will administer one test before and one test after information literacy training; often, the test is identical. Pre-tests and post-tests are usually designed by the researchers (that is, not standardized) and are often used to determine the effect of information literacy training or to prove its value. This method can be used for "one-shot" library instruction or for longer information literacy programs. Studies using the pre-test and post-test method appear frequently in the literature. Zhang, Goodman, and Xie designed and used a pre-test and post-test method to assess the information literacy skills of first-year engineering students at the University of Western Ontario.[24] McClurg et al. used a pre-test and post-test to assess the effects of information literacy training in an undergraduate medical education program at the University of Calgary.[25] The University of Rhode Island Libraries have used a pre-test and post-test method of assessing information literacy skills for years.[26] Numerous other studies describe pre-tests and post-tests used to assess information literacy instruction.[27]

There can be other types of objective information literacy assessment beyond the pre-test and post-test model. Erlinger found that the most common type of information literacy assessment was "CATs [classroom assessment techniques]/performance measures,"[28] a type of in-class assessment that allows for instant evaluation and feedback[29] and commonly uses in-class worksheets.[30] Spievak and Hayes-Bonahan used "psychological decision-making theory and research design" in their assessment of undergraduates' information literacy skills by asking volunteer study participants to evaluate web pages and Google searches.[31] Standardized testing is another method for objective assessment that uses an already-developed instrument instead of newly designing an evaluation tool. The Standardized Assessment of Information Literacy Skills (SAILS) assesses information literacy skills based on the ACRL Information Literacy Competency Standards for Higher Education.[32] The Information Literacy Test (ILT) is another standardized test for assessing information literacy that is also based on the ACRL

Information Literacy Competency Standards for Higher Education.[33] This study uses a modified version of the Beile Test of Information Literacy for Education (B-TILED), an instrument originally designed for evaluating the information literacy skills of education students,[34] as a means of objectively assessing participants' information literacy skills.

Effectiveness of Information Literacy Training

The literature indicates that academic libraries put a lot of effort into developing and providing information literacy training, but is this training effective in improving students' skills? In general, the findings of most studies indicate support for the effectiveness of training in improving information literacy and library skills. However, different studies report varying levels of efficacy depending on factors such as training method, instructional design, lesson content, and student population. Burkhardt examined the information literacy skills of over 1,000 undergraduate students who took an information literacy credit course, analyzed students' pre-course and post-course test scores, and found that their scores improved "significantly" in the post-test.[35] Similarly, McClurg et al. found that students' information literacy skills improved after multiple short, small group library instruction sessions that were integrated into an undergraduate medical course,[36] and Beile also found that students' library skills improved after information literacy training that was integrated with a course.[37] Zhang, Goodman, and Xie studied the effects of online and in-person information literacy training on the skills of undergraduate students and found that the training improved information literacy levels.[38] Walker and Pearce found an improvement in students' information literacy skills after they had received both user-centered and traditional library instruction,[39] even though both types were of the "one-shot" variety. Spievak and Hayes-Bonahan also found "one-shot" library instruction to be effective in improving students' information literacy skills and library use.[40] Even online information literacy training has been shown to be effective.[41] While the literature differs on the effectiveness of different training methods, overall, information literacy training in some form helps improve students' skills.

Current developments in the literature have emphasized the important role of information literacy training and assessment of information literacy outcomes. This study will contribute to the literature in these areas through an examination of the effect of information literacy training on the information literacy skills of graduate students studying in the areas of arts, humanities, and social sciences. While there are many studies about information literacy training effectiveness and assessment, this study is particularly valuable for its use of quantitative data analysis to confirm the influence of training on information literacy skills and for its examination of the unique relationship between objective information literacy skills, self-assessed information literacy skills, and information literacy training. The use of a standardized instrument (the B-TILED questionnaire) for assessing information literacy skills is also notable.

Methodology
Survey Instrument

Participants' information literacy skills were assessed using an online survey that was developed from the Beile Test of Information Literacy for Education (B-TILED),[42] a survey instrument that was developed by Beile O'Neil and is used to assess information literacy skills.[43] The B-TILED survey has been applied by Robertson and Felicilda-Reynaldo,[44] Magliaro and Munro,[45] and

Soltani and Nikou[46] in their information literacy studies. While the original B-TILED instrument was used for undergraduate students, Magliaro (2011),[47] Magliaro and Munro,[48] and Soltani and Nikou[49] have used a modified version in assessing the information literacy skills of graduate students, demonstrating the success and applicability of the B-TILED for a graduate student population. Since the original B-TILED questionnaire was intended for education students, the modified version used in this study was customized to better align with the academic disciplines of the participants. For instance, the name of the database ERIC (a popular database for education research) was changed to JSTOR (a database for research in arts, humanities, and social sciences). Another way in which the B-TILED questionnaire used in this study differed from the original instrument was the reflection of a Canadian rather than American context. In addition to demographic information questions, survey questions 11 and 12 were used for subjective assessment by asking students to rate their own research abilities, and questions 13 to 36 objectively assessed students' information literacy skills using the modified B-TILED questionnaire.

Data Collection

All University of Windsor graduate students studying in the Faculty of Arts, Humanities, and Social Sciences (FAHSS) were sent an invitation to complete the survey via email. The next day, student responses started arriving. A week after the initial email, a second reminder email was sent out to all students. At this point, there were only 46 responses out of a potential 626 responses (7.8%). In an effort to increase response rate, the researcher visited classrooms, arranged for more departmental emails to be sent out, and asked instructors to encourage participation. The survey opened for eight weeks (from January 19 to March 16, 2017), allowing enough time for students to access the survey. After these efforts, the response rate increased to 23.18%,[50] or 137 participants.[51] The researcher also offered a prize incentive to encourage study participation by entering participants' names in a draw to win a bookstore gift card.

Participants spent an average of thirty to forty minutes answering the survey questions. Survey responses were labelled as either "complete" or "incomplete." In both categories, some of the responses were weighted as lower scores. If, for instance, a student answered fewer than ten survey questions and spent fewer than six minutes completing the survey, the response was counted as valid but weighted lower. There were fourteen blank surveys in the "incomplete" category that were deemed invalid. Out of all 137 responses, eighty five were "complete" (which included one empty response), fifty two were "incomplete" (which included fourteen empty responses), and nine were weighted lower. There were 122 valid responses in total. Since the total number of registered FAHSS graduate students in the University was 591, the response rate was 23.18%, which is reasonable based on previous studies.[52]

Statistical Analysis
Predictors
The main area of interest in this study is the effect of information literacy training on information literacy skills. The survey included three questions about respondents' training information: "Have you attended an orientation of the library?" "Have you attended a library instruction session held in your classroom?" and "Have you had one-on-one intensive organized instruction with a librarian?" The responses for these questions were in binary form (Yes=1; No=0). Based on these, we created a binomial variable of training that equalled 1 if respondents reported they received either kind of training.

Outcomes

Inasmuch as this study seeks to answer the two specific research questions in the introductory section, we studied several distinctive outcome variables. The first research question is about the effect of training on perceived ability to search library databases and the internet to find information. The survey included the questions "Overall, how would you rate your ability to search library databases to find information?" and "Overall, how would you rate your ability to search the internet to find information?" to collect students' self-perceptive information literacy abilities. The answers to this question were "1. Poor; 2. Below average; 3. Average; 4. Above average; 5. Excellent." For these two self-rated searching abilities, we created two corresponding binomial variables that equalled one if respondents reported they were above average or excellent separately. We estimated binomial logit regression in which we regressed probability of being above average or excellent on training and a comprehensive set of covariates that may potentially explain the perceived searching ability, namely, individuals' gender, native language, level of study, or program of study. The estimation was conducted separately for the ability to search library databases and the internet. Figure 1 illustrates the conceptual model of this information.

FIGURE 1
Conceptual Model for Binomial Logit Regression Analysis

Predict Variable:
    Training

Response Variables:
    (1) Self-rated the ability to search library databases
    (2) Self-rated the ability to search internet

Control Variables:
    (1) Gender
    (2) Language Speaking
    (3) Level of Study
    (4) Program of Study
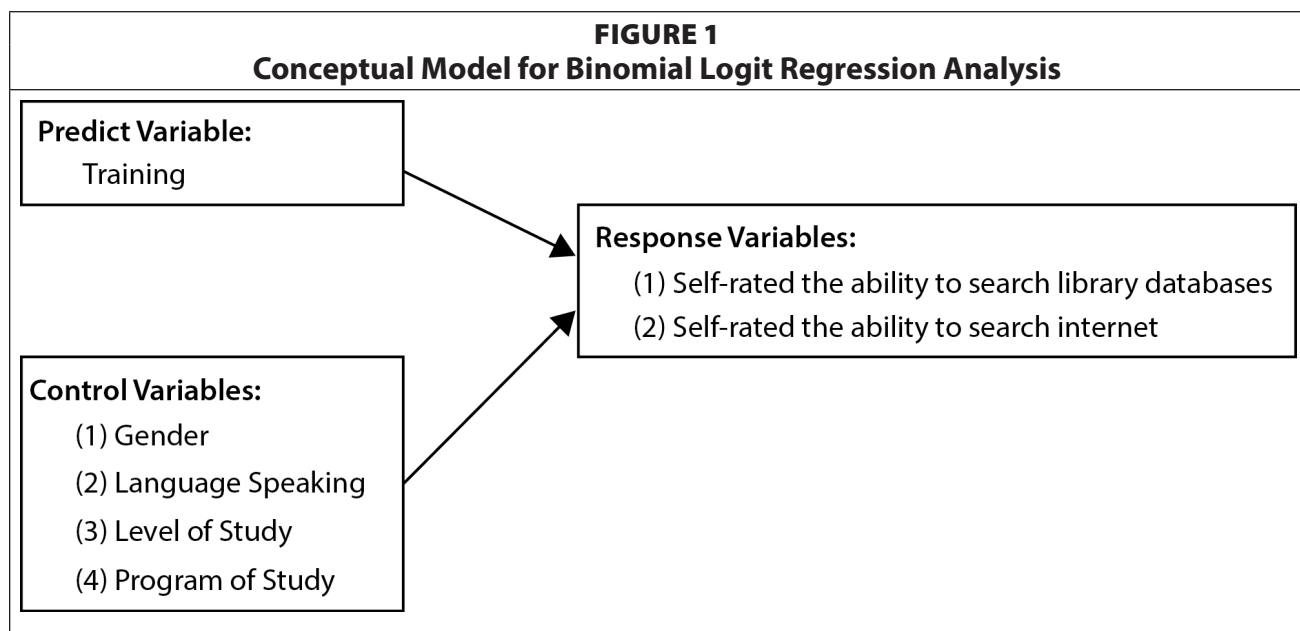
The second research question concerns the effect of training on an objective assessment of five dimensions of information literacy skills: (1) search strategy skills, (2) knowledge of electronic resources; (3) knowledge of academic databases; (4) citation; and (5) ethical considerations and copyright. These five information literacy dimension scores have been rescaled between zero and one as the number of questions correctly answered divided by the total number of questions in each area after evaluating based on the students' responses to knowledge questions in the survey (questions 13 to 36). We estimated linear regression, in which we regressed scores on training as well as demographic variables. Figure 2 illustrates the conceptual model of this information. Sample statistics for predictors, outcomes, and covariates can be found in Table 1.

FIGURE 2
Conceptual Model for Multiple Linear Regression Analysis

Predict Variable:
   Training

Control Variables:
   (1) Gender
   (2) Language Speaking
   (3) Level of Study
   (4) Program of Study

Response Variables:
   (1) Search strategy skills
   (2) Knowledge of electronic resources
   (3) Knowledge of academic databases
   (4) Citation
   (5) Ethical considerations and copyright
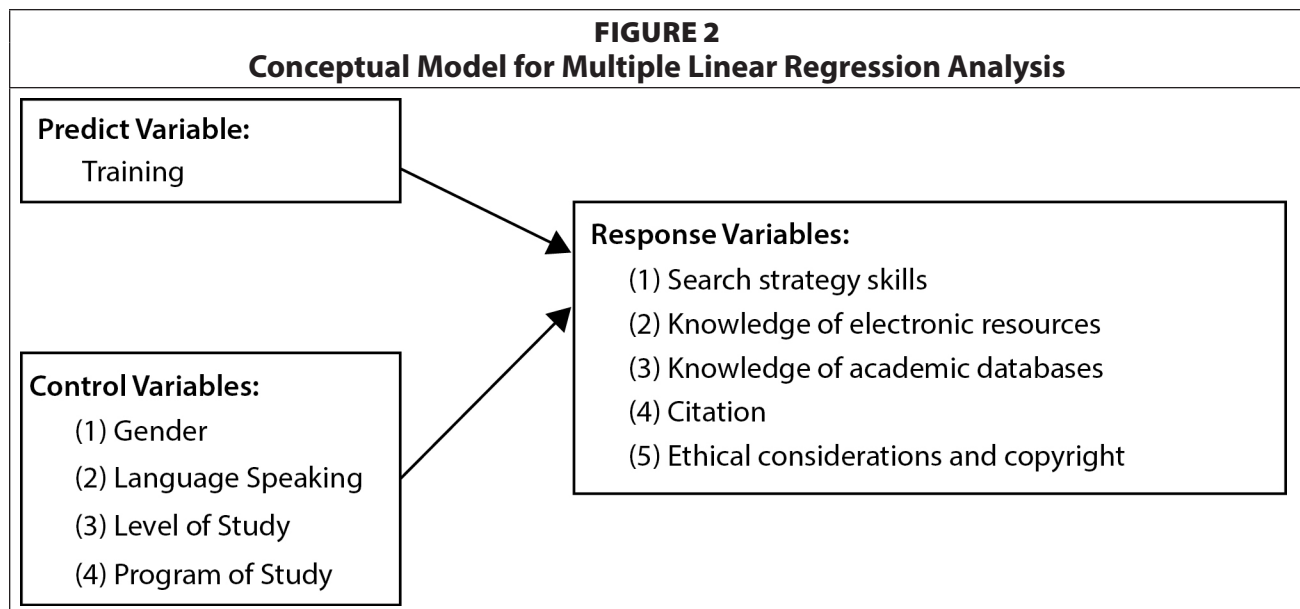
Table 1 shows that 69. 67% respondents accepted information training. Approximately three fourth (74.59%) of respondents self-identified as female, 67.21% respondents reported they are native English speakers, and 78.69% of respondents are master's students. These FAHSS graduate students were from various departments, including Communication, Media & Film, Creative Arts, English Language & Literature, History, Philosophy, Political Science, Social Work, and Sociology & Anthropology. Among the respondents, 54.92% assessed their database-searching abilities as above average or excellent, and 68.03% assessed their internet-searching abilities as above average or excellent.

TABLE 1
Descriptive Statistics

Variable	Description	Mean/ Percentage	SD
Outcome Variable			
Self-Rated Ability in Searching Databases	=1 if respondent reported they were above average or excellent	54.92	
Self-Rated Ability in Searching Internet	=1 if respondent reported they were above average or excellent	68.03	
Search Strategy	Score assessed by responses to survey questions	0.55	0.21
Knowledge of Electronic Resources	Score assessed by responses to survey questions	0.82	0.23
Knowledge of Academic Databases	Score assessed by responses to survey questions	0.5	0.22
Citation	Score assessed by responses to survey questions	0.74	0.24
Ethical Considerations and Copyright	Score assessed by responses to survey questions	0.63	0.26
Predictors			
Training	=1 if respondents reported they attended orientation or in class instruction or one-on-one instruction	69.67	

	TABLE 1		
	Descriptive Statistics		
Variable	**Description**	**Mean/ Percentage**	**SD**
Covariates			
Female	=0 male, =1 female	74.59	
Native Language	=1 if respondent's native language is English	67.21	
Level of Study	=0 Master, =1 Doctorate	78.69	
Program of Study			
Communication, Media & Film	=1 if respondent from Communication, Media & Film	5.74	
Creative Arts	=1 if respondent from Creative Arts	4.92	
English Language & Literature	=1 if respondent from English Language & Literature	7.38	
History	=1 if respondent from History	7.38	
Philosophy	=1 if respondent from Philosophy	5.74	
Political Science	=1 if respondent from Political Science	5.74	
Psychology	=1 if respondent from Psychology	26.23	
Social Work	=1 if respondent from Social Work	27.87	
Sociology & Anthropology	=1 if respondent from Sociology & Anthropology	9.02	

Results
Self-Rated Searching Ability
The results of binomial logit regression for the probability of students' self-rated ability being above average or excellent in searching library databases and the internet to find information are reported in table 2. The results are presented in the form of marginal effects. As shown, the effect of training is not significant in all models, which means there is not a statistically significant difference in self-rated searching ability between students with training and those without any training at the significant level α=0.05.

Table 2 also indicates that gender, language speaking, and level of study had no significant effect on any students' self-rated searching ability. Only students from the program of Political Science reported better self-rated searching ability than from those from the program of English Language & Literature. There was no significant difference in self-rated searching ability among other programs.

Objective Information Literacy Skills
The results of the effect of information literacy training on search strategy skills, knowledge of electronic resources, ethical consideration and copyright, and overall information literacy skills scores are presented in table 3. Effects of training are significant in all estimations after controlling for a comprehensive set of covariates. The average score of trained students was 0.147 ($p < 0.001$) higher in search strategy skills, 0.171 ($p < 0.001$) higher in knowledge of electronic resources, 0.150 ($p < 0.001$) higher in knowledge of academic database, 0.120 ($p < 0.01$) higher in citation skills, and 0.180 ($p<0.001$) higher in ethical consideration and copyright than those of students without training at the significant level α=0.05.

	Model 1	Model 2
TABLE 2 **Probability to Be Above Average or Excellent (Marginal Effects of Binomial Logit)**		
Variables	Searching Database	Searching Internet
Training Situation		
Without Training (ref.)		
With Training	0.127	0.064
	(0.109)	(0.110)
Gender		
Male (ref.)		
Female	0.027	-0.039
	(0.115)	(0.108)
Language Speaking		
Native English (ref.)		
Non-native English	-0.127	-0.034
	(0.103)	(0.102)
Level of Study		
Master (ref.)		
Doctor	-0.118	-0.074
	(0.131)	(0.123)
Program of Study		
English Language & Literature (ref.)		
Communication, Media & Film	0.228	0.001
	(0.392)	(0.010)
Creative Arts	0.437	0.070
	(0.231)	(0.226)
History	0.364	0.065
	(0.229)	(0.220)
Philosophy	0.001	0.002
	(0.159)	(0.212)
Political Science	0.511*	0.128
	(0.229)	(0.231)
Psychology	0.206	-0.026
	(0.240)	(0.225)
Social Work	0.075	-0.073
	(0.208)	(0.197)
Sociology & Anthropology	0.329	-0.057
	(0.235)	(0.230)
N	120	118

Notes: Robust standard errors are in parentheses.
Significance *<0.05; **<0.01; ***<0.001
ref.: Reference category
N: Total number of observations in the model

As shown in table 3, gender had no significant effect on any students' information literacy skills. Compared with non-native English speakers, native English speakers presented better skills in search strategy, knowledge of electronic resources, knowledge of academic databases, citation, and ethical consideration and copyright capabilities. Doctoral students had better performance in all five dimensions of information literacy skills compared with master's students. Students from different programs had similar levels in information literacy skills.

	TABLE 3 Training Effects on Objective Information Literacy Scores (Regression Coefficients Reported)				
	Model 3	Model 4	Model 5	Model 6	Model 7
Variables	Search Strategy Skills	Knowledge of Electronic Resources	Knowledge of Academic Database	Citation Skills	Ethical Consideration and Copyright
Training Situation					
Without Training (ref.)					
With Training	0.147***	0.171***	0.150***	0.120***	0.180 ***
	(0.036)	(0.047)	(0.010)	(0.031)	(0.015)
Gender					
Male (ref.)					
Female	-0.058	-0.090	-0.117	0.142	-0.026
	(0.112)	(0.082)	(0.118)	(0.108)	(0.120)
Language Speaking					
Native English (ref.)					
Non-native English	-0.302**	-0.159*	-0.084*	-0.082*	-0.249*
	(0.101)	(0.074)	(0.042)	(0.043)	(0.102)
Level of Study					
Master (ref.)					
Doctor	0.083*	0.078*	0.074*	0.089*	0.077*
	(0.048)	(0.033)	(0.032)	(0.036)	(0.035)
Program of Study					
English Language & Literature(ref.)					
Communication, Media & Film	-0.052	0.189	0.309	-0.480	0.038
	(0.372)	(0.268)	(0.360)	(0.322)	(0.349)
Creative Arts	0.406	0.240	-0.216	0.280	0.173
	(0.246)	(0.177)	(0.271)	(0.225)	(0.252)
History	0.127	0.236	-0.192	0.406	0.103
	(0.248)	(0.184)	(0.285)	(0.228)	(0.247)
Philosophy	0.484	0.346	-0.497	0.699	0.169
	(0.482)	(0.347)	(0.459)	(0.415)	(0.450)
Political Science	0.082	-0.242	0.078	-0.068	-0.109
	(0.275)	(0.210)	(0.295)	(0.251)	(0.272)
Psychology	0.392	0.229	0.213	0.261	-0.012
	(0.239)	(0.173)	(0.292)	(0.209)	(0.227)

TABLE 3
Training Effects on Objective Information Literacy Scores
(Regression Coefficients Reported)

Variables	Model 3 Search Strategy Skills	Model 4 Knowledge of Electronic Resources	Model 5 Knowledge of Academic Database	Model 6 Citation Skills	Model 7 Ethical Consideration and Copyright
Social Work	0.267	0.243	-0.038	0.282	0.069
	(0.216)	(0.156)	(0.251)	(0.189)	(0.206)
Sociology & Anthropology	0.177	0.221	-0.152	-0.044	-0.205
	(0.243)	(0.175)	(0.270)	(0.216)	(0.238)
N	109	102	86	93	92

Notes: Regression results reported: coefficients and standard errors in parentheses.
　　　Significance *<0.05; **<0.01; ***<0.001
　　　ref.: Reference category
　　　N: Total number of observations in the model

Discussion

The results emphasize the impact of information literacy training on information literacy skills. Students who received information literacy training scored higher in all areas of the objective information literacy skills assessment than students who had not received training. The impact of training attendance on information literacy skills that was found in this study is especially significant because librarians do not always get the chance to witness the effects of information literacy training or assess a training session's impact in a meaningful or detailed way, especially with the "one-shot" sessions that commonly occur at library orientation events or in classrooms. While some librarians and educators do collect feedback or administer assessment activities in some way after single information literacy sessions, it can be difficult to gauge the longer-term effects of one-time library training sessions, especially since follow-up assessment in this context can be challenging.[53] However, the results indicate that library training does make a difference in teaching students valuable information literacy and research skills, confirming the findings of previous studies.[54] While this study did not examine the details of the training that students received beyond the broad categories of library orientation, classroom sessions, and one-on-one instruction, it is likely that most of the training that study participants experienced was some form of "one-shot" information literacy training. The students surveyed were graduate students at the University of Windsor, where information literacy training occurs via individual appointments with liaison librarians, classroom sessions on information literacy and library research conducted by liaison librarians, and library tours and other orientation activities that occur as part of an annual program for incoming first-year students. Students who visit the research help desk in the library will also sometimes receive an impromptu one-on-one information literacy lesson, an interaction that could be viewed as a "microteaching opportunity."[55] As Walker and Pearce note, "one-shot" training is still very common in academic libraries,[56] and librarians usually have little choice but to make the best of a one-time session.[57] Notably, though, since most of the training methods included as part of this study were likely "one-shot" sessions experienced by participants, the findings suggest that the correlation between information literacy training experience and stronger information literacy skills can occur even with "one-shot" library instruction. While "one-shot" instruc-

tion is sometimes criticized in the library world, there are studies that suggest that single session instruction can be effective. Spievak and Hayes-Bohanan found that students who had attended a "one-shot" library instruction session demonstrated "a more complex reasoning strategy when evaluating sources"[58] and were more likely to ask a librarian for help and to use library tools and services.[59] Walker and Pearce also found that one-time library instruction improved students' information literacy skills.[60] While previous studies on the effectiveness of one-time instructional sessions are varied, the findings of the present study support the idea that information literacy training in any form, including single instruction sessions, can have a positive, measurable impact on information literacy skills.

Like information literacy training at many other academic libraries, the training provided by the University of Windsor's Leddy Library varies widely. The amount and content of information literacy training received by study respondents could be inconsistent for a number of reasons. Librarians tend to develop their own training sessions, so the content and nature of instruction would depend on the individual librarian who provides the training. Moreover, the nature of instruction also usually depends on the level of study and the subject area. Streatfield, Allen, and Wilson studied information literacy training for postgraduate and postdoctoral researchers in UK universities and found significant variation and inconsistency in the training provided.[61] Inconsistent information literacy instruction could be detrimental to students if they do not receive training in basic information literacy skills and concepts. However, it makes sense for information literacy training to differ depending on discipline and level of study. In this study, discipline did not appear to have a notable impact on objective information literacy skills, as students from different programs had similar information literacy scores. However, all respondents were studying in the Faculty of Arts, Humanities, and Social Sciences. Assessing and comparing the information literacy levels of students across different faculties and studying in vastly difference disciplines may have yielded different results. Level of study could also impact the nature of information literacy training and, in turn, affect information literacy skill level. This study focused on graduate students and found that doctoral students demonstrated higher levels of information literacy skills than master's students. Although this study did not examine the nuances in form and content of information literacy training, future studies might consider how such details as training session content, subject area, and level of study impact the effectiveness of training. Overall, the study results indicate the benefits of information literacy training regardless of format or content, and academic libraries would do well to ensure a minimum level of information literacy training for students.

Another significant finding from this study is the necessity of objective information literacy skills assessment. Even though students without training self-assessed their research skills to be similar to the skills of students who had received training, the objective assessment of information literacy revealed otherwise. Students who had received training objectively had stronger research skills. This suggests that students are not particularly accurate in assessing their information literacy skills, a finding that aligns with previous studies.[62] Assessment of information literacy instruction has increasingly become a point of interest in library research,[63] and this study reiterates the necessity of objective assessment in information literacy research and practice. Streatfield, Allen, and Wilson found very little evaluation of information literacy training in an examination of information literacy instruction practices for UK researchers.[64] According to Julien, Gross, and Latham, incorporating evaluation is one of the main ways for

librarians to improve their information literacy instruction.[65] In order to provide useful and effective instruction, librarians must know the information literacy levels of their students and how instruction impacts those levels.

Librarians should continue to focus on information literacy training and ensure that as many students as possible receive information literacy instruction, at least at a basic level. Julien, Gross, and Latham found that librarians have the opportunity to improve their instruction in a variety of ways, such as by developing education objectives and assessing outcomes.[66] Since information literacy sessions are not always well attended, librarians should focus on strategies for increasing participation, such as expanded advertising and promotion, incentives, and instructor involvement.

There are a few limitations to this study that should be noted. The study is not widely generalizable due to the sample size of only 137 responses. Out of the potential 626 student respondents, only 137 responses were collected. However, 137 was an adequate number for this study's data analysis, and in fact the response rate for this study was higher than the response rate of similar studies.[67] Moreover, the study only focuses on graduate students studying in the areas of arts, humanities, and social sciences. Undergraduate students' information literacy skills and experiences with information literacy training are likely quite different due to their experience and academic level. Additionally, students studying in fields other than arts, humanities, and social sciences might also have a vastly different experience with information literacy training. Zhang, Goodman, and Xie note that students studying science and engineering require an information literacy skillset that allows them to effectively navigate disciplinary fields that are constantly evolving.[68] Despite these limitations, this study provides valuable insight into the effect of information literacy training and students' perceptions of their research skills. Future studies might expand on the research in this study by increasing sample size and focusing on groups of students at different levels and in different disciplines.

Conclusion

This study has contributed to the literature in the areas of library training effectiveness and students' self-perceived research skills by offering quantitative evidence on the relationship between training attendance, objective information literacy skills, and students' self-rated search abilities. The main finding of this study is that information literacy training has a positive effect on information literacy skills. Through an objective assessment of information literacy skills, this study found that graduate students who had received information literacy training had stronger information literacy skills in the areas of search strategy, knowledge of electronic resources, knowledge of academic databases, citation, and ethical considerations and copyright. However, this study also found that there was no significant difference between the self-assessed information literacy skill levels of students with training and without training. More than anything else, the findings of this study emphasize the importance of information literacy training for students. By quantitatively demonstrating the effectiveness of information literacy instruction, these findings are useful in confirming the need for a continued focus on information literacy training in academic libraries and across university campuses. Librarians and other information literacy educators can use these findings to inform their teaching practice and keep continuously improving their instruction methods for the benefit of students.

Appendix. Modified Survey Questionnaire
Beile Test of Information Literacy for Education (B-TILED)

The library is gathering information to evaluate the effectiveness of its instruction program. This questionnaire consists of demographic questions and a library and information skills quiz.

Demographic Information

1. What is your gender? _____
2. Please indicate which language(s) you normally speak at home: _____
3. Please indicate your level of graduate status
   a. Master
   b. Doctorate
4. Please indicate your program of study
   a. Communication and Social Justice
   b. Criminology
   c. Film & Media Arts
   d. English
   e. History
   f. Philosophy
   g. Political Science
   h. Psychology
   i. Social Work
   j. Sociology
   k. Visual Arts
5. How long have you been continuously enrolled at University of Windsor as a graduate student?
   a. One semester or less than 1 year
   b. 1 to 2 years
   c. 3 to 4 years
   d. More than 4 years
6. Have you ever attended another university or college?
   a. No, I have never attended another university
   b. Yes, I finished my undergraduate degree at an institution other than the University of Windsor
   c. Yes, but I transferred to the University of Windsor to finish my undergraduate degree

Knowledge of Library Services

Please indicate whether you have attended any of the following since you began your studies at University of Winder.

7. Have you attended an orientation of the library?
   a. Yes
   b. No
   c. Not aware of it
8. Have you attended a library instruction session held in your classroom?
   a. Yes

    b.   No

    c.   Not aware of it

9. Have you had one-on-one intensive organized instruction with a librarian?

    a.   Yes

    b.   No

    c.   Not aware of it

10. Have you used the troubleshooting system (i.e., elecprod@uwindsor.ca) when you use the library's electronic resources?

    a.   Yes

    b.   No

    c.   Not aware of it

Search Strategy

11. Overall, how would you rate your ability to search library databases to find information?

    a.   Excellent   b. Above average   c. Average   d. Below average   e. Poor

12. Overall, how would you rate your ability to search the internet to find information?

    a.   Excellent   b. Above average   c. Average   d. Below average   e. Poor

13. Most research and periodical databases have basic and advanced searching interfaces. Which of the following can you do ONLY in advanced searching?

    a.   Add Boolean or search connectors between terms

    b.   Enter multiple search terms

    c.   Search by keyword

    d.   Search multiple terms by field

14. Research studies in arts, humanities, and social sciences are generally first communicated through:

    a.   Books published by arts, humanities and social sciences associations

    b.   Arts, humanities, and social sciences encyclopedia entries

    c.   Newsletters of arts, humanities, and social sciences associations

    d.   Professional conferences and journal articles

15. You have been assigned to write a short class paper on effective instruction techniques for a Creative Writing Project. Your professor indicated that three recent scholarly sources would be sufficient. Which strategy is best to locate items?

    a.   Search a general academic and an arts, humanities and social sciences database for journal articles

    b.   Search an arts, humanities and social sciences database for journal articles

    c.   Search the library catalog for books

    d.   Search the library catalog for encyclopedias

16. Select the set of search terms that best represent the main concepts in the following: What are the health risks associated with the use of drug therapy for hyperactive students?

    a.   Drug therapy, health risks, hyperactivity

    b.   Drug therapy, health risks, students

    c.   Drug therapy, hyperactivity, students

    d.   Drugs, hyperactivity, therapy

17. Select the set that best represents synonyms and related terms for the concept "college students."

    a.   Colleges, universities, community colleges…
    b.   Gen X, students, undergraduates…
    c.   Graduate students, first years, second years…
    d.   University, adult learners, educational attendees…

18. While researching a paper on *First Nations*, you find that these populations are also sometimes called *Native Americans* or *Indigenous* populations. You decide to look for information on the subject in a research database, and to save time you write a search statement that includes all three terms. Which of the following is the best example to use when you have fairly synonymous terms and it does not matter which of the terms is found in the record?
    a.   First Nations and Indigenous and Native Americans
    b.   First Nations or Indigenous or Native Americans
    c.   First Nations, Indigenous, and Native Americans
    d.   First Nations, Indigenous, or Native Americans

19. You are using a research database that uses an asterisk (*) as its truncation symbol. When you type in *read** you would retrieve records that contained which of the following words?
    a.   Examine, peruse, reader, reading
    b.   Peruse, read, reader, reading
    c.   Read, reader, reads, readmit
    d.   Read, reader, reading, reapply

20. You have a class assignment to investigate how group work impacts student learning. A keyword search in JSTOR on "group work" has returned over 19,000 items. To narrow your search, which of the following steps would you next perform?
    a.   Add "impacts" as a keyword
    b.   Add "student learning" as a keyword
    c.   Limit search results by date
    d.   Limit search results by publication type

21. Your professor has assigned a paper on the whole language movement. You are not familiar with the topic, so you decide to read a brief history and summary about it. Which of the following sources would be best?
    a.   A book on the topic, such as Perspectives on whole language learning: A case study
    b.   A general encyclopedia, such as Encyclopedia Britannica
    c.   An article on the topic, such as "Whole language in the classroom: A student teacher's perspective."
    d.   A subject specific encyclopedia, such as *Encyclopedia of Psychology*

Knowledge of Electronic Resources
22. Which of the following characteristics best indicates scholarly research?
    a.   Available in an academic library
    b.   Indexed by JSTOR
    c.   Reviewed by experts for publication
    d.   written by university faculty

23. Research or periodical databases are designed to include items based on which of the following criteria?
    a.   Found on the internet
    b.   Not found on the internet

   c.   Owned by your library

   d.   Relevant subject matter

24. JSTOR is the most appropriate database to search to locate:

   a.   Journals, reviews, and articles relating to the humanities, social sciences, and literature; includes back issues.

   b.   Social sciences publications from 1877 to current

   c.   Full-text articles solely relating to biology

   d.   Entire e-books

Information Literacy Assessment

25. You are writing a paper on the Black Lives Matter movement and your professor asks you to include a current primary source. Which of the following would fulfill these criteria?

   a.   *Toronto Sun* article from July 2015 describing one of the protests

   b.   A book written by one of the activists that started the movement

   c.   A WordPress website discussing the Black Lives Matter movement in Toronto

   d.   A referred journal article on racism from the 1960s

26. You are asked to find a work of American Poetry to bring to class next week. Which database would offer access to this information?

   a.   Literature Online

   b.   Science Direct

   c.   Project Muse

   d.   Historical Abstracts

27. How can you determine that a book contains relevant information on your topic?

   a.   The title includes any of the words from your search

   b.   The table of contents lists a chapter on your topics

   c.   The topic is listed in the index

   d.   The author has written books on your topic before

Citation

28. The following citation is for:

Massaro, D. (1991). Broadening the domain of the fuzzy logical model of perception. In H. L. Pick, Jr., P. van den Broek, & D. C. Knill (Eds.), *Cognition: Conceptual and methodological issues* (pp. 51-84). Washington, DC: American Psychological Association.

   a.   A book

   b.   A chapter in a book

   c.   A journal article

   d.   A website

29. Your professor suggested you read a particular article and gave you the following citation. Which of the following would you type into the Leddy Library's One Stop Search to locate the actual article?

Morren, & Grinstein. (2016). Explaining environmental behavior across borders: A meta-analysis. *Journal of Environmental Psychology*, 47, 91-106.

   a.   Author search: Morren

   b.   Journal title search: Journal of Environment Psychology

   c.   Article title search: Explaining environmental behavior across borders: A meta-

analysis
    d.   Subject search: environmental behavior

30. The following item was retrieved from ACM Digital Library. What kind of source is it?

Title: Computers and modern art: digital art museum

Author(s): Mike King

Published in: C&C '02 Proceedings of the 4th conference on Creativity & cognition

Publication Year: 2002

Note: Presented at Creativity and Cognition (Loughborough, UK — October 13–16, 2002).

    a.   A book
    b.   A book chapter
    c.   A conference paper
    d.   A journal article

31. You are a graduate assistant for an undergraduate political science class. While developing a lesson plan on the U.S. legislative system, you find the following story on the internet:

Congress Launches National Congress-Awareness Week

WASHINGTON, DC—Hoping to counter ignorance of the national legislative body among U.S. citizens, congressional leaders named the first week in August National Congress Awareness Week. "This special week is designed to call attention to America's very important federal lawmaking body," Speaker of the House Dennis Hastert said. The festivities will kick off with a 10-mile Walk for Congress Awareness.

The item is from a newspaper web site, which states it is "America's Finest News Source." Given this, the following action is in order:

    a.   you can use the story as it's obviously from a reputable news source
    b.   you decide to investigate the reputation of the publisher by looking at their Web site
    c.   you decide to investigate the reputation of the publisher by looking at other Web sites
    d.   you should not use the story because web information is not always trustworthy

32. Which of the following sentences must add a reference?

    a.   Technology use in the schools is often characterized as a potentially dehumanizing force.
    b.   Perhaps the fear that the virtual world may lead to passivity and isolation, at the expense of literal social interaction, is valid.
    c.   Certainly, educators must ask which uses of technology result in increased learning and a better quality of life.
    d.   To address these issues, Hunter has proposed that students work in groups with the computer peripheral to the group and the teacher acting as facilitator.

Ethical Considerations & Copyright

33. When is it ethical to use the ideas of another person in a research paper?

    a.   It is never ethical to use someone else's ideas
    b.   Only if you do not use their exact words
    c.   Only when you give them credit
    d.   Only when you receive their permission

34. You are a graduate assistant preparing a document for class. Browsing the internet, you find a report regarding First Nations populations in Canada, which is an Indigenous and Northern Affairs Canada publication. If you distribute 30 copies of the report to students in the class, which of the following copyright choices is the proper action?

   a. Permission is not needed as the report is openly available from the government agency's website.
   b. Permission is not needed as the report was found on the internet.
   c. Permission is not needed as you are only distributing 30 copies.
   d. Permission to distribute 30 copies of the report must be acquired.
35. You have an assignment that requires you to use course management software to practice setting up a class grade book. Your library has purchased the software and loaded it onto the computers in the computer lab. Due to work conflicts, you have a difficult time getting to the lab. A friend loans you the software and you load it on to your personal computer. Is this legal?
   a. No, because this action constitutes a violation of copyright.
   b. Yes, because it is already freely available in the lab.
   c. Yes, because it is educational software and therefore able to be shared.
   d. Yes, because your friend owns it and can share as they want.
36. Browsing a weekly news magazine, you come across an article that discusses the future of space exploration. As you are teaching this topic you decide to make copies of the article and share it with your class. Which of the following concepts makes it legally permissible to reproduce portions of works for educational purposes without permission?
   a. Copyright
   b. Fair dealing
   c. Freedom of information
   d. Intellectual freedom

Thank you!

Test Key

13. D	21. D	29. C
14. D	22. C	30. C
15. B	23. D	31. C
16. A	24. A	32. D
17. C	25. D	33. C
18. B	26. A	34. A
19. C	27. B	35. A
20. B	28. B	36. B

Notes

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Making and Using AI in the Library: Creating a BERT Model at the National Library of Sweden

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How can novel AI techniques be made and put to use in the library? Combining methods from data and library science, this article focuses on Natural Language Processing technologies, especially in national libraries. It explains how the National Library of Sweden's collections enabled the development of a new BERT language model for Swedish. It also outlines specific use cases for the model in the context of academic libraries, detailing strategies for how such a model could make digital collections available for new forms of research, from automated classification to enhanced searchability and improved OCR cohesion. Highlighting the potential for cross-fertilizing AI with libraries, the conclusion suggests that while AI may transform the workings of the library, libraries can also play a key role in the future development of AI.

Introduction

Recent developments in machine learning can transform the working practices of the library. The advent of artificial neural networks offers tantalizing possibilities for libraries to classify, organize, and make huge digital collections searchable with the help of artificial intelligence (AI). To this end, various academic and national libraries have established data labs as testing sites to explore and harness such potential, LC Labs at the US Library of Congress being one prominent example. Yet remarkably little work has been published on this subject, either theoretically or in terms of practical examples. In contrast to many other fields where studies on the impact of AI have proliferated, a recent survey within information science could still point toward the general "absence of scholarly research on AI-related technologies in libraries."[1]

This article counters this gap by exploring the scope for making and using novel AI techniques in the library setting. More precisely, it focuses on creating and implementing natural language processing (NLP) tools in the context of national libraries, emphasizing the value of AI for medium- and low-resource languages—i.e., for libraries in countries beyond the linguistic resources of the Anglophone world and other major languages.[2] The particular NLP technology examined is the *language model*: e.g., a statistical model that through exposure to vast amounts

of text can be used to understand and generate human language.[3] Our principal argument highlights the democratic effects that these libraries can contribute to AI development via such models, given their function as custodians of large volumes of language-specific data. AI may well have the promise to transform the workings of the library, as we will suggest, but libraries also have a potentially significant role to play in the future development of AI.

We consider how AI techniques can be made and used at the library via the example of a BERT language model (Bidirectional Encoder Representations from Transformers—elaborated on below) created at the National Library of Sweden (*Kungliga Biblioteket*, hereafter KB).[4] Methodologically, we seek to bridge AI and library science insofar as we write from the perspective of KBLab, KB's lab for data-driven research, where cutting-edge knowledge in data science combines with considerable experience of the library's information systems and working processes.

The first part of this article explains what a BERT model is and describes how we used KB's collections to train such a model for the Swedish language: KB-BERT.[5] The second part outlines specific use cases for a BERT model in academic libraries, detailing strategies for making digital collections available for new forms of research: from *automated classification* to *enhanced searchability* and *improved OCR cohesion*. In showing how the model could be employed to create novel research openings, these use cases suggest the value of AI to the operating practices of libraries more generally. We conclude the article with some broader reflections about the opportunities and risks connected to the cross-fertilizing of AI and libraries, a trend that we expect will grow in the future.

Literature Review
AI Applied, but Not Made, in the Library

There has been surprisingly little research published on the impact of AI techniques in the library. Yet some scholars have started to consider how libraries might focus their attention on AI as a means of addressing the distinctive informational challenges posed by digitalization. Ryan Cordell recently offered a panoramic overview of the state of the field in "Machine Learning + Libraries," where he provided a general description of the current applications of machine learning in library settings—from crowdsourcing and discoverability of collections to library administration and outreach.[6] A similarly broad view can be found in the work of Thomas Padilla and his colleagues in the "Collections as Data" movement, which has produced various reports that, while highlighting the value in applying AI in the library, emphasize the need for libraries to take a responsible approach that mitigates the potential harm of these emerging technologies.[7] More specific studies have examined the infrastructural challenges for libraries in supporting data-driven research that seeks to analyse Big Data,[8] as well as the problems that the application of Optical Character Recognition (OCR) technology to historical material has created for both libraries and researchers.[9]

However, a notable characteristic of this body of scholarship is its focus on the library principally as a target site for the application of AI. While understandable, such a focus also risks making libraries an unnecessarily passive agent in this process—as effectively the recipient of black boxed technologies that have been designed and made elsewhere. We wish to nuance the understanding of this relationship between AI and the library by exploring a case study in which novel AI techniques are actually made in the context of the library. Beyond providing a set of practical use cases that detail how a BERT model could be implemented to enhance the

research potential of a library, in this article we provide an account of how the library's collections enabled the production of this model in the first place.[10] We begin therefore with a brief introduction to BERT, framed in terms that are intended to be comprehensible to a non-specialist.

Theoretical Context: Deep Learning and BERT Models

In the following section, we provide the theoretical and practical background to our work in developing KB-BERT at the National Library of Sweden. What is deep learning? What is a BERT model? What is required for a library to make such a language model, and why bother? We address these questions to provide sufficient contextual knowledge to grasp what is at stake in our subsequent discussion of AI implementation in the setting of the library.

Deep Learning in Natural Language Processing

Deep learning is a subset of machine learning, which in turn is a subset of AI. The main intuition behind deep learning is that machines can learn from being exposed to large amounts of data using algorithms that to some extent resemble biological brains. These types of algorithms are called artificial neural networks.[11] Deep learning is extremely powerful compared to traditional machine learning methods, but it requires larger datasets and more computational resources to reach good performance. These are two significant bottlenecks that can make the training of deep learning models a significant challenge for many teams and organizations.

An important milestone in deep learning research has been the appearance of transfer and self-supervised learning.[12] Traditional supervised machine learning techniques learn from labelled datasets where human annotators have marked the properties in the data that they want the model to learn. This is a very time-consuming process, and few datasets exist that are large enough to allow deep learning models to reach their full potential. The innovative dimension of transfer learning is to divide the training into two steps: in the first, self-supervised training step, the model is shown a large amount of unlabeled data from which it can extract general patterns; in the second step, the model is fine-tuned on smaller, annotated datasets to learn how to perform a specific task.

We can take an example from NLP to illustrate how this works in practice. During the pre-training stage, the model is shown a huge amount of natural language text and trained to predict a word given the context in which it occurs, or vice versa. In this way, the model learns how words co-occur in that language and forms a representation of their meaning. Let's assume we want to train a model to predict whether a movie review is positive, negative, or neutral. The number of stars can be considered as the label, and the text of the reviews is the training data. We would take our model that we have previously trained on generic language data, and we would train it to specialize in sentiment analysis for movie reviews. The knowledge accumulated during pre-training would make the model much more effective at learning this classification task, since it already has a representation of how language in general works.[13]

Transformers and BERT

The most popular architecture for deep learning in NLP today is the Transformer.[14] The Transformer was originally proposed for machine translation but has since been applied to all kinds of tasks, from text classification to computer vision. Its main strength is a mechanism called "attention," which allows the model to focus on particular parts of a sentence when processing a specific word. For instance, given the sentence "The dog didn't want to play

because it was too tired," in processing "it" the attention mechanism would focus on "the dog" in order to make sense of the pronoun. Transformer models are also popular because of their architecture, which lends itself to efficient parallelization—i.e., the ability to carry out complex tasks simultaneously spread across several processors. This in turn allows researchers to train models that are larger than ever.

The release of the pre-trained Transformer-based model BERT in autumn 2018 marked a significant turning point in NLP research.[15] BERT stands for Bidirectional Encoder Representations from Transformers, and applying this architecture to language processing has enabled state-of-the-art performance on many benchmark datasets. Evaluated according to the standard testing framework—GLUE, or General Language Understanding Evaluation[16]—BERT achieved unprecedented scores on a series of NLP tasks, ranging from question answering (when the model is shown a paragraph of text and then posed a question based on this) to causal reasoning (i.e., given a sentence, which among four choices is the most obvious continuation?)[17] In short, BERT broadened the horizons of possibility for what a language model could do.

The initial development of this model demanded considerable resources, both computationally and in terms of training data. BERT was trained by Google AI on a 3.3-billion-word corpus that was composed of books and the text of English Wikipedia. The researchers at Google who released the model explained that the training of a medium-sized BERT took four days on their specialized processing units called TPUs, which are optimized for machine learning applications.[18] This gives an idea of how much computing power is required to train one such model; it is certainly not something that can be done on an average laptop. However, what makes BERT so attractive from the perspective of AI implementation is that it is freely available for anyone to download and then fine-tune on their own data. As a powerful, general-purpose model, it can be adapted to apply cutting-edge language processing to specific use cases at a local level.

The Need for a Swedish BERT

The design and distribution of huge language models such as BERT reflect global hierarchies of power and resources. Whereas Google AI developed dedicated BERTs for English and Chinese, they released a multilingual model for the rest of the world that was trained on Wikipedia articles from 104 different languages: M-BERT. While achieving fairly good performance on many NLP tasks, researchers knew that specialized monolingual models would be able to outperform M-BERT. This led many institutions and universities around the world to train new BERTs for their particular language of interest.[19] Soon most of the major languages such as German, French, Spanish, Korean, Japanese, and Dutch had their own models, the only limitations being the availability of sufficient text data and computing power to produce the model. It was in this context of an expanding array of monolingual models that KBLab at the National Library of Sweden decided to train and publish a BERT for Swedish.

The first dedicated Swedish BERT had already been released by AF-AI, the AI lab at the Swedish Public Employment Agency.[20] AF-AI trained a BERT model using the data from Swedish Wikipedia that consists of about 300 million words, which is just a fraction of the size of the corpus used to train the original English BERT. The developers at AF-AI state that their model was intended as a temporary solution to fill a gap for the Swedish NLP community, while more substantial and better models were in the making.[21] KBLab saw an opportunity to contribute by training a Swedish BERT on a larger and more varied dataset that would enhance performance and produce a model with more robust language understanding.

This undertaking was enabled by KBLab's unique access to otherwise unavailable material. Legal deposit requirements dictate that every publication issued in Swedish must be submitted to KB so a copy can be preserved as a part of future culture heritage. This also applies to digital material since the introduction of legislation for electronic publications from 2015, which means that the library receives an enormous amount of Swedish text every year.[22] The library's collections thus encompass a diverse collection of text genres, ranging from newspapers, magazines and books to scientific journals and governmental reports. Although far from all the physical collections have been digitized, enough exist in digital form to create huge datasets that are orders of magnitude larger than any publicly available, curated collections of Swedish text like Wikipedia. It is the holding of such rich bodies of linguistic material that gives national libraries like KB a key role in the future training and creation of new language models.

Making a BERT from the Library's Collections

To make KB-BERT, we took advantage of the extensive textual resources in the library's digital archives. The model was trained on a corpus of about 3.5 billion words, which is almost exactly the size used by Google AI to train the original English BERT (meaning that KB-BERT could be expected to reach comparable performance levels). Our aim in assembling this specific corpus was to produce a body of text that could be described as being, to a degree, *representative* of the living language of the national community.[23] Here we can point to the distinctive advantages of smaller languages for achieving such data representativity for NLP development, given that KB's collections contain something close to population data for Swedish, whereas this is practically impossible for larger languages like English and Chinese.

We made significant use of the library's newspaper holdings to compile this selection of modern Swedish, extracting over 16 GB of (cleaned) text from OCR'd newspapers in the library's archives for the period ca. 1945–2019. This was supplemented by material derived from governmental reports, ebooks, social media, and Swedish Wikipedia, with the incorporation of text from a broad range of social domains as a conscious choice to expand the representativeness of the language within the training corpus.[24] The diversity of the social voices represented and the breadth of language usage were strengthened by the presence of quotes and reported speech from a wide variety of actors in the newspaper material, as well as the innovative new forms of Swedish provided by the 31 million words from social media in our corpus.

The variety of registers and styles in the training material was paramount to enhancing the model's performance. During training, BERT is to some extent "learning" the language by trying to extract patterns from the noise. Being exposed to many different types of writing allows the model to identify the underlying principles of syntax and semantics that are common to all instances of correct (and also slightly incorrect but intelligible) modern Swedish text. Our central hypothesis was that by training KB-BERT on a broad spectrum of texts, we would be able to produce a model with more flexible and sophisticated understanding of natural language.

That we could test this hypothesis in practice depended on direct access to KB's collections. While Swedish Wikipedia and social media text, though rather difficult to clean, are publicly available for anyone through different APIs, much of the data used to train KB-BERT is copyrighted and cannot be made available to the scientific community except under very strictly controlled circumstances. Technical security concerns together with legal restrictions of copyright and EU data protection (GDPR) mean it is not currently possible for the digital

materials in KB's archives to be shared with researchers outside of KB's internal network. These circumstances give KBLab a strategic, if contingent, role in the future development of NLP resources for Swedish: if language models are not created in-house at KB then the data currently available externally would lead to models of lesser quality and more limited capacities for Swedish AI in general.

Evaluating Performance

Evaluating the quality of a new language model demands comparing its performance with that of existing models. This rests on the application of a fair and objective means of comparison, which is a challenge for smaller languages like Swedish, since the standard testing benchmarks that exist for NLP in English—i.e., GLUE/SuperGLUE[25]—are still in the process of being developed. Given the absence of common evaluative frameworks, testing instead involves fine-tuning a model for a so-called downstream task—e.g., a particular NLP task that one might want to use the model for in the future—where results can then be compared with the performance of other models. In the case of KB-BERT, one of the principal evaluation tasks we selected was that of named entity recognition (NER), which tests the capacity to extract predefined types of named entities such as persons, places, and organizations from a given text.

In order to fine-tune a language model for NER, a dataset annotated with named entities must be available, which is not entirely the case for Swedish. The Stockholm-Umeå Corpus version 3.0— SUC 3.0[26]—has been manually annotated with various NLP characteristics such as part-of-speech tags, morphological analysis, and lemma, but the named entities have been automatically tagged using a tool called Sparv.[27] This lack of human annotation means that the dataset cannot be considered a gold standard and that any performance measure should be taken with a pinch of salt. However, despite its shortcomings, SUC 3.0 is still the best NER dataset currently available for Swedish, and we used it to evaluate the downstream performance of KB-BERT in relation to other BERTs. While evaluation based on a substandard dataset cannot give us an indication of the absolute performance of any BERT for the task at hand, it does enable reliable comparison between different models that have been evaluated using the same dataset.

To conduct such an evaluation for KB-BERT, we tested our model in relation to the BERT model previously released by the Swedish Public Employment Agency, AF-AI, and Google AI's multilingual model, M-BERT. This evaluation process used standard testing praxis from the field of NLP, whereby the SUC 3.0 dataset was divided into training (70%), development (10%), and testing (20%) subsets.[28] Each model was then fine-tuned using the same training data, before being exposed to a series of NER tasks from the test set. We chose the eight particular categories of named entity for these tasks (person, organization, location, time, measure, work of art, event, and object), since these have been annotated in the SUC dataset. The table below indicates how each model performed, with the scores between 0 and 1 signifying the accuracy of the model's predictions of named entities in the test data.

These results show that KB-BERT consistently outperforms the other models on this particular evaluation task. More precisely, the model scored 5% higher than the AF-AI BERT trained solely on data from Swedish Wikipedia, and 2% higher than Google's M-BERT that was trained on Wikipedia data from over 100 different languages.[29] KB-BERT performed better on all types of named entities because it was trained on a larger volume of high-quality and more varied data, and thus has a better level of language understanding. This also helps explain the varying performances of the models across these different categories: entities,

Type of Named Entity	AF-AI	M-BERT	KB-BERT
TABLE 1 **Comparison of Swedish BERT models on NER using SUC 3.0 dataset**			
Person	0.913	0.945	0.961
Organization	0.780	0.834	0.884
Location	0.913	0.942	0.958
Time	0.655	0.888	0.906
Measure	0.828	0.853	0.890
Work of art	0.596	0.631	0.720
Event	0.716	0.792	0.834
Object	0.710	0.761	0.770
Total average	0.876	0.906	0.927

which appear more frequently and are fairly consistent in both linguistic form and the context in which they are used, are easier to recognize, which is why all three models tend to perform well on "Persons"; yet a more diffuse entity such as "Work of Art," which is a larger umbrella category with more variable forms, proved harder to recognize. Again, that KB-BERT still performed comparatively better on identifying these more challenging entities is a result of the quality and quantity of KB's Swedish data.

By utilizing the library's textual resources, we were therefore able to create a more powerful and effective model than those trained solely on freely available data. On the one hand, this demonstrates the tautology within NLP regarding the centrality of data volume for improved language understanding: the more data used in training, the better the model performs. On the other hand, it supports our suggestion that using a diverse range of language from a number of social domains would enhance the model's performance; through being trained on a richer corpus of modern Swedish than simply Wikipedia alone, KB-BERT has achieved a more advanced level of understanding. More broadly, this evaluation also highlights the importance of high quality and varied language-specific training data in producing state-of-the-art language models like BERT.

Applying BERT at the Library

The creation of a high-performing, general-purpose model for Swedish has opened up many possibilities for the application of NLP techniques. Since being released in February 2020, KB-BERT has been implemented by various organizations and public authorities in Sweden that have been able to take advantage of its capacities for rapidly processing large amounts of language data.[30] Insofar as this implementation contributes to the adoption of more effective procedures for public sector administration, it highlights the broader social benefits that can result from the development of these language models.[31]

But beyond such wider value, what does KB-BERT mean for the library itself? How might this be applied to KB's internal practices, given the centrality of information management to the library as a cultural heritage institution and an infrastructure for academic research? In the following section, we explain three particular use scenarios where the model could be used to enhance the library's digital collections and the ways that users interact with these to pursue new forms of research. For each specific use case, we provide an overview sketching

the area that BERT might be directed toward and how this would work in practice, as well as detailing the advantages and challenges with these applications.

Text Classification
What?
The first scenario involves applying KB-BERT to assist in **classifying incoming digital material** to the library. This is a matter of exploiting one of the principal capacities of BERT: *scalability*, or the ability to quickly and effectively deal with large volumes of text data. By fine-tuning the model to recognize particular categories, it becomes possible to organize—and make more readily available—types of material that have previously remained relatively hidden from the library's users, such as advertising ephemera, which has not conventionally been catalogued at the level of the individual item.

How?
Training BERT to distinguish between different categories requires the creation of an annotated dataset of the specific material that is to be classified. It presumes, in other words, the existence of a series of appropriately categorized examples that can be given to the model to learn from. Just how many examples are necessary depends on the complexity of the task, but at least a few thousand examples will generally be required. The first step for fine-tuning BERT to classify in the library is therefore to recruit a team of annotators to produce such a set of examples.[32] This could be organized via crowd-sourcing volunteers among library staff or users at large. The key point is to generate a sufficient and representative range of material that has been tagged.

The next step, once the annotated data has been produced, is using it to teach BERT how to distinguish between different types of material—if, for instance, an advertisement should be classed as relating to, say, sport, technology, or some other category. Here the learning process is made more effective by a machine learning technique called "bootstrapping," whereby the model requires less and less human correction for each round of fine-tuning.[33] The reason a Transformer model is so adept at such training is that text categorization is one of the tasks it excels at: being exposed to large volumes of data and then asked to categorize based on the contents of documents is one of the principal tasks BERT was created for.

Once the model has achieved sufficiently high-performance levels, it is ready to be applied to classification in practice. How this should be implemented in concrete terms is an open question, but given the nature of the task it is conceivable that some form of "human in the loop" implementation would be an appropriate starting point—i.e., a setup that involved library specialists working in tandem with data scientists, and the language model, to help ensure optimal results. This has the advantage of allowing the model to be refined based on the expertise of the library staff, while at the same time allowing the staff to learn more about—and to trust—the workings of the model.

Challenges?
While custom-made tools like Prodigy enable the crowdsourcing of annotation,[34] there are still certain challenges with producing the initial annotated dataset needed for this implementation of BERT. On the one hand, it is a process that requires a fair amount of labor to produce sufficient examples, which means having a group of volunteers prepared to undertake the

repetitive and (for some) boring task of annotating the data. On the other hand, the cross-checking and approval of completed annotations can be a tricky task in itself, since categories are often fluid and ambivalent—with boundary cases demanding the creation of further distinctions and subcategories that need to be adjusted iteratively. Given the problem of the "subjectivity of [individual] judgements," having a project leader to oversee and standardize the verification of the tags is a prudent measure.[35]

Why?
Using BERT to classify incoming material is a smart way of making the library's collections more accessible for new forms of research. By training the model to categorize those parts of the legal deposit collections not currently classified as individual objects—i.e., ephemera—this AI implementation would make material that otherwise risks disappearing into the archive more visible and searchable for the library's users. That such classification also provides the material with

FIGURE 1
Making Collections of Commercial Ephemera Available for Innovative New Research
(Photo: Ann-Sofie Persson/KB)

a structure amenable to machine learning means researchers would be able to apply innovative, data-driven approaches in using it.

Enhanced Searchability
What?
The second use case is employing KB-BERT to **enrich metadata** for the library's digital collections. A central challenge facing libraries today is how to make their holdings amenable to the type of highly specific, granular search enquiries that users—especially academic researchers—have come to expect from the experience of using the internet and search engines like Google. Of course, a necessary precondition for such searchability is the digitization of the material (born digital collections aside), but the next step demands improved metadata, which is where a BERT model comes in. This is a more complex application than that of classification considered above, but it is also one with greater potential gains for the library's users, and thus for research at large.

How?

The principal NLP technique that BERT performs here is named entity recognition (NER), which —as mentioned previously—is the ability to extract entities such as places and names from texts. To maximize the searchability gains made possible by the model in this regard, there are various components that need to be put in place. This involves integrating BERT with a number of other tools from data and information science, as we explain below. Here it is worth noting that since NER is a broader, language-wide task, there are more likely to be external resources that can be adapted and used, as opposed to internal library classification where less help is available.

Firstly, BERT needs to be fine-tuned to recognize the particular types of entities likely to be of interest to library users when they are searching the collections. The standard types that NER models tend to be trained on are persons, places, organizations, times, and measurement, but this could be expanded for a library ecosystem to include even titles of publications, literary

FIGURE 2
Using BERT to Identify Named Entities in the Library's Collections
(Image: Elena Faton/ KB)

genres, and cultural movements. As soon as the particular categories of interest have been determined, a set of training data needs to be produced to allow BERT to learn how to identify these entities in large volumes of text. As with the previous example of classification, this requires the production of an annotated dataset compiled of appropriately tagged examples. Beyond its use in training this model, the creation of such a NER dataset is also a significant contribution to the national NLP community, insofar as it can then be released for other actors to use and develop in future research and development.

Secondly, once trained to find these entities in the library's collections, BERT needs to be connected to a specific model for named entity disambiguation (NED). This is a system with the ability to distinguish between entities with the same name that refer to different things.[36] If, for instance, we were to type "Abraham Lincoln" in Wikipedia's search window, then we arrive at a "disambiguation page" that lists the various entities this could refer to: from the sixteenth president of the USA in person to the many works representing his life, and from a list of commemorative statues to other usages within transport (models of trains, etc.) Or if we search for "Lars Andersson" on Swedish Wikipedia, then we receive a similar result: a long list distinguishing the different historical and contemporary figures that share this name
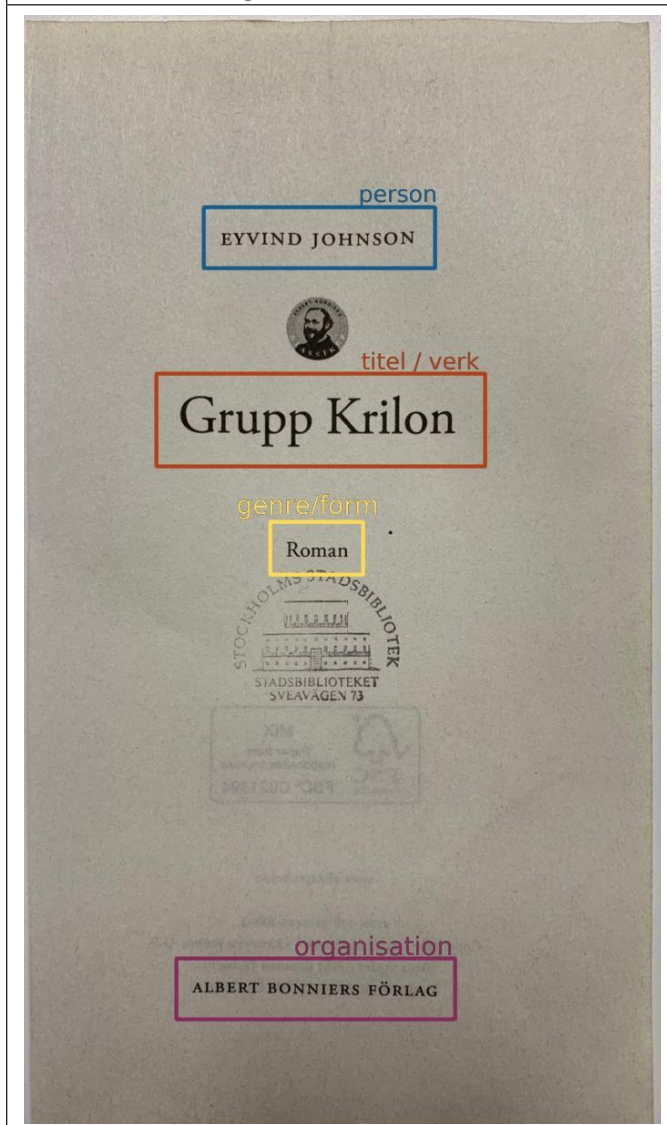
FIGURE 3
Entity Disambiguation: The Diverse Referents of "Abraham Lincoln"
(Wikipedia CC BY-SA 3.0)

Article   Talk

Abraham Lincoln (disambiguation)

From Wikipedia, the free encyclopedia

Abraham Lincoln (1809–1865) was the 16th President of the United States.

Abraham Lincoln may also refer to:

Film and theatre [edit]

- *Abraham Lincoln* (play), a 1918 play by John Drinkwater
- *Abraham Lincoln* (1924 film short), a film by J. Searle Dawley
- *Abraham Lincoln* (1924 film), an American feature film
- *Abraham Lincoln* (1930 film), a biographical film by D. W. Griffith

Literature [edit]

- *Abraham Lincoln* (Parin d'Aulaire book), a 1939 book
- *Abraham Lincoln* (Morse books), an 1893 biography by John T. Morse

People [edit]

- Abraham Lincoln (captain) (1744–1786), grandfather of President Lincoln
- Abe Lincoln (musician) (1907–2000), American Dixieland jazz trombonist

Statues [edit]

- Abraham Lincoln Statue and Park, a 1902 statue by George Edwin Bissell, in Clermont, Iowa
- *Abraham Lincoln* (Lincoln Memorial), by Daniel Chester French, at the Lincoln Memorial, Washington D.C.
- *Abraham Lincoln* (bust by Jones), an 1862 bust by Thomas Dow Jones, in Indianapolis
- *Abraham Lincoln: The Man*, an 1887 statue by Augustus Saint-Gaudens, in Lincoln Park, Chicago; Parliament Square, London; Parque Lincoln, Mexico City
- *Abraham Lincoln: The Head of State*, a 1908 statue by Augustus Saint-Gaudens, in Grant Park, Chicago
- *Abraham Lincoln* (relief by Schwarz), 1906 commemorative plaque by Rudolf Schwarz, in Indianapolis
- Statue of Abraham Lincoln (Cincinnati), a 1917 statue in Cincinnati, Ohio

FIGURE 4
Entity Disambiguation: The Diverse Referents of "Lars Andersson"
(Wikipedia CC BY-SA 3.0)

Artikel   Diskussion

Lars Andersson

Lars Andersson kan syfta på:

- Lars Andersson Rålamb (1563–1599), fogde
- Lars Andersson (talman), bondeståndets talman år 1734: se listan över bondeståndets talmän
- Lars Andersson i Halmstad (1815–1891), politiker
- Lars Andersson i Utterud (1823–1873), politiker
- Lars Andersson i Nora (1824–1880), politiker
- Lars Anderson i Landa (1831–1913), även kallad *Andersson i Ölme*, politiker
- Lars Andersson i Hedensbyn (1888–1974), politiker i bondeförbundet
- Lars Andersson (konstnär) (1910-2005)
- Lars Andersson (fotbollsspelare) (1927–1992)
- Lars Andersson (militär) (1936–2012)
- Lars Andersson (född 1941), svensk socialdemokratisk riksdagsledamot
- Lars Andersson (professor) (född 1947)
- Lars Andersson (kanotist) (född 1948)
- Lars Andersson (arkeolog) (född 1961)
- Lars Andersson (författare) (född 1954)
- Lars Andersson (ishockeyspelare), (född 1954)
- Lasse Anderson (låtskrivare född 1958), son till Stikkan Anderson
- Lars Andersson (nydemokrat) (född 1959)
- Lars M. Andersson, historiker (född 1961)
- Lasse Andersson (låtskrivare född 1963)
- Lars Andersson (sverigedemokrat), riksdagsledamot (född 1964)

(see figures 3 and 4). In practice, there are various ready-made tools that can be adapted for this task of disambiguating different uses of the same name—e.g., Bootleg[37]—but doing so is an essential part of creating an effective search system built on NER.

Thirdly, to produce an end-to-end system for entity recognition that maximizes search potential, BERT should be integrated with a tool for entity linking. This is a matter of connecting the library's internal databases with the wider knowledge base of the semantic web to ensure that the named entities identified by BERT within the collections are interconnected with—and made available as—open linked data.[38] This linking achieves the mapping of entities mentioned within the library's collections onto the existing network of information about these items contained in the vast structured data of, say, Wikidata—the database underpinning Wikipedia and related projects. By harnessing the power of BERT to identify entities on a massive scale, and by making this part of the huge informational resources of the semantic web, it becomes possible for users to search the collections with an entirely new level of scope and precision.

To show how this works in practice, we can consider the example of a researcher with a broad set of search parameters—say an interest in murders in West Sweden between 1850 and 1930. A search system built on BERT could perform such an enquiry across a large range of material—i.e., all the newspapers from the period—using the contextual knowledge of named entities the model has gained. Given that KB-BERT knows that the city of Gothenburg is situated in West Sweden, for instance, it would be able to include items for the above search terms without the reports explicitly mentioning this wider geographical term. The model thereby provides faster and more effective ways of helping researchers find what they are looking for.

Challenges?

Beyond the difficulties of producing an annotated dataset outlined in the previous example, this use case involves a number of fairly significant challenges. Firstly, developing and operating this NER function using BERT demands substantial computational resources—without sufficient processing power it will simply prove impossible. Secondly, it is demanding in terms of technical expertise: producing an integrated system for entity linking presumes the presence of an in-house team of data scientists to oversee such an implementation. Thirdly, and perhaps most importantly, it requires that these experts manage the integration of the library's internal databases with the open linked data of the web, which is a far from trivial task. In short, this is a complex and resource-intensive form of implementation, but one that offers transformative gains.

Why?

Using BERT as the foundation of an integrated system for named entity recognition and linking enables the library's digital collections to be searched in new, more expansive ways. Whereas conventional searches reveal the presence of named entities only insofar as they are present in traditional metadata—i.e., title, author, date of publication—a BERT model also has the capacity to search among the *contents* of the material in locating such entities. This allows a user to gain an insight of the collections at a vastly different depth than that which was previously possible. In this context of enhanced searchability, it is no coincidence that models like BERT are already deployed for the online searches we take for granted when using Google. Applying such a technology to the library promises a means of enhancing how researchers are able to interact with, and use, the collections.

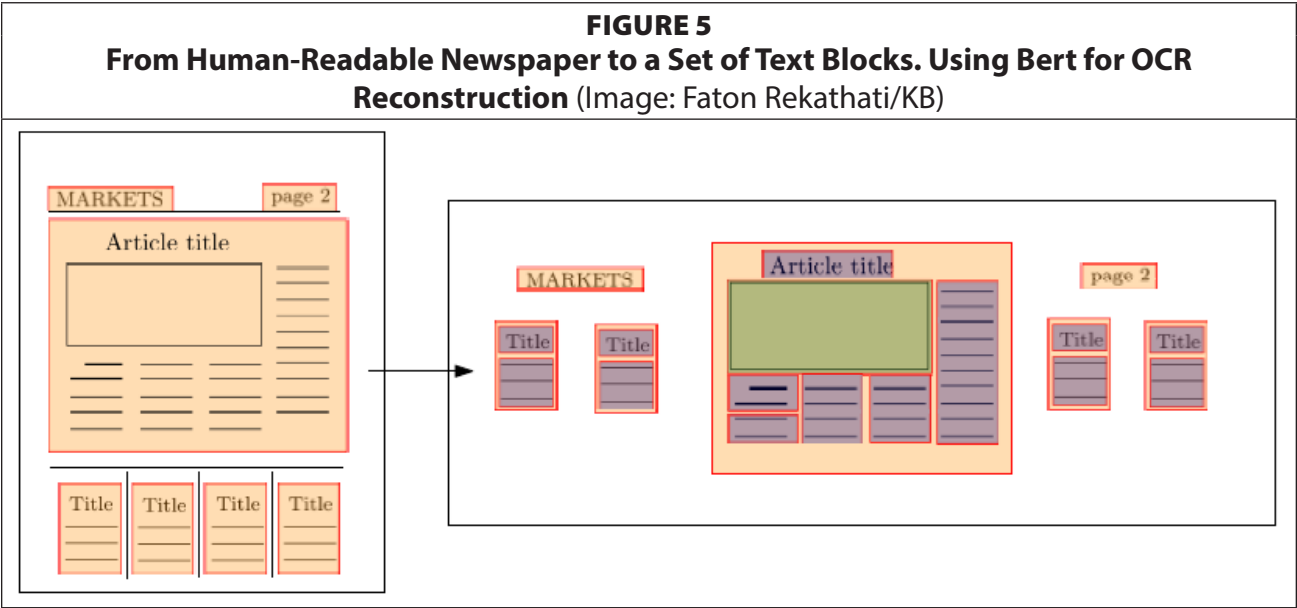## *Improved OCR Cohesion*
What?
The third example for implementing KB-BERT at the library also involves enriching metadata but relates more specifically to **improving the cohesion of digitized collections** to make them more accessible for users, particularly academic researchers. This is especially pertinent for historical material such as newspapers, which have been previously digitized but have lost various contextual markers that we take for granted as human readers—i.e., the presence of specific articles and sections within the newspaper, rather than simply a collection of blocks of text.[39]

How?
The principal problem that needs to be resolved when trying to reconstruct the structure of a newspaper is identifying where a given article *starts* and *stops*. This is the case since the OCR process used to digitize the material effectively strips the text of such markers in breaking it down into smaller segments (see figure 5). If a language model like BERT can be taught to recognize the beginning and end of each article, it becomes possible to piece together the newspaper, article by article.

There are several different options for how BERT could be used to address this task, depending on the particular circumstances of the library. One alternative is to use a function integral to the model, *next sentence prediction*, to reassemble the OCR boxes into article form. This would work by training BERT to recognize the characteristic linguistic features of the opening and closing sections of an article, and to compare the likelihood of connecting sentences among adjacent text blocks to establish the correct order of the article's main body.[40]

The advantage of such an approach is that predicting next sentences was one of the original training tasks used to create BERT, meaning that no further fine-tuning is necessary to realize this capacity. However, it presumes the existence of a dataset of coherent newspaper articles that can be used to train BERT to identify how these typically start and finish. If the library is in possession of such data, as is the case at KB through the collection of Swedish newspapers received via electronic legal deposit, then this training process is simple, since it is a form of

FIGURE 5
From Human-Readable Newspaper to a Set of Text Blocks. Using Bert for OCR Reconstruction (Image: Faton Rekathati/KB)

self-supervised learning where, given a few thousand examples, BERT will be able to teach itself the characteristics of a beginning and an ending. If the library does *not* possess such material, this would instead necessitate the manual collection of a set of examples, which is both more time-consuming and resource-intensive.

An alternative approach, and one to consider in the absence of such a readily available training set, is to combine BERT's capacity for language processing with a model for image recognition and use them in tandem.[41] This would involve training this latter model to recognize the visual clues that signify the beginning and end of a particular article—for instance, the presence of a title at the start or of, say, a square at the end. BERT's ability to predict next sentences could then be deployed to link together the sequence of text blocks between the first and the last block of each article. While undoubtedly more complicated, insofar as this involves the use of two different models, such an option has the advantage of using both textual and visual information in the data to reconstruct articles.

Challenges?

In addition to the problems of producing annotated data that might arise here, a number of more specific challenges connected to the particular nature of this implementation also exist. Firstly, treating material that spans a broad period of time can be complex: if the newspapers to be processed range back over a long period, there might be different style and visual conventions contained within the material. This, in turn, could mean that the model needs to be further fine-tuned to adapt to such shifts over time. Secondly, there are likely to be a greater number of OCR errors in the digital copies of older newspapers, which can likewise complicate the process of using BERT to understand and make predictions based on the contents of this material.[42] Thirdly, this is an implementation that demands a degree of technical expertise: it is not a straightforward fix, but rather an iterative process that will require systematically testing various parameters to ensure the best possible results. This presumes, once again, the presence of personnel with a background in data science and experience in working with such questions.

Why?

Taking advantage of BERT's language understanding to reconstruct historical newspapers is another instance of using AI to enhance the accessibility of the library's material. By improving the OCR cohesion of the newspaper archive, this implementation adds a level of metadata to digital collections that is key to unveiling their value for research purposes. Once this structure has been reestablished, it becomes possible to navigate the digital archive at the article level—to identify and search all the articles written by a particular author, for instance, which is a far from trivial gain from the users' perspective. As with the previous two use cases, such an application could significantly improve the quality and effectiveness of the library as a research infrastructure.

Concluding Discussion

In this article, we have presented how the textual resources of the National Library of Sweden provided the basis for a powerful new BERT model that outperforms existing models for Swedish. We have also explained three potential use cases for KB-BERT to highlight the relevance of such NLP techniques for the operating practices of the library. More precisely,

we showed how the model could be applied to improving access to collections for researchers, by (i) providing an automated form of classification, (ii) enhancing the searchability, and (iii) improving the OCR cohesion of digital collections. In each case, we suggest that KB-BERT's language processing capacities can be harnessed to add clear value to the library's working processes.

Insofar as we have discussed both how the library can contribute to the future development of AI and how AI could help transform the future of the library, the article raises broader questions about the opportunities and challenges for cross-fertilizing libraries with AI. In this conclusion, we therefore delineate these questions and explore some of their implications. What are the principal gains of closer interaction between national libraries and AI? What are the potential difficulties, on the other hand, of integrating the AI-related insights of data science with the information practices of the library?

National Libraries as Sites for Ethical AI

The key rationale for locating AI development in the context of national libraries is *democratic* in emphasis. The first part of this argument is essentially positive and concerns maximizing the social good that can be gained from the libraries' collections. Recognizing that the material preserved in the archives constitutes a form of commons—i.e., a shared resource for the community that is publicly funded[43]—contributing to the making of language models provides a means to distribute the novel forms of value contained within these institutions' collections as widely as possible. Partly a matter of the broad utilitarian benefits that result from more effective and cheaper administration procedures once public authorities implement these AI models, this also pertains to the general value of releasing open source NLP tools for the public to use as they see fit. In exploring new ways to unlock the potential of archival holdings beyond traditional forms of academic research, national libraries can help ensure that society at large derives some benefit from the era of big data.

Using the library's resources to participate in a wider societal project of AI development is especially pertinent for lower-resourced languages. As the evaluation results from this article demonstrate, the multilingual model released by Google for languages beyond English and Chinese offers less effective NLP capacities than monolingual BERT models trained for a particular language. Where giant tech companies perceive little incentive to invest in tools specifically for smaller languages, there is a risk of a chasm emerging between the state of AI in major and lower-resourced languages.[44] In this context, national libraries for this latter group can play a vital role in harnessing their holdings of large volumes of high quality, language-specific data for the making and distribution of state-of-the-art language models.[45] If there are legal restrictions preventing the sharing of such data, establishing in-house data labs at these libraries becomes a necessary work-around. By investing in such projects, national libraries have the chance to underpin the development of a national AI infrastructure, while laying claim to a potent new form of relevance in the process.

The second part of this democratic argument is more critically inclined and relates to probing the problems of an AI future driven purely by private sector actors. One of the key concerns with implementing large-scale language models like BERT is the negative effects of bias, given that the models inevitably reproduce the perspective of the data used to create them. Highlighting the sociopolitical risks of relying on vast, unaccounted-for web materials in training these models, a recent paper warned that such datasets "overrepresent hegemonic

viewpoints and encode biases potentially damaging to marginalized populations."[46] That one of the authors of this research was subsequently forced to leave their role at Google amply demonstrates the lack of space to explore these critical issues in the setting of big tech.[47] Developing language models at a national library, by contrast, it is possible not only to scrutinize the workings of data representativity and bias, but also to pursue the type of responsible data documentation that has been proposed as a prerequisite for more accountable forms of NLP.[48] In creating more representative and open tools, national libraries can adopt an ethical approach to AI development that supplements—and in some cases complicates and challenges—the strategies of private tech giants like Google.

Domain-Specific Expertise in Tandem with Data Scientists

Although compelling arguments thus exist for the pursuit of a library-based AI, there are still fairly substantial challenges that must be addressed in order to initiate such an undertaking. The first and clearest obstacle is a question of funding: without significant investment in both computational resources and technical expertise, the type of AI development we have discussed in this article will not prove possible. Presuming such resources have been secured, the second issue that needs to be dealt with is how to organize these experts within the framework of the library to achieve optimal results. This is a generic problem for the introduction of AI-related techniques in an organization: should technical competence be centralized within, say, a lab, or is it better for data scientists to be dispersed and embedded as part of particular groups of the core operation? While there is no "one size fits all" answer, since the particular goals of a given organization will demand specific solutions, it is worth underscoring the need for new forms of collaboration this creates. Developing and implementing AI in a library will require intricate cooperation between the domain-specific expertise of professional librarians and the technical skills of data scientists.

New collaboration will also be needed with a range of external actors if the maximum potential of this AI development is to be realized. One dimension of this is working alongside, and learning from, researchers who are using the library's collections for innovative forms of data-driven research: in many cases, synergy effects will emerge between the needs and explorations of such projects and the library's AI interests. Another, perhaps more significant, dimension is participating in national and international networks of AI actors with diverse stakeholders from private companies to university departments, who are starting to work together in a rapidly changing field of knowledge. These novel constellations of actors reflect the fact that, in the demanding space of AI development, it is smarter to pool resources and act collectively than to struggle alone. Given the centrality of high-quality data to the prospects of such enterprises, data labs at libraries—and especially national libraries—can have a significant role to play in the future of AI.

AI should not be regarded as a silver bullet that is capable of providing solutions for all the various complexities of the workings of a library. Neither should the elusive combination of resources, expertise, and strategic leadership that is necessary for these libraries to participate in the development of national AI infrastructures be underestimated. Yet as we have sought to demonstrate via the example of a Swedish BERT, there are many good reasons for a closer integration of libraries and data science. In seeking to address the opportunities and challenges created by our era of big data, exploring the possibilities of a library-centered AI is certainly a promising place to start.

Acknowledgements

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Book Stories: 20 Years of Library Book Plate Celebrations

Kate McDowell

Using storytelling as a framework, this study analyzes a faculty promotion book plating ritual through the lens of a twenty-year corpus of faculty-created and library-gathered data. The sources for this analysis are faculty reasons for book selection, or "book stories," which are part of an annual book plating ritual at the University of Illinois at Urbana-Champaign library to celebrate promotion and tenure. Findings include increased personal information sharing over time. Libraries in the midst of pandemic reinventions should consider sustaining, reviving, and innovating new forms of storytelling to extend the impact of the library as the bedrock of academic community.

"The expanding frame of Max's world leads him from his bedroom and his wolf suit out into the world of wild things. The thrill of this journey into the unknown is what I aspire to teach my students to love."

~ 2013 selection statement for *Where the Wild Things Are*, by Maurice Sendak

Introduction

In the everyday world of academia, there are occasional storytelling moments, such as introductions to public lectures. When a celebrated scholar speaks, ceremonies feature multiple academic leaders giving one introduction after another, layering together a story of why this person was selected to give this address at this time. Such rituals are taken for granted in the information worlds of librarians and faculty members, experienced but not analyzed. And yet they are characteristic of academia as an information world and of the culture of scholarship. With this gap in mind, this study uses storytelling as a framework to analyze a faculty promotion book plating ritual through the lens of a twenty-year corpus of faculty-created and library-gathered data. The sources for this analysis are the traces of the ritual: faculty reasons for book selection, here termed book stories. This highly structured storytelling situation occurs as part of an annual book plating ritual at the University of Illinois at Urbana-Champaign library to celebrate promotion and tenure.

Though reading is central to academic pursuits, little attention has been given to faculty book choices. We take for granted but may not deeply understand how books matter to scholars. Understanding what books mean to faculty sheds new light on what libraries can mean to their communities. Although each faculty member's promotion and book choice is individual, these book-plating practices are one part of the "small world" of faculty life. In Chatman's

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terms, "what holds a social reality together, and ultimately, establishes proper bounds for information-seeking is the recognition by others that those behaviors are the customary ones to pursue" (Chatman 1996). Jaeger and Burnett draw on Chatman's ideas for the theory of information worlds, with emphasis on the interactions among small worlds and larger contexts, including multiple small worlds as well as the interactions between them. "Few individuals exist only in one small world; a typical person is a part of many small worlds—friends, family, co-workers, people with shared hobbies, etc" (Jaeger and Burnett 2010).

At the University of Illinois library (and elsewhere), commemorative book plates celebrate faculty who achieve tenure and promotion. Faculty are invited to select a meaningful book and write a brief statement or book story about the selection: "Please tell us, in approximately 50 words or less, why you chose the book you did, and what significance does it have to you?" Book choices (title, author, cover) and book stories are preserved collectively on the library website.* This practice has been sustained from 2000 to 2019, and the celebration has evolved to include an event celebrating scholar's achievements. At the event, books, book plates, and book stories were on display, with room to move around, read one another's selections, and socialize. The website preserves the traces of a consistent practice, capturing the book stories of faculty at a moment of career transformation; faculty removed in time and space remain connected by the records of this ritual.

Librarians Lisa German and Karen Schmidt jointly authored a descriptive article about leading the creation of this "unique program of honoring faculty who attain the honor of tenure and/or promotion in rank" as the "only event on campus where the promotion and/or tenure of all faculty members was recognized in a public way" (German and Schmidt 2001). Since that time, similar programs have been developed in other places, some extending the idea of faculty bookplates to virtual bookplates in the library catalog and bookplates in honor of donors (Carrico, Fleming, and Simpson 2010; Foster and Robinson 2012). Faculty promotion programs at other universities also typically solicit "a brief paragraph as to why they (faculty member) selected that particular book" (Riddle et al. 2005). These statements are "meant to provide a personal glimpse into the faculty member and to inspire students and others in their scholarly pursuits" (Fischer, Conger, and Bazirjian 2007). One librarian noted that "faculty did not always select books from their specific research or teaching focus or even their general subject area. Many chose novels or books of general interest because they had been particularly inspired by these works during their lives" (Riddle et al. 2005).

In addition to these examples, a Google search using the terms "faculty promotion bookplate" reveals that this practice has become widespread. At least twenty institutions use these terms to describe a celebration ritual around promotion, including Florida State University, University of Idaho, The Ohio State University, University of North Carolina Greensboro, and others—and there may be more that use slightly different terms. It would be interesting to explore the histories of these practices comparatively, analyzing statements from faculty across multiple institutions. However, differences in institutional culture, such as duration of the practice and participation of faculty, would make systematic comparison challenging. As an entry point into research on book stories as traces of these rituals, this study focuses on one institution's faculty promotion bookplates, with a corpus of more than 1,500 book stories

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* Book stories are publicly available on the "Faculty Bookplates" webpage, under "Featured Collections and Acquisitions," itself under the "Collections" section of the University Library website, https://www.library.illinois.edu/collections/special-collections/bookplates/.

recorded over a twenty-year period. Although previous publications have described promotion book-plating practices, the present study appears to be the first to analyze book stories as content and ask what book selections mean.

Generations of faculty have written book stories and participated in this celebration and collective ritual transition at the University of Illinois at Urbana-Champaign. Reading through book stories offers glimpses into the personal histories of careers, career choices, and how academic paths and passions developed, as well as family history, geography, identity, and more. These book stories show that the process of promotion is both deeply personal and collective, revealing the significance of books as everything from disciplinary influence to family bedtime reading. As faculty, I have participated in this ritual myself, as has my partner and many of our friends. I have attended multiple celebration events and written my own book story. Being embedded in the university defines my "information world" and that of many of my colleagues, an information world where books and reading matter. These book stories capture the lives, attitudes, and passions of many of my colleagues. They reflect one person's personality, another person's intellectual passion, yet another person's devotion to family life, and more. While short, these glimpses into colleagues' lives are also profound.

In the information worlds of faculty, promotion and tenure are meaningful moments, but rarely does an opportunity arise to analyze what they mean. This article explores book stories as traces of a collective ritual at one institution, where faculty give glimpses into what motivates them and how their academic journeys are personally meaningful through their book stories. Through this analysis, we ask: What do faculty book stories reveal about why books are selected to commemorate promotion, individually and collectively? What, if anything, has changed over twenty years, and what do these findings mean for libraries?

Literature Review

Book selection and display as a kind of self-disclosure—from undergraduate dorm room shelves to backdrops for films of experts sharing their expertise—is a longstanding trope. The idea of the "credibility bookcase" has taken on new life in an era of videoconferencing, via actual or digital bookshelf backgrounds (Hess 2020). For academics, books are meaningful in professional ways, but relatively little attention has been given to how those meanings cross over personally. In an investigation of personal meaning, Gorichanaz draws on phenomenology to analyze "information experience in three domains of personal meaning-making." Based on these empirical studies, he argues for including "personally meaningful activities as a site for information behavior research," not least because personal meaning is "a necessity for human beings" (Gorichanaz 2019).

Other studies have explored the intersection of personal and professional meanings of books. In the book *A Narrative Compass*, Hearne and Trites gather essays by faculty members who describe the books and stories that have served as "compasses" or guiding narratives that span and connect their lives and their work. "When scholars understand the relationship between text and context, between the subject they study and their own lives, they can draw on their internalized knowledge of storytelling to help analyze what they study" (Hearne and Trites 2009). Through exploring writing processes, embodiment, nurturing roles, and more, this collection of essays thoughtfully and systematically explores what books mean to scholars while challenging academic taboos against sharing personal narratives. The collection also

opens the door to looking for other moments when personal meanings are shared, such as in rituals around promotion and tenure.

There is room for more library and information science (LIS) narrative inquiry as we draw from varied research traditions to qualitatively understand the meanings of libraries to all stakeholders. The value of narrative inquiry for LIS has been asserted elsewhere in relation to major career transitions: "For example, we may ask to hear librarians' lived experiences of promotion and tenure reviews." Ford argues that "by asking for and listening to our colleagues' lived experiences, we invite the opportunity to reflect on and reimagine these systems" (Ford 2020) a phenomenological qualitative research methodology, examines individual human experiences—stories. Mining collections of book stories is a way to leverage library assets that have already been collected and curated to stimulate such reflection and reimagining. Narrative inquiry like this may redress the persistent "imbalance in information science," which centers predominately on the lower things (everyday life and problem solving) and overlooks "higher things"(Kari and Hartel 2007) like experiences of promotion, which appears among other career events in a recent taxonomy of major life events (Haimson et al. 2021). Achieving promotion is typically a positive experience, but there is more room for understanding what makes career transitions meaningful. The analysis of this corpus of book stories offers one window to understanding what scholars value about books.

Because of the ritual nature of this celebration, from invitation to book display, the lens of storytelling is useful for situating the analysis. Storytelling has a rich, century-long tradition in professional youth services librarianship. Conceptually, this practice has focused on the dynamic relationship between the teller, tale, and audience. The triangle of librarian-as-storyteller, public-as-audience, and the story-as-book (or any item in the collection) means that the same story may be told differently depending on the specific people and content involved, with an emphasis on the collective experience of storytelling (McDowell 2018). Research on organizational storytelling in libraries affirms a similar dynamic. In researching how "organizational stories" serve as a way of communicating "valuable tacit knowledge related to (librarians') work to colleagues," Colón-Aguirre asserted that "the role of the narrative seems to be related to the audience, or those with whom participants were sharing the stories" (Colón-Aguirre 2015). Storytelling has also been posited as a means of enhancing library organizational leadership, most notably in Kate Marek's handbook on "how to use narratives to navigate change and build community" and "communicate shared goals" in everyday challenges of librarianship (Marek 2011).

Storytelling can be spontaneous, but much academic storytelling is highly ritualized, and faculty promotion book plating is meticulously ritualized storytelling. Story in the information sciences has recently been defined in two ways: structurally as narratively patterned information, and functionally as the content shared through the narrative experience of storytelling (McDowell 2021). The use of the term "book story" here draws on the second definition. The sharing of book stories is a form of collective narrative experience, both at the event—where authors browse one another's books stories and books—and in preserving book stories on the library website. In this context, the story consists of a brief statement about book selection, and yet the corpus is vastly diverse. Some select their own books, telling the story of their own achievements. Others select books by mentors, advisors, or students, with stories of important relationships in their career trajectories. Still others select books written by relatives or read to children, offering stories of personal life.

There is increasing evidence that story as narrative experience interconnects individuals. Neural story processing involves a "mirroring process of embodied subjectivity" or experiences of "narrative emotions" predicated on story's "ability to intertwine our experience of time" (Armstrong 2020). Specialized "mirror neurons" in the brain contribute to experiencing empathy through story (Rizzolatti 2008), and contextual empathy cues increase the potential for empathetic experience through story (Roshanaei et al. 2019). Though a complete review of neurological storytelling research is beyond the present scope, these findings indicate that the multiplicity of a collective story audience is more complex than the mere sum of individual experiences.

Although the storytelling in this case involves written and read book stories, there is a shared narrative experience in the celebration ritual. These book stories' authors are present together at an event where part of the intrigue of the setting is the potential to not only read about what others have selected but to make new acquaintances as colleagues mill around each other's books. This event and the website archive sustain potential for dynamic exchange between tellers-as-authors and audience-as-university-community. "Rich metaphorical understandings of what a storytelling process can be, may afford the kind of reframing that is necessary to enliven thoughtful, critical, inventive library services" (McDowell 2020).

In this ritual, libraries preserve stories of faculty accomplishments, celebrate faculty development, and position faculty as storytellers. Although academic leaders tell stories about faculty and university impact, faculty storytelling exists primarily in publications and classrooms. The book plating celebration is an opportunity for faculty to tell their stories as part of the institution, with the library as a larger stage for their accomplishment to be seen and celebrated. Since only brief glimmers of personal stories appear in academia, those glimmers are important to analyze. Faculty book stories reveal much about a common, collective experience of academic information worlds that cuts across usual personal and professional distinctions.

Methods

Over a twenty-year period, all faculty who are promoted to associate or full professor with tenure have been invited to participate in this ritual, but of course not all do. Participation rates are not available for all twenty years, but ten years of data indicate a response rate that ranges from just over half to about three quarters of those invited.

TABLE 1 Participation Rates			
Year	Number of Faculty Promoted	Number of Faculty Responses	Participation Rate
2010	91	68	75%
2011	128	89	70%
2012	116	85	73%
2013	103	79	77%
2014	88	47	53%
2015	81	47	58%
2016	86	62	72%
2017	99	67	68%
2018	115	83	74%
2019	130	88	68%

Participation rates show that, from 2010 to 2019, this has been a program with uptake of about 70% among promoted faculty. Of course, the disruptions of COVID-19 impacted this ritual, so data for 2020 and beyond will be different. Understanding what such rituals mean for this library and academic community may inform how institutions reinvent book plating events. More mundane disruptions have also impacted past participation, as with one faculty member who shared disappointment to have missed the email invitation that "slipped through the cracks."

A blend of qualitative methods was chosen to investigate what faculty book stories reveal, individually and collectively. Analysis drew on reflexive thematic analysis and topic modeling. Reflexive thematic analysis involves a six-stage process for thematizing codes and understanding what the data means (Braun and Clarke 2006; Braun 2019). This analysis takes an inductive approach to analysis, focusing on the entire data set from 2000 to 2019 (Braun and Clarke 2006) and used NVivo 12 to capture and refine the code book, themes, and subthemes.

Topic modeling complemented the findings from reflexive thematic analysis. Topic modeling is an automated way of understanding the contents of text corpuses through the process of training topic models. The output consists of lists of closely related words in the corpus, from a computational standpoint, that can reveal hidden semantic patterns. Word lists, in increments of ten, were generated from ten to fifty topics and again in increments of one from fifteen to twenty-five topics. At twenty topics (with the minor adjustment of excluding one least meaningful word from each set), the word sets both echoed and complemented the thematic analysis findings, yielding some additional insights.

Although initial plans were to analyze patterns of book titles/authors, the vast majority of the books chosen were uniquely selected, meaning that most titles appeared just one time in the list of approximately 1,500 books. A number of possibilities remain for future research, including generating a schema for analyzing subjects or contents of books themselves by drawing on other data sets. Such future work could produce better understanding of how book choices relate to the scholarly field of the celebrant, comparisons of books selected across institutions, and more. However, given the very low incidence of duplication, the books as works selected are not the focus of the present analysis. Instead, it focuses on the book stories from one consistent practice at one institution over twenty years. The findings are organized in themes developed in the analysis, with examples. These are followed by an overview of complementary insights from topic modeling.

Findings: Themes and Excerpts

The reflexive thematic analysis process yielded five themes, each with a variety of subthemes that help to elucidate the scope of the theme and clarify the content. The five themes were career stories, good books, life stories, social justice, and other. When relevant, a single statement was coded in multiple ways. For example, when a book story referenced career path (career stories), being part of an underrepresented group (life stories), and the need for social justice (social justice), then it was coded in all three themes. Table 2 provides a visual overview of the themes and subthemes.

Although each statement is a short text, the overall corpus is extensive, as was the coding process, which involved two research assistants examining just over 1,500 statements. A brief overview of the numbers of coding instances for each of the themes indicates the frequency of different kinds of meaning found in the statements.

TABLE 2 Themes and Subthemes	
Themes	**Subthemes**
Career stories	Own book or contributed to book
	Influenced career direction
	Person who influenced career direction
	Excellent textbook or inspired teaching
	Student achievements
	Impact of library or university
Good books	Enjoyable or well written
	Influenced or changed worldview
	Personally influential
	Influential in the field
	Written to reach beyond the field
	Speaks to the human experience
Life stories	Childhood
	Family
	School and career stories
	Place stories
	Underrepresented life stories
Social justice	(no subthemes)
Other	Humor
	Uncategorized
	No book story

TABLE 3 Themes and Coding References	
Theme	**Number of Coding References**
Good books	1548
Career stories	996
Life stories	639
Social justice	91
Other	78

This provides a snapshot of which kinds of meaning appeared most often in the statements. Before continuing with analysis of the findings, there must be a note of caution about making too much of such trends, because the prompts for book stories were not standardized from year to year. There was consistency in that faculty were always asked to select books, but the emails inviting participation are not all available for analysis. It is clear that later invitations included some example books and book stories from previous years, so the process evolved over time (see historical analysis, below). Earlier requests were doubtless modified to appeal to faculty and encourage them to participate. In other words, even the most numeric data in this analysis should be understood as deeply qualitative. An exemplary quotation for each theme will help to illustrate the kinds of content coded.

TABLE 4 Exemplary Quotations	
Theme	**Exemplary Book Story Excerpt**
Good books	*"This book embodies the wonder, beauty, and strangeness that printed volumes can convey."*
Career stories	*"Most of my research has drawn heavily upon ideas that were first developed in this book."*
Life stories	*"To symbolize that it is possible to balance an academic career with family and laugh along the way!"*
Social justice	*"This book affirms, among other things, the relationship between critically-engaged history and social justice, between anti-racist teaching and the possibilities of a genuinely pluralist democracy."*
Other	*"I like unusual fruits."*

Each theme was based on these kinds of typical expressions, from praise for good books to moments of humor. For example, "I like unusual fruits" was the full statement for a book about unusual fruits. While accurate in a literal sense, this book story was a humorous contrast to academic language that is rarely so plain and direct.

A secondary analysis revealed the average coding occurrences over approximately five-year increments. The numeric values are percentages of occurrences, so that each column adds up to 100. Although these values are based on counting qualitative research coding, and should be read with that qualification, two trends were evident.

TABLE 5 Percentage of Themes per Year Range					
	2000–2004	**2005–2009**	**2010–2014**	**2015–2018**	**Trend**
Good books	38	44	41	36	steady
Career stories	33	25	24	25	downward
Life stories	22	26	30	36	upward
Social justice	4	3	3	2	steady
Other	3	2	2	1	steady

These trends were a slight downward trend in career stories, and a slight upward trend in life stories. These changes over time may reflect the impacts on academic culture of broader cultural shifts toward greater self-disclosure generally and toward a more personal way of being in workplaces. Because the culture of academia has traditionally separated the personal and the professional, some might read these trends as the encroachment of the personal into work life, while others might laud increased willingness to openly share personal life stories. No matter why caused or how understood, this change points to an opportunity for libraries to consider expanding avenues for open-ended story sharing, including life stories.

More detailed description of thematic analysis findings, below, represents typical content of subthemes and provides a sense of range. Each theme is a ***bold heading in italics*** and each subtheme is *italicized* within the body of the text.

Career Stories
This theme encompasses statements related to faculty career or career path, from selecting their own book to selecting a book that influenced them or a book that honors a colleague,

mentor, or the institution itself. Career stories define central aspects of faculty life as an information world. Some faculty chose their *own book or a book to which they contributed,* reflecting faculty information worlds defined by the production of a book in some discipline. As one person succinctly stated: "This is the first book that I wrote and published." A humorously short statement was: "I wrote it."

The subtheme *influenced career direction* encompasses books relevant to choice of career or the development of a career path. As one said: "This paradigm guides my own research." Others selected books foundational to a newer area within a field: "All scholarly analysis of Latino politics that have been published since 1977 (including my own work) owe it a debt of gratitude." This kind of book story emphasized continuity with thinkers and authors who came before.

Person who influenced career direction encompasses inspirational book authors, editors, and contributors as well as the biographical subjects of books. Sometimes the author or contributor was known personally to the faculty member. Descriptions of such collegial connection ranged widely from formal ("she was a mentor to me") to casual ("the authors are from U of I and colleagues of mine"). Sometimes the inspirational person was the subject of the book, such as public/historical figures Mahatma Ghandi and Benjamin Franklin. From personally known mentors and colleagues to historically distant figures, these were stories of influential people and their interconnected scholarly conversations.

In the *excellent textbook or inspired teaching* subtheme, book stories often mentioned courses for which the book had been assigned reading. Graduate courses featured frequently, which is not surprising since, in faculty information worlds, the opportunity to teach graduate students tends to be less common and desired. One celebrated "university life: a lifetime of reading and a desire for both our faculty and students to teach and learn from one another." Stories occasionally described *student achievements* including writings by or with former students. A poignant example acknowledged a book "by one of my former undergraduate students" as "a brilliant discussion of how religious truth becomes established as orthodoxy;" the faculty member shared that the student had since passed away.

Statements honoring *the impact of the library or university* praised "the extraordinary collections in the University of Illinois libraries" or the "intellectual environment" of the university. Some faculty strategically chose a book to augment the library's collections: "I'd be honored to be the alibi for its availability in our Library's collection." This ritual moment is one among many moments of the ongoing relationship between the faculty member and the library and/or university. These book stories offer glimpses of the library in the lives of faculty members, and they can inform libraries as they continually revitalize services for faculty.

The statements in this theme evoke an image of faculty within career networks of interconnecting generations of thinkers. Research, writing, and teaching are confirmed as connective activities. Over time, students are inspired to become teachers and researchers who invent paths influenced by mentors who came before. Libraries would do well to consider their own roles in these networks, amplifying the library's role in telling yet untold stories of such connections.

Good Books

Some book stories described a good book. The specific ways of being "good" elucidate a range of ways that books figure into faculty information worlds, from influencing an academic field

to bringing academic subjects to broader audiences. These book stories also speak to deeply meaningful personal experiences of reading, from the pleasurable to the life changing.

The *enjoyable or well written* encompasses books described as "beautifully written," "beautifully crafted," or "poetic." One told of a book written with "perfectly rounded sentences that seemed to make each observation an aphorism." One faculty statement said that the book's "true star" was "the English language; although written in prose, the book reads like poetry." The word "poetry" was used as praise for prose in a number of cases. There were also lighter indications of enjoyment, such selecting a book "because it makes me laugh" or even contrasting pleasure with career: "This book has no special academic significance to me; it's just a pleasure to read."

The lasting impact of books appeared frequently. For instance, one book was praised for having given "great joy for nearly twenty years." Another person signaled enduring appeal: "This is my favorite and most read book of all time. I have recommended it to friends and colleagues many times." This focus on enduring books indicated that the meaning of a book choice can reflect more than the moment of promotion and may signal influence that has lasted throughout a career or even a lifetime.

Books that *influenced or changed worldview* changed a person's life or "changed how I see the world." Some statements connected the change to career, noting "profound influence on my perspective on research and academia." This kind of influence seemed to involve more than just the faculty member's information world, extending to their experience of life generally. As one person wrote: "Few books have had as profound an influence on my life as this one." These book stories evince the power of books.

The *personally influential* book stories were interestingly abstract, such as: "I discovered this book, and found it refreshing to my soul and mind." As in the previous subtheme, some book stories indicated a long and repeated reading experience: "I still read it when I need to be reminded of what matters most." Sometimes the term "personal" itself was used to elide a more specific meaning: "it has personal significance for me." The abstraction of these book stories asserted the power and right of the faculty-member-as-storyteller to limit what they share. In such a professional setting, acknowledging the personal may imply a richer life context, but some divulged no more than that. Book stories allow the faculty member to openly share that they are keeping secrets, and that tension illuminates an important aspect of faculty information worlds. Even though there is evidence of increased emphasis on the personal in book stories over time, normatively the personal and the professional remain separate.

Influential in the field stories focused on a particular academic area, indicating that books were chosen for being a "definitive text," "authoritative," or "classic." This reflects the ways that books and their contents constitute the substance of academic fields. One person wrote: "This extensive volume captures and synthesizes the most significant research that has been completed in the field." Some described reading influential books over long spans of time: "I have owned a copy of this book for seventeen years and I regularly go back to it."

Other selections were *written to reach beyond the field*, to make academic fields accessible or "engaging to all." Some statements explicitly mentioned those outside of a particular field as the audience ("on linguistics for non-specialists"), while others indicated a broad variety of audiences across multiple fields ("policymakers, environmentalists, researchers, and corporate actors"). One person succinctly said: "Very accessible book. Wish I had written it!" Choosing books for broader audiences highlights an awareness of the boundaries of academia as an information world, with distinct insider and outsider audiences.

Book stories occasionally described how a book *speaks to the human experience,* indicating a broad, general importance and usually referring to "human nature" or "humanity." They included books that were selected for conveying an "erudite and provocative set of philosophical reflections on what it is to be human," for describing "the death and re-birth of the human spirit," or for telling "a tragic story that exposes human nature at its worst and best." As Kari and Hartel argue, the profound is "anything that objectively reflects humanity's possibilities for reaching its full potential" (Kari and Hartel 2007). These book stories earnestly reflected a profound impact in referring to the human condition.

The statements that describe and define "good books" show, as information worlds theory argues, that people traverse intersections between various small worlds, or distinct "bubbles." Book stories indicate faculty consciousness of the boundary between personal and professional, of academic insiders and outsiders, and a wide range of ways of maintaining or crossing those boundaries. As storytellers, faculty approaches range from philosophical abstraction to personal revelation and encompass allusions to the personal without further disclosure. These book stories demonstrate the power of the author as storyteller, to share or withhold the story. Librarians could launch narrative inquiries to better understand why faculty and other library users share personal and professional meanings.

Life Stories

This section delves more deeply into book stories about echoing, reflecting, amplifying, or evoking life stories. Faculty frequently mentioned the roots of their careers in *childhood*, and chose books that related to that period of their lives. Striking in these statements is vivid language used in recollection of childhood experience, from the wonder of early childhood ("From the first moment I touched a horse, at the ripe old age of four, there's been nothing more beloved or magical in my world") to the frisson of adolescence ("high school years—the craving and adventure of discovering ideas for the first time"). Some youthful experiences were first career steps: "I first read it at sixteen, and it made me want to devote my life to studying literature." A few book stories contained adult reflections looking back, such as one faculty member who wrote "as a former working-class kid who is now a middle-class parent." Though this example is an exception, childhood stories typically emphasized some continuity of identity from those earlier years to the present, demonstrating that experiences of books as guides or "compasses" can start in childhood (Hearne and Trites 2009).

Statements in honor of or acknowledging *family* revealed a range of connections, from past to present. Some statements looked to the past, such as one statement that honored a grandfather who "worked his way through Princeton," starting "a tradition of academic inquiry in our family." Another chose a book coauthored by her mother about "differentiated instruction in the classroom" as noteworthy because faculty ranks were closed to women until recently. There were also books chosen in honor of deceased family members and books received as gifts from family members. In a career path where women are strategically quiet about family and career balance, it was interesting to see several statements by women like this one, here quoted in full:

> This book is beloved by my three beautiful boys. As all three were born during my husband's and my time as assistant professors at Illinois, the book bonds me to my children and to my husband, while serving as a temporal reminder of uncertainty of the pre-tenure years.

These expressions of the importance of family life are interesting disclosures; the faculty member is newly protected by the guarantees of academic freedom. The typical six-year period (or possibly longer with rollbacks of the tenure clock related to a new child or children) leading up to tenure is a time of scrutiny, and family life is not a usual topic of conversation in academic contexts.

School and career stories reflected pivotal life moments or memories along the path to the successful faculty career. People chose books by influential professors, books that guided choice of major, and books that revealed "exciting new ways of thinking." One person chose "the first book I checked out from the library stacks as a first-year graduate student." Other "firsts" included books that were, for example, the first one read in college, or one that came out the first year of the faculty position that "has since been a beacon." One of the few titles chosen multiple times by several faculty members across the years was Ernest Shackelton's book *Endurance*, and these book stories emphasized the metaphorical resonance between enduring the extreme conditions of polar exploration and the difficulties of graduate school and/or the tenure track.

Some faculty shared *place stories*, remembering their home town, home country, or place of origin, the choice signifying "home and the characters that I once lived amongst." There were book stories that recounted the place stories of family tragedies, such as a history of the "1957 hurricane Audrey that swept through a very remote area in coastal Louisiana" and "colored the lives of three generations in my family." One described a political place tragedy:

> As a native of Zimbabwe raised on a farm, which was taken away by the government without compensation, this memoir provides an account of the conditions and situation in that country that closely resemble the outcome for my family members.

Place stories also revealed ongoing displacement and the experience of not fully finding a home:

> It is still the story of so many Filipinos around the world, and perhaps a good many other people as well, exiles hovering like ghosts—searching for home. Herein are all the passions and the dangerousness of these specters.

Place stories speak to continuity of emotional connection and nostalgia for location, whether sentimental for remembered home or stories of traumatic disruption so that one cannot go back. In faculty information worlds, some degree of displacement is the norm because universities typically do not hire their own graduates. Perhaps it is not surprising then that dislocation of some sort was implicit in all the place stories. Place stories reveal that some have traveled not only long distances but also across multiple information worlds to arrive at this faculty promotion ritual.

Statements coded as highlighting an *underrepresented life story* provided counternarratives to the ways that academia is racialized and gendered (normatively though not exclusively) as white male space (Cooke 2017). Some faculty used book stories to positively claim identities as people of color, for example by selecting a book that provided "a clear picture of the terms of Caribbean cultural identity" in order to "define and describe the pride I take in being a West

Indian." Another faculty member chose a book that linked their identity to their aspirations: "It is one of the first Hopi-authored books on the Hopi people of northeastern Arizona, and it has always inspired me to write Hopi books of my own." These counter-storytelling moments were widely varied, but all had in common assertion of identity as important to this celebration.

Life stories demonstrate that many faculty choose to share personal information through this professional book stories ritual. At the same time, not all choices about identity rest entirely with what the storyteller chooses to tell. For example, a faculty member of color may choose to reflect on being racialized or not, and yet, as Sara Ahmed points out, people of color in academia "*already* embody diversity by providing an institution of whiteness with color" (Ahmed 2013). Therefore, the choice to highlight one's own underrepresented identity is a form of counter-storytelling that asserts the right to belong. It is not surprising, then, that the statements of faculty members who highlighted their own underrepresented identity were frequently also coded in the social justice theme.

Social Justice

Faculty framed social justice in personal and academic terms, sometimes blending the two. Academically, many books documented and named ongoing social injustices to make the case to right these wrongs. Books were selected because they provided, for example "important social criticism of and for race and democracy in America" or combined analysis with science fiction (*Parable of the Sower*, by Octavia Butler) in a way that "demands justice in the face of pessimism." Some chose a particular life story, such as *The Autobiography of Malcolm X*, because of being "about transformative change of an individual who struggles and strives for social justice." Some issues were explicitly personal, for example, the choice of a book that "provided a name, a concept and a framework for understanding how working-class identity is lived out." This faculty member also noted that the book "echoes both the voices of my education and the voices of my cultural traditions." Others wrote about the personal importance of authors from underrepresented groups, like Gloria Anzaldua, whose book was chosen because, as one faculty member wrote, "her prose has given me the strength and courage to embrace the tensions in my own work and life. This book reminds me that I am part of a movement of decolonization in academia and in solidarity with others."

Other statements highlighted books that made landmark academic contributions, adding what was previously excluded as a form of social justice. One faculty member provided this rationale for book selection:

> It is the first comprehensive treatment of indigenous maps and mapmaking—a topic that has been largely neglected by geographers and historians of cartography who focus almost exclusively on 'Western' maps.

The social justice theme encompassed analyses of causes of injustice, calls for necessary change, and visions for better futures. As in the previous section, many of these selections were counternarratives in an academic context. In this theme, commitments to social justice rendered intrinsic interconnections between information worlds more visible. As libraries strive for greater diversity in their ranks and full inclusion in all in their services, looking to faculty book stories could inspire social justice action on an institutional level.

Other

Playfulness characterized most statements that did not fit any other coding scheme. *Humor* was comparatively rare, but often relied on the brevity of the book stories format. For example, one person selected a German brewery menu: "Life is too short to drink bad beer." Another person chose the book *Uncommon Fruits Worthy of Attention: A Gardener's Guide*: "I like unusual fruits." One faculty member played with form, poking fun at the formality of academic jargon: "It is a seminal discourse on the expectations, perceptions and reality of the journey of today's young adults within the American culture; oh yeah, and it has really neat pictures!" In the context of academic language and ritual, humor arises in the contrast between serious critical language and "neat pictures."

Among those *uncategorized* were faculty who took the opportunity to be mysterious, writing just an evocative word or two, such as "Gratitude" or "Beautiful evidence." One left only a scavenger hunt clue: "Pages 142, 143." A few books had *no book story*, meaning the faculty member chose a book but did not compose a statement to explain their choice, exercising the power of the storyteller to withhold stories. This theme reflected a conscious breaking of expectations as writers deliberately baffled the audience, refusing to conform to the expectations of the genre. For example, in resisting the solemnity of the occasion, one person wrote: "I also couldn't think of anything I had read lately that touched me very deeply. Perhaps I am getting less deep in my old age."

Topic Modeling

Topic modeling complemented thematic analysis by confirming the coding scheme and suggesting a future research path. In a qualitative application of a more typically quantitative text-mining research tool, topic modeling was used to sort the full text of twenty years of statements for word frequency and proximity. The output consists of sets of closely related words in the corpus by these two measures.

Two coders assessed and sorted the topic modeling output and found that fourteen of twenty topics modeled confirmed the qualitative coding. Themes were clearly related to the word sets, and they were related in a similar proportion to the frequency of the appearance of that coding in the corpus (see tables 3 and 5 above). Table 4 shows the fourteen topics that confirmed one or more themes.

TABLE 6 Themes and Topics	
Theme(s)	**Word Sets from Topic Modeling**
Career stories	work, field, shape, topic, community, include, graduate, major, contribution
	author, book, teach, choose, mentor, teacher, friend, teaching, guide
	book, university, interest, Illinois, academic, inspiration, engineering, excellent, lead
Good books	write, insight, literature, offer, writer, English, reader, beautiful, volume
	book, great, good, make, give, challenge, reminder, writing, support
	book, important, early, knowledge, mind, fundamental, learn, pursue, influential
	book, student, collection, continue, publish, edition, reference, textbook, resource
	world, inspire, hope, scientific, age, open, eye, view, classic
	theory, wonderful, nature, problem, approach, information, understanding, technology, model

TABLE 6 Themes and Topics	
Theme(s)	**Word Sets from Topic Modeling**
Life stories	life, change, personal, remind, perspective, grow, place, capture, journey
	read, book, child, learn, love, favorite, young, enjoy, mother
	people, live, family, language, show, memory, person, struggle, parent
Career stories and Life stories	professor, write, honor, feel, career, describe, father, advisor, begin
	research, influence, area, study, develop, development, profound, undergraduate, graduate school*
*"Graduate school" was considered one term, since these two words were consistently adjacent in the corpus.	

What was left out through topic modeling was any indication of the life stories subthemes *place* and *underrepresented life story* and the **Social Justice** theme. The best explanation for this is that words that signal place (geographic names), underrepresented identities (cultural, group, or ethnicity descriptors) and social justice (anti-racism, protest, democracy, etc.) are as highly diverse in wording as the topics they represent. In other words, these themes could not be captured by the topic modeling process because of the great variety of terms that signaled these meanings. Although semantic analysis might identify place names as a category, many computational methods would miss the significance of this content. This demonstrates the importance of including human coding along with computational methods in qualitative analysis to accurately analyze important information about ethnicity, gender, social constructions of race, and related concepts.

Another interesting finding was the intersection and overlap of word sets in two areas, career stories and life stories. Very similar words appeared in the topics aligned with these two themes, such as mother and parent (in life stories) and father (in career stories). It is interesting that these words, though closely related, echo societal gender biases. Other words such as "grow, journey, influence, develop" show overlap between these categories. For many people, career stories were aligned and intertwined with individuals' lives, which may speak to how privileged backgrounds facilitate pursuit of faculty careers.

The other six topics suggested language patterns related to academic discipline—construed broadly as the humanities, sciences, and social sciences. These were not captured in the qualitative coding process. Again, the output consists of sets of closely related words in the corpus, so these groupings of words are kept together. Each of the word sets appears in the column on the right, and the related disciplines that the coders identified appear on the left.

TABLE 7 Disciplines and Topics	
Discipline	**Word Sets from Topic Modeling**
Humanities	history, work, text, write, represent, music, scholarship, scholar, create
	time, find, experience, book, read, introduce, artist, powerful, career
Sciences	book, science, understand, scientist, present, modern, fascinating, introduction, material
	book, system, biology, process, focus, aspect, evolution, central, plant
Social Sciences	social, idea, human, economic, question, society, intellectual, role, practice
	study, culture, today, political, power, art, American, issue, woman

Future topic modeling analysis of this and other sets of promotion book stories could provide a window on how discipline influences book choices. However, it is a surprisingly difficult task to verify every individual faculty member's discipline. While faculty members' departmental affiliations are recorded with book stories, colleges have changed names, merged, and otherwise evolved rapidly over twenty years at just one institution. Further, some colleges and departments are multidisciplinary, from large colleges like Liberal Arts and Sciences to iSchools. Cross-institutional analysis would be even more complex. Therefore, unfortunately, it is not a simple matter to analyze book story patterns (or book choices themselves) in relation to the faculty member's discipline. Still, these findings suggest promising avenues for future research analyzing faculty member's disciplinary affiliation and book story meanings.

Discussion

In the competitive spaces of academia, celebrations are infrequent, and collective celebrations of accomplishments are extremely rare. At a time when personal and profound meaning are mostly absent from research questions in library and information science, this study shows that they are nonetheless present in information institution practices. Book stories are important for the work they do in several dimensions: as celebration, as connection to the library at/as the institution, and for the meanings they convey. This analysis shows that life stories have greater presence in book stories than in the past. Along with a decrease in career stories, this suggests that personal meaning is becoming more acknowledged in academic contexts. Book stories celebrate faculty achievements and commemorate them for the future, pushing back against the tendency for "milestones in the lives and careers of faculty" to receive "little celebratory notice" (Fischer, Conger, and Bazirjian 2007). Making achievements of all faculty more visible is particularly important in an institutional context where there are still many improvements to be made in equity, particularly in the promotion and tenure of BIPOC faculty (Gutiérrez Y Muhs et al. 2012).

Another vector of importance relates to the library and the role it plays in the life of the faculty and in the university. One academic librarian described the challenge of communicating the place of the library:

> So often we ask, not at all rhetorically, "Where exactly is the library? What does it mean anymore to be in the library?" Hosting faculty recognition programs can help readjust the balance of the library between being simultaneously a real place and a cyber place, so that the physical presence, the "place of the library as the center of scholarship on campus, can be reaffirmed (Riddle et al. 2005).

Among other things, this ritual of celebration is important because it centers the library in the institution as a site of pleasure, of celebration, of satisfaction and even of marvel at the many lives dedicated to knowledge accumulated. Book plates are a concrete way of inviting every promoted scholar into the library, seeing themselves in its collection. Some patterns of meaning in book stories provide fresh avenues for thinking about the library in the life of the faculty member, as a contribution to research on the library in the life of the user (Wiegand 2015). Tensions around the library's position in the university have been heightened as physical buildings have closed or diminished in occupancy due to COVID-19 and library websites became the primary or sole library presence. Revisiting, revising, and reinventing this and

other venues for celebration with the library will take on new meaning in postpandemic times. Understanding the histories of rituals like this is one important means of informing decisions about what kinds of presence libraries will sustain or re-create in academic institutions going forward.

Research on individuals' information sharing in positive contexts has found that "sharing happy information is important for building, maintaining, or strengthening relationships" (Tinto and Ruthven 2016). Faculty are stakeholders in academic libraries, but for practical reasons engaging them tends toward conversations with administrative leadership, such as department chair, or more general "spending time with faculty" (Harland, Stewart, and Bruce 2019). A national survey documenting the "current state of librarian roles in campus-wide faculty development" demonstrated that librarians are building new roles as willing partners in faculty development efforts (Fribley, Vance, and Gardner 2021). Book plating celebrations and other practices can strengthen the relationship between the faculty member and the university and the faculty member and the library. Rituals like these deserve greater visibility as a way that libraries engage stakeholders. Academic librarians could also use these insights to experiment with innovative ways of engagement. In a context of increasing trends toward personal information sharing, libraries have a role in expanding bridges between the personal and the professional to extend the impact of the library.

In information worlds theory, Jager and Burnett describe "bubbles" that touch at the edges, arguing that most people live in multiple information bubbles. In this theory, "boundaries between the soap bubbles represent points of contact between different small worlds" (Jaeger and Burnett 2010). This analysis revealed that meaning is made at precisely those places where worlds intersect, in rituals and book stories. Separation of career and family is set aside, and interconnections between life stories and academic paths become clear. Faculty members reveal where they came from, how they became academics, and who helped them along the way. These book stories represent the first ritual moment of expression after tenure, perhaps the first use of a newly protected voice, and it is telling that they have increasingly been used to share life stories. Librarians could use what is revealed here to lower barriers and remove obstacles. For example, understanding that a faculty member succeeded despite obstacles such as traumatic displacement from their homeland makes possible empathetic approaches that consider the whole person's needs as a member of an academic community. As the cornerstone of one's academic home, it is fitting that libraries should sustain and grow ritual opportunities like this one to share stories.

If the metaphor for information worlds theory is "a sink full of soap bubbles," then storytelling is the surface tension that defines and spans the spaces between bubbles. The act of storytelling—sharing and listening to stories—is one way that information worlds touch. Storytelling is a strong tension; tellers tell, audiences listen, and tellers become audiences (and vice versa). Metaphorically, the library is the sink, the immediate container through which these particular sets of (small world) bubbles touch. And, just as a burst soap bubble may leave a faint impression, brief book stories leave a trace from a moment of career celebration. However, the storytelling between the "bubbles" of information worlds is not simple. Faculty may choose to share or not share about, for instance, their children or home life, and faculty who are from racialized, underrepresented groups may choose whether to include their identities in book stories, but underrepresented faculty cannot consistently choose how they are identified by others. What a person can do is to choose what to claim and amplify

when invited to tell, whether they choose career stories, life stories, or counter-storytelling with social justice aims. These complexities point to the power (and limitations) of faculty member as storyteller. Understanding these dynamics allows librarians to consider this history in looking ahead to postpandemic reinventions or adjustments to the presence and meaning of the library in academic culture.

Storytelling offers one additional practice as concept: retelling. In career as in life, important stories are told again and again. Book stories frequently feature mentions of the length of time that a person has lived with a book as indicative of its importance. Books are part of faculty life stories, and the value of books is inherited from advisors, taught to students, passed around with colleagues, and otherwise shared. The enduring importance of books for people is both real and rhetorical in faculty information worlds. In book stories, mentioning time is a way of communicating: Pay attention. My story with this book encompasses and represents years of life experience.

Conclusion

Analyzing book stories by two methods reveals strong patterns in collective meanings (career stories, life stories, etc.). Books can catalyze life events and inspire career directions. Books are woven into family life, in reading to children, and across generations. Books serve as portals to new passions and inspire entire research careers. Twenty years of book stories also reveal that time matters, and that life stories are shared more often over time. Questions remain for future research, including analysis of book contents, how choices relate to the discipline of the celebrant, who did not participate and why, and comparisons across institutions with similar rituals.

Faculty information worlds are often experienced individually, and yet these rituals instantiate the library as a space of commonality, virtually and physically. Library practices of soliciting and collecting book stories generate a record of conversations, with continuities and tensions, reflecting generations of reading and meaning making. In a context of increasing trends toward personal information sharing, libraries could claim a larger and more deliberate role in bridging the personal and the professional. Further opportunities for collecting and sharing other book stories could be a positive step, as could any innovative practices that allow information worlds to intersect, stories to be told, and librarians to listen. Engaging the dynamic relationships between teller, audience, and story could bring the library into sharper focus for faculty, who often know more about one database than about librarians' work. Sustaining, reviving, and innovating new forms of storytelling connections could extend the impact of the library as the bedrock of the academic community.

Acknowledgements

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Conducting a User Needs Assessment through the Consortia: Pooling Resources to Examine Student and Faculty Habits

Ruth Szpunar and Eric Bradley*

From 2016 to 2020, ten smaller schools in one regional library consortium participated in a user needs assessment project. This article documents the process for implementing a collaborative user needs assessment by utilizing the shared interest and enthusiasm of a team of librarians to create a consortial toolkit. The toolkit supplied direction and leverage to conduct ethnographic research at consortial schools while providing clarity and consistency for testing across multiple sites.

Introduction

Students at small to medium-sized private colleges and universities exist within a diverse smattering of close-knit campus communities. These students and the schools they attend represent an important sector of higher education often overlooked in the literature on ethnography in libraries. Many of these schools have missions unique to higher education and attract specific demographics of students. With limited resources, these schools often lack the opportunity on their own to conduct student behavioral research, particularly observational approaches such as ethnography, that can provide insights beyond mere numbers. While existing ethnographic research can help these libraries support students in general, specific local research is missing on how these libraries can best support their students within their own campus contexts. However, the regional library consortium Private Academic Library Network of Indiana (PALNI), working with a shared pool of resources, developed an efficient model of ethnographic research by creating a collaborative toolkit to investigate the research habits and needs of this group of users.

Literature Review

The use of ethnographic methods among libraries and librarians blossomed after anthropologist Nancy Fried Foster's research at the University of Rochester on student study habits.[1] Ethnography is "a scientific approach to discovering and investigating social and cultural patterns and meaning in communities, institutions, and other social settings."[2] Roger Sanjek describes

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it as both a product (written work) and process (methodology), rooted in an anthropological triangle with comparison and contextualization.[3] This literature review focuses on ethnographic methods, such as the techniques of observation, interview, and questionnaire, developed by anthropologists to conduct ethnography.

The use of ethnographic methods and other forms of qualitative research "allows you to make fine distinctions and see ambiguities in your data… [and] facilitate in-depth and open-ended investigations into observed phenomena, often allowing the researcher(s) a great deal of flexibility in pursuing research questions."[4] Ethnography isn't an easier way of collecting data but a way to collect data chosen specifically because of the viewpoint it allows the researchers to take. It looks at a phenomenon or process within a context or culture by asking the participants to describe and demonstrate their lives. Ethnography looks for themes rather than proof.

An extensive literature review of ethnographic methods in libraries found eighty-one published studies, the majority published after 2005, most of which used observation or interview methods.[5] A later literature review outlined three primary ways in which libraries were using ethnographic methods: to evaluate space assessment, to monitor student behavior, and to assess library resource usage.[6] Other reviews focused on the use of visual research and spatial theory in library space studies.[7] Many of these studies pull heavily from the Ethnographic Research in Illinois Academic Libraries (ERIAL) project's guide to ethnographic research.[8] Project Information Literacy has used ethnographic methods in its reports on student information usage habits since 2009; in 2015, it began the professional community UXLibs, which supports an annual conference, yearbook, and training events.[9] While ethnographic methods have proliferated within libraries, such usage has not reached maturity, with challenges of buy-in and awareness across library leadership and staff limiting adoption.[10] Likewise, anthropologists have criticized libraries using ethnographic methods without an ethnographic mindset or set ontological assumptions, arguing that measurable, short-term projects to fix problems miss the goals and purposes of ethnography and can result in incomplete results.[11]

Most published library ethnographic projects come from large universities with the staffing and support for such work, although scalable testing models suitable for smaller colleges are becoming more common.[12] A handful of studies do exist from smaller liberal arts colleges, frequently as part of consortial collaborative efforts. Illinois Wesleyan University (IWU), with a 2009 enrollment of 2,066, was one of five members of the ERIAL project conducted in 2008–10, which utilized fourteen different interview and mapping methods to investigate student study habits. IWU implemented thirteen of the fourteen methods with 245 participants.[13] Reed College, with a 2014 enrollment of 1,339, conducted a mapping activity and focus group in Spring 2014 with seven student participants, asking about their research process and how they obtained a print book from the collection. The project was developed using a service design which employs an ongoing working group of participants.[14] Gustavus Adolphus College (GAC), with a 2015 enrollment of 2,457, was one of eight members of the "A Day in the Life" (ADITL) project, where 19 GAC participants received text messages throughout the course of one day asking for their location, activity, and feeling. Results were geocoded and maps were created of each student's day.[15] GAC's own study on student research experiences in spring 2018 included interviews, a mapping activity, and photo diary.[16]

In the literature, collaborative ethnographic projects take one of two forms: studies conducted across a multicampus college or university system, and studies conducted across

multiple independently functioning universities. There is currently a gap in the literature for consortia-led studies. Studies across multicampus college or university settings include the 2009 to 2011 City University of New York (CUNY) system's six-site Undergraduate Scholarly Habits Ethnography Project, and the 2013 to 2016 Montgomery College three-site study.[17] Collaborative multi-university collaborations came in all shapes and sizes. The ERIAL project was focused on colleges and universities within a shared geographic area: the state of Illinois.[18] A three-site study focused on a specific library type, performing arts libraries, while the schools were scattered across the country (Clark et al., 2020). The ADITL project's participants were from diverse college and university types, selected "based on their libraries' capacity and experience in undertaking ethnographic research."[19]

The literature highlighted above illustrated for us the challenges of small and/or under-resourced institutions to conduct quality ethnographic research, which included staffing levels, skill sets, and institutional support. To address these challenges, smaller colleges often leveraged collaborations and sought out anthropologists outside the organization for consultation.

A Consortial Toolkit

PALNI's 2014–16 strategic plan called for "strengthening libraries' ability to demonstrate relevance and value" and "assessing user needs and behaviors." To fulfill this strategic initiative, PALNI's executive director asked that a user-needs assessment study be done. We needed to develop a model that would fit the diverse membership of our consortium, that would support a long-term project, and include, but not be dominated by, staff with some background in user research. In order to conduct our consortial-level user needs assessment, we designed a consortial toolkit for the project. While the ERIAL Project's *Practical Guide to Ethnographic Research in Academic Libraries* provides helpful advice and documentation, we decided to go one step further and create a digital toolkit with all the documentation and information needed to perform the study based on our group's literature review.[20] To our knowledge, ours is the only such consortial toolkit for conducting a user needs assessment. This article will walk through our process of creating and using a consortial user needs assessment toolkit (see appendix A for a link to our toolkit).

Project Team

We started our user needs assessment by bringing together a project team. We have found that successful projects at this scale generally require at least one consortial staff member to head the project. Given that capacity at individual schools may be limited for ethnographic research, a centralized person dedicated to this task (even if the project is just one of their various job tasks) is key.

Our project team originally consisted of three consortial employees (two of whom worked part-time for the consortium alongside their other librarian commitments), five librarians employed by libraries in the consortium, and two LIS graduate student interns. Structured as a short-term task force, the team was open to any librarian employed in the consortium. As the project progressed, the team shrunk to four members, due to attrition. This did not cause a problem, as the bulk of the work of designing the toolkit was done up front, and the team became more efficient over time. Our first task was to determine research questions and methods. As Arnold Arcolio, a user researcher for OCLC, advises: "Clearly define your research questions. Otherwise, you'll

spend the rest of your life reviewing the data and finding interesting things."[21] As a group, the team developed a large list of research question ideas derived from previous studies. We ranked and prioritized the questions, then removed questions outside the scope of our study, such as those focusing on information literacy or directly on individual libraries. Our final research questions focused on three areas: faculty, spaces, and study habits (appendix B). After our research questions were complete, we chose five methods from the dozens available that we believed would be manageable for anyone to implement. These methods, which included interviews, photo essays, photo collages, day mapping, and library mapping, were intended to elicit robust responses to our research questions as well as complement each other. We specifically excluded surveys from our method list as we wanted qualitative versus quantitative data.

TABLE 1 Ethnographic Research Methods	
Method	**Details**
Interviews	We asked students fourteen questions about their study habits. We asked faculty eight questions about their research and their students' research. The interviews lasted between ten to thirty minutes. **Pros**: The most effective method for answering all our research questions. **Cons**: Allowed for the least amount of creativity on the part of participants.
Photo Essay	We asked students to take twenty photos over a forty-eight hour period, each corresponding to a specific prompt about their study habits. We then asked them to participate in a short interview in which they explained why they chose each photo. **Pros**: Provided an in-depth look at a participant. **Cons**: This was the most challenging of our methods to schedule as it required two meetings with the participants.
Photo Collage	We chose 300 stock photos and printed them on heavy cardstock the size of a business card. We laid them across a table and asked students to pick five photos that answered a question. Each student responded to three questions, so they chose a total of fifteen photos. We then asked them to tell us why they chose each photo. **Pros**: This was the method that attracted the most students. Students would stop by without being asked just to see what we were doing with all the shiny cards. It worked great in a busy location such as a coffee shop. **Cons**: The need to store and share cards between team members and schools took extra time.
Day Mapping	We asked students to draw a map of their typical day around campus. We then asked them to explain the map to us. **Pros**: This was a great method for learning about student traffic patterns that were not shared using other methods. **Cons**: This was the most difficult method to visually represent in our reports.
Library Mapping	We asked students to draw us a map of their normal route through the library. We then asked them to explain the route to us. **Pros**: Multiple methods identified popular study spaces in the library, but this was the method that related the spaces to one another most effectively. **Cons**: The method was limited to the library and library users.

Toolkit Overview

Now that the basics of our study were determined, we decided to create our toolkit on Google's Team Drive product, already in use by the consortium. We stored the toolkit on the Team Drive with public visibility, and all the project documents and data on a separate Team Drive only visible to the project team. (Alternative solutions could include Microsoft OneDrive or wiki software.) We chose the Team Drive approach because everyone in the consortium could access files stored there, and the files could easily be updated, but only by our project team.

In our collaborative toolkit, we included the following documents: an overview of the project, a methodology chart, a list of research questions, applicable information for Institutional Review Board (IRB) applications, demographic forms, descriptions of how to implement each method, and signage and recruitment templates.

In the project overview document, we chose to include the following information:

- What is a user needs assessment? (Local definition based on the literature)
- Why should I participate in a user needs assessment? (Local justification based on the literature)
- A high-level overview of the research questions
- A high-level overview of the methods being used
- Information about the (IRB) process
- Details about how coding would be performed
- Information about incentives for participants

The methodology chart provided a clear overview of each of the methods used in the study and why a school might choose or reject to implement a method at their school.

TABLE 2 Example Method from Methodology Chart	
Method	**Photo Collage**
Library Needs Met	Physical spaces Physical resources General feedback
Research Questions Answered	What variety in study spaces do students need? What would students consider their dream workspace? What spaces on campus do students use for studying? Why do students choose a study spot?
Description	Participants are asked to describe life, research, and spaces through pictures. Geared toward students.
Equipment Needs	Printed photos (available from the consortium office)

Since IRB approval is required before conducting ethnographic research, we included an IRB folder in our toolkit to help each school obtain approval on their campuses. While IRB approval processes vary widely by school, we provided the standard required information. Additionally, we found that it was easier and faster to have the consortial employees from the project team fill out most of the IRB paperwork for each school, as they were already familiar with variation in IRB forms and the project. Sometimes schools would need to share the IRB forms, as they were hidden on intranets or other locations only accessible to employees of the school. Many schools also required the project team to take some training covering research

with human subjects. The most common site for this training is the Collaborative Institutional Training Initiative (CITI Program). We had each member of the team acquire CITI certification at the beginning of the project.

The next piece of our toolkit was the demographic forms that were used for the entire study. The data points we chose for students were school, academic status, age, gender, major, GPA, housing location, devices owned, enrollment status, first generation status, employment status, affiliation with a fraternity or sorority, or international status. (A note about gender: We asked for gender but did not include it in any of our data analysis or reporting. We only did a quick check to ensure that we spoke to multiple genders on each campus as a representative sample of the population.) For our faculty participants, we asked for their department, research specialty, number of years spent teaching, and whether they teach online classes. For our study, we used JotForm's free plan to create our demographic forms. In our investigation of form platforms, only JotForm gave us the ability to assign each of our participants a unique ID number. Neither Google Forms, Survey Monkey, or any of the other products we investigated at the time could do this for the same price point or at all. JotForm also allowed files to be uploaded for the methods forms, which we used for several methods.

The largest piece of our toolkit was a document for each of our methods that included a method description, research questions covered by the method, and steps to conduct the method. (Appendix C contains an example method document.) This included a list of items necessary to perform the method including consent forms, writing utensils, demographic and transcription forms or links, a fully charged audio recording device, and specific items for a test method such as paper, markers, or photographs. These documents explain the methods and make the method process easily reproducible by anyone, regardless of whether they were a member of our project team.

The final piece of our toolkit was a detailed list of items needed for a campus visit. This included clear and consistent language for signage and recruitment templates that campuses could adjust to match institutional branding.

Toolkit Implementation

Once our toolkit was complete, we ran a beta test during the summer of 2016. Each member of the task force conducted a method with a student worker or faculty member colleague at their own school to see what tweaks needed to be made. As we started the beta testing, we received promising feedback. One researcher still regrets that she could not actually write up a report with a student's comments, which she found very insightful. Similarly, she walked away from her faculty test with at least two action items based on the faculty member's responses.

Then, we moved forward with piloting the study. We chose a larger, centrally located school for our pilot test. We involved every member of our project team and performed every method in our toolkit. Along with finding stress points in our toolkit, we were also able to share with each other the experience of conducting each method and its testing benefits and drawbacks. We continued having debriefing meetings after each campus conducted the study to share initial insights with the whole team. Our next step was for the consortial employees to work together to establish a code tree for the project (appendix D). We scanned numerous sources for this process, but the most practical source we found was *Qualitative Data Analysis: A Methods Sourcebook*, by Miles, Huberman, and Saldaña.[22] For our coding we used Dedoose, web-based software for qualita-

tive data analysis. We looked at other options, including CATMA and QCAmap, but found that Dedoose worked best for our purposes. We chose to code the data for each individual school as the study progressed, rather than coding all the data at the end of the study. Then we shared the coded data with the members of the project team for further analysis. Using the analyzed data, we worked together to produce a report sharing the results of the study for each school. Each report included:

- A project overview
- Demographic information on participants
- Research questions
- Research question findings
- Highlighted findings
- Most-used terms from participants
- Questions aimed at starting insightful campus/library conversations
- Specific method sections (such as maps of student paths around campus and/or their library)

We wrote our reports in Google Docs (visibility set to public) as the consortium was already using that product, but as mentioned earlier, Microsoft OneDrive or wiki software would also work well. We used ArcGIS and Carto to create the mapping pieces of our study. There are dozens of mapping programs available, but these were the two with the features we wanted to include.

After piloting the study, it was our intention for member libraries to take this toolkit, conduct the ethnographic tests themselves with the guidance of a team member, then share the results with the team, who would code them and write a report of the findings. Originally, this was the benefit of developing a toolkit. The reality turned out to be much different. With limited staffing, the burden of becoming acquainted with a toolkit and making time to conduct a study was too much for most of the schools. Rather, each institution requested a visit from a project team member to conduct the study. The institutions worked with that project team member to determine the methods that would be used at that campus and the timing for the study, and to complete the IRB paperwork. One site additionally provided librarians to facilitate some of the testing. Having dedicated interns helped with this process, as we sent them to several schools without having to send another member of the project team. Our interns also did much of the coding for the project. While the toolkit did not become a transferable tool for individual schools to use, it became increasingly helpful for the project team over time, as it provided clarity and consistency with standard language and procedures to implement across campuses.

Study Completion

Our study ended earlier than planned, as the COVID-19 pandemic forced our last two schools to cancel midway through IRB approval. At this point, 194 students and 14 faculty members across ten schools had participated in the study. We finished our project by debriefing and writing our final report as we had all along using web conference meetings and collaborative writing tools, another positive result of the collaborative approach. We reanalyzed the coded data in its entirety as well as results from each school. We also made recommendations for future testing. In each individual school report, we gave answers to each of our research questions. In our final report, we generalized our findings to share generic PALNI students' study

habits. We also included personas to represent twelve of the most common types of students who participated in our study (appendix A).

Discussion

Creating a collaborative consortial toolkit was a successful approach for our team, even though our individual libraries did not have the capacity to implement the toolkit on their own. This approach helped build individual skill sets and added local expertise in using ethnographic methods. It developed collaborative relationships between consortial staff and members of the project team, along with the librarians at each school who participated in the project. It also focused the project with a clearly defined end in mind, keeping it consistent along the way. As librarians entering the world of ethnographic testing, we quickly realized there was a large gap between our areas of expertise and those of anthropologists. Our strengths as professional research librarians allowed us to develop a robust literature review on this subject area and dive deep into a topic with which we were otherwise unfamiliar. With the resources of the consortium backing us, we sought out collaborations among fellow librarians to complete this work, as well as the insight of a professional anthropologist. We also were able to easily organize and document our project and share it with others in the form of a toolkit. Thus, our inexperience in conducting ethnographic testing was an asset, not a liability.

However, it was a challenge to convey the value of ethnographic testing and our project to stakeholders. After our project team presented the final toolkit to the consortial board, it was slow to gain traction for implementation. After repeated one-on-one conversations with stakeholders and successful site visits implementing the toolkit, word spread about the toolkit's value and benefits, which then resulted in interest in the project. It was also a challenge and a steep learning curve to learn how to evaluate the coded qualitative data and make definitive statements from our research.

During our consultation with the professional anthropologist mentioned above, we were told: "At the end of your study, you will discover that all students are the same." However, the benefit of using ethnographic methods was that these procedures helped us understand our individual students' specific preferences. While *all* students may seek a place that they feel comfortable, our study allowed us to find the places and spaces in which they feel comfortable on each campus, allowing librarians to develop programs and spaces to meet their students' needs more specifically. Every library director or dean who participated in the study appreciated both the process and the results. Each library rearranged or bought new furniture, redecorated spaces, and more. As Tonya Fawcett, Director of Library Services at Grace College and Seminary, wrote, "the experience was great (even without knowing the results) and my concerns about how much time it would require from us were unfounded." Julie Miller, then Dean of Libraries at Butler University, shared that "We used [the report] to inform our strategic priorities. I also used it when I was part of the executive team that visited Wabash College as they were in the process of hiring a new library director. It helped the search committee made up primarily of faculty and administrators to understand the ways in which PALNI can provide support, especially for institutions with relatively few library staff."

Conclusion

Using a shared pool of resources through our regional library consortium allowed us to develop an efficient model of ethnographic research to investigate our users' research habits

and needs. Working through a consortium gave us the resources we needed to complete this project and allowed us to compile a dedicated team to develop a collaborative toolkit model to work with all our schools, as well as the scope and limits of our study structure. While we hit a few bumps and roadblocks along the way, the toolkit allowed ten small private institutions to conduct a thorough user needs assessment without requiring substantial local resources.

Acknowledgments

APPENDIX A: Toolkit

Our complete toolkit and reports are accessible by visiting https://libguides.palni.edu/inap.

APPENDIX B: Research Questions

Faculty
- How often are academic sources required for assignments?
- How are faculty integrating information literacy into their classes?
- Where do faculty members do research?
- Where do faculty point their students when they ask for help?

Spaces
- Where do students go to collaborate/work on projects with a group?
- What spaces on campus do students use for studying?
- Where do students study during the late night? (Is this different from other hours?)
- Why do students choose a study spot?
- What library resources (vs. computers, wifi, printers, etc.) are students using while they are in the library?
- What variety in study spaces do students need?
- What would students consider their dream workspace?

Study Habits
- Where do students find their class readings?
- What items help students study?
- What distracts students from studying?
- Whom do students ask for help with studying?

APPENDIX C: Example Method Document

Students—Day Mapping
Description
Day mapping is used to visually illustrate a participant's needs and the series of interactions, places, and resources that are necessary to fulfill those needs. In this activity, the participant is given a campus map and asked to track their movements over the course of a day. Afterward, the participant will explain their map in a short interview. What makes this methodology unique is its ability to highlight the flow of the participant's daily experience with critical pain points, where our attention and focus will have the most impact..

For informational purposes, things we want to learn (research questions)
- What spaces on campus do students use for studying?
- Where do students study during the late night? (Is this different from other hours?)
- Why do students choose a study spot?
- Where do students go to collaborate/work on projects with a group?
- What would students consider their dream workspace?

Before you start testing
1. Have consent forms printed and writing utensils available.
2. Have the following pages open in a web browser:
    a. Demographic form: [insert link here]
    b. Transcription form: [insert link here]
3. Have blank paper or printed campus maps.
4. Have recording device available and ready (if using).
5. Request access to the Google folder the maps will be uploaded to. (This will be granted within one business day.)

Procedure
1. Review and follow general guidelines in the Getting Started Document.
2. Have the student sign a consent form.
3. Have the student fill out the demographic form
4. Open this form (contains all questions): [insert link here]
5. Give the student a blank piece of paper or a printed campus map. Then, ask the student to do the following:
    a. With this map, draw out your usual routes and activities during a typical day. After you finish, I'll ask you a few questions about your map.
6. *Optional:* If using a recording device (audio/visual), begin recording, ensuring the microphone is close to the student.
7. Ask the student the questions on the form and transcribe the answers. Include the student's participant ID number (see Getting Started Document). Submit the form.
8. Thank the student for their time and allow them to leave.
9. Add student participant ID number to the finished map and take a photo or scan it.
10. Upload the digitized map to the Google folder.
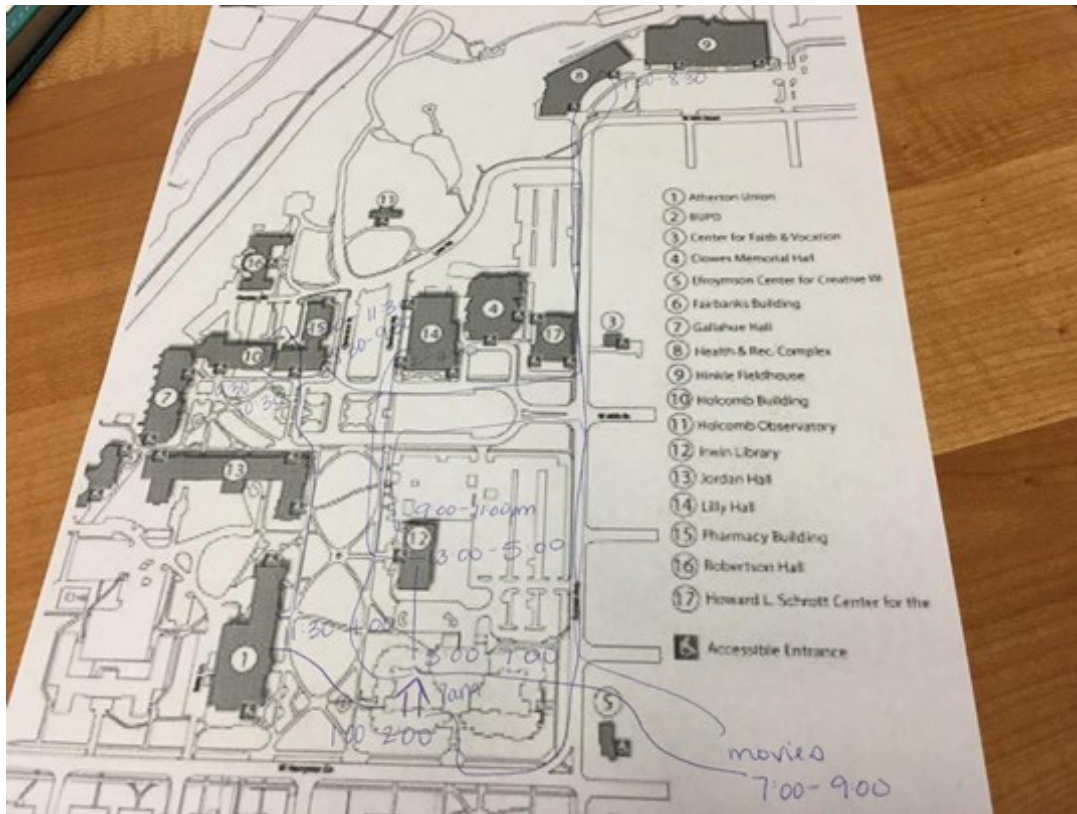
Example Student Map

Debrief Interview

Q – Please provide an overview of your day.
A – It was a Tuesday, so I have class from 8:30 to 11:30 and then I work in the afternoon. I worked out in the morning and went to a movie at night.

Q – Let's go into more detail. Can you please walk us through each part of your day, letting us know what specifically you were doing in each location?
A – I left my house at 7am and walked to the HRC to work out.

Q – What did you carry with you?
A – Backpack, change of clothes, books for my first two classes, water bottle, my phone.

Q – Okay, let's go back to your map. You're at the HRC…
A – I showered and rushed to class in the Pharmacy building by 8:30. I was in class from 8:30 to 11:30. I go back and forth between Pharmacy and the Science Building. Then I went to lunch in Atherton and home for an hour to change for work. I went to one more class in Lily and then to work for two hours at the library. I went home again for dinner and to relax a bit. My friends wanted me to go to a movie, so we drove off-campus. Then at night, starting around 9, I had to get homework done so I went back to the library.

Q – Was that the only time during the day when you were doing homework/studying?
A – Yes, on Tuesdays I don't have time during the day.

Q – If applicable: Where did you go in the library? And why did you select this space?
A – I sat at the tables on the second floor. I like the first floor better, but it was crowded and I knew I needed someplace with no distractions.

Recommended Resource
- Chapter Seven: Mapping Diaries, or Where Do They Go All Day from *Studying Students: The Undergraduate Research Project at the University of Rochester*

APPENDIX D: Coding Schema

Category 1: Faculty
- Code: Academic sources
  » Use for any mention of academic sources or sources used in course work.
- Code: Information literacy
  » Use for references to finding, selecting, using, or evaluating sources. This includes plagiarism, citations, information literacy, or similar phrases.
    1. Child codes: Use when any of these terms are mentioned:
       a. Plagiarism
       b. Citations
       c. Evaluating Sources
- Code: Research locations
  » Use when faculty members specify a physical or virtual location in which they do research.
- Code: Research guidance
  » Use for any mention of faculty recommendations for research help.

Category 2: Spaces
- Code: Study spaces
  » Use for any mention of a space used for studying or course work.
    1. Code: Group Space
       a. Use for any mention of groups working together on an assignment.
    2. Code: Late-night spaces
       a. Use for any mention of late-night studying.
    3. Code: Library
       a. Use for any mention of library as study space
    4. Code: Study Space reason
       a. Use when a reason is given for choosing a space for studying or doing course work.
          i. Child codes: Use when any of these terms are mentioned:
             1) Beauty
             2) Comfy / Cozy
             3) Flexible space
             4) Food
             5) Natural light / Windows

      6) Not quiet
      7) Outlets
      8) People
      9) Personal space / Spacious
      10) Printers
      11) Projector
      12) Quiet
      13) Secluded
      14) TV
      15) Whiteboard

- Code: Library resources
  - » Use when any library resource is mentioned.
    1. Child codes: Use when any of these terms are mentioned:
       a. Books
       b. Charging cables
       c. Library computers
       d. Online resources
       e. Printers
       f. Restrooms
       g. Vending
       h. Wi-fi
- Code: Ideal space
  - » Use when any ideal space for studying is mentioned.
    1. Child codes: Use when any of these terms are mentioned:
       a. Beauty
       b. Books
       c. Candles
       d. Coffee
       e. Comfy / Cozy
       f. Food
       g. Good light
       h. Mentor
       i. Music
       j. Natural light
       k. Open
       l. Outdoors
       m. Outlets
       n. Quiet
       o. Screen
       p. Secluded
       q. Table
       r. White Noise
       s. Wine

Category 3: Study Habits
- Code: Course readings
  - » Use for mention of discovering, location of, and use of student's course readings.
- Code: Distractions
  - » Use for noting what items, people, or places distract students from studying or completing course work.
    1. Child codes: Use when any of these terms are mentioned:
       - a. Doodling
       - b. Food
       - c. Friends
       - d. Games
       - e. Noise
       - f. Phone
       - g. Social media
       - h. Videos / TV
- Code: Research assistance
  - » Use for references to people: peers, faculty, librarians, family, etc. who assist the student with their course work, academic advice, and/or find resources and/or materials for them.
    1. Child codes: Use when any of these terms are mentioned:
       - a. Classmates
       - b. Faculty
       - c. Online
       - d. Tutors / Writing Center
- Code: Study items
  - » Use for mention of items students directly or indirectly use when studying/completing course work or in a study space.
    1. Child codes: Use when any of these terms are mentioned:
       - a. Backpack
       - b. Binder / Folder
       - c. Books / Textbooks
       - d. Calculator
       - e. Chapstick
       - f. Chargers
       - g. Clipboard
       - h. Coffee
       - i. Computer
       - j. Food
       - k. Headphones
       - l. ID
       - m. Keys
       - n. Music
       - o. Paper / Notebooks
       - p. Phone
       - q. Planner

    r.   Wallet / Purse

    s.   Water

    t.   Writing utensil(s)

Notes

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Correlation Between Library Instruction and Student Retention: Methods and Implications

Mary K. O'Kelly, Jon Jeffryes, Maya Hobscheid, and Rachael Passarelli

Eight years of data from Grand Valley State University Libraries show a positive correlation between in-class library instruction and student reenrollment the following fall semester. Using consistent statistical methods over time, controlling for confounding factors, and using a large population (N>16,000 annually) and strict protocols that restrict library employees from having access to individual student data, researchers have developed a replicable, secure process for exploring the relationship between library engagement and student success that prioritizes data security and subject anonymity alongside scalability. Results have informed modifications to the Libraries' instruction program and have raised interesting additional questions about the impact of having classroom faculty who actively engage their students with the academic library.

Introduction

Universities request their libraries to demonstrate the impact of their work with concrete data drawn from a variety of assessment methods in order to make decisions about resource allocation and academic support programming. In response to this kind of evidence-based decision making, libraries have begun looking at the impact of a variety of services and resources on student success metrics, such as grade point average (GPA) and student retention. This paper describes a reproducible methodology and findings that other institutions may adopt to demonstrate the impact of their course-integrated library instruction and to inform further research into the relationship between library engagement and academic success.

Grand Valley State University (GVSU) Libraries found a statistically significant positive correlation between course-integrated, in-person, librarian-led instruction and student retention every year between 2012 and 2020.[1] These findings have been methodologically stable and replicated for eight academic years. This paper shares the unique methods—including analysis scripts—and the results of the analysis for validation and reuse throughout the library analytics community. The paper also provides an overview of the findings and how the results have

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been used to inform and iterate the Libraries' instruction program in order to give a proof of concept on the instructional improvements such studies can facilitate.

The methodology used to determine this positive relationship between library instruction and student retention is made even more significant by the strong adherence to student data security and subject anonymity followed throughout the study. The datasets were pulled from well-controlled course registration data collected centrally by the university and then combined with individual library instruction session data collected by instruction librarians. University Libraries and the university's Institutional Analysis (IA) department worked together to connect library instruction with fall enrollment data and then analyzed that data annually. This methodology prioritized security and anonymity by retaining all private institutional data within the secure environment of IA; the Libraries never held any personally identifying student data.

Review of the Literature

This study is grounded in a body of literature that explores the specific connections between different aspects of library interaction and student retention. These studies followed earlier, broader research on the role of libraries and student engagement, such as that of Kuh and Gonyea, which posited that "Another research question is whether student use of the library and interactions with librarians are associated with persistence and graduation, net of other factors."[2]

A few years later, Oakleaf's *Value of Academic Libraries: A Comprehensive Research Review and Report*[3] helped spark a variety of new research approaches for measuring and communicating the impact of academic libraries. That report focused on "library value *within the context of overarching institutions.*"[4] One recommended approach to ensuring institutional connections was through collaboration with institutional data partners so as to make it possible to connect library data with university data: "Integrating library data with institutional data is critical; without joined data, joint analysis is difficult."[5] This recommendation became a foundational approach for this study.

Other researchers have adopted this approach of comparing institutional-level existing data with descriptive data of library activities, and a burgeoning genre of impact research has analyzed student academic data in connection with library services, tools, and expertise. Those studies range from investigating libraries' participation in recruitment to identifying more specific markers of libraries' impact on retention.[6] Such retention-focused papers have described relationships between student grade point averages and retention with the use of library collections;[7] student retention with general library use;[8] library, instruction, and academic support expenses per full-time equivalent (FTE) population with retention;[9] staffing per FTE with retention;[10] library expenditures with retention;[11] student use of library resources with self-reported development on learning outcomes beyond information literacy such as critical thinking, writing skills, and reading comprehension;[12] and book borrowing and e-resource use with the level of degree results.[13] More comprehensive collections of this type of study can be found in Oliveira's[14] review article on retention studies and the meta-analysis conducted by Robertshaw and Asher[15] on library learning analytic studies.

Background

For eight consecutive years, GVSU, a masters-large comprehensive university with approximately 24,000 students, has consistently identified a statistically significant difference

in year-to-year retention between students who had a librarian visit their class compared to students who did not.

The academic year at GVSU is divided into three sections: fall semester (August to December), winter semester (January – April), and spring/summer session (May – July). This study defines student retention as reenrollment for the subsequent fall semester.

Relationship with the University's Institutional Analysis Office

The first step to implementing a cross-campus collaborative analytics study was to gather administrative support. The Libraries' former head of instructional services initiated the study by first securing the support of the dean, and then, in partnership with an associate dean of the Libraries, met with the director of IA to explicitly ask for one analyst's time to collaborate on the assessment of library influence on student success.

The pitch to IA outlined the benefits to the university: the partnership would protect student privacy by keeping all student-level enrollment data in the IA office, transmitting only aggregate data to the Libraries. The collaboration would also provide IA with direct access to all library instruction data, and the resulting analysis could be used by any campus assessment department or committee to communicate the university's efforts to measure student success.

An agreement was reached that included the following parameters:

1. University Libraries collects its own data about librarian-led instruction sessions.
2. IA analyzes data in large batches, only once or twice a year, following a predictable schedule (e.g., in the two weeks following the end of the academic year) so that they can plan their workload.
3. University Libraries is responsible for the interpretation of the data (although the analyst would be available to answer questions about statistical methods and results).

The IA department at GVSU manages secure student-level data such as GPA, enrollment, and year in school, which was needed for the correlation analysis. It was paramount that this data remained secure, and therefore it was never transferred to the Libraries. Instead, descriptive library instruction data (which contained no student-level data; librarians do not take attendance) was transferred to IA in late August or early September every year for the annual statistical analysis. This close partnership allowed the Libraries to correlate instruction with student enrollment without jeopardizing student privacy and permitted the Libraries to leverage expert analysis skills that otherwise were not available internally. This approach also proactively bypasses the common challenges of campus data silos, which can impede analytics studies.[16]

After the agreement was made and an analyst assigned, the head of instructional services met with the analyst to provide the context of the project, explaining the research questions to be answered and discussing the intent to connect the findings to the institution's strategic plan. They also communicated with the campus institutional review board (IRB) office to confirm that this anonymized analysis of existing educational records and normal library instruction session descriptive data was exempt from IRB review and that no identifying information was to be given to the researchers in alignment with FERPA guidelines. As discussions between the Libraries and IA proceeded, a list of twenty-four initial inquiry questions was developed by carefully exploring what the librarians wanted to know about the scope and reach of their instruction program and, of those initial queries, which ones were realistic for the analyst to pursue (e.g., How many students did the instruction program reach? What percentage of

freshmen participated in a library session? Which academic programs did the librarians not reach?). With iteration and input from the instruction librarians and library administration, that list eventually grew to thirty questions (see Appendix A). Those assessment questions framed and helped focus the entire scope of the study.

Even though only one of those questions emerged as the foundation of the current study's hypothesis, University Libraries sends the entire list of questions to Institutional Analysis annually for three reasons: to ensure consistent longitudinal analysis, to have ready answers about all instruction trends (even those not related to retention), and—in a respectful nod to the pressures on a university analyst's time—to provide IA with a very well-structured, predictable request that can reliably be used to plan departmental workload. After spending time to set up the SAS data analyzation script in SAS Enterprise Guide 7.1 analysis software, the analyst expects to spend no more than four hours per year on calculating the data and creating the final aggregated Excel report that will be sent to the Libraries.

A Note about Privacy

As mentioned above, maintaining the security and confidentiality of university-held enrollment records was intentionally included in the original design of this study. The university collects student-level data such as major, GPA, and enrollment and holds those secure, and IA staff handled all student data for the purposes of this study. They have the expertise, software, and data controls to ensure it remained secure. IA never shares that individual data with the Libraries. Instruction librarians enter in all their own session-specific instruction data, but they do not take attendance or collect student names or identification numbers. The enrollment data is used to evaluate a regular educational program in typical educational settings taught by faculty librarians, and no student is denied any instruction nor experiences any altered instruction in this methodology.

Literature in the field of library and information science reflects concerns about ethics and privacy of student data.[17] As outlined in the methodology, student privacy issues were considered seriously in the planning of this study from the outset. This methodology describes an approach to assessing library instructional activities with significant measures taken to protect student data. Briney[18] cited O'Kelly's particular methodology (as presented previously) as an example of an analytics study that "handled data well" through a "neat avoidance of the burden of security by having the library hold only aggregate data." The Libraries' interest lies only in the broader trends that can be found in aggregate data to make iterative improvements to the instruction program and communicate the impact of library instruction to campus stakeholders.

Methods

The population studied is drawn from the total enrolled student population at GVSU, and students who enrolled in any course section at any level that included library instruction are compared to students who did not during one academic year. The analyzed population is limited to those students who encountered library instruction through a credit-bearing course. Those students had to have at least one course in their schedule that had at least one section experience a library instruction session, even if it wasn't that student's section. In other words, if a student had zero opportunity to encounter a librarian through any course because no sections of any course in their schedule included library instruction, their data was stricken

from the analysis; this explains why the N of the population analyzed differs from total annual university enrollment.

By limiting the analysis to in-class librarian presentations and not including any voluntary workshops or orientations, this study removes the complicating variable of student agency and counters any unintended bias that may occur through over-representation of intrinsically motivated students who sought out library instruction on their own; this is a direct response to other studies that only investigate self-motivated, voluntary student engagement with library services and collections.

University Libraries' instruction librarians recorded all library instruction data into Springshare's LibAnalytics (now LibInsight) datasets. The Institutional Analysis department uses Ellucian's Banner program, an enterprise resource planning and student-information system, to manage student data.

The Libraries' instruction datasets used three fields to collect standardized information about the courses in order to cleanly match these three fields with corresponding Banner fields: course code, course number, and section number. In addition, librarians recorded their own name and the name of the course's lead instructor, to assist with cleaning data; in cases when it was not clear whether the section and course number were accurate, the professor name could be used to cross-check for accuracy. Other fields are date of instruction, location, duration (in minutes), and content of instruction session. Librarians did not take attendance because, according to the IA department's experience with similar enrollment analysis, typical student absences fall within the margin of error. For the purposes of this study, it is assumed that a typical absence pattern occurs in course sections with librarian instruction.

The types of courses taught include a wide and diverse variety of disciplines. As librarians provide support to all First-Year Writing instructors, the majority of courses reached are in the writing department. There is also a high number of courses reached in STEM and health science departments. The instruction program usually reaches a higher percentage of freshmen than of other classes, though the percentage of students reached in each class varies from year to year. While each librarian develops their own instructional content in collaboration with their disciplinary faculty, the Libraries used a set of information literacy core competencies as guiding learning outcomes for the first five years of this study and now use an information literacy assessment rubric.

At the end of each academic year (early August), the librarian responsible for instruction assessment downloads the annual instruction data, aggregated from all the entries of individual instruction librarians, from LibAnalytics/LibInsight into Excel, cleans the data to remove extraneous fields of information irrelevant to the current study, and ensures all entries are consistent. The clean spreadsheet is then forwarded by the Libraries to the analyst in IA. These data are accompanied by the primary research hypothesis and a secondary list of additional assessment questions.

The analyst compares the Libraries' instruction data to Banner enrollment data for the entire population of enrolled students using secure computers in the IA office. The analyst matches the Libraries' instruction datasets to Banner data using the course section and academic term fields. (The analyst determines the term with a simple IF function in Excel, using the date of instruction to logically determine academic term.) With the term and course information matched, IA then creates a subset of student identification numbers for those students enrolled in the courses with library instruction.

To break it down further, the IA analyst follows these four procedures: determine which courses had at least one section with a library instruction session; then determine which students were enrolled in the sections that had a library instruction session and which students were not; further determine which students reenrolled the following fall semester; and finally compare those populations of students. After the correlation analysis, results are returned to the Libraries in aggregate.

Methods were chosen for their ability to answer the central research question (R1) and potentially reject the null hypothesis (H_O).

R1 – *Of the students who saw a librarian in class, what percentage of them reenrolled for the following fall semester compared to students who did not see a librarian?*

H_O – *There is no relationship between library instruction and student retention.*

This question emerged as the most critical of the thirty assessment questions GVSU Libraries had selected to measure and evaluate the instruction program, as retention has proven to be a key goal for the institution. The remaining questions ranged from simple queries about how many students were reached to very complex questions about the intensity effect on reenrollment for students who saw a librarian in class multiple times.

Statistical Analysis

The analyst performed a chi-squared test of independence to determine the relationship between students who experienced an in-person library instruction session and students who reenrolled in the University for the following semester.

A fixed p-value of .05 was used to test significance and eventually tested down to a p-value of .0001. Various confounding factors (ACT score, high school GPA, socioeconomic status, and first-generation status) were controlled using a generalized linear model due to having a mix of categorical and continuous variables.

Odds ratio was used as part of the chi-square test of independence to determine the measure of association. The chi-square test of independence tells whether there is a relationship between the variables studied (students enrolled in classes that include a library instruction session and student retention). The odds ratio indicates the strength of that relationship. The analyst chose odds ratio because of having two binary variables; however, a phi coefficient could also have been used though likely would have returned similar results.

The IA analyst used a script in SAS Enterprise Guide 7.1 to set up the analysis of the data. (See Appendix B for the full script.) The script includes a chi-square test with odds ratio and a generalized linear model.

Results

The following results illustrate the findings at GVSU. The methodology outlined above, employed in collaboration with an Institutional Analysis office, explores the Libraries' instruction program's relationship with student success measures, avoids issues of data siloing, and protects student data security and subject anonymity.

Discussion and Implications

The results of this study suggest that students who participate in courses that had a librarian-led instruction session at some point in the semester have a statistically significant higher chance than their peers of being retained. This study defines student retention as reenrollment for

Year	Librarian in Class	No. of Students	Percent Retained	Odds Ratio
			TABLE 1	
	GVSU Correlation between Library Instruction and Student Retention (p-value = .0001)			
2012–2013	No	8,762	70.90	1.14
	Yes	8,763	73.70	
2013–2014	No	9,925	72.10	1.15
	Yes	8,560	74.90	
2014–2015	No	10,040	71.00	1.31
	Yes	8,340	76.10	
2015–2016	No	9,819	71.20	1.23
	Yes	8,799	75.20	
2016–2017	No	10,170	70.49	1.29
	Yes	9,558	75.52	
2017–2018	No	9,347	70.39	1.13
	Yes	8,556	75.35	
2018–2019	No	9,156	70.5	1.2
	Yes	7,979	74.4	
2019–2020	No	9,504	65.7	1.5
	Yes	7,930	74.6	

the subsequent fall semester. These results have been consistent across the length of the study from 2012–2013 to 2019–2020 (Table 1). The significance was tested down to a p-value of .0001, indicating that the 2.8–8.9 range of percentage differences in retention is statistically significant.

The odds ratio results indicate that students who enrolled in courses that included library instruction sessions do have a higher likelihood of reenrollment than those students enrolled in courses that do not include library instruction sessions, but the magnitude of the difference is small as evidenced by the odds ratio consistently remaining only slightly greater than one. An odds ratio of one indicates there is no association between the two groups. The greater the odds ratio is above one, the greater likelihood of increased occurrence of the event (in this case, library instruction students reenrolling at a higher rate than non-library instruction students). A small difference is an odds ratio less than 1.5 and a large difference is an odds ratio greater than five.

Other studies on student success measures such as retention and GPA are often confounded by student motivation. Motivated students who voluntarily choose to use academic support services, including library services, simply may be more successful students who have higher GPA and retention rates. This study bypasses this limitation by using whole-course-section data. By using the enrollment of an entire course section and focusing the analysis on sections that had a professor engage a librarian in instruction, we have removed intrinsic motivation as a potential confounding factor. It is assumed that when a librarian visits a classroom or a professor brings a class into the library for instruction, those students did not volunteer to seek out that particular form of supplemental academic support.

Using only whole-class data raises another factor for consideration: the role that instructional faculty play by including librarians and the library in the design and delivery of assignments. By integrating the library into the course, faculty connect their students with the

library as an academic support service. The results of this study suggest that faculty engagement with an instruction librarian and integration of library instruction into a course also is correlated with student retention results.

The study results show a downward trend in the number of students reached over the period discussed in this paper. One possible reason might be the rise in online instruction, which did not begin in earnest at GVSU until 2016. Librarians are much more likely to create asynchronous learning objects for online courses, which are more challenging to track as teaching faculty may reuse and share them without notifying the librarian. It is also possible that the downward trend is connected to shortages and changes in personnel that have affected the Libraries' capacity for instruction and outreach. There have also been some environmental factors, such as large-scale class cancellations due to inclement weather and the COVID-19 pandemic. However, it is difficult to pinpoint the definitive cause; it is more likely the result of several coinciding factors.

The possibility that engagement with the library is a high-impact educational practice has compelling implications.[19] One of the thirty assessment questions that University Libraries and IA explored asks, "Is there a relationship between *faculty* who work with a librarian on library instruction and the retention of *students who have that faculty member*?"[20] The answer, as shared previously by O'Kelly, is yes.[21] Not only is there a significant correlation between retention and having a faculty member who asked a librarian to teach an information literacy session, but also the odds ratio is similar. Additional research is needed to further test the null hypothesis that there is no relationship between faculty inviting library instruction and student retention; if proven false, it could indicate that encouraging student engagement with the library via library instruction is a faculty best practice and has a place alongside other high-impact practices such as undergraduate research, writing-intensive courses, and first-year experiences that were identified by George Kuh.[22]

Impact on Instructional Practices

The results of the study have had a direct impact on the instructional practices at GVSU Libraries and demonstrate how analytics studies may inform day-to-day instructional practices while also communicating impact data to Libraries and campus administrators.

The analysis reports generated by IA show the number of unique students reached and the number of instruction sessions held, making it possible to track larger trends of engagement with library instruction across the university over time (Table 2).

TABLE 2 Unique Students Reached and Number of Instruction Sessions		
Year	**Unique Students Reached**	**Instruction Sessions**
2015–2016	8,799	637
2016–2017	9,558	755
2017–2018	8,556	691
2018–2019	7,979	629
2019–2020*	7,930	429
COVID-19 ended library instruction mid-March 2020 through the end of the academic year, lowering the number of library instruction sessions for the year.		

The analysis reports generated by IA identified academic programs that librarians were not reaching. This information triggered an opportunity for targeted outreach to those programs. The longitudinal tracking of overall instruction sessions allows the Libraries to view trends in library involvement with courses and programs over time. These data make the identification of pattern changes possible early and allow librarians the opportunity to ask questions about what might be changing in order to support a department's evolving needs.

TABLE 3 2018-2019 GVSU Students Reached by Class			
Number of Students Reached by Class	Total Students	Number of Students in Library Courses	% of Students in Library Courses
Freshmen	4,904	2,968	61%
Sophomore	6,412	1,768	28%
Junior	7,595	1,613	21%
Senior	10,441	2,282	22%
Masters	3,613	723	20%
Doctoral	290	62	21%

The GVSU Libraries are also better equipped to strategically integrate GVSU's information literacy outcomes throughout the instruction program. One area of opportunity stems from the results in the data on the number of students reached at each grade level (Table 3). This data informs current strategizing on programmatic approaches to information literacy integration across all disciplines. The numbers of current academic-year-level integration support work in identifying information literacy-based learning objectives connected to year in school with the ultimate goal to more systematically incorporate higher-level information literacy competencies into upper-level courses scaffolded by consistent integration of introductory concepts in earlier years.

The data collected by the Libraries also measures the use of library instruction labs. Monitoring the percentage of instruction sessions held in library spaces provides evidence-based rationales for the use of spaces and in making funding requests to refurbish library instruction spaces and add new or additional resources in these spaces, as well as showing the need to retain those spaces specifically for library instruction purposes.

The data gathered at the Libraries-wide level and the strong relationship with IA also allows for individual instruction librarians to more easily work with IA to dig deeper into their own disciplinary instruction. By performing a more granular analysis of the data for their own disciplines than that analyzed at the programmatic level, instruction librarians have gained further insights into their individual instruction methods and subsequent impact.

Limitations

There are limitations to note with this study. It measures correlation, and while confounding factors such as intrinsic motivation, ACT score, high school GPA, socioeconomic status, and first-generation status were controlled via study design and analysis, this does not prove that library instruction causes an increase in student reenrollment the following fall. The large

population, length, and replicability of the study indicate something interesting is happening; further research is needed to determine what is causing that interesting relationship.

The particular institutional context may also limit the generalizability of the results to other institutions and, while the process was designed to be reproducible, the results themselves are not generalizable to all academic libraries.

Because we gathered the data through self-reported instructional data, this study is limited by human error at the data collection stage. For instance, if a librarian incorrectly enters a course code, this could have a minor impact on the final results. Although errors are mitigated by IA's cross-referencing of the course information with the lead instructor name, some entry errors may still persist into analysis.

As mentioned earlier, the librarians intentionally do not take attendance during the instruction sessions, so the attendance is estimated based on the overall enrollment in the course, not the actual students who attended the instruction session. Although the Institutional Analysis department is confident that typical absences for a course fall within the margin of error for analyses like these, it does mean that students who were absent on the day the library session occurred may have been included in the retention analysis.

Similar to the attendance limitation, there was no non-intrusive way within the scope of this study to determine how attentive or engaged students were during library instruction sessions. It is possible that students who were in attendance at the library instruction session were otherwise distracted or unengaged; they physically may have been present but were not learning the material, which therefore limits any implication that there is a relationship between actual internalized learning of library instruction content and subsequent reenrollment.

The study does not account for online instruction. Online instruction did not begin in earnest at GVSU until after 2016, with complete online instruction during the COVID-19 closure between mid-March and August 2020. Online instruction, therefore, did not represent a large enough sample to analyze. Online and hybrid instruction is a growing area at GVSU, with ongoing strategic emphasis on growing the Libraries' capacity and expertise in online instruction, so its impact on student learning could be explored in greater detail in future studies but is necessarily absent from this study.

There are also limitations in how we define retention; in this case, retention is not persistence to graduation, but rather a return to the university the following fall semester. This study does not account for graduation rates. The study also notes that decisions to withdraw from a specific academic institution are often complicated and multifaceted, as there are many reasons or combinations of reasons that students choose to return or withdraw, independent of library engagement.

Conclusion

The retention analytics methodology outlined by this eight-year study provides a reproducible path for other institutions to partner with their local institutional analysis colleagues to create a study that explores the relationship between library instruction and student reenrollment while also protecting individual students' data. By focusing on students in enrolled classes with mandatory in-class instruction sessions instead of voluntary workshop or circulation data, the methodology also reduces the likelihood that students' intrinsic motivation will indicate an over-reporting of impact in the findings of libraries and student success.

This study demonstrates a positive correlation between library-led instruction and student reenrollment the following fall at GVSU, along with a reproducible and reliable method for measuring that correlation. Although the results do not suggest a causal relationship, the large population studied and the consistency of the results over time warrant deeper exploration in order to further define which specific factors are influencing the results. By replicating the process at different institutions and different instruction models (such as online), and by designing future research studies that dive more deeply into the potential significance of faculty engagement with libraries as a high-impact practice that positively influences student success, more details may emerge that help explain the phenomenon of higher fall-to-fall retention and library instruction.

Appendix A

Research Questions

1. How many students did we reach in total? And per cent?
2. How many students did we reach in each of the programs (AAA, HTM, HST, etc.)? And per cent?
3. How many freshmen, sophomores, juniors, seniors, graduate, etc. in total? And per cent?
4. How many freshmen, sophomores, juniors, seniors, graduate, etc. in each of the programs? And per cent in each program?
5. Of the students who saw a librarian in 2020–2021, what percentage of them re-enrolled for F21, compared to students who did not see a librarian? (overall and by grade FR SO JR SR GM GD)
6. How many programs did librarians reach?
7. How many programs are not listed here?
8. Which programs are not listed here?
9. How many unique classes did librarians visit? (Some librarians visit a class multiple times, and will have same course code/number/section within one semester.)
10. How many students saw a librarian more than once?
11. What are the characteristics of those students who saw a librarian more than once (classes, year in school, major)?
12. What is the highest number of times that a student saw a librarian?
13. Is there an intensity effect on reenrollment or GPA of students who saw a librarian multiple times?
14. What number and percentage of freshman take WRT 098? And WRT 150?
15. What number and percentage of those freshman did we reach in the WRT 098 classes? And the WRT 150 classes?
16. What percentage of WRT 150 students who saw a librarian re-enrolled for F15, compared to those students in WRT 150 who did not see a librarian?
17. What percentage of first-generation freshmen take WRT 098 and WRT 150? How many did we reach?
18. What percentage of library sessions were in the library ("location" field)? What percent online?
19. How many hours of instruction in total ("duration") did librarians provide in 2020-2021?
20. Can you create a line graph showing the number of instruction sessions per day over the course of the academic year?
21. How many sessions did each librarian teach, sorted by librarian?
22. How many sessions did each librarian teach in each program, sorted by librarian?
23. How many students did each librarian teach, sorted by librarian?
24. Can you create a bell curve of the distribution of the number of sessions each librarian teaches?
25. What are the majors of the students who enrolled in WRT150? What are the majors of the students who enrolled in WRT150 AND saw a librarian?
26. What are the top ten courses at the university that reach the most freshmen?

27. P value for the library instruction reenrollment correlation AY2020–2021 (significance level .05)
28. Total number of faculty at the university each of those three years
29. Retention of (all students who were taught by faculty who had a librarian come into class) compared to retention of (all students who did not have faculty who had a librarian come to class) for AY 2020–2021
30. Variables to control: ACT score; high school GPA; low income; first generation

Appendix B

SAS Script

The IA analyst used the following script in SAS Enterprise Guide 7.1 to analyze the data:

Chi-square with odds ratio:

```
proc freq;
table library*retent/chisq or;
run;
```
Note: Library is coded 1 for "student who was in library instruction section" and 0 for "student who was not in library instruction section."
Note: Retention is coded 1 for "student was retained the following fall semester" and 0 for "not retained in the follow fall semester."

Generalized linear model:

```
proc glm data=retention;
class library firstgen pellever;
model retent=library actecomp hsgpa1 firstgen pellever/solution;
run;
```
actecomp – Comprehensive ACT score
hsgpa1 – HS GPA
firstgen – First generation student (1=Yes 0=No)
pellever – Student is pell-eligible (1=Yes 0=No)

Notes

1. Preliminary, partial results of this ongoing study have been presented and published in other venues. This is the first complete peer-reviewed publication of the methods and data for all years 2012–2020.

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3. Megan Oakleaf, *Value of Academic Libraries: A Comprehensive Research Review and Report*, Chicago: Association of College and Research Libraries, 2010. http://www.ala.org/acrl/sites/ala.org.acrl/files/content/issues/value/val_report.pdf.

4. Ibid.

5. Ibid.

6. Melissa A. Hubbard and Amber T. Loos, "Academic Library Participation in Recruitment and Retention Initiatives," *Reference Services Review* 41, no. 2 (June 2013): 157–81. https://doi.org/10.1108/00907321311326183.

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20. This was presented to the analyst as, "What is the retention of (all students who were taught by faculty who had a librarian come into class) compared to retention of (all students who did not have faculty who had a librarian come to class) for academic year XXXX-XXXX?"

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22 George D. Kuh, *High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter,* Washington, DC: Association of American Colleges and Universities, 2008.

The COVID-19 Pandemic and the Rapid Shift to an Exclusively Online Format: Tracking Online Instructors' Utilization of Library Services Over a Year of Virtual Learning at the University of Memphis

Jessica McClure

At the beginning of the Spring 2020 semester, academic institutions in the United States shifted rapidly to virtual instruction amid the COVID-19 pandemic. This shift forced the libraries associated with these institutions to create innovative ways to reach faculty, staff, and students in an online mode. At the University of Memphis, librarians enhanced many existing online services and developed new ones. This study tracks the utilization of these services by online instructors during the span of one year since the COVID-19 pandemic began. The methods were mixed, involving a survey soliciting information from online instructors using both qualitative and quantitative methods and follow-up interviews conducted privately and virtually with teaching faculty and staff. This article presents the findings of this research and details the plans for further action at the University of Memphis to enhance and promote library services to online faculty. The plan involves increasing the level of online marketing, involvement with faculty training, and the enhancement of existing services, specifically embedded librarianship.

Introduction

During the COVID-19 pandemic, academic librarians worldwide rose to the challenge when students, faculty, and staff shifted abruptly into the world of online learning. Existing online services such as embedded librarianship, virtual reference, research consultations, Interlibrary Loan (ILL), and electronic resources were enhanced, and formerly in-person services such as the reference assistance desk, library tours, and information literacy instruction sessions were adapted to be exclusively in virtual format for the first time. While many libraries around the world physically closed for months, University Libraries (UL) at the University of Memphis remained open even after the safer-at-home order was issued in Memphis in March 2020.

The University of Memphis is an R2 institution in an urban setting. Its student population was 22,203 in the Fall of 2020, but enrollment, specifically online and at the graduate-level, is steadily increasing. According to the Facts at a Glance website, the University of Memphis has

approximately 2,500 employees including 930 full-time faculty. There are thirteen colleges at the University of Memphis as well as seventeen bachelor's degrees in more than 250 areas of study, master's degrees in fifty-four subjects, doctoral degrees in twenty-six disciplines, education specialist degrees in two areas, and graduate certificate programs in forty-four areas of study.[1] Furthermore, UofM Global provides programs and degrees fully online. Through UofM Global, it is possible for students to gain a quality education without ever stepping foot on campus. Other programs include the Cecil C. Humphrey's Law School, the only law school located in Memphis. UL comprises McWherter Library on the main campus and three branches: The Music Library, the Health Sciences Library, and the Lambuth Library. Since the branch libraries are part of UL, all services offered at McWherter Library can also be offered at any of the branch libraries. This includes online services such as instruction, chat, and research consultations. The McWherter Library (located on the main campus) never closed its doors completely, but physical access was limited to members of the campus community. Only patrons with an active University of Memphis ID card were able to enter. The three branches closed temporarily and reopened (again, with limited access) at the beginning of the Fall 2020 semester.

COVID-19 Efforts at University Libraries

For the librarians at the University of Memphis, there was a consolidated effort to find online alternatives for all existing services. Librarians continued to provide reference services through online research consultations and chat. Online library instruction was implemented, a service that had never been approached at UL before. Rather than cancelling library instruction sessions, they were redesigned quickly to be presented in an online format through asynchronous tutorials and video conferencing (via Zoom). Other instruction efforts involved the creation of a virtual library tour using a mobile device. UL also was the chosen site for providing laptops and hot spots to be checked out for the duration of a semester. The Circulation Department provided a pick-up service that enabled a member of the University of Memphis community to make a request for an item (using a form online or calling). An employee in the Circulation department would then search for the book in the upper floors, disinfect the item, and allow the patron to pick up the item at the Circulation Desk. This limited the high numbers of patrons in the stacks and helped promote social distancing guidelines. The three branch libraries – Music, Lambuth, and Health Sciences – were closed, but the Music, Lambuth, and Health Sciences librarians continued to offer their services online through research consultations and meetings via video conferencing. UL also hired a Virtual Instruction Librarian and a First-Year Experience Librarian despite a hiring moratorium at the University of Memphis. These positions were an exception since they would help provide essential services to the University while all courses were online.

Requests for electronic resources and interlibrary loan items increased as well. These were promptly accommodated by the librarians and staff at UL, including scanning documents located in McWherter Library to minimize the number of patrons entering and exiting the library. Documents that needed to be viewed in person, such as primary sources located in the Special Collections Department, could be requested in advance, disinfected, and provided to the patron in a socially distanced, contained manner.

Literature Review

There were not many research studies on academic libraries' responses to the COVID-19 pandemic yet. There were reports of responses to the pandemic, but they were limited, providing

evidence of patron feedback only through social media and observations. Furthermore, there were none that provide online instructors' experiences with the online services provided. Several studies focused on the utilization of library services overall. For example, Amity University in Lucknow, India, tracked the utilization of electronic resources by researchers and post-graduate students, concluding there were many factors influencing the low number of usages at this site. Among these were limited access to computers, internet speed, inadequate number of titles, and lack of technical support.[2]

But faculty were not included in the participants. Before the pandemic, the University of Northern Colorado studied library usage by undergraduate students. The librarians analyzed the relationship between undergraduate student success and library usage overall and found a small correlation to the role teaching faculty play in their findings. Students from a student success program reported high use of the library because instructors were assigned librarians to work with them.[3] The success of these students increased because the instructors were involved in their students' decisions to use the library. There were more recent studies of library utilization,[4] but none that provided feedback from online instructors specifically.

Other studies analyzed specific online library services. The University of North Florida investigated the importance of a library's integration into Canvas, a learning management system (LMS). The study included an online instructor's ability to select and incorporate research guides into their course shells created by the library, as well as the SpringShare chat widget to the LMS (which facilitated students' interactions with librarians). The project "…not only increased the library visibility in the online environment but enabled all students, whether in-person, hybrid, or online, with direct access to the resources they needed for their coursework."[5] Likewise, Jimmy Ghaphery and Erin White spoke on the use of research guides at Virginia Commonwealth UL. But this study was conducted through analyzing in-house data and interviewing other academic librarians.[6]

In 2021, during the COVID-19 pandemic, librarians shared observations of the effects that the previous year, amid the shutdowns and service limitations, had on libraries. Many studies used data from the beginning of the pandemic, many as far back as the Spring 2020 semester.[7] The University of Toledo described the development of one-shot information literacy sessions delivered online in March 2020[8] but did not acknowledge the aftermath of this shift and its long-term effect on the patrons. In an extensive report (published at the beginning of the pandemic in May) on the maintenance of library services during the pandemic, Peggy Johnson observed budget reductions to ensure services are maintained for patrons. But she states explicitly, "My thoughts on this are based on assumptions and perceptions …and my best guesses."[9] Many authors confirmed the limitations of these studies because data collection and the shift to online learning occurred instantaneously. The Knowledge Centre for Health Ghent in Belgium used the COVID-19 pandemic as an opportunity to assess users' needs and reorient their services for future years.[10] Likewise, Samantha Harlow at the University of North Carolina conducted a qualitative study on her library's chat service during the COVID-19 pandemic.[11]

Literature released in 2020 about the utilization of library services focused primarily on all patrons including students, faculty, staff, and community members. The University of Toronto observed positive feedback on their social media accounts and were encouraged by their efforts.[12] At Singapore Management University, one researcher observed, "We do not know what the future holds for us, but now libraries are learning to adapt.… Libraries have always been and will continue to be… a provider [*sic*] of credible and important information…."[13] Likewise, Western

Colorado University reported on the importance of collaboration and resilience between various higher education departments during the COVID-19 pandemic.[14] While these were encouraging sentiments, they did not address the satisfaction of the patrons over the duration of the COVID-19 pandemic. These studies were, understandably, limited because of the changing nature of the pandemic and the evolving decisions academic institutions faced daily. Academic librarians can gather information from their own institutions, peruse the literature on the subject, or make decisions based on prior studies of disaster preparedness and online information services. At the time that this article was written, it was apparent that certain library services will remain online for the time being until COVID-19 cases decrease and vaccinations are widespread.

Fortunately, studies on disaster preparedness in academic libraries were conducted before the COVID-19 pandemic. In 2007, the University of Minnesota's Bio-Medical Library assisted in a plan for continuing educational programs in the event of a pandemic influenza outbreak. This was in response to the "ongoing health concern"[15] of ten influenza pandemics. Amid these ten, the three deadliest were the "Spanish flu" (1918–19), the "Asian flu" (1957–8), and the "Hong Kong flu" (1968–9). The recommendations from this task force were intensive training for all teaching faculty on using WebCT (otherwise known as Blackboard, an LMS), reserving at least two faculty members qualified to continue course instruction in the event of illness, mandatory training for all faculty with certificates guaranteeing that the individual faculty member have the necessary skills to continue courses online at the basic level, routine maintenance of the LMS, and that documentation for all legislation for emergencies should be communicated clearly and be easily accessible.[16] These findings are helpful and can be applied to the continuity of academic libraries during future disasters.

Research Questions

This study tracks the utilization of library services among online instructors during the span of one year since the COVID-19 pandemic began. The methods were mixed, involving a survey soliciting information from online instructors using both qualitative and quantitative methods and follow-up interviews conducted virtually with teaching faculty and staff. This article presents the findings of this survey (Appendix A) and proposes further action for the librarians at the University of Memphis to enhance and promote services to online faculty. Questions were designed to glean an understanding of online instructors' satisfaction with UL's efforts to provide online services and answer the following research questions:

- Has the behavior of University of Memphis online instructors changed toward UL during the Covid-19 pandemic? If so, how and why?
- According to online instructors' feedback, has UL offered adequate virtual services during the Covid-19 pandemic?
- What is the reason for the noticeable decrease in online instructors' utilization of certain library services?
- What can UL do to enhance and promote library services for University of Memphis online instructors during the remainder of the Covid-19 pandemic and online instruction overall?

Methods

Both quantitative and qualitative methods were used in this research study. The Virtual Instruction Librarian at the University of Memphis sought to effectively provide UL services to online

FIGURE 1
How Many Semesters (Including Summers) Have You Taught Online Courses?
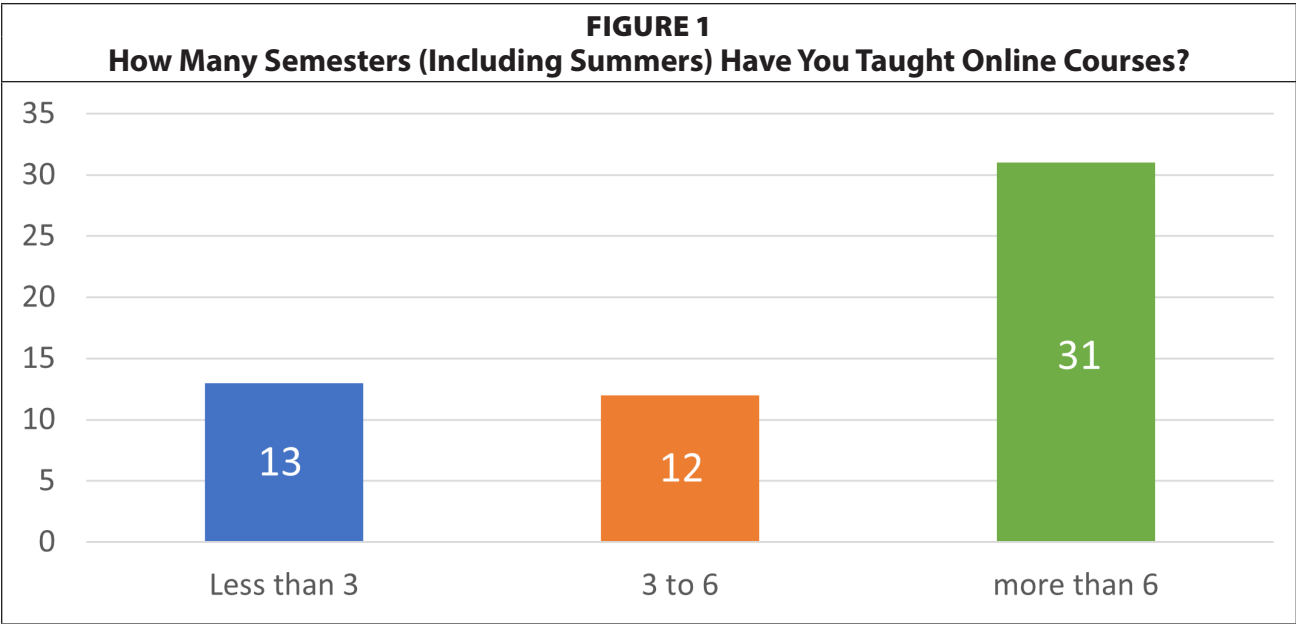
faculty. Since all faculty were considered online faculty during the pandemic, the 2020–21 academic year was a prime opportunity to reach a broad spectrum of participants. The confidential survey developed by the Virtual Instruction Librarian was distributed among all Deans and Department Chairs at the University of Memphis, including instructions to encourage all faculty teaching an online class to participate. Responses were gathered on February 22, 2021. The survey consisted of open-ended, ranking, multiple choice, and Likert scale questions. Furthermore, participants had the option to be contacted for a follow-up interview, but only two responded to this call. Interview questions for these participants appear in Appendix B. This research study was evaluated and approved by the Institutional Review Board (IRB) at the University of Memphis.

Participants

There was a total of fifty-six respondents to the survey. All were online instructors at the University of Memphis. Thirty-one participants reported they are experienced in teaching

FIGURE 2
What Student Level Do You Teach Online?
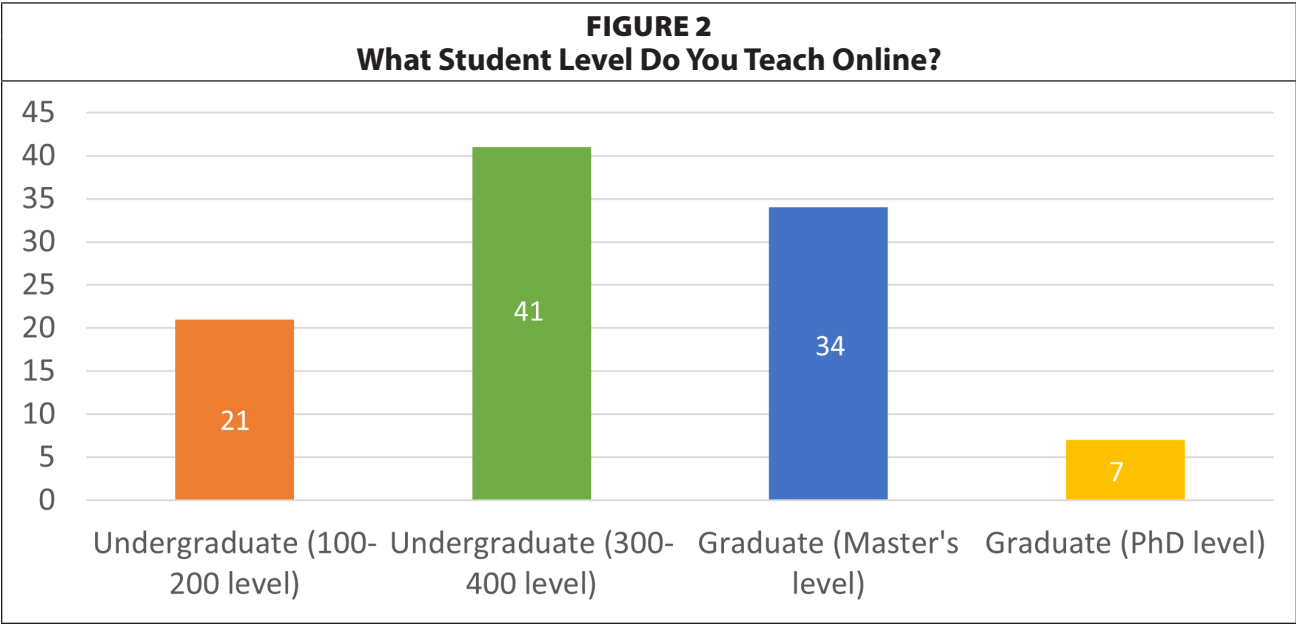
courses online (a minimum of six semesters). Thirteen reported they have taught fewer than three classes online, and twelve reported they taught three to six. This is reflected in figure 1.

Most participants (forty one) taught upper-level undergraduate courses (300–400 level). Thirty-four participants taught online graduate level courses at the master's level, twenty one taught online undergraduate level courses at the 100–200 level, and seven taught online PhD level courses. This is reflected in figure 2.

A variety of departments and subjects were represented. Appendix C (table 1) represents the survey results for the participants. It includes the subjects, number of courses, and number of participants who taught a particular subject.

Limitations

As reflected in appendix C, English, Music, and other subjects with an intensive research component are not represented highly in this survey. Therefore, the data might not be the most accurate representation of the overall use of services since the results do not include the departments that work most closely with UL, daily. However, this did give UL the opportunity to hear from departments historically lacking consistent communication with UL. Likewise, as demonstrated in the results below, just taking the survey alerted faculty to online services they were unaware of. Another limitation concerns the distribution of the survey. It was sent to all department chairs at the University of Memphis with instructions to provide it to all online instructors in their departments. In other words, the effective distribution of the survey to all online instructors at the University of Memphis relied solely on the department chairs to provide the information. It is unknown if all department chairs followed these instructions.

Results

The results of the survey are divided into quantitative and qualitative data sections. The qualitative provide valuable insight into UL's services and explanations for responses.

Quantitative Results

Participants were asked to describe their use of Libraries services in their online courses. They were given a variety of options to choose from and could check all that applied. These options can be found in appendix D. Fifty-eight selections indicated many participants mostly use electronic resources in their online courses. There were thirty-two selections for uploading PDFs of online articles, e-books, etc. for course readings and twenty-six selections for inserting permanent links/stable URLs to online articles, e-books, etc. for course readings as well. The other most-selected choices were encouraging students to make a research consultation with a librarian (fourteen) and to use Resource Delivery/Interlibrary Loan services (thirteen). Twelve instructors indicated they do not use Libraries services in their online courses at all. There were eleven selections for streaming media sites (Kanopy is the most-used at the University of Memphis). Nine instructors encouraged students to employ the online chat service, eight instructors linked Research Guides in eCourseware, and seven instructors placed materials on course reserve. For the other choices, less than five instructors took advantage of these services and none at the Health Sciences Library and Music Library (these disciplines were not represented). The top five results are reflected in figure 3.

The next question provided the participants with the same choices, which they were asked to rank from most useful to least useful. The seven most useful were categorized as

FIGURE 3
How Have You Utilized University Libraries' Services In Your Online Courses?
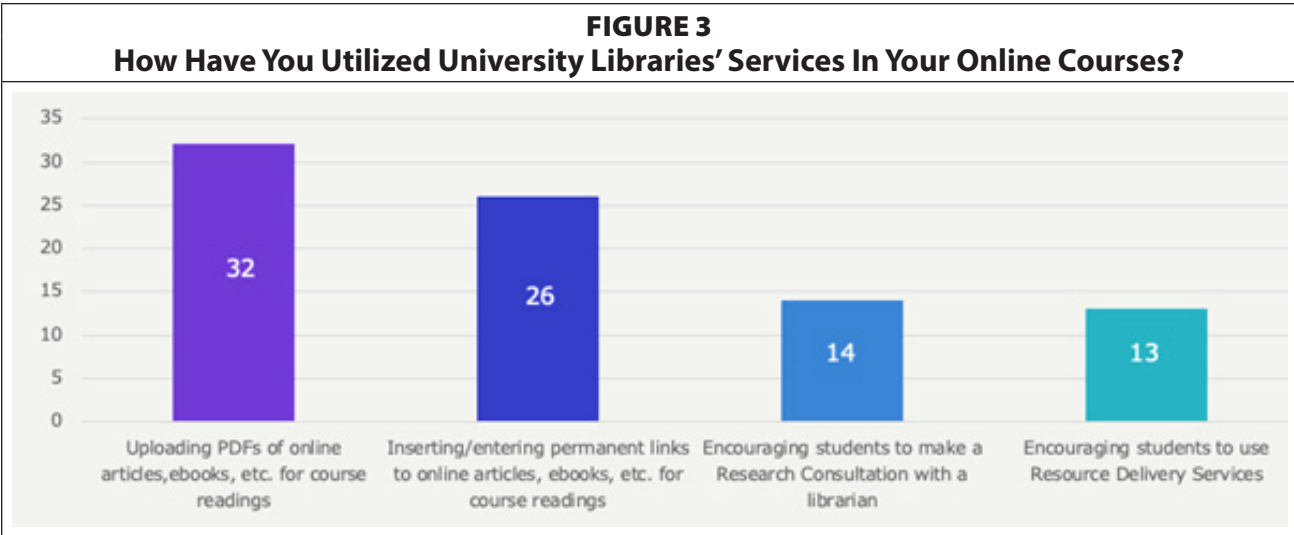
seeking research assistance and accessing library resources. The highest choice was inserting permanent links/stable URLs to online articles, e-books, etc., and the second-highest choice was uploading PDFs of online articles, e-books, etc. Other than these two services managed by the Electronic Resources Librarian, those identified as most useful were provided by the Research and Instructional Services Department. These include, in order from most useful to least useful, research guides, research consultations, video tutorials, and chat. The second category comprised services involving various departments within UL with a virtual library instruction session being the ninth choice and the Music Library being the last. Dividing the two categories is "I have not used any library resources in my online courses." Table 2 reflects the order of most useful to least useful.

TABLE 2
University Libraries' Services Ranked from Most Useful to Least Useful

Rank	Service
1	Inserting permanent links to online articles, e-books, etc.
2	Uploading PDFs of online articles, e-books, etc.
3	Using an embedded librarian
4	Research Guides
5	Research Consultations
6	Providing links to video tutorials created by UL
7	Chat
8	I have not used any library resources in my online courses.
9	Virtual instruction session
10	Resource Delivery/Interlibrary Loan
11	Special collections
12	Placing materials on course reserve
13	Government publications
14	Streaming media sites (Kanopy, MetOpera, etc.)
15	Health Sciences Library
16	Music Library

FIGURE 4
How Can University Libraries Assist You and Your Students in The Future?
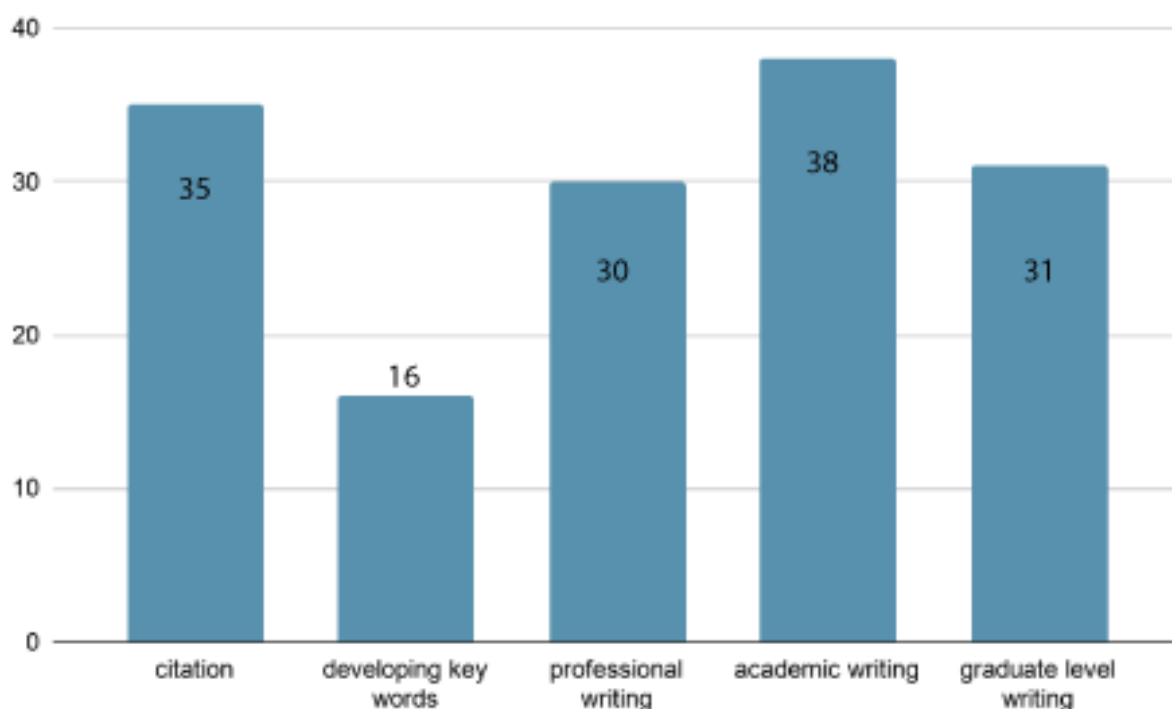
The instructors were asked how the Libraries might assist them with content in their online courses. In order of preference, the majority of participants desired assistance with academic writing skills (thirty-eight selections), citation (thirty-five selections), graduate level writing skills (thirty-one selections), and professional writing skills (thirty selections). Sixteen participants requested help with developing key words for improved searching. These responses are reflected in figure 4.

The next section of quantitative data addressed the changes in participants' utilization of Libraries services during the COVID-19 pandemic: Had it decreased, increased, or changed

FIGURE 5
Since March 2020, Has Your Use of University Libraries Services Increased, Decreased, or Changed in Other Ways?

FIGURE 6
Do You Believe You Are Sufficiently Familiar with University Libraries Services to Effectively Use in Your Instructional Plans?
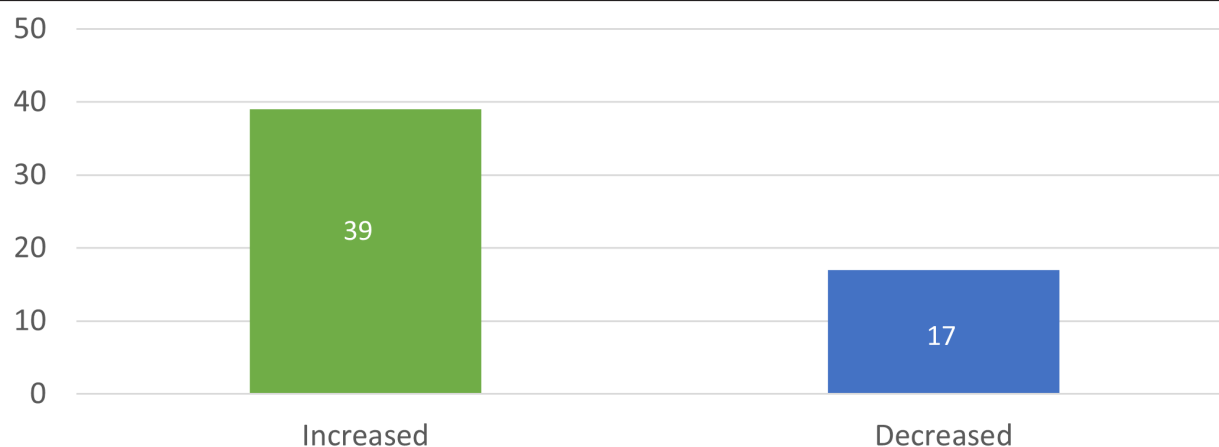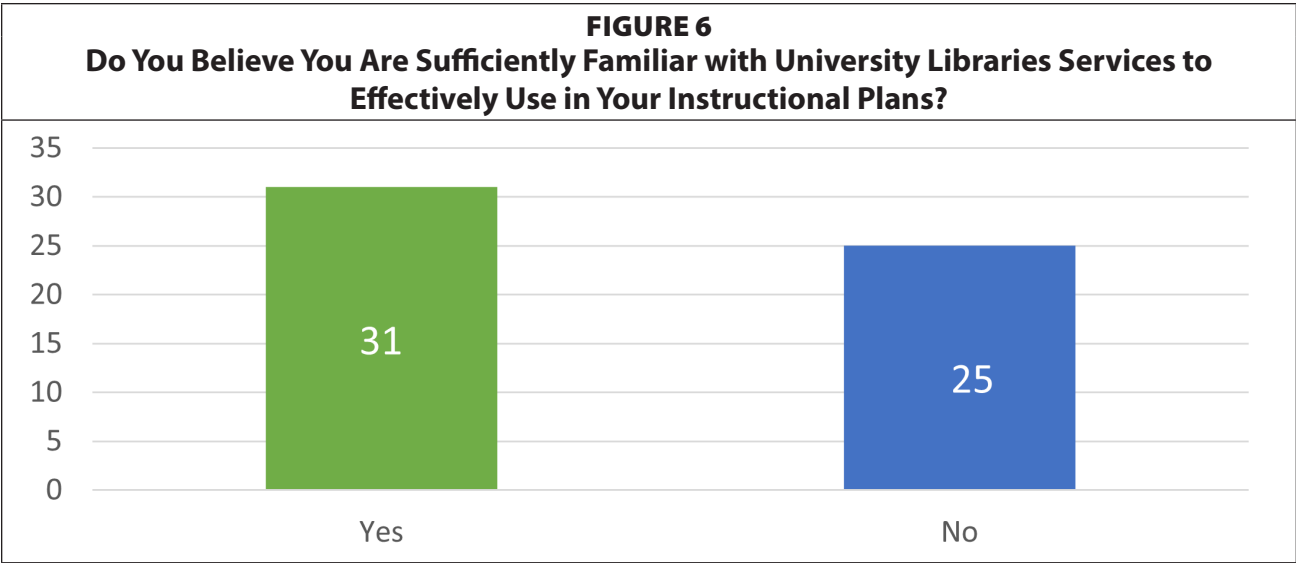
in other ways? Thirty-nine indicated their use of Libraries services increased, but for seventeen it decreased. These results are reflected in figure 5. In the open-ended response section, sixteen participants stated that their utilization of services did not change at all. They used the same services they had prior to the COVID-19 pandemic but did not take advantage of others despite the expansion and addition of many.

Participants were also asked if they had stopped using a particular library service since the COVID-19 pandemic. Forty-seven checked no; nine checked yes. When asked if they had started using a Libraries service during the COVID-19 pandemic, thirty-nine responded no; seventeen said yes. The participants had an option to provide open-ended responses to justify their answers. Identified services online instructors started using during the COVID-19 pandemic were chat, Kanopy, Scopus, and permanent links/stable URLs.

The final section of quantitative data assessed the level of communication between UL and online instructors. When asked if they considered themselves to be sufficiently familiar with UL services, thirty one stated yes, while twenty five stated no. When asked if they were

FIGURE 7
As an Online Instructor, I Am Satisfied with the Support I Receive[D] from University Libraries During the COVID-19 Pandemic
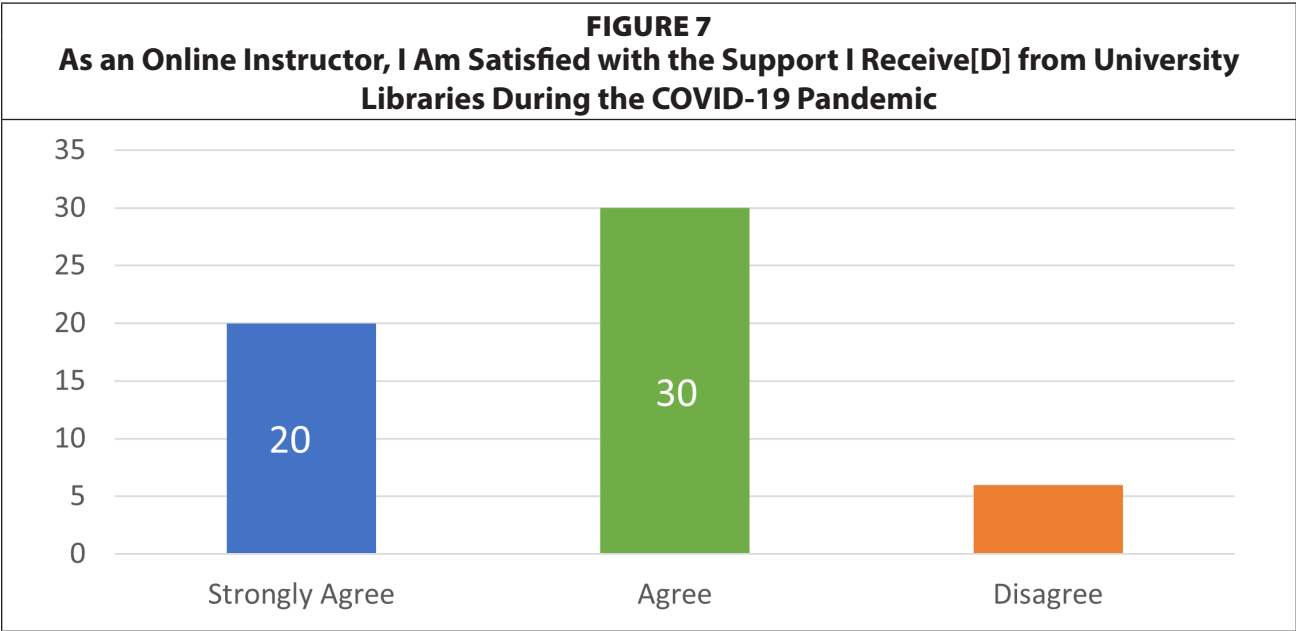
satisfied with the support they received from Libraries during the COVID-19 pandemic, twenty strongly agreed, thirty agreed, and six disagreed. These results are reflected in figures 6 and 7. These results were encouraging, but the next question asked if they would have liked more assistance from UL during the COVID-19 pandemic. Thirty-four disagreed and twenty two agreed. Explicit feedback from this question revealed that online instructors would have liked to know more about our services and were not sufficiently aware of the online expansion that occurred during the COVID-19 pandemic.

Qualitative Results

Qualitative data was gathered through open-ended questions throughout the survey and two follow-up interviews with online instructors (the open-ended questions can be found in appendix A, and the interview questions can be found in appendix B). The qualitative data reflected the use of UL's online services by online instructors at the University of Memphis. Instructors were asked to rank the most useful services to the least-useful services and to explain their choices. Examples of explicit feedback are found in table 3 and reflect the most common open-ended responses.

TABLE 3 Of the University Libraries Services and Resources Used in Your Online Courses, Please Rank in Order from Most Useful to Least Useful.	
Participant #3	"I find the one-on-one assistance available through a research appointment or online chat to be the most effective, particularly when students contact me afterward to describe what they learned, how it will influence their projects, and ask me follow up questions."
Participant #5	"I have not used the library's resources as the course syllabus/outline has been developed by another professor. I implement the course syllabus, guidelines, and expectations."
Participant #13	"I like providing the permanent links so that students can see how easy it is to research our online libraries. I like to create self-directed learners, so I encourage students to fully engage with the online libraries by clicking links and scheduling appointments with library staff."
Participant #19	"As I only teach adjunct now, I have less and less awareness of campus resources. The students in my program tend to have limited financial resources, so the more material I can provide for free, the better."
Participant #22	"I use Kanopy and embedded article in most of my courses. This has been especially valuable since the pandemic."

Many addressed the need for increased communication about our services but also stated that their classes did not use library services and resources because all content was in the syllabus and/or the course textbook. Other comments worth mentioning included praise for specific services such as Library Instruction (including information literacy sessions and embedded librarianship), Kanopy, and Resource Delivery (ILL). A consolidation of this feedback about library services and the commonalities are reflected in figure 8.

To track utilization of services during the COVID-19 pandemic, specifically, online instructors were asked about their interaction with the library since March 2020 and the shift

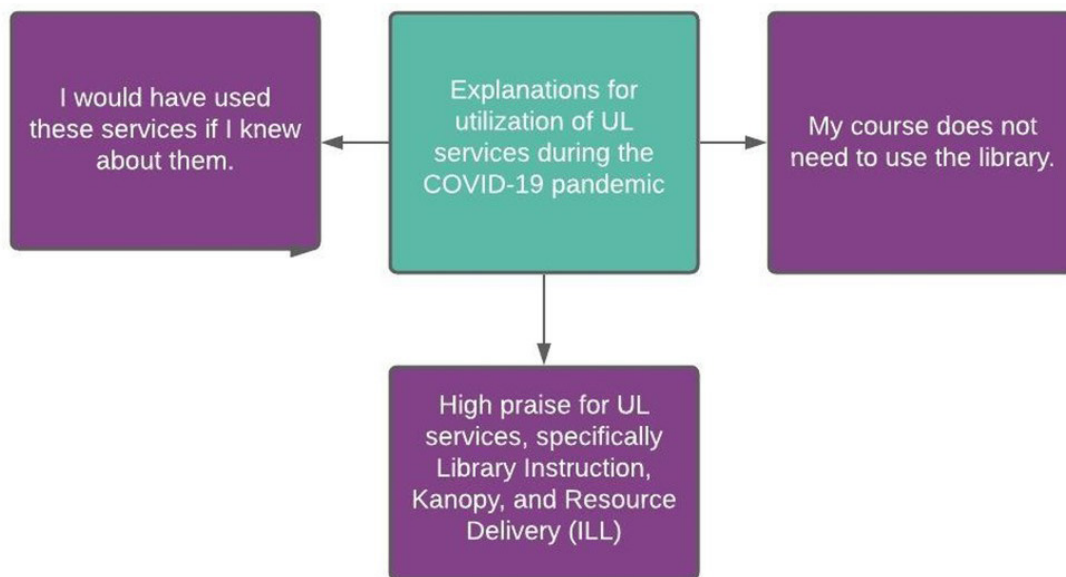**FIGURE 8**
Feedback about Library Services and the Commonalities

TABLE 4
Since March 2020, Has Your Use of University Libraries Services and Resources Increased, Decreased, or Changed in Other Ways?

Participant	Increased or Decreased?	Why?
Participant #2	Decreased	"I usually set up multiple sessions for my students, but we are not on campus and finding synchronous meeting times has been challenging."
Participant #3	No Change	"It has really stayed the same."
Participant #15	Increased	"…moved to use of library e-books for courses; require library sources only for research papers."
Participant #22	Increased	"Media resources were more important because of less face-to-face interactions with students."
Participant #31	Increased	"The willingness of the library to get e-books that I've assigned in my online classes that the library didn't already own—I didn't know I could ask for this before the pandemic. Having electronic versions of the books I've assigned has been very helpful to everyone. Before, I thought I was just out of luck if we didn't already own an e-version of an assigned text. Same for movies that I would show in class via DVD. It's been wonderful to have help getting access to these online."
Participant #32	Increased	"Fewer students on campus, leads to less interaction in the physical building. Those services that were currently available in the courseware are being used at the same rate, with maybe a slight uptick in usage."
Participant #38	Decreased	"I changed the final project in my classes to not include the requirement that they research the academic literature on a topic; I worried that without in-person instruction in class and at the library (where we had an in-person session on academic sources previously) they would not be able to carry this out well. Now they read the news and use what they learn to make sense of current events instead."

to online learning. Data was gathered in a quantitative manner, but instructors were asked to provide an open-ended response clarifying their answers. For example, when asked if their use of library services since March 2020 has increased or decreased, many explained their reasoning for their answers. Examples of these responses (table 4) are reflective of the most common open-ended responses. Many instructors who selected the option of "decreased" opted not to provide an open-ended response. Sixteen participants stated that their use of the library has not changed during the COVID-19 pandemic.

When prompted to provide recommendations to further enhance online services, participants suggested virtual tours, presentations about services, APA tutorials and videos, plagiarism and citation videos, prompt response to inquiries, writing and citation resources, instructor outreach, longer check-out periods, instruction sessions on Libraries resources, and basic library videos.

Discussion

Apart from instructor outreach and increasing visibility, UL provided these recommended services to all students, staff, and faculty. One service added in response to the COVID-19 pandemic is the option for faculty to request instructional materials such as video tutorials, research guides, self-guided tutorials, self-guided tours, and handouts—in addition to instruction sessions or embedded librarians. Materials such as the APA tutorials and videos, virtual tours, plagiarism and citation videos, presentations, and basic library videos can be requested through a link on our homepage and are fulfilled in a timely manner. Materials such as the writing and citation resources, instruction sessions, and basic library videos were available on the UL website as content on Research Guides. Prompt responses to inquiries are addressed through virtual reference with increased hours and staffing. In anticipation of increased use, the number of UL personnel on chat shift was doubled and the service hours increased to include weekends and evenings. Longer check-out requests can be fulfilled. However, many of the instructors who participated in the survey were unaware of these options.

The impact of this study on the University of Memphis and other academic libraries moving forward during and after the COVID-19 pandemic can be separated into three categories: Marketing and Outreach, Faculty Involvement and Training, and Enhancement of Existing Services.

Marketing and Outreach

Based on the results of this study, UL's previous outreach efforts were insufficient to promote online services to faculty. Outreach efforts during the COVID-19 pandemic were limited to social media posts and consistent e-mails sent from the Executive Director/Associate Dean of Libraries to Deans and Department Chairs at the University. UL's liaisons also notified departments through e-mail. Ideally, the liaison program would have increased communication with faculty, but in an interview an online faculty member stated she did not know the liaison program existed or how to request journals for her students. While the qualitative data from the survey indicates that online faculty who knew about the UL's online services during the COVID-19 pandemic believed the services were exceptional in quality, there is clearly a communication divide between University of Memphis librarians and online faculty. Proposed solutions recommended by UL faculty strongly encourage better marketing through increasing visibility on campus and to develop more effective outreach efforts to online faculty at the University of Memphis. Librarians at UL, particularly those from the Research and In-

structional Services Department, the Music Librarian, the Health Sciences Librarian, and the Lambuth Campus Librarian, began developing action items to increase communication with faculty, including online instructors, which began during the Fall 2021 semester. Research and Instructional Services Librarians developed a presentation to present both online and in-person at faculty departmental meetings. UL's Executive Director/Associate Dean confirms that further research will be conducted on how to better market our services to faculty. UL's Virtual Instruction Librarian conducted more follow-up interviews with online faculty to hear their concerns and inform them of services already in place. A UL committee whose sole purpose is to develop faculty outreach strategies was formed in May 2021 to support the UL's Outreach Associate's efforts to increase the UL's presence online through social media, events, and faculty outreach..

Faculty Involvement and Training
During the Summer 2021 semester, UL merged with two other departments on campus: Center for Teaching and Learning and the Center for Innovative Teaching and Learning to form UM3D. This is to assist online instructors with instructional design and incorporate information literacy concepts in courses from the very beginning of the course assessment and design process. Librarians and University of Memphis's instructional designers now work together to develop various materials and present at trainings for faculty. This allows UL the opportunity to inform faculty of the multiple services UL can offer instructors and provide best practices for utilizing electronic resources. Furthermore, UofM Global is working closely with University Libraries to enhance its presence in the University's LMS and will provide links to UL webpages in University of Memphis websites. As the University's fully online program, UofM Global is an important ally for UL in reaching online faculty and providing training. UL marketed their services during the summer faculty training (UofM Global Summer Institute 2020) and presented during the winter faculty training after the Fall 2021 semester (UofM Global Winter Summit 2021).

Enhancement of Existing Services
Based on this study's findings, library instruction is listed as one of the most useful services. University of Memphis librarians and staff are developing hybrid instruction services to support online faculty and students on the main campus and with students at the Lambuth campus in Jackson, TN. Furthermore, Research and Instruction Librarians attended the Library Instruction Tennessee 2021 Conference and are seeking to enhance one-shot information literacy services by providing information literacy workshops instead. Interlibrary Loan and Electronic Resources (including Kanopy) were also listed very highly on the most useful results. While many instructors do not desire any changes to be made to these services, the Resource Delivery/Interlibrary Loan Department is piloting the Article Galaxy Scholar, which offers instant purchase-on-demand (POD) access to research articles not available in the University Libraries' collection based on cost, interest, and usability. Furthermore, UL will soon provide access to open educational resources (OER) for faculty, staff, and students at the University of Memphis. Lastly, a follow-up study to enhance the embedded librarianship service has been approved by the Institutional Review Board (IRB) to increase the expectations of online instructors who utilize the service. Embedded librarians will increase communication with online instructors and be more involved in the course design process. Instructional materials

(such as library tutorials, research guides, videos, etc.) will be embedded in the online course as well. This study will provide the Research and Instructional Department with an avenue to enhance the embedded librarianship service and increase communication between University of Memphis librarians and online faculty.

Conclusion

Many online instructors are grateful for the support and services received from the Libraries during the COVID-19 pandemic—when they know about them. Whereas many instructors felt that they did not need the library's assistance in their courses, the majority felt that they would have used more of UL's resources if they had received notice on what services were offered to them and training for how to utilize these services. Through marketing, faculty training, and enhancement of existing services, UL can better reach online faculty who may not be able to take advantage of the in-person services offered on campus. The COVID-19 pandemic has affected the utilization of library services in a myriad of ways. According to many online instructors at the University of Memphis, the utilization of certain services such as Interlibrary Loan and Electronic Resources have greatly increased because all courses were being taught exclusively online. But many of the other efforts in the library to provide quality online instruction went unnoticed. Even though the Research and Instructional Librarians worked to provide online information literacy instruction sessions, embedded librarianship, and more, requests were at an all-time low. Furthermore, since many online instructors (sixteen out of fifty six) indicated their utilization of the library had not changed, this shows that many new services that were enhanced and/or created during the pandemic went unnoticed. At the time this article was written, the COVID-19 pandemic is still a global crisis, despite the availability of vaccinations. This affects libraries worldwide that are still seeking ways to provide and promote services that continue to meet the information needs of their communities. At the University of Memphis, librarians are taking the information gleaned from this study to continue to enhance services and increase communication with faculty, especially as more students continue to take classes online. Currently, it is apparent that, even when the COVID-19 pandemic abates, online learning is becoming a, if not the, primary format for higher education. This study is just the beginning for what this will look like for academic libraries..

Acknowledgements

Appendix A

1. How many semesters (including summers) have you taught online courses?
    a. Fewer than 3
    b. 3–6
    c. More than 6

2. What student level do you teach online? Check all that apply.
    ____ Undergraduate (100–200 level courses)
    ____ Undergraduate (300–400 level courses)
    ____ Graduate (Master's level courses)
    ____ Graduate (PhD level courses)
    ____ Other _____

3. List the specific online courses you teach in your subject area in the box below (Please submit in the following format: ENGL 1020, ACAD 1100, etc.).

4. How have you utilized UL's services and resources in your online courses? Check all that apply.
    ___ I have not used any UL resources in my online courses.
    ___ assigning a designated (or embedded) librarian
    ___ copying/pasting permanent links to online articles, e-books, etc. for course readings
    ___ uploading PDFs of online articles, e-books, etc. for course readings
    ___ copying/pasting links to Research Guides created by University Libraries
    ___ copying/pasting links/embedding video tutorials created by UL into your online course
    ___ encouraging students to make a research appointment (or research consultation) with a librarian at UL
    ___ encouraging students to use Chat on UL websites if they need assistance with research, citation, etc.
    ___ requesting a virtual library instruction session
    ___ encouraging students to use Interlibrary Loan/Resource Delivery services to obtain materials UL does not own
    ___ encouraging students to contact the Special Collections department at UL to obtain primary resources
    ___ encouraging students to contact the Government Publications department for access to government-issued documents
    ___ placing UL materials on course reserve for students to check out
    ___ encouraging students to contact the Music Library for access to subject-specific resources
    ___ encouraging students to contact the Health Sciences Library for access to subject-specific resources
    ___ providing access to streaming media sites such as Kanopy, MetOpera, etc.
    ___ Other_____

5. Of the UL services and resources used in your online courses, please rank in order from

most useful to least useful. (If you have not used any, check "I have not used any library resources in my online courses" at the top).

___ I have not used any UL resources in my online courses.

___ assigning a designated (or embedded) librarian for your online course(s)

___ copying/pasting permanent links to online articles, e-books, etc. for course readings

___ uploading PDFs of online articles, e-books, etc. for course readings

___ copying/pasting links to Research Guides created by University Libraries

___ copying/pasting links/embedding video tutorials created by UL into your online course

___ encouraging students to make a research appointment (or research consultation) with a librarian at UL

___ encouraging students to use Chat on UL websites if they need assistance with research, citation, etc.

___ requesting a virtual library instruction session

___ encouraging students to use Interlibrary Loan/Resource Delivery services to obtain materials UL does not own

___ encouraging students to contact the Special Collections department at UL to obtain primary resources

___ encouraging students to contact the Government Publications department for access to government-issued documents

___ placing UL materials on course reserve for students to check out

___ encouraging students to contact the Music Library for access to subject-specific resources

___ encouraging students to contact the Health Sciences Library for access to subject-specific resources

___ providing access to streaming media sites such as Kanopy, MetOpera, etc.

___ Other_____

Please explain the reason for your rankings:

6. If you have not used any library resources in your online courses, please elaborate:

7. Is there a service you used that you would not use again? If so, please explain in the box below.

8. How might UL assist you and your students in the future?
    ___ citing correctly
    ___ developing key words
    ___ professional writing
    ___ academic writing
    ___ graduate-level writing
    ___ developing course materials
    ___ other: _____

9. Since March 2020, has your utilization of UL services increased or decreased during the COVID-19 pandemic?

___ Since the beginning of the pandemic, my use of UL services as increased.
___ Since the beginning of the pandemic, my use of UL services has decreased.
___ A mixture of both. I have used some UL services more, while I have used less of others.
___ My utilization of UL services has not changed.
___Other _____

10. What was the reason for the decrease and/or increase?

11. Do you agree with the following statement?:
As an online instructor, I am satisfied with the support I received from UL during the CO-VID-19 pandemic.
   ___ Disagree ___ Agree ___ Strongly Agree

12. Do you agree with the following statement?:
As an online instructor, I would have liked more assistance from UL during the COVID-19 pandemic.
   __ Disagree ___ Agree ___ Strongly Agree

13. Please elaborate on your answers to questions #12 and #13. UL will use your answers to better serve the University of Memphis community.

14. As an online instructor, what are your recommendations for UL to enhance online services?

15. Is there anything else you would like to add?

Appendix B

1. How long have you been teaching online courses?
2. What student level do you teach online?
3. What courses do you teach online?
4. How have you used UL services before the COVID-19 pandemic?
5. Has this changed at all while you have been teaching exclusively online?
6. Did you begin using a library service during the COVID-19 pandemic? If so, which service?
7. How do you think Libraries services have changed during the pandemic?
8. How did you learn about library services you have used in the past?
9. How can the Libraries increase communication about our services among the online faculty at the University of Memphis?
10. Describe some ways UL can support you in your online courses moving forward.

Appendix C

TABLE 1 Representation of Courses and Subjects		
Subject	**Number of Courses Represented**	**Number of Participants**
Accounting	8	2
Anthropology	7	2
Audiology and Speech Pathology	10	3
Aviation	1	1
Biology	15	4
Child Development and Family Studies	1	1
Composition	2	1
Educational Psychology	9	2
English	1	1
Exercise, Sport, and Movement Sciences	3	1
Finance, Insurance, and Real Estate	3	2
French	3	1
Health Administration	2	1
History	6	2
Honors Forum	1	1
Hospitality and Resort Management	10	1
Management	4	1
Management Information Systems	5	2
Marketing	2	2
Math	9	3
Merchandising	3	1
Political Science	4	3
Professional and Liberal Studies	12	5
Public Health	5	2
Religion	1	1
Social Work	22	7
Sociology	4	1
Sport and Leisure	11	2
Supply Chain Management	8	3
I do not wish to answer		2

Appendix D

- I have not used any UL resources in my online courses.
- assigning a designated (or embedded) librarian
- copying/pasting permanent links to online articles, e-books, etc. for course readings
- uploading PDFs of online articles, e-books, etc. for course readings
- copying/pasting links to Research Guides created by UL
- copying/pasting links/embedding video tutorials created by UL into your online course
- encouraging students to make a research appointment (or research consultation) with a librarian at UL
- encouraging students to use Chat on UL websites if they need assistance with research, citation, etc.
- requesting a virtual library instruction session
- encouraging students to use Interlibrary Loan/Resource Delivery services to obtain materials UL does not own
- encouraging students to contact the Special Collections department at UL to obtain primary resources
- encouraging students to contact the Government Publications department for access to government-issued documents
- placing UL materials on course reserve for students to check out
- encouraging students to contact the Music Library for access to subject-specific resources
- encouraging students to contact the Health Sciences Library for access to subject-specific resources
- providing access to streaming media sites such as Kanopy, MetOpera, etc.
- Other_____

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Indispensable, Interdependent, and Invisible: A Qualitative Inquiry into Library Systems Maintenance

Ruth Kitchin Tillman

Over thirty years after such systems were first developed, the Integrated Library System underlies most operations of an academic library. Yet in the literature, its day-to-day maintenance is often reduced to a list of tasks. Through interviews with sixteen system maintainers, this study attempts to develop an experiential understanding of its maintenance. Findings suggest that most maintainers find such work meaningful but face barriers when colleagues and administrators don't understand what they do well enough to support it. This article proposes steps toward building a workplace where core maintenance tasks are recognized and supported.

Introduction

In their 2019 "Information Maintenance as a Practice of Care," the Information Maintainers expand Russell and Vinsel's 2016 definition of maintenance as acts that "sustain and repair people and things" to include "[acts that sustain] the interfaces we design to function between and among information systems."[1] Perhaps no role in the library fulfills this latter aspect so clearly as that of the person or team charged with managing the Integrated Library System (ILS) and maintaining its many connections to library, institutional, and vendor systems. When listing the roles of library IT workers in 1994,[2] Tim Lynch named "maintainer" first among the six he identified. Yet in the nearly thirty subsequent years, little research has been done on maintainers in the library.

This research project into library systems maintenance began with a presentation at the 2019 Maintainers III conference on the maintenance implications of replacing a decades-old "classic catalog" with a Blacklight or VuFind-based public catalog. The conversation it generated suggested the need for deeper inquiry into the experience of maintaining library systems at academic institutions.[3] This article focuses on what has been traditionally known as the Integrated Library System or ILS,[4] because it remains core to the operation of academic libraries.

The ILS is the site of acquisitions, catalog record and item maintenance, and circulation management. It provides data to the library's public catalog or discovery system and can be queried for statistical analysis of item use and overviews of holdings. Despite its centrality to the work of the library, its maintenance is rarely discussed in the literature of the profession.

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Yet an incomplete understanding of ILS maintenance is an incomplete understanding of the very thing that keeps the library functioning.

In this article, maintenance is defined to include regular system upgrades, updating system settings, addressing bugs and issues, upkeep of integrations with other institutional systems, and minor tasks to improve user experience or support existing functions. The latter type of work spans maintenance and innovation,[5] but when it consists of bringing *existing* systems into alignment with expectations and work already being performed, it aligns closely with other areas of maintenance included here. The term "library systems maintainer" is used here because not all maintainers are librarians, and to emphasize that those in this role also support interoperability between the ILS and some or all other technical systems used in the library.

Literature Review

The literature of library systems work consists primarily of retrospectives of system setup or migration, speculations on future innovation, and surveys gathering data to define job requirements for the educational needs of a systems librarian.[6] Even Ojedokun, Olla, and Adigun's highly concrete retrospective on seven years maintaining a Koha system returns in its analysis to the subject of implementation.[7] Yet a literature of systems maintenance can be assembled by identifying recurring themes across retrospectives and survey-based research.

Emerging from this literature is the need for the library systems maintainer to understand the operation of the library and the university as a whole. In 1996, Eric Morgan described systems librarianship as "the art and science of combining the principles of librarianship with the abilities of computing technology." Xu and Chen[8] found that while library directors believed that systems librarians would benefit from library school courses on computer software and system or database design, systems librarians themselves overwhelmingly identified "Organizing information" and "Reference," followed by studying the ILS itself, as necessary preparation for their work. Similarly, Guinea[9] and Tyson[10] describe the importance for systems librarians of knowing all major functions of the library, and how these functions interact with each other in order to make the best system-wide decisions.

Understanding library operations supports maintainers in the challenging work of managing interoperability between the ILS and many other systems. Its earliest mention comes in Epstein's 1983 identification[11] of fundamental interoperability needs between software vendor, terminal manufacturer, modem/multiplexor manufacturer, and telecommunications provider. By 1999, systems directors interviewed by Lavaginino[12] describe interoperability concerns between multiple software packages in a networked environment and between database providers and ILSes. Breeding's 2006 "Knitting Systems Together"[13] reflects the desire to create a seamless user experience even as maintainers find themselves managing more systems and dependencies than ever before, many entirely under someone else's control.

These shared maintenance environments increase the need for strong communication and collaboration skills.[14] Tyson describes "networks and contacts" as "the new systems librarians' tools of the trade."[15] These networks and contacts include others at the institution, peers in the field, and the vendors from whom one licenses systems. In comparing the technical support expectations and experiences of librarians maintaining both open source and proprietary ILSes, Singh learned that half of survey respondents contact technical support four or more times a month.[16]

The field has done an excellent job of documenting systems maintenance *tasks*. These quantitative approaches do not provide a clear picture of qualitative experience. When publications

have focused on maintainer experience, they have been the reflections of individual maintainers. This study takes an approach that is both broader than the individual, seeking to identify shared experiences and patterns, yet also sensitive to the qualitative nature of the experiences it seeks to describe. As everyone in the library is affected in some way with the systems being maintained, this article has been written for a broad audience of academic library workers.

Methodology
Rationale
In seeking a different way of understanding the work, this project uses qualitative research methods, combining a deductive approach to grounded theory[17] with a phenomenological inquiry.[18] The research instrument (see appendix) used open questions developed from topics identified in the literature review. Grounded theory's flexible inquiry, where themes and hypotheses emerge from the data through coding, review, and analysis, was then used to construct themes from the interviews representing shared elements in the performance of library systems maintenance work.[19] These themes form the core of the article and identify research questions that could be investigated through larger-scale surveys.

Recruitment
Institutional Review Board (IRB) approval was obtained from Penn State University in June 2020, and interviews were conducted in June and July 2020 and January 2021. Participants were recruited directly to ensure at least two interviewees were included from different institutions currently or recently supporting[20] each of the five main commercial ILSes in use at academic institutions in the US over the last decade: Aleph, Alma, Sierra, Symphony, and Voyager.[21] Participants were identified through existing relationships, online library directories, and requests to department heads to provide contact information for the person or persons responsible for maintaining the ILS. Workers at twenty institutions were contacted, and representatives of thirteen institutions agreed to participate. In two cases, because of shared responsibilities and interest in the interviews, more than one person at an institution was interviewed for a total of sixteen interviewees.

The sixteen participants came from thirteen universities in the United States. Eleven of these universities are classified under Carnegie Classification of Institutions of Higher Education as R1: Doctoral Universities – Very High Level of Research Activity; the remaining two were classed Doctoral/Professional. Eight were public institutions and five Ivy+ institutions. Of the public institutions, three (all R1s) provide ILS support to one or more smaller institutions.

Participants supported the five main commercial ILSes being used in academic libraries.

TABLE 1 ILSes Used in Academic Libraries		
ILS/LMS	**Number of Participants**	**Vendor**
Aleph	4	Ex Libris
Alma	5*	Ex Libris
Sierra	2	Innovative Interfaces (III)[22]
Symphony	3	SirsiDynix
Voyager	2	Ex Libris
* In two cases, participants had significant experience maintaining a legacy ILS[23] (one Aleph and one Voyager) before migrating to Alma.		

Participants had a wide range of experience, from recent graduates to longtime professionals.

As table 2 shows, while the number of years participants spent maintaining the ILS varied widely, they generally had additional years of experience working in other library roles. Notably, only one of the four participants who had spent three years or less maintaining an ILS worked with Alma. That person held a newly created position, while the other three were replacing longtime maintainers of legacy systems (and Sierra).

TABLE 2 Years of Experience				
	1–3 years	4–9 years	10–19 years	20+ years
Years as a systems maintainer	4	8	4	2
Years working in libraries	0	3	10	3

While personal demographic information such as gender was not collected during the interviews, it became apparent when coding the data that women raised the subject of negative affective impact more than men. To confirm this hypothesis, participants were contacted during the writing of this article with a request for gender demographic information. All but one participant replied, and participants' email responses are represented as "female," "male," and "nonbinary."

TABLE 3 Gender of Participants	
Gender	Number of Participants
female	9
male	5
non-binary	1
no response	1

Unless gender appears to have a specific bearing on an issue, the neutral "they" is used when referring to individual participants below.

Interviews

Interviews were arranged with each participant through email and conducted over Zoom, using the research instrument that can be found in the appendix of this article. The primary set of interviews took place in June and July 2020. Several additional interviews were conducted in January 2021 when a gap in representation of experience level in Voyager ILS administrators was identified. Audio and VTT (transcript) files were downloaded from Zoom and stored in a private Box directory, and recordings were deleted from Zoom.

Coding and Analysis

Interviews were coded in NVivo using an open and iterative approach. While cleaning up the automated transcription, recurring topics and themes, such as "amount of time spent working" and "lack of control over vendor choices" were identified. These were recorded in a text file, which became the initial codebook. Interviews were then coded line by line, and new codes were added as needed to express a concept. Codes were organized hierarchically where appropriate. NVivo's node export was used to generate Word documents with the quotes for each area of coding, which were analyzed further in conjunction with the literature and summarized in a new document, along with illustrative quotations representing each theme.

Results

Five themes emerged from the coding: unpredictability, invisibility/time, collaboration, com-

munication, and affective impact. Just as few jobs can be broken into truly discrete tasks, none of these themes stands by itself. The fifth theme, affective impact, emerged in discussions of the four other themes. The order in which themes are presented below attempts to demonstrate how themes flow into each other, weaving together to create a fuller picture of the subject.

Systems Maintenance is Unpredictable

When describing their regular maintenance work, most participants emphasized its unpredictability. Because a maintainer's primary job is to keep the system working, minor malfunctions take priority over the long-term projects that provide the most visible evidence of their productivity. Each integration, modification, or enhancement becomes another area that requires monitoring and periodic maintenance. Most begin their day by checking on the outputs of overnight processes or "reports." If a report failed or contained errors, they will need to investigate the cause and either fix it themselves or file appropriate support tickets. Issues may arise at any time:

> It's not always predictable, both in terms of the basic workload [and] which […] things are going to take a ton of time and effort. We've all had this experience where, from the outside some things look easy but they're really hard. Some things look hard, but in fact they're really easy.

Systems maintainers receive tickets, emails, chats, and phone calls throughout their day ranging from "the system is down" to "please upgrade [person's] privileges in __ module." These might derail days of planned work or be simple fixes, but even the act of monitoring email cuts into one's capacity for focused work. Such work is never complete, only done for now:

> Maintenance work will never go away. Maintenance work increases with external dependencies. Maintenance work doesn't make a machine better, it just moves the marker a little bit forward.

Another area of unpredictability which surfaced in the interviews was that of vendor-mandated system updates. While legacy systems tend to update in large releases that can be scheduled, the field's consolidation has led to few newer options. These are only available as Software as a Service (SaaS),[24] which means one must work on the vendor's timeline. For example, Ex Libris pushes monthly updates to its Alma LMS and quarterly updates to the Primo front-end display. Maintainers must monitor product roadmaps, read release documentation, and understand the impact of changes on both technical integrations and tasks performed by other library workers. They must then determine how and to whom the change should be communicated, and whether they will need to update settings or write new code to ensure their colleagues are not negatively affected by the change:

> You could have four months in a row with no updates that will really affect people. Then BAM, four months back-to-back of big features.

Even less predictable are the changes to external systems and how these will impact

one's work. Several participants noted that vendors who provide MARC records and other regularly ingested data periodically change their data formats without updating the mapping they provide to libraries. Another needed to drop everything when their university announced changes to its authentication system. Supporting these changes may require anything from a couple days of tinkering to an intense, ongoing project that preempts other work.

If unpredictability is not recognized and incorporated into expectations for the position alongside more visible work, a maintainer's everyday work may not be perceived as productive. As one participant noted, when one's email is the place one receives reports from monitoring systems, support tickets, and direct emails from colleagues, watching one's inbox is a fundamental part of the job:

> It might look like you're not doing anything. But if you're not paying attention to your email, then [something] could come in and it's important, but nobody sees it.

Systems Maintenance is a(n Invisible) Full-Time Job

As they outlined the challenges of unpredictable work, participants expressed a sense of accomplishment that comes from their skillset and track records in solving problems for others. Because their work is most often visible when something breaks, however, they feel that coworkers, administrators, and even managers often have little idea of what they do with the rest of their time:

> As long as everything's running smoothly, no one thinks about us. …at some point, they forget that we're doing a lot of work to keep everything running smoothly. Then you get your directors saying, "Okay, let's start this new service and let's start this and let's do that." It's like, hang on, we are spending 60 percent of our time just maintaining and supporting what we already have.

When discussing issues of communication and capacity, three-quarters of participants noted that the frequent invisibility of their work leads to the perception that they have greater availability than they do.[25] One participant, who works at a Midwestern Doctoral/Professional-class university, shared that when the one-person system librarian role became a two-person team:

> … it seemed to surprise people that there was so much more being done. I think most people were under the impression that the systems person can just handle all the behind-the-scenes stuff and keep things humming along smoothly.

Participants split about fifty-fifty[26] on whether they regularly worked more than a forty-hour week. Some occasionally work extra hours but are often able to take comp time in its place or keep the occurrences limited to a couple of times a year.[27] Several who do not work overtime emphasized that they had enough possible work that they had to make the decision *not* to work overtime and that their institution would benefit from hiring another full-time person to do the work. A participant (quoted above) was hired into a newly created position

and found their colleagues were surprised by the improvements in the system. Another had managed to cut back on overworking by prioritizing the critical work that they could accomplish in forty hours each week and recording all tasks that they were leaving undone. With the help of a supportive manager, this task list turned into a second position. When describing how their role had expanded over the past two decades, one longtime maintainer said:

> …as the library world becomes more complicated and there's so many new things you can do … EDS and Summon and ILLiad and SFX and CORAL and a million different new things and options. Part of system maintenance is making all these things work together and letting them talk to each other, sending data back and forth to each other.

Participants identified a lack of understanding of what it is that they *do* as a key contributor to the invisibility of their work. Communicating about technology can be time-consuming work and cut into one's time to accomplish other things. Nor are such communications requested. The sense that only technology workers can or should be familiar with technology can be damaging at all levels of the library:

> I think most library administrators are not going to have come from [systems positions] right? So, if anything, I wish other librarians were more familiar with the way that the systems work together. …if I were going to ask people to learn more, that's what I would ask.

As the participant quoted above indicates, the lack of familiarity many library workers have with the systems they use every day means many administrators don't understand a vital service that keeps the library running. Others noted that when a colleague understands elements of a system, they write more helpful tech support tickets and come up with more feasible ideas for improvements. These benefits underscore the collaborative nature of systems maintenance work.

Systems Maintenance is Collaborative

While those with titles like "systems librarian" or "systems programmer" are often perceived as the one person who maintains the ILS, the work of systems maintenance is collaborative. Solving everything from minor bugs to network outages often requires communicating with or requesting assistance from internal and external colleagues. Support work that does not require significant access to the system itself may be distributed throughout the library. A (designated or informal) point-person often troubleshoots their coworkers' issues with the ILS before the system maintainer gets involved. They may even file tickets on behalf of the department. Such work requires developing an understanding of the ILS as it affects one's area of work and other skills such as writing a good support ticket. ILS maintainers can improve this decentralized support system through regular communication with the point people.

To receive the support they need, systems maintainers develop a network of contacts across the institution and at vendors.[28] In some cases, library IT provides primary support and acts as intermediary between the maintainer and the institutional IT. In others, the maintainer

has built their own relationships with the campus technologists who manage everything from enrollment data to server allocation to user authentication. When seeking support outside the library, several participants described the importance of relationships with individuals. In a university IT context, this allowed the individual support contact to learn the specific functions of the library and the eccentricities of library systems. One participant described their institution's shift from a dedicated person in university IT to a ticketing system as leading to very inconsistent levels of support received.

Vendor support, or the lack thereof, was a consistent pain point in the network. Participants felt they could not rely on the vendor to solve bugs in the ILS in a timely manner. Most expressed a level of dissatisfaction with the support they received. A particular theme was that of a ticket languishing for weeks in the tier-one support queue before escalation to someone who would fix it.[29] One participant expressed frustration that only one vendor technician responds knowledgeably to their tickets:

> So, when it's [him] I'm very happy. When it's anyone else, I feel like I know more than you do about your own systems. …I feel bad saying that but…

Several spoke about the importance of the relationships they developed with individual support workers. Some directly apprised this person of submitted tickets:

> …it's not just "who can I email?" it's "I need to call up so-and-so and we'll get to the heart of the matter."

Two participants described what can happen when such relationships do not exist. Upon beginning their positions, each discovered a backlog of serious, though not catastrophic, tickets in their (different) vendor's system. These tickets were not only unresolved but had no response or indication whether they had been resolved in subsequent releases.

Others paid for enhanced service levels from their vendor or for direct access to the code so that someone local could fix it instead, or used institutional power to schedule meetings with higher-ups at the vendor to discuss unaddressed tickets. A participant who also supports Ex Libris's Summon discovery service referenced a frequent practice of emailing the Summon listserv when submitting a ticket as an attempt to enforce transparency about issues they were experiencing. However they noted that this was less productive for their ILS, despite it also being an Ex Libris product.

One assumption made in this interview's design was that participants received and provided some support through listservs. However, only two participants said that this avenue was important to them. For both, it became important just after migrations to Alma. One noted that "there are always going to be things that another library is going to understand a lot better than a vendor will get, no matter how hard the vendor's trying." Two others described peer support networks that had developed with others using the same legacy ILS. The three reasons participants gave for not regularly engaging with listservs were the lack of helpful answers when they had a question, that the vendor could access their backend and fix the code (and should because they were paid to), or a team at their own institution could solve most issues. While collaboration is a core element of systems maintenance work,

listservs and cross-institutional support play a smaller role in collaborative communication than anticipated.

Systems Maintenance is Communications Work

The amount of internal and external collaboration required by this role underscores the degree to which systems maintenance requires investing time in interpersonal relationships and communications work:

> …people don't necessarily think about the difficulty in communicating something … complicated and technical to an audience who needs to understand what is happening and the broad outlines of why it's happening but who isn't interested in and doesn't have the background to really get the full technical details [and doesn't need them].

When asked how much time they spent on communication, responses ranged between 10 percent and 25 percent of a person or team's time, with some noting a significant increase if meetings and messages about project work were added to maintenance-specific communication. Several noted that documentation work should also be considered communication, as it is a site of effective communication about common tasks and issues. One participant found significant communication and time spent fostering trust was often required to "get others on board" with larger maintenance tasks such as automated data cleanup or batch removal of expired accounts. When describing how they spent their time, another explained:

> There's just so much customer service. I kind of hate that phrase but being a good colleague and doing that internal customer service is [a critical] part of maintenance work.

When a systems maintainer or team neglects interpersonal work and communication, it may damage the relationships that are necessary to successful maintenance work. One newer systems maintainer described the barriers that had formed between an in-group who had been maintaining the system for decades and everyone else. When replacing a retiree, they felt hostility from other members: "uncomfortable to be around, like I am clearly not wanted. Here, you two would rather just talk to each other, [that] kind of thing." Another newer maintainer described part of their early work as coaxing colleagues back into engaging with the system and with them as its maintainer. Talking and listening was a first step to rebuilding trust:

> [Even] if [my] answer was no, they were at least beginning to email. [I became] someone who cared about them enough to say "You're right that is important. I'm going to work for you."

From "customer service" to "caring," communications work included an affective element that was intensified by unpredictability and the sudden visibility of often invisible work.

Systems Maintenance Has Strong Affective Elements

It sucks because I'm responsible for it, but I don't have any control over it.

A thread that weaves throughout the previous four themes is the strong (and often negative) affective consequences of these experiences. This was the only area of the interviews in which an apparent gender gap emerged. Women were more likely to describe a negative affective burden of being the public face of things one could not control. Specifically, when talking about the inability to depend on timely support from vendors or the limitations of hosted software one cannot configure, half of female participants described negative impact on emotions, mood, or self-perception. One of the female participants reflected:

> [a delay in vendor response] really impacts our unit's reputation within the library but also our library's reputation within the university.

Several women who support legacy systems mentioned the stress of an anticipated increase in such interactions post-migration, when they would still be learning how to use a new system and have less control because it was Software as a Service. Of the male and nonbinary participants, only one male participant described anything comparable. Another male participant noted that he's found his colleagues generally understanding that the delay is being caused by the vendor, not him. Because of the small sample size in these interviews and because only half the female participants described this impact, the apparent gender difference is suggestive, but more research is needed. Are there other factors involved, such as an expectation that the women will do more communications work? Does the gender variance still emerge when someone else is responsible for library-wide communication?

Migration and anticipated migration had a mostly negative affective impact regardless of gender. When discussing the possibility of migration from their ILS to Alma or FOLIO, all but one legacy ILS maintainer brought up concerns about how this would impact the service they could provide. "[Coworkers] got really used to having a mature system for 12 years" said one, who worried that people outside the systems department were unprepared for the many complications of a migration. Even when colleagues are understanding, such changes demoralize workers. A participant who had migrated from a legacy ILS to Alma several years before described the stress and sadness of feeling they transformed overnight from a skilled worker who solved colleagues' problems (a point of pride and part of a strongly positive affect toward their position) to a beginner.

Even when maintainers feel competent in their roles, the element of invisibility described above leads to incidents that harm their morale. Two participants mentioned that their institutions prioritized and praised highly visible developers, even when they had been an equal or primary contributor. As one said:

> …nobody mentioned me, nobody mentioned the months that I spent working on this, and my direct supervisor still does not recognize that that work had to be done. Nobody ever knows that my work comes first and then the guy who worked on the website gets to do the cool thing that everyone can see.

Several participants described the difficulty of sharing experiences that generate positive affect, such as pride in a very technical success. Most colleagues could only understand the success in very general terms, and they can only meaningfully celebrate within a very small group of people who are also familiar with the technology. In such a context, a drop in complaints could feel as significant as a commendation:

> It does feel like some of the biggest impact. I love that. The best thing I've ever heard is that you don't hate me.

Discussion

This research suggests that the greatest challenges faced by library systems maintainers are a general ignorance about the nature of this work and an unpredictable swing from invisibility to hypervisibility within the library. When the hypervisibility results from stress-inducing bugs that are outside their control, this hypervisibility leads to negative affective experiences, apparently at a higher-level among women. In some cases, the affective strain results from harsh communications from stressed coworkers. It can also be caused by the maintainer's dissatisfaction with their inability to help others and questioning their own competence.

The interviews closed by asking participants what they wished colleagues or administrators knew about their work. Answers—which built on the themes of unpredictability, visibility/full-time work, and collaboration—all came back to ensuring that workers have sufficient capacity to maintain and enhance the systems on which the entire library relies. Drawing on these themes, this article suggests necessary steps for developing a culture in academic libraries that better supports all those performing maintenance work.

Unless workers have sufficient capacity for both innovation and maintenance, projects that carry prestige among peer libraries will siphon time needed to support library operations, harming both patrons and workers. Strategic plans, job descriptions, and performance evaluations should consider that maintenance and incremental improvement are at least as important as innovation. Expectations should be set accordingly.

Nor should such commitments be limited to technical maintenance. Support for maintenance must encourage language that re-envisions maintenance in the library as a shared task, on par with other work. Here, the responsibility for culture-building shifts from those with administrative power to library workers broadly. Not everyone can be a leader all the time, yet many workers throughout the library provide underlying support for both critical operations and cutting-edge experiments. Systems maintainers benefit from learning the functions of the areas they support throughout the library,[30] but their colleagues may need administrative and cultural encouragement to develop reciprocal approaches, particularly for tasks far removed from their regular work.

Such a shift could have transformative effects in planning and completing work but will also have its challenges. Communicating effectively about technology is a time-consuming process. Those proactively sharing about their work may face an underlying presumption from non-technologists that it will be too complex for them to understand. System maintainers might support this by dedicating some time to coming up with high-level explanations of core work that gradually improve others' comprehension of the systems. Such communication could be supported by the practice of naming how workers inside and outside the library contribute

to the success of its operations. Individuals should be encouraged to identify their own roles as a maintainer, whether of LibGuides, budgets, patron records, or a subject collection.

Learning more about the systems one uses and how they interact with each other gives one grounding to identify improvements one hadn't previously known were possible. It may also contribute to a better understanding of the collaborative nature of such work and to setting more realistic expectations of what the maintainer can and can't control. For new initiatives to be successful, one must take into account that every new system, integration, or project added brings with it more maintenance tasks and possible points of failure in addition to the ones already in place. Recognizing the time needed to maintain existing systems and integrations is key to setting achievable goals for projects throughout the library. Nothing is no-maintenance or set-and-forget.

Limitations

Because these research interviews were carried out during the summer of 2020 and in January 2021, both the participants and researcher were working under the strains of the COVID-19 pandemic. This likely lowered the number of invitees who felt they had the capacity to participate.

In some cases, more than one person from an institution was interested in participating. An attempt to balance these factors was made by ensuring that all major commercial systems currently in use were represented by at least two maintainers at two separate institutions. Any analysis of such rich interviews is also limited by the format in which it must be communicated. Although the five themes identified above capture the core of these conversations, many insights had to be left out of this analysis.

Additionally, participants came primarily from R1 institutions and are thus not representative of maintainers at all colleges and universities. Subsequent research should involve a survey developed from the themes in this work to explore their resonance with the experiences of system maintainers broadly.

Conclusion

Maintenance work can be rewarding. Handling an unpredictable challenge, whether by learning a new skill or drawing on years of experience, can lead to a deep sense of accomplishment. It is often done behind-the-scenes but also deeply collaborative. At the best times, this leads to strong bonds with team members and creates a network of peers who recognize and appreciate one's successes. It can lead to strong affective responses, which may be positive, such as when one is the face of a success or an improvement that has made colleagues' lives easier.

The concerns participants expressed—having sufficient time to handle all their work and others not understanding that their varied tasks combine to make a full-time job—arose not from the work itself but from colleagues not understanding the nature of their work. This has consequences from not being recognized for one's contributions, to feeling judged as "lazy" by coworkers,[31] to being overloaded with projects by higher-ups who did not recognize the time commitments required to maintain current systems.

Maintenance work is not prestigious, yet it keeps the library going. It is the author's hope that this research will lead others to inquire into types of maintenance that support their workplaces. Only together can we build a culture in which maintainers are duly recognized alongside innovators.

Author/Acknowledgements

Appendix

Research Instrument

My research project, "Labor, Maintenance, and Library Systems" (study ID STUDY00015392) has been determined to be Exempt research by the Penn State IRB. Your participation is voluntary, and you may decide to stop at any time. You do not have to answer any questions that you do not want to answer. You can also ask me to turn off Zoom recording for an answer.

I'll reference this email and confirm your verbal consent during our call. The call will be recorded and transcribed using Zoom software, and then I will complete the transcription and delete the Zoom recording. I will retain the transcription in my institutional OneDrive folder for coding and possible quotations. If you have any concerns about that, we can talk about alternatives. I am including a list of the questions I plan to ask, along with possible follow-ups.

If you have questions regarding your rights as a research subject or concerns regarding your privacy, you may contact Penn State's Office for Research Protections at 814-865-1775.

Q1. How long have you supported library systems?

Q2. What system do you currently support?

Q2a. How long have you supported that system?

Q2b. Did you support any systems before it? If so, were you involved in the migration process?

Q3. What do you consider core maintenance activities of your position?

Q4. What do those core maintenance activities look like throughout an average month? Do you find yourself working overtime to keep up with them?

Q4a. What do they look like over the course of a year?

Q4b. What do you think core maintenance activities would look like if your department had your ideal staffing level?

Q5. What does maintaining interoperability between library systems look like for you? (e.g., ILS and OPAC, ILS and KnowledgeBase, etc.)

Q5a. How much time do you estimate that you spend on interoperability concerns?

Q6. What does getting external support look like for you (e.g., putting in tickets with vendors, posting to listservs, reaching out directly to peers)?

Q6a. How does availability (or lack thereof) of external support impact your ability to maintain library systems?

Q7. Do you provide external support to others in similar roles, such as answering listserv questions and assisting peers?

Q7a. How much time would you estimate you spend on providing such support?

Q8. How often do you communicate with those outside your department about issues of systems maintenance (responding to tickets, warning of upgrades, planning minor improvements, etc.)?

Q8a. Do you find yourself communicating with the same people over and over or with a wide sampling of the people who work in the library?

Q8b. Do you rely on or communicate with people outside the library (e.g., campus IT)?

Q9. What do you wish that more administrators or strategic planners knew about library systems maintenance work?

Q10. Is there any aspect of library system maintenance that you expected this survey to cover but was not discussed?

Notes

1. Devon Olson et. al (The Information Maintainers), "Information Maintenance as a Practice of Care," *Zenodo* (June 2019), 11, https://doi.org/10.5281/zenodo.3251131

2. Tim Lynch, "The Many Roles of an Information Technology Section," *Library Hi Tech* 12 no. 3 (1994): 38–43.

3. The context of ILS maintenance in public libraries differs too much from the academic context for them to be studied in the same survey. This would be a rich area for future study.

4. This article uses "ILS" as a catchall term to refer to both the ILS and the "Library Management System"/"Library Services Platform" (LMS/LSP). For more on distinctions between the ILS and LMS/LSP, see Marshall Breeding, "Smart Libraries Q&A," *Smart Libraries Newsletter* (October 2020), https://librarytechnology.org/document/25609.

5. See *Gridium*'s interview with Lee Vinsel for an exploration of the complementary and dichotomous relationships between maintenance and innovation at https://gridium.com/lee-vinsel-maintenance/.

6. This section uses the article's term for the systems maintainer, most often "systems librarian."

7. Ayoku A. Ojedokun, Grace O. O. Olla, and Samuel A. Adigun, "Integrated Library System Implementation: The Bowen University Library Experience with Koha Software," *African Journal of Library, Archives & Information Science* 26, no. 1 (2016): 31–42. The authors seek to remedy the lack of literature on day-to-day systems work. They draw on nine years of quarterly and annual reports to identify recurring issues and specific incidents.

8. Hong Xu and Chen Hsin-liang, "Can We Meet the Challenge? The Educating Systems Librarian Research Project Report 3," *The Electronic Library* 19, no. 5 (2001): 315–26, https://doi.org/10.1108/02640470110408896.

9. Janet Guinea, "Building Bridges: The Role of the Systems Librarian in a University Library," *Library Hi Tech* 21, no. 3 (2003): 325–32, https://doi.org/10.1108/07378830310494508/

10. Lisa Tyson, "Library systems teams—more than just peripherals," *Library Hi Tech* 21 no.3 (2003): 317–24, https://doi.org/10.1108/07378830310494490.

11. Susan Baerg Epstein, "Maintenance of Automated Library Systems," *Library Journal* (December 15, 1983): 2,312–13.

12. Merri Beth Lavagnino, "Authentication, Bandwidth, and Collaboration: The Library Systems Directors' ABCs," *Library Hi Tech* 17, no. 4 (1999): 396–402, https://doi.org/10.1108/07378839910303054.

13. Marshall Breeding, "Knitting Systems Together," *Computers in Libraries*, 29 no. 9 (October 2006): 32–4.

14. David Ratledge and Claudene Sproles, "An Analysis of the Changing Role of Systems Librarians," *Library Hi Tech* 35, no. 2 (2017): 303–11. Youngok Choi and Edie Rasmussen, "What qualifications and skills are important for digital librarian positions in academic libraries? A job advertisement analysis," *The Journal of Academic Librarianship*, 35, no. 5 (2009): 457–67.

15. Tyson, "Library Systems Teams," 321.

16. Vandana Singh, "Expectations versus experiences: librarians using open-source integrated library system," *The Electronic Library* 32 no. 5 (2014): 695, https://doi.org/10.1108/EL-10-2012-0129. These requests may not all be to the same vendor/for the same system.

17. Kathy Charmaz, "Grounded Theory," in *The SAGE Encyclopedia of Social Science Research Methods*, eds. Michael S. Lewis-Beck, Alan Bryman, and Tim F. Liao, (Thousand Oaks, CA: SAGE Publications, Inc., 2004): 441–44. https://doi.org/10.4135/9781412950589.n381.

18. J.W. Creswell, *Qualitative Inquiry and Research Design: Choosing among the Five Approaches*. (Thousand Oaks, CA: SAGE Publications, Inc., 2013): 76–83.

19. The phenomenological elements were inspired by Kaetrina Davis Kendrick's phenomenological approach to the study of low morale. "The low-morale experience of academic librarians: A phenomenological study." *Journal of Library Administration*, 57 no 8 (2017): 846–78, https://doi.org/10.1080/01930826.2017.1368325. Kaetrina Davis Kendrick and Ione T. Damasco, "Low morale in ethnic and racial minority academic librarians: An experiential study," *Library Trends*, 68, no2 (2019): 174–212, https://doi.org/10.1353/lib.2019.0036. "The public librarian low-morale experience: A qualitative study," *Partnership: The Canadian Journal of Library and Information Practice and Research*, 15 no. 2 (2021): 1–32, https://doi.org/10.21083/partnership.v15i2.5932. The author was also influenced by her spouse, Micah Tillman, whose PhD work on phenomenology has brought its concepts and terms into her everyday life.

20. As Ratledge and Sproles found in their analysis of job postings from 2014 (published 2017), the actual tasks of a systems librarian (or equivalent) vary widely. Qualification for inclusion in this study was a position that included responsibility for managing at least some parts of the ILS.

21. For numbers of active installations, see Marshall Breeding's annual report in *American Libraries* https://americanlibrariesmagazine.org/tag/library-systems-report/.

22. While this survey took place shortly after III was acquired by Ex Libris, this had not yet impacted par-

ticipants' day-to-day work.

23. A legacy ILS is one which is still used by many libraries but is no longer the focus of the vendor's active development work. In this study, that includes Aleph, Symphony, and Voyager and, with Ex Libris's purchase of III, may soon include Sierra.

24. Joseph Koivisto, "The narrowing field: The interrelationship of systems librarian training & ILS marketplace consolidation," *Journal of New Librarianship*, 3, no. 2 (2018): 202–5. https://doi.org/10.21173/newlibs/5/6

25. Respondents who did not discuss perceptions of their availability came from well-staffed departments. One added that they did not think the institution understood how much work would stop being done if they lost staffing levels.

26. Several participants who normally worked forty hours/week added that periods of the COVID-19 pandemic pushed them well in to fifty- and sixty-hour weeks. I did not mark them regularly as working overtime but consider this worthy of a note.

27. Despite a major shift in the kind of work being performed (c.f. Ratledge and Sproles, 2017), this is similar to Muirhead's 1991 survey of 416 UK systems librarians, which found that 62.8 percent regularly worked overtime and 32.3 percent occasionally did so. Graeme A Muirhead, "The Role of the Systems Librarian in Libraries in the United Kingdom," *Journal of Librarianship and Information Science* 25, no. 3 (September 1993), 129. https://doi.org/10.1177/096100069302500303. Special thanks to the Penn State Libraries and UW-Madison library ILL teams for a color scan of figure 5, which contains this data. The publisher scan was of unusable quality.

28. Tyson, "Library Systems Teams," 321.

29. This experience is also reflected in Singh's responses from non-open-source ILS maintainers, "Expectations versus experiences," 697–8.

30. Guinea (2003) and Tyson (2003).

31. While multiple participants expressed variations on this concern, none recounted instances where a coworker stated or implied that they weren't doing enough work.

Students' Perceptions of Preprints Discovered in Google: A Window into Recognition And Evaluation

Tara Tobin Cataldo, Ixchel M. Faniel, Amy G. Buhler, Brittany Brannon, Lynn Silipigni Connaway, and Samuel Putnam[*]

Preprints play an important role in scholarly conversation. This paper examines perceptions of preprints through the lens of students using a simulated Google environment. Data were collected from 116 high school, community college, undergraduate, and graduate students with attention toward the helpfulness, credibility, and identification of preprints. Findings show preprint and peer-reviewed cues play little to no role in judging helpfulness or citability, but peer-review does when judging credibility. Further, most students did not recognize these resources as preprints. Implications and recommendations are discussed surrounding awareness and use of these openly available sources of scientific information.

Introduction

Preprints can be described as scholarly manuscripts "posted by the author(s) in an openly accessible platform, usually before or in parallel with the peer review process."[1] Preprints have been a part of scholarly communication for decades. ArXiv.org, a preprint server that primarily archives research in physics, mathematics, and computer science, was created in 1991. Other preprint servers such as bioRxiv for the life sciences and ChemRxiv for the chemical sciences, were created in the past decade. Fraser (2021) surmised that the growth of preprints could be disruptive to the online information environment, and this came to fruition during the COVID-19 pandemic.[2] The easy access to and enormous output of preprints has sparked debates about their positives and negatives,[3] their use in journalism,[4] and journal policies and guidelines.[5] The publishing world is by no means united in its view of preprints. Journals such as *Anesthesiology* prohibit references to non-peer-reviewed scientific articles.[6] Others, such as *eLife*, require authors to submit their manuscripts to a preprint server.[7] Klebel (2020) details the ambiguity of

many journals' preprint and peer review policies.[8] Some studies have compared preprints to the published versions of the articles, and most find the differences markedly small.[9] Many are concerned that without peer review, poor quality research in preprints will clutter the scholarly discourse. Others argue that even with peer review, questionable studies are still published. As of this writing, the Retraction Watch service listed 190 COVID-19 articles as having been retracted.[10] Only forty-one (22%) of the articles are preprints, and some of the retractions are from prestigious journals such as the *New England Journal of Medicine* and *The Lancet*.

Despite the controversy over preprints and the value of the peer review process, researchers are citing preprints in their work. Lariviere et al.'s study showed articles indexed in Web of Science cite arXiv preprints in a range of 0.2% to 6.6% depending on the discipline.[11] Pagliaro used the databases Scopus and Dimensions to study preprint citation patterns from three servers, amassing evidence that preprints are regularly cited in peer-reviewed journal articles, books, and conference proceedings.[12] Students are using preprints in academic work as well. Flynn reported that preprints represented 4.6% of citations from an analysis of math and statistics dissertations.[13] Flynn expressed concern that the average age of the preprints was 8.4 years, but the study did not investigate if the preprints had published versions available at the time. In Dotson and Frank's study of civil engineering, computer science, mathematics, and physics dissertations, up to 4.2% of the citations were preprints.[14]

The lack of formal peer review is an important characteristic of preprints and the key differentiator between preprint articles and journal articles. A review of the literature finds no studies examining the relationship between peer review and preprints amongst students. However, there are studies of students' perceived value of peer review and application of this cue in the information seeking process. For example, Komissarov's survey revealed that undergraduate students value peer-reviewed sources, although this attribute ranked fifth in importance, after subject relevance, full-text availability, understandability, and currency, respectively.[15] In an observational study of twenty undergraduates' evaluation of online information, Rempel discovered that students were attracted to descriptions mentioning "peer review" or "scholarly" when choosing their search tool.[16] However, once students began selecting resources within a tool, they mostly favored content or their ability to understand and apply the information from a resource, with peer-review status not necessarily serving as a deciding factor. Several students in the study also assumed that the library databases would provide only peer-reviewed sources, and none used the peer-review facet available in one of the search tools. This is contrary to the Kliewer et al. study, which found that when undergraduates did apply a facet to their search, they applied the peer-reviewed facet about a third of the time.[17] Blummer et al. also found that graduate students mentioned using the peer-reviewed facet, looking at peer-reviewed journals only and peer-reviewed articles endorsed by a trusted professional association.[18]

The literature on students' perception of preprints and their lack of peer review is sparse. One exception is a recent study by Soderburg et al., who surveyed researchers (including graduate students) regarding the cues they value as important to the task of assessing the credibility of preprint articles.[19] The study found that researchers who view preprints favorably (including 80% of graduate students) place less value on 'traditional' metrics like author and peer-review information. Instead they tend to value open science (e.g., links to analysis scripts and data) and independent verification indicators (e.g., links about independent reproductions). However, participants were not specifically asked about peer review, but instead if they valued the user comments about a preprint or even simple thumbs up/thumbs down

ratings by other users. Their low value of this cue could be because researchers didn't equate this type of open peer-review with the formal process conducted by a journal.

In the discussion and studies around preprints, there has been little consideration to date about whether students recognize or contextualize preprints and how that influences their information choices and evaluations. Disintermediated search tools like Google and Google Scholar are ubiquitous in the search for information, including academic research, and preprints are discoverable in the search results, especially in Google Scholar. In recognition of the growing importance of preprints, the National Institutes of Health (NIH) launched a preprint pilot wherein preprints from NIH-funded studies would be ingested into PubMed Central and consequently the PubMed database, and then picked up by Google Scholar.[20] The project took significant pains to ensure preprints were clearly labeled both visually and within the bibliographic record metadata. However, there is no evidence whether clear labelling affects recognition and use of preprints. The Researching Students' Information Choices (RSIC) study begins to address the gap in preprint research by examining students' perceptions of preprints. Using data from our study of students searching Google for a school research assignment, this paper will highlight how students perceive preprints and whether they can distinguish them from other publication types such as peer-reviewed journal articles.

Methods

The data for this paper were collected from 116 students in the RSIC study (IRB Protocol #2016-U-0131) from four educational cohorts. These cohorts were high school (n=26) and three post-secondary cohorts: community college (n=30), undergraduate (n=30), and graduate (n=30). Each student completed an initial demographic questionnaire, followed by a facilitated task-based session using a simulated search engine environment. The simulated search engine environment allowed students to navigate and interact in a realistic way with a controlled set of Google search results and captured their real-time clicks and decisions. A think-aloud protocol was used during the task-based simulation to capture what students were thinking during each task. The think-aloud audio files were transcribed and a codebook was created to capture the cues and common judgments. Each student's transcript was coded in the NVIVO software. Cataldo et al. details the full research methodology.[21]

In the task-based sessions, students were presented with a research assignment appropriate for their educational cohort about the Burmese python's impact on the Florida Everglades. They started the simulation by performing a Google search. Then they completed five tasks using the simulated search results. They were asked to determine the resources' helpfulness, citability, credibility, and container identity, in that order. Helpfulness encompassed two tasks: one in which they selected resources they deemed helpful for their research assignment, and one in which they described why the unselected resources were not helpful. Students only judged citability and credibility on the resources they found helpful. Students used a yes-no option to decide whether their helpful resources were citable and a scale of 1 (not credible) to 5 (highly credible) to rate credibility. For the container task, students in the same cohort were shown the same set of resources, whether they found them helpful or not. The students were presented with eight containers to choose from, and preprint was one of the choices. The others were blog, book, conference proceeding, journal, magazine, news, and website. The students were not given definitions for the containers. A short video demonstration of the simulation session can be viewed at http://ufdc.ufl.edu/IR00010570/00001/video?search=rsic.

FIGURE 1
**bioRxiv Google Snippet and Front Page**
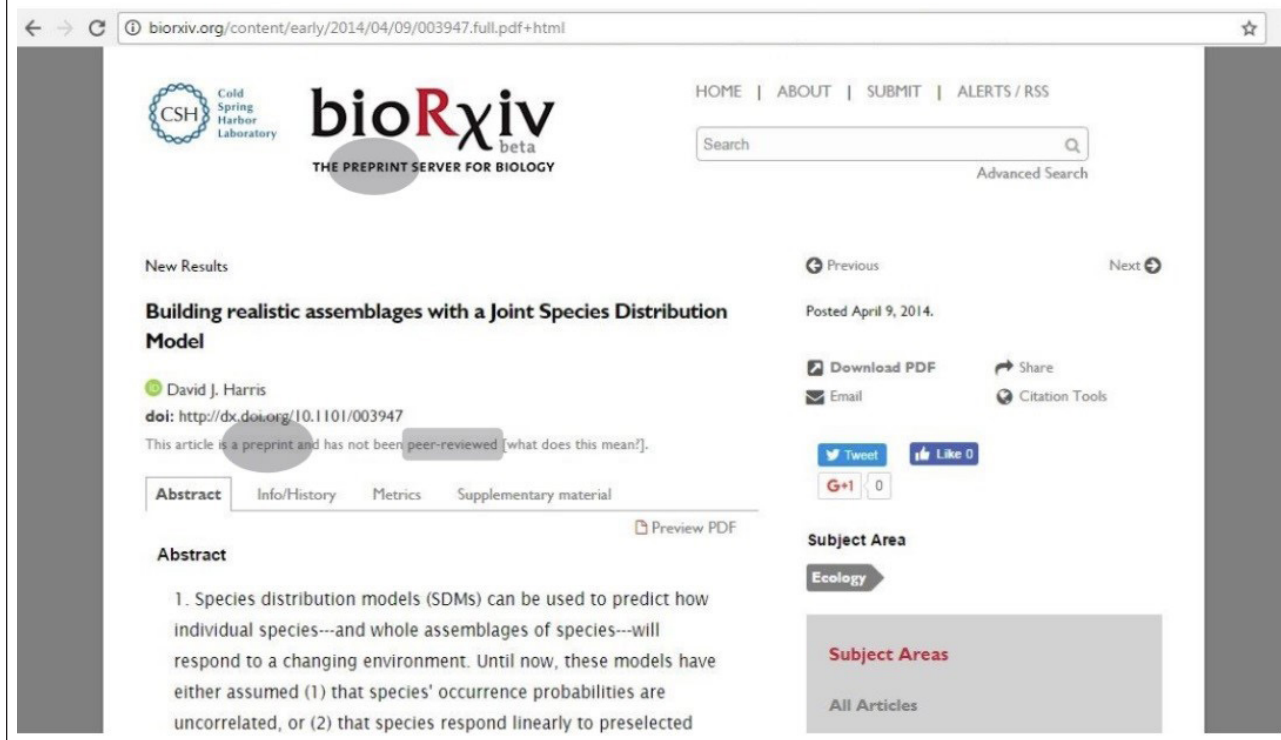
This paper analyzes qualitative and quantitative data pertaining to two preprint articles included in the RSIC study and discoverable in the simulated Google search results. Both articles were from preprint servers, a bioRxiv preprint article (hereafter referred to as bioRxiv) and a PeerJ preprint article (hereafter referred to as PeerJ). A few visual details about each resource will be helpful in understanding the students' perceptions. The images were captured for the study in 2017. The bioRxiv Google snippet had no mention of preprint while the PeerJ snippet had three. The bioRxiv front page had two preprint cues and one peer-reviewed cue (figure 1). PeerJ had seven preprint cues and three peer-reviewed cues (figure 2). In addition, one of the seven PeerJ peer-reviewed cues linked to the peer-reviewed version of the article that students could open, and another cue noted users could "browse peer-reviewed articles instead." Students were not able to click to a peer-reviewed version of the article for bioRxiv as none existed.

Results

BioRxiv appeared in the search results for the post-secondary students (n=90), while PeerJ appeared for the post-secondary and high school students (n=116). Overall, our findings show few mentions of preprint regardless of the educational cohort, even though there were more preprint cues than not-peer-reviewed cues. This may be due in part to students not knowing

FIGURE 2
PeerJ Google Snippet and Front Page
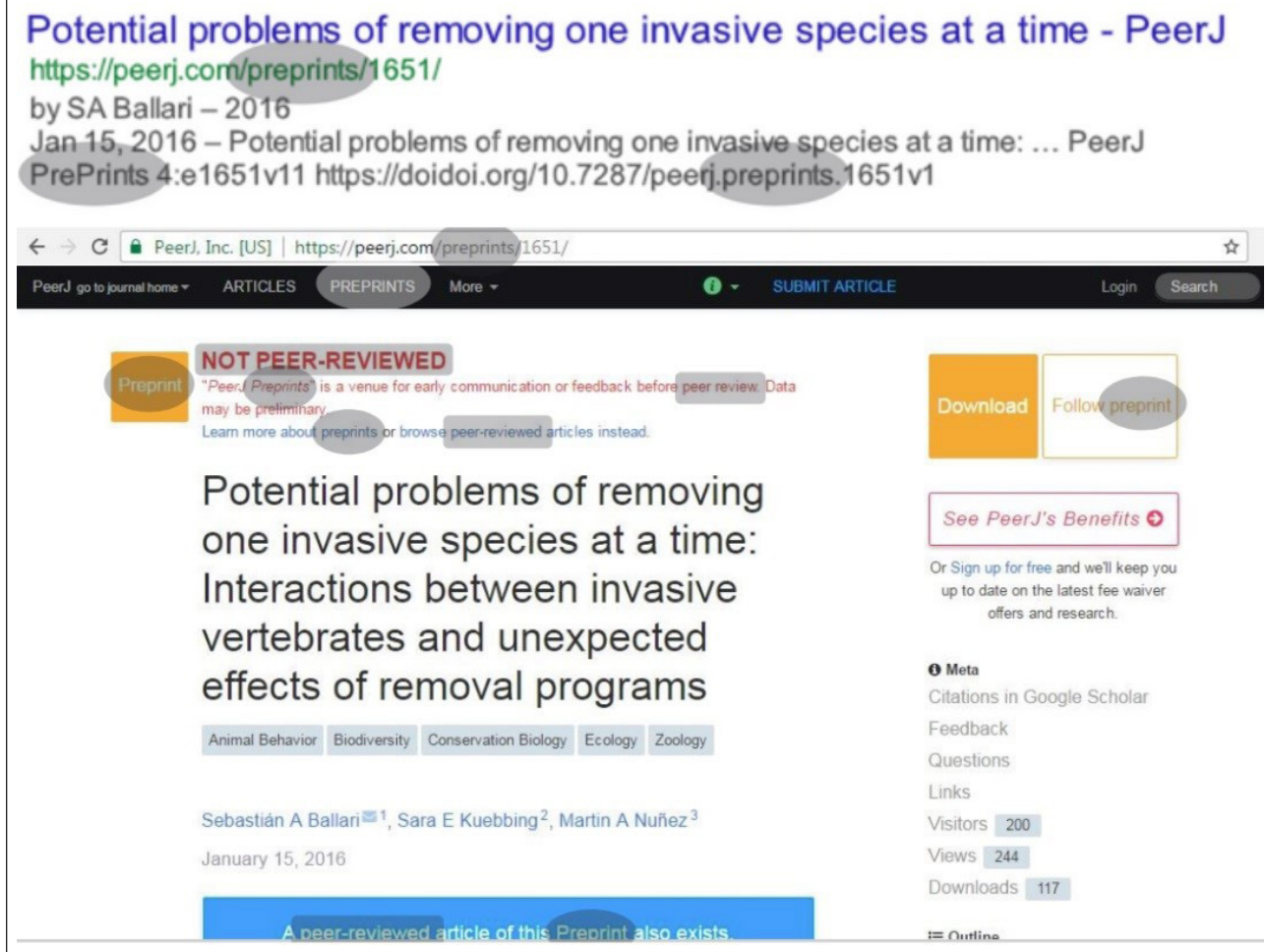
what preprint means. Few students made the connection that part of what makes a preprint is that it has not been peer-reviewed. Some students did not mention preprint until it was given as a choice in the container task. The same can be said of the not-peer-reviewed cue, which was mentioned most frequently during the credibility task.

Helpfulness

Results show that most students did not choose bioRxiv or PeerJ as helpful. Fifteen of the ninety post-secondary students (17%) chose bioRxiv as helpful, whereas twenty-eight of the 116 post-secondary and high school students (24%) chose PeerJ as helpful. Very few students mentioned the articles' preprint cues during this task. More students attended to whether the articles were peer-reviewed when evaluating PeerJ (25%) than when assessing bioRxiv (7%). Although the majority of students who attended to the not-peer-reviewed cue concluded that the lack of peer review made the articles less desirable, it was not used as their primary determinant when deciding whether the articles were helpful.

bioRxiv

Students who did not select bioRxiv as helpful (n=75/90) did so for a variety of reasons. The top three were lack of relevance, its conceptual focus (i.e., aboutness), and lack of keywords of

interest within the resource. One student expressed "This one also looks good, but it doesn't really talk about the Burmese pythons anywhere in this little info"(community college 22). Only a few mentioned cues associated with preprint and/or peer review. Some were confused by the term preprint because they thought the article was from a journal: "I actually don't know what this is.… I'd have to look if this is a journal" (graduate 16).

Some noticed bioRxiv was not peer-reviewed and used that as their sole reason for not choosing it, but this was rare. More often students used it as one of several reasons for not selecting it. Other reasons were that it was too complicated or not necessary given other journal articles already chosen.

> I did not use this one because I didn't know what that was.… Some sort of a preprint server for biology. Some sort of laboratory. But it's not saying that it's peer-reviewed or anything, so I'm probably going to skip it because I have my PLoS ONE and I have my Springer (community college 11).

No clear theme emerged among the students who selected bioRxiv as helpful, though reasons for selecting it loosely revolved around the content, such as its relevance or aboutness.

> Building realistic assemblages with a joint species. I would possibly check on this one. It probably provides a solution. What happens after an invasive species enters the biodiversity of the Florida Everglades (undergraduate 1).

Very few noticed that it was a preprint and not peer-reviewed. Interestingly, those that did were not deterred, because they were familiar with preprints. One graduate student equated bioRxiv to arXiv and concluded it was a research paper. Another contextualized preprints by the peer-reviewed process that was expected to follow.

> They're preprints, so they're not peer-reviewed yet. But, ideally, it says that it's been accepted for publication somewhere but I don't see anything saying that. So it's a little questionable but that's okay (graduate 26).

PeerJ

The students' reasons for not choosing PeerJ as helpful (n=88/116) were similar to those given for bioRxiv (e.g., lack of relevance, its aboutness, and lack of matching keywords). Others also mentioned not choosing it because they did not recognize it.

> I don't know what this is, either. PeerJ.com. I mean, it could be a journal article. I see DOI on here (undergraduate 12).

Similar to bioRxiv, few students mentioned that PeerJ was a preprint. However, 25% mentioned cues associated with peer review. A few simply mentioned the term peer review. Others specifically mentioned the not-peer-reviewed cue and quickly rejected the article: "Not peer-reviewed. Goodbye" (high school 7). Others were more tentative but questioned the credibility of the resource based on the lack of peer review: "I don't know if that's going to be credible

information at the moment" (graduate 12). Some who mentioned the preprint and not-peer-reviewed cues in conjunction rendered similar judgements: "This preprint is not peer-reviewed. So probably not a reputable source" (community college 5). A few others provided explanations that described their perceptions of the peer-review process, which were not always accurate.

> peerj.com. Not peer-reviewed… and it even warned you, "Early communication or feedback before peer review…." Usually, peer review means that experiment was done over with similar results, you would think. I don't know. Not sure (community college 14).

Similar to bioRxiv, the majority of students who thought PeerJ was helpful based their decisions on article content. For instance, some thought it was interesting or could help them provide a counterargument for their project. A couple mentioned that the article was not peer-reviewed, but they drew different conclusions. One had second thoughts about using it: "So maybe I wouldn't use that" (undergraduate 2), whereas the other thought "it might still have good information" (community college 7). Only one graduate student mentioned both preprint and not-peer-reviewed cues: "That's interesting, not peer-reviewed. So this is another preprint but it's more recent. Oh, cool. Peer reviewed version exist" (graduate 26). This student and a couple of others who mentioned peer review noticed the link to the peer-reviewed version.

Citability

Twelve of the fifteen post-secondary students (80%) who chose bioRxiv as helpful also thought it was citable. For PeerJ it was nineteen out of twenty-eight high school and post-secondary students (70%). Of those that decided not to cite the articles, only a few attributed the lack of peer review as the reason. None of the students mentioned the articles being from preprint servers as a reason.

bioRxiv

No clear theme emerged as to why students found bioRxiv citable, though a few mentioned it was a "paper" and therefore could be cited. Others referred to different aspects of the article's content that made it citable. For instance: "it uses computation to look at if pythons are actually causing any problems in the ecosystem" (graduate 32) and "it gives me a different approach than most of them" (undergraduate 16). An undergraduate who said they would cite it was decidedly confused by the website and potential access:

> I think this is a book, but the website. If it's a journal, if I don't have access to the full journal I wouldn't cite it, but if I did have access, if it's a journal or an article, then I would not cite the website, I would cite the article (undergraduate 26).

Although the three students who chose not to cite bioRxiv did not mention preprint as the reason, one did mention lack of peer review as a deciding factor. That student also noted they "didn't see that [not-peer-reviewed cue] earlier" (community college 32) during the helpful task.

PeerJ

Although students could click on the peer-reviewed version of the article for PeerJ, none of them mentioned this when describing why they would cite it. Instead, similar to bioRxiv they discussed different aspects of the content.

> I would also use this as the first one that I've seen, like I said earlier, about the problems of removing the species. Not just why we should remove the species. I'd use that because that's just new information (undergraduate 5).

Only a few who chose not to cite PeerJ mentioned the lack of peer review as the reason: "So I wouldn't use this just because, I mean, it says on the top it's not peer review" (undergraduate 2). Other reasons for not citing PeerJ were that they didn't think they had access, the content was not right, and they were not familiar with the source.

Credibility

The students who chose bioRxiv (n=15) and PeerJ (n=28) as helpful also had to rate the articles' credibility. When rating the credibility of bioRxiv, very few students mentioned the preprint and not peer-reviewed cues. Both cues were more prominent for PeerJ and half of the students mentioned the not-peer-reviewed cue, but very few students mentioned the preprint cue. The average credibility rating dropped as a result with bioRxiv a 4.27 out of 5 and PeerJ only 3.28.

bioRxiv

Most of the students rated bioRxiv's credibility highly for reasons typically associated with credibility. For instance, several mentioned that it was from a journal or was an article or paper. Others noted that it was research or mentioned the research approach used (e.g., distribution model, modeling process) as reasons for their credibility ratings. One who used a combination of these factors said "Since this is a paper from a laboratory. I mean research laboratory I would give it high credibility" (graduate 10).

Many students who did mention the preprint and/or not-peer-reviewed cues drew different conclusions and rated bioRxiv as somewhat credible. They also provided additional reasoning for their ratings, noting "it was cited by only one person, and it's been three years since they published it" (graduate 11) and "I don't know who the authors are… [and] it doesn't list their qualifications" (community college 32). Another student noticed the article's DOI link, assumed they could find a "peer-reviewed version of this paper" (graduate 26), and rated the article very credible as a result.

PeerJ

Students attending to the not-peer-reviewed cue in PeerJ indicated this was the primary reason for the lower credibility rating. More than half of the students rated it between not credible and somewhat credible. A few questioned other aspects of the article such as the website, authors and their affiliation, and the journal. The students who rated it highly did so for reasons similar to the students who rated bioRxiv highly, noting it was a paper, article, or journal. A couple of others attributed their ratings to these and/or some aspect of the content, such as the supplemental information or the diagrams. In one case the student didn't even understand

the diagrams but thought they were evidence of the authors' expertise.

> Peer reviews [are] usually pretty good [and] once again the diagram and stuff which don't even make any sense to me to make [me] feel like they know what they are talking about (undergraduate 5).

One of the students who noticed that a peer-reviewed version of PeerJ existed during the cite task rated it very credible. This is the same student mentioned above who incorrectly assumed a peer-reviewed version of bioRxiv existed upon seeing the DOI. After comparing the two versions of PeerJ to identify changes made, the student concluded that the changes were minor but still wanted to cite the peer-reviewed version: "So this resource by itself is non-citable, but the peer-reviewed version is" (graduate 26).

Container

All the post-secondary students were presented with bioRxiv during the container task (n=90), and all post-secondary and high school students were presented with PeerJ (n=116). Students mentioned preprint the most during this task. Close to 30% of students (n=26/90) mentioned the preprint cue when discussing bioRxiv, and nearly 50% (n=57/116) did so when discussing PeerJ. These percentages roughly align with the percentage of students who correctly identified the articles as preprints in the task (figure 3). However, it cannot be ignored that at least half of the students incorrectly identified the articles' containers, with most picking journal.

FIGURE 3
Container Decisions for bioRxiv and PeerJ
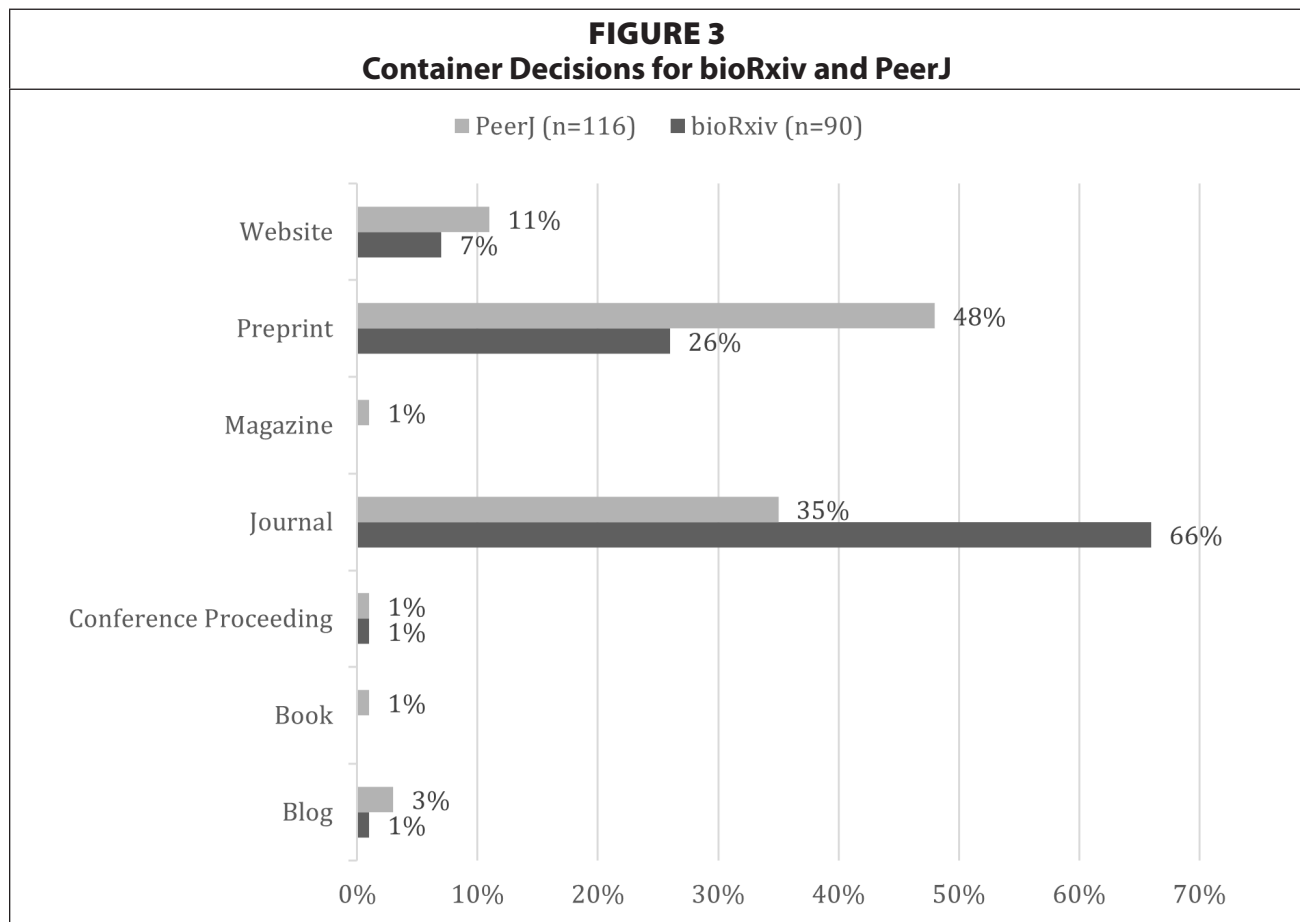
bioRxiv

The students who thought bioRxiv was contained within a journal reasoned that it mimicked the look and structure of a journal article. Some based this decision on it being an article: "This is an actual article. There's actual research here. That's a journal" (community college 26). It looked like a research or scientific paper—"Looking at it, it's a scientific paper. It's from a journal. That's all I know" (graduate 27), and was associated with a lab: "Cold Spring Harbor Laboratory, okay, this looks like a journal" (undergraduate 3).

Others based this decision on seeing abstract and methodology sections or charts and diagrams: "So this is a journal for sure, because it has proper structure, like abstract and main content" (graduate 31). Another used the DOI as an indicator: "Well, it has a DOI, so. So, I guess, that's a journal" (graduate 16).

Even those who chose preprint did not come by the decision easily. Attending to the preprint cue helped redirect some students.

> Oh, Cold Spring Harbor. So yes, I would. This is a journal…. Well, it's Cold Spring Harbor so that's actually—I'm from New York so this is—I know the research place this is done. And I'm just looking to see if this is journal or—oh, this says preprint on it so I guess that's a preprint (community college 31).

Some students who attended to the preprint cue did not always know what it meant or how it differed from the other options they were considering.

> The preprint server for biology… I'm going to say that this is a blog. Although I don't think it's a blog [laughter]… I'm very confused as to what this is. It could be a blog. Book, conference proceeding. I don't think so. Preprint? I don't even know what a preprint is. I don't think it's a journal. So what would I do? I'm going to go with preprint. I saw a PDF version (community college 6).

> BioRxiv. What's that? This looks like a journal. It's an abstract. [silence] It says this article [is] a preprint and has not been peer-reviewed. What does this mean, so that would say that it's not a journal. I guess website (graduate 25).

PeerJ

Similarly, some students simply used the preprint cue in PeerJ to correctly identify the article, regardless of whether they knew what it meant. Some who also attended to the not-peer-reviewed cue used it to contextualize the term preprint.

> It's a preprint; it says it right there. Not peer-reviewed. I guess that's what preprint is (undergraduate 10).

> I don't know what a preprint is. Does that mean that it's not peer-reviewed [laughter]? Assuming, because it says preprint [laughter]. So I'm just going to assume that that's that [laughter] (graduate 15).

For others however, the not-peer-reviewed cue, when used in conjunction with the "PeerJ go to journal home" cue caused confusion.

> Potential problems of removing one invasive species at a time. So this is an article. Let's see. So author and article information. Published, where was it published? PeerJ preprints. So I guess it's still… I mean, it's saying preprints, but I think it's still a journal because I think PeerJ preprints is the journal because it has the 4:e1651v1. So I think it's still a journal. And it says, "PeerJ, go to journal home" (graduate 3).

> I don't even want to put journal for that because it's not peer-reviewed. But I mean, it just says journal so I'm just going to (community college 11).

Discussion

Implications for Practice

Our findings indicate familiarity with cues and how they relate can influence whether and how they are used. The term preprint was unfamiliar to most students who encountered it, which likely contributed to its limited use across tasks. Mentioned the most during the container task, the students who correctly labeled bioRxiv and PeerJ as preprints did so by matching the articles' cues to the label options, often asking what a preprint was or saying they were unfamiliar with the term. These findings suggest several implications for practice.

First, in order to use cues, students must know what they mean. Many students treated bioRxiv and PeerJ as journal articles, because they looked like published journal articles despite cues to the contrary. The scholarly community recognizes that it is important for preprints to be labeled clearly so their status as a non-peer-reviewed publication is explicit. Ravinetto et al. (2021) make very specific recommendations, including statements that not-peer-reviewed works should be on the first page of preprints, and each page should include a red watermark stating "Caution – Not Peer Reviewed."[22] This is work for the content providers, but changes also need to happen in the educational settings. Given the increasing availability of freely accessible preprint articles on the internet and debates about their use, information literacy instruction needs to build awareness about the existence of preprints, what they do and do not provide, and guidelines for their use. For example, when teaching PubMed, the new filter for preprints can be demonstrated and can open up a discussion on preprints. Additionally, preprints can be woven into instruction on citation styles and creating bibliographies. Organizations like NIH require preprint citations to be labeled as such and calls for more standardization are increasing, but to date, preprints are not showing up as a format in most citation management software. This makes preprints a good example of when you have to create or edit a citation manually.

Second, the cues students mention and use relate to the type of evaluation. Relevance was the primary factor for most students when deciding whether the articles were helpful and citable, aligning with some of the findings by Komissarov and Rempel.[23] There were few mentions of the preprint and not-peer-reviewed cues during these tasks. Students mentioned the not-peer-reviewed cue most during the credibility task and many of these students knew what it meant, which impacted their ratings. This was particularly true for PeerJ because the cue was displayed more prominently. Yet, this prominently placed cue was only mentioned

and used by half of the students. These findings suggest information literacy instruction should build awareness even for well-established cues such as peer review and provide a more nuanced discussion of the circumstances under which the cues should be used, especially in an information landscape that is growing in complexity. Discussions incorporating preprint and peer review cues could include lectures on the information life cycle (figure 4) or lessons that introduce the use of Google Scholar that show the versioning of articles, including preprints.[24] Another way to help students contextualize preprints within the information lifecycle is through the use of experiential learning like the scaffolded approach employed by Scheifele, Tsotakos, and Wolyniak (2021) where students compared and contrasted a preprint article with the final version, reflecting upon the differences.[25]

Third, the helpfulness of a resource goes beyond relevant content. For instance, a preprint article that has not been peer-reviewed may be helpful if it cites relevant resources, whereas a peer-reviewed journal article that has been retracted is likely to be viewed as not helpful. Citable resources on the other hand are expected to be credible as well as relevant. Yet students did not consider the credibility of resources during the cite task. Moreover when they did evaluate the credibility, findings showed students who did not use the not-peer-reviewed cue evaluated the preprints like journal articles, because the preprints presented research conducted in labs, data analytics techniques, and diagrams. In other words, they relied on what Rempel et al. called superficial criteria.[26] Information literacy instruction can help students go beyond choosing and using resources that look relevant, citable, and credible on the surface by providing them with ways to critically examine and correctly apply the content within the context of their educational stage. This includes providing guidelines for students that help them determine whether or not they have the expertise necessary to vet and correctly use a resource and choosing not to use it if they do not.

FIGURE 4
Information Life as Taught to Chemistry Students

https://guides.uflib.ufl.edu/chemistry/sourcetypes
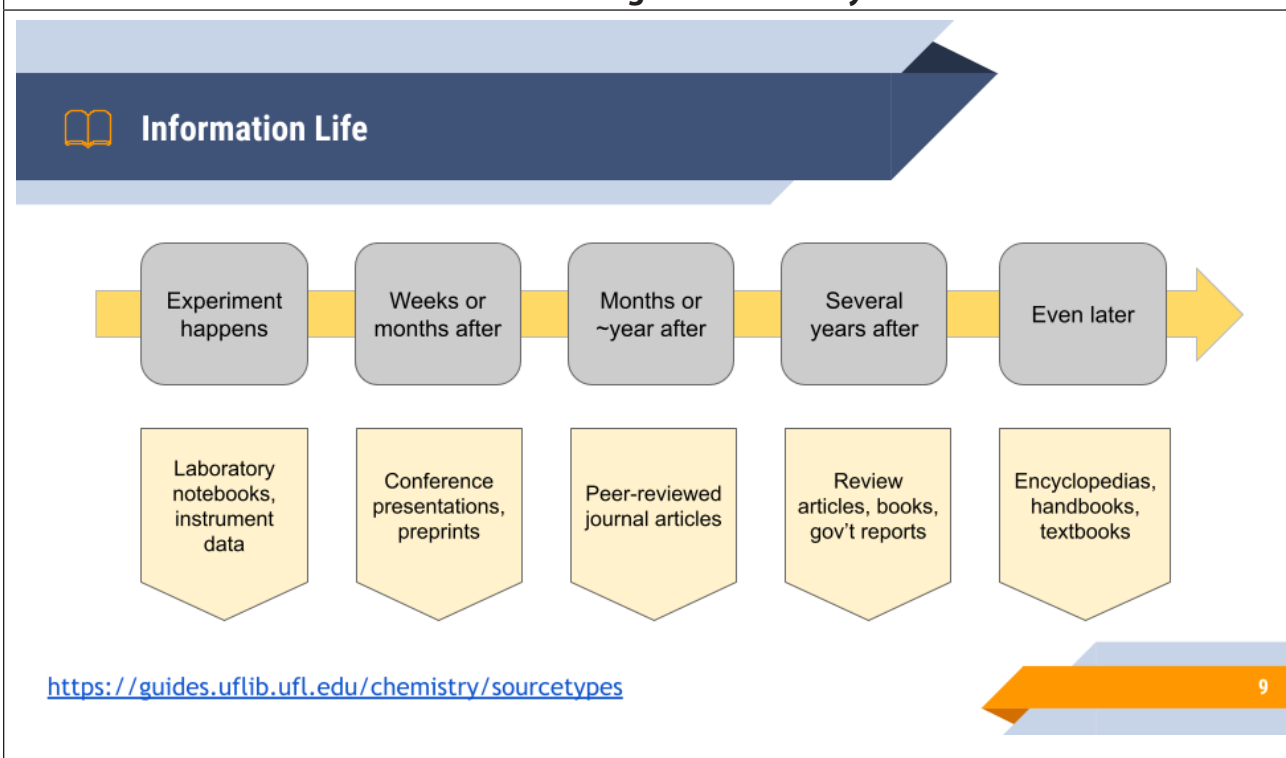
Changes in bioRxiv and PeerJ

The challenges that our findings illuminate need to be addressed not only by educators but also by those creating and hosting preprints. Since some time has passed since the preprint images used in the simulations were captured, it is worth discussing what, if anything, has changed. New images were captured on December 2, 2021. The bioRxiv Google snippet has changed slightly but has not added any preprint or not-peer-reviewed cues. PeerJ has two Google snippets, one for the HTML and one for the PDF, and these changed more significantly. They both went from having three preprint cues to only two, but the PDF snippet added a peer-reviewed cue where there were none before. On its webpage, BioRxiv now has a large, yellow box above the article which focuses on COVID-19 and emphasizes that the articles "have not been formally peer-reviewed" (figure 5). The statement adds one more peer-reviewed cue to the page, bringing it to a total of two. Otherwise, the article appears the same. PeerJ's webpage reduced the number of preprint cues from seven to five and increased its peer-reviewed cues from two to four (figure 6). This movement towards emphasizing peer review instead of preprint is a positive one as the students in our study were more likely to attend to and understand peer review as opposed to preprint.

Limitations and Future Research

The task-based simulation used for this study is not without limitations, the details of which can be found in Cataldo et al.[27] A couple of limitations are discussed here in the context of future research. First, the simulation provided a controlled environment that allowed for comparisons within and across student cohorts, but created a level of artificiality.[28] Part of this

FIGURE 5
bioRxiv Google Snippet and Front Page in 2021

FIGURE 6
PeerJ Google Snippets and Front Page in 2021

artificiality is that students are not likely to separate and order their evaluation of resources by task (e.g., helpful, citable, credible). They also are not likely to evaluate resources only during point of selection, but rather reserve and/or revisit their evaluations as they engage with resources over the course of their research assignments. Future research in a naturalistic setting that collects longitudinal data over the course of a research assignment would balance the findings from our task-based simulation study. This would provide an understanding about whether students' information behavior changes over the course of their research assignments and if so, when, how, and why. In addition, the simulation did allow students to click and explore resources, but not all of the links within and outside of the resources were made clickable in order to manage simulation design complexity. Research that examines

students' interactions with preprints through eye tracking or heat mapping software to see what they are looking at in addition to what they are saying could serve to complement this work. Providing these kinds of insights would create a holistic picture of students' behaviors in relation to the discovery, analysis, and use of preprints.

Conclusion

The role of preprints in scholarly communication continues to evolve. Publishers are reviewing and revising their policies. Funding agencies are determining the appropriateness of their appearance in grant applications, with some for (NIH) and some against (Australian Research Council).[29] Members of standards organizations are calling for revisions to recommended practices (the National Information Standards Organization's 2008 Journal Article Versions Recommended Practices[30]). Conversations are happening within professional organizations, especially those involved in open access such as the Open Access Scholarly Publishing Association.[31] However, these conversations are rather siloed, since librarians, publishers, and the hosts of repositories have one type and researchers and editors have another. Our findings on students' judgments of preprints suggest that a more collaborative approach is needed to make preprints more recognizable and understood. Given the importance of preprint servers as an openly available source of scientific information, publishers, scholars, librarians, journalists and teachers should work together to ensure standardized, universal approaches. The perceptions of students, as seen in this study, can help illuminate the way.

Acknowledgments

Funding

Notes

1. COPE Council, "COPE Discussion Document: Preprints" (2018). https://doi.org/10.24318/R4WByao2

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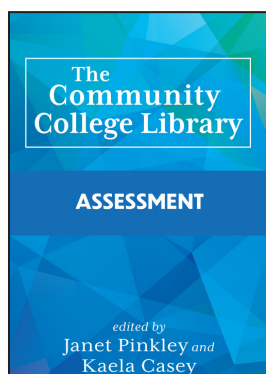
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Book Reviews

The Community College Library: Assessment, edited by Janet Pinkley and Kaela Casey, successfully weaves together a colorful tapestry of library assessment initiatives that are varied in their methodologies. While the approaches and objects of assessment are different in each chapter, they all strive towards two common goals: demonstrating the library's value and proving the connection between library use and student success. The chapters address key concerns including effective ways of assessing a library's impact, the importance of diverse areas of focus in assessment, the resources required to ensure a thorough assessment, essential research tools used for assessment, and strategies for revealing the library's direct link to student success. Pinkley and Kaela organize the volume in a manner that allows readers to identify the overarching themes of collaboration, assessment mentorship, flexibility, and reflection. Rather than centering on one area, the volume addresses both instructional assessment and services assessment. Readers will find that many authors underscore the significance of developing a clear plan, building on existing frameworks, and making assessment a structured, habitual activity for libraries.

A common thread among the authors is the necessity of building teams for effective assessment. Creating partnerships with other libraries provides an opportunity to learn from each other. Establishing a team that includes teaching faculty, college administrators, and other key players outside of the library has a bonus effect of showing, not telling, the library's effectiveness. Michael J. Krasulski, Elizabeth Gordon, and Courtney Raeford's chapter, "A Library-Friendly Assessment Framework: Administrative, Educational, Student Support Services (AES) Unit Assessment at the Community College of Philadelphia," demonstrates the power of working with an institutional research office (IR) and assessment office when developing assessment plans for the library. Their chapter highlights the library's unique ability to lead assessment in both service and education due to the dual role libraries play at community colleges. As a result, the library's contribution led to an inclusive assessment framework that benefitted all AES units. The chapter concludes with recommendations to readers about pairing with the college IR and assessment offices.

Similarly, Jamie Holmes and Amy Lagers provide an example of a successful assessment program at Tulsa Community College (TCC) Library that focuses on instruction. TCC Library's Instruction Development and Assessment initiative sets up a professional learning community involving mentorship and peer observations. The authors suggest adding faculty from outside of the library as participants. Collaboration with teaching faculty is also encouraged by Bryan Clark and Amy Glass from Illinois Central College (ICC). Clark and Glass describe the creation of a program designed to assess embedded librarianship initiatives and one-shots; teaching faculty at ICC were included in this process of creating assessment for all forms of library in-

struction. Readers searching for instruction assessment examples will appreciate Joy Oehlers, Joyce Tokuda, and Erica Davis's chapter. The authors shift from assessing database and catalog use to critical thinking skills. Sample rubrics and activity handouts such as "CRAAP test," "Show Me the Evidence," and website evaluation are utilized in the classroom to help gauge student engagement with information.

In addition to chapters that chronicle instruction assessment and student learning outcomes-based assessment, Pinkley and Casey include discussions of assessment for services, space, and the library's role in student retention. Sharell Walker and Joanna Thompson cleverly utilize focus groups as the tool to assess the Borough of Manhattan Community College's library space. Their student-centered approach supplied insight into how library space is used and produced evidence-based suggestions to improve it.

Space has value, and retaining students who will use spaces is imperative. We know that libraries impact retention, but measuring the impact of library instruction on retention rates can be challenging. At Hagerstown Community College and Arizona Western College, librarians designed an assessment plan that evaluates this connection. In Angela L. Creel, Wendy Hoag, and Kendra Perry's chapter, readers learn that students exposed to library instruction sessions were more likely to enroll in the subsequent semester. The authors acknowledge other influencing factors; however, the study offers a process others can use when attempting to assess the correlation between retention rates and the library.

Sample assessment plans can prove helpful, but assessment can still be overwhelming and intimidating for librarians, especially those unaware of how to begin the process. To assuage these fears, Pinkley and Casey include a chapter that emphasizes the role established frameworks, such as the Association of College and Research Libraries's (ACRL) Assessment in Action (AiA), can play in boosting confidence. In "Building Librarian Assessment Confidence through Communities of Research Practice," Aryana Bates, Mary Ann Lund Goodwin, Jacquelyn Ray, and Melinda McCormick Coslor incorporate ACRL's AiA into a team-based mentorship initiative supporting independent assessment projects. Readers learn how assessment mentorship can help transform perceptions of assessment from a peripheral to a normalized and collaborative activity.

The volume also offers novel ways of thinking about assessment. Joseph Eshleman convincingly makes the case that librarianship has much to learn from approaches to assessment in baseball. The chapter discusses the use of ACRL's Project Outcome, an online toolkit to aid libraries in measuring outcomes and offering support. Eshleman encourages libraries to assess their programs holistically, as done in baseball. Amanda M. Leftwich urges readers to use reflective practice as a method of assessing our own well-being. Leftwich provides steps to achieve a state of meditative awareness before, during, and after a reference interaction. Citing Symphony Bruce's care ethics research, Leftwich gifts readers with a form of assessment that is inclusive, simple, introspective, and necessary.

The volume's introduction and "Goal of the Series" section set clear intentions to "inspire community college librarians to reflect on their own practices" (p. viii). Pinkley and Casey have expertly curated a volume that is analytically helpful to community college librarians embarking on new assessment initiatives or improving existing ones. It succeeds in bringing more community college voices into the larger assessment in higher education conversation. This foundational volume should be standard in every community college library collection.—*Emma Antobam-Ntekudzi, Bronx Community College*
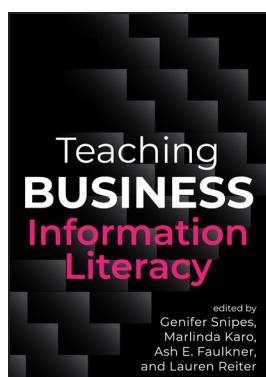
Teaching Business Information Literacy. Genifer Snipes, Marlinda Karo, Ash E. Faulkner, and Lauren Reiter, eds. Chicago, IL: ACRL Press, 2022. 412 p. Paper, $98 (ISBN: 978-0-8389-3909-3).

A collection of forty-one contributed chapters organized into nine topical sections, *Teaching Business Information Literacy* offers something for everyone engaged in library instruction in the contexts of business and entrepreneurship programs. From basic business research to more niche subjects, the chapters detail instructional approaches for a wide variety of topics and situations, with plenty of suggested modifications to further tailor each instructional session to suit the reader's circumstances.

The nine sections (Basic Business Research, Finance and Accounting, Entrepreneurship, Management, Marketing, Specialty Subjects, Data Literacy/Data Visualization, Experiential Learning/Career, and Using Technology in the Classroom) each contain three to six chapters. Most chapters are a concise four to six pages long, though a couple extend to seventeen pages. The instructional approaches range from the simple to the complex, and the time suggested for each intervention ranges from the typical forty-five minute one-shot to a semester-long workshop series. More than half are designed for an undergraduate audience, but most are adaptable to various audiences.

While the content is wide-ranging, the editors had the foresight to provide a structure for the authors to follow so that each chapter provides roughly the same information in the same order, though there is variation in the depth and scope of the various parts of each chapter. An introduction that precedes sections on planning and preparation describes the intended audience and the resources and tools used. Learning outcomes follow, along with an outline of the instruction itself. Most chapters also contain a section called "Transferability," which discusses how to adapt the instruction and activities for a variety of audiences, class sizes, time frames and venues (online versus face-to-face), as well as suggestions for alternative databases and resources. This consistent format makes the book more usable; a quick scan is all that's needed to grasp the main points of any chapter and determine its utility for a particular situation.

The introduction explains that one objective of this book is to provide guidance to those new to teaching information literacy in a business context, including new business librarians and those called upon to provide business information instruction, despite it being outside their wheelhouse. Of course, experienced business information literacy instructors can always benefit from new ideas and approaches, and so even those with years of experience can find fresh ideas and new resources here to reinvigorate their teaching. More than a third of the chapters include appendixes with worksheets or slides that can be copied or adapted, and many others provide links to download similar materials. These materials can save the reader hours of work. Another boon for any reader is the trove of freely available resources discussed, including information sources, as well as tools and platforms for teaching and interactivity. Familiar standbys like Census.gov are mentioned frequently, but it will be the rare reader who is familiar with every freely available resource the book mentions. Those with fewer database subscriptions may find this aspect of the book especially worthwhile.

The chapters are designed to provide easy-to-follow outlines that can be carried out by someone relatively inexperienced in business information literacy instruction. Perhaps the larger potential value here is not in following the plans to the letter but, instead, using the

various chapters as a source of inspiration. The most effective instruction is one that you're comfortable delivering, and it's hard to imagine that most users would not adapt what's presented to their own styles, preferences, and situations. To that end, this reviewer recommends reading the entire book. Even chapters written to teach a particular topic, e.g., market research, can be useful sources of activities, lesson structures, and tools for teaching about a different topic entirely.

The few minor drawbacks do not detract from the usefulness of the book. While the introduction promises that ancillary materials are all available via the ACRL Sandbox, that is not actually the case. Many of the authors have provided links to access to these materials through various online platforms such as Google Drive, OSF, or their own institutional server space. At the time of writing, all the links currently worked and the materials were accessible. But as we all know, links get broken, servers are taken offline, and online providers disappear without warning, all of which raise concerns about the continued availability of these materials. Those new to business information literacy should be aware that some chapters are better than others at explaining everything with no presumptions about the reader's existing knowledge, so some additional reading and research may be required for the truly uninitiated. Finally, as with all collections, some chapters are better at living up to the book's title and stated goal than others. For example, a chapter on teaching business ethics outlines an interesting lesson plan but is only tangentially related to information literacy. These minor issues are more than made up for by the stronger aspects of the book.

In sum, whether you're new to business information literacy or a seasoned pro, there is something of value here. For those short on time and/or not blessed with reservoirs of instructional creativity, the generosity of the authors in sharing not only their ideas but their instructional materials as well will no doubt be appreciated. Readers with more time and headspace for instructional innovation will find many inspirational springboards and plenty of food for thought. This book's structured approach manages to provide a relatively comprehensive overview of the topic in a more organized and accessible way than the ACRL Sandbox has yet managed to do.—*G. Arave, Indiana University*

Daniel Levin Becker. *What's Good: Notes on Rap and Language.* San Francisco, CA: City Lights Books, 2022. 312p. Trade Paper. $22.95. (ISBN 978-0-87286-876-2).

What's Good: Notes on Rap and Language is a studied, well-researched, critical, and loving exploration of the wit, humor, nuance, intelligence, meaning-making, truth telling, occasional hyperbolic absurdity, and craft of the MC and, in turn, Hip Hop culture. Becker approaches the topic with the care, competence, and appreciation of a lifelong Hip Hop aficionado and, as a result, *What's Good* is a remarkable achievement that deserves a place in any Hip Hop studies collection, just as it enjoys a spot on Virginia Tech Digging in the Crates: Hip Hop Studies' True School Studios' already crammed bookshelf.

Each of the nearly fifty concise chapters begins with a single line, couplet, or verse that serves as a jumping off point for a broader—and often extraordinarily wide-ranging—exploration. Topics range from the (former cultural faux pas?) biting, the evolution of slang, writing versus freestyling, values, criticism, irony, intelligences, and more. The chapters often prominently feature Becker's lived personal experiences. Despite the occasional detour,

the ingenuity of the MC—and not merely the experiences of the studied backpack Hip Hop fan—appreciatively remains at the forefront of this work.

The breadth of the referenced verses-as-text is both impressive and necessary. Becker thankfully does not simply focus on one era or region of Hip Hop culture and music. Instead, he features work from global megastars like Drake, Kanye West, Nicki Minaj, Chance the Rapper, Snoop Dogg, Kendrick Lamar, Beyonce, and (her husband) Jay-Z; legends like MC Lyte, Slick Rick, the late Shock G and (his former backup dancer) 2Pac, the late Biz Markie, Rakim, Nas, Ghostface Killah, LL Cool J, and Big Daddy Kane; and lesser-known underground luminaries including Chicago's Vakill, Pennsylvania's Count Bass D, Philadelphia's Bahamadia, the late Big L, and the late MF Doom. Unlike many similar texts, *What's Good* does not show a preference for so-called Golden Era sources but instead engages with work that was released as long ago as 1979 and as recently as the last several years. Interestingly, Becker often puts MCs' work from widely different eras in direct conversation with each other to great results. As a consequence of this approach, *What's Good* is a uniquely enjoyable, entertaining, energetic, and thought-provoking analysis of the ever-evolving art of MCing.

As someone who learns aside college students in a variety of contexts with Hip Hop at the center, *What's Good*'s regional, topical, and temporal breadth and depth is especially appreciated. Becker's refreshing coverage of the art of MC would make it a solid supplementary addition to many Hip Hop Studies syllabi. It would also prove helpful for teaching librarians looking to incorporate Hip Hop into their praxis. Without question, *What's Good: Notes on Rap and Language* is recommended for both certified *Stretch & Bobbito Radio Show* tape traders and those among us who are newer to appreciating the arguably greatest cultural force of the last half century. —*Craig Arthur, Virginia Tech*

Stefan Vogler. *Sorting Sexualities: Expertise and the Politics of Legal Classification*. Chicago: University of Chicago Press, 2021. 280 p. Paperback, $30 (ISBN: 9780226776767)
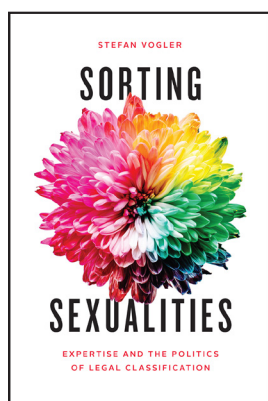
What is classification? What is its purpose and its impact in different institutional contexts? What can those impacts add up to in our material realities? *Sorting Sexualities* encourages us to ask these questions when we think about and describe sexuality. This slim but dense volume delves deeply into the ways that sexuality is seen and understood in different legal settings. In doing so, it leads the reader to confront the contradiction between our common social understanding of sexuality as a purely personal aspect of one's identity, and the fact that the state has claimed a significant level of power in legal settings to define what is "normal" and what is "deviant" in sexuality. State interests can have enormous impacts on the lives of those whose sexuality is scrutinized and controlled by those definitions.

The introduction establishes the book's focus on two specific legal settings in which courts are called upon to "determine" a person's sexuality: LGBTQ+ asylum determinations in US immigration, and the evaluation and carceral placement of sex offenders, largely alternating between these two settings chapter by chapter. The first two chapters establish historical context and theoretical backdrop for much of the analysis in the rest of the book. Chapter 1 describes nineteenth- and early-twentieth-century ideas of "sexual deviancy" that lumped non-consensual sex and queerness together, deeply affecting how we think about those topics

today. The association between the two remains alive in politics and policies around sexuality. Chapter 2 explores the wide differences between conceptions of sexuality in different legal settings. The differences can stem from whose expertise informs the construction of categories of sexuality, and the context of the cultural and historical moment in which policies are formed. Vogler also points out that how sexuality is understood in a given legal setting can have large impacts on people's rights of participation in society when their sexuality is under scrutiny.

In these early chapters, Vogler acknowledges that a significant bulk of the book deals with how the sexuality of men, people assigned male at birth, and people who have penises is seen and understood. He offers a very general framing for how his analysis can potentially impact and apply to people of other genders, but the remainder of the book does not present his observations and analysis in a more generalizable way. The author also acknowledges in this early section that sex offenders tend not to be sympathetic subjects, and that lumping non-consensual sex with queerness can be harmful. In the book itself, his explanation of why sex offenders' legal setting is significant to examine in queer studies feels disconnected from any framework of sexual consent that I think many everyday readers will likely want to see acknowledged. This may be a convention of one or more of the disciplines that he writes within. Vogler explains his argument somewhat more clearly in an interview for the New Books Network's *New Books in Gender* podcast. There, he notes that sex offender law is exceptional in that it allows the state to seek the indefinite confinement of an individual through civil commitment after they have already served a criminal sentence. Exceptional forms of law created for a singular population like sex offenders can often be expanded in application from one population to many in moments of moral panic. The civil commitment statutes also codify a counterintuitive view of sex offenses not as discrete behaviors to be penalized, but as stemming from a diagnosable sexuality or sexual orientation of the offender (Stuart, 2021).

For librarians, chapters 3 through 6 will be particularly interesting. Here, Vogler explores how courts rely on non-state field expertise when laws call on them to identify a subject's sexuality and manage perceived risk based on it. This both legitimizes particular types of expertise and strengthens the state's own authority and control. These concepts will resonate with library workers who engage with and teach about authority in their work. Chapter 3 traces a struggle for authority between psychiatry and forensic psychology, two professional fields with different approaches to evaluating and understanding the mental health and fitness of sex offenders and building penal categorizations based on them. By contrast, chapter 4 portrays a process by which LGBTQ+ asylum determinations in US immigration came to be informed by "insurgent networks" of lawyers, activists, and "lay" experts who articulated the significance of subjects' narratives of their own sexuality. Chapters 5 and 6 discuss the ways that the state identifies sexuality and "measures" or evaluates risk to self or society based on that identification. Chapter 5 details the asylum complex's gradual shift over time from the 1990s, when evidence of a person's sexuality included things like their responses to invasive questions about sex acts that they had performed, through current adjudicators' emphasis on how the asylum seeker characterizes their own sexuality. Chapter 6 offers a contrasting example in the case of sex offenders. Though not advocating for leniency for sex offenders, Vogler takes some care to point out that courts tend to value evidence stemming from problematic tests like polygraphs and penile plethysmographs as "objective" measures of sexuality.

The last few sections of the book bring together many of the threads of the earlier chapters by exploring the levels of control the state can exert over subjects' participation in society, rein-

forcing the connection between this control and the elements of nineteenth-century discourse on "deviant sexuality" that persist into the present. For asylum cases, adjudicators seek to understand the risk of persecution that the asylum seeker faces if they are returned to their home country. Narrative evidence from the asylum seeker is situated alongside state intelligence and news reports on the political safety conditions for queer people in different countries. For sex offenders, adjudicators seek to assess the risk that the offenders pose toward others, resulting in the use of actuarial assessments that are designed to boil the assessment down to as few questions as possible, often completed without the input of the individual in question. The book particularly points out the assessment's tendency to attribute "sexually violent predator" status to offenders and the consequences of that status: a sentence of incarceration and civil commitment afterward, essentially an underexamined form of extended incarceration. The conclusion brings together parallels between asylum and sex offender cases, particularly where the assessment of risk associated with sexuality plays an enormous role in adjudicating what rights of citizenship and participation in society an individual may have. Vogler points out that the state tends to enroll different networks of non-state expertise to legitimize and inform its policies and stances on sexuality according to what is politically advantageous at the time. Vogler's final argument encourages us to rethink how we understand sexuality in general, not as a personal and individualized matter of identity, but an area in which the state constitutes its power.

Ultimately, Vogler challenges us to understand that anti-queerness and sex negativity continues to animate legal complexes that regulate sexuality. As we have seen in the year since this book was published, the few gains that have been made in LGBTQ+ rights are easily imperiled as long as that is the case. Vogler's work can be particularly interesting for critical catalogers. The author traces an expansive history of how descriptive language and categorizations evolved in two institutional settings. In library cataloging and classification, it is not often acknowledged that descriptive practices summarize entire worlds of knowledge, often constituted through both significant battlegrounds and significant coalitions between different professional fields. These conflicts and alliances are then reduced to just a few descriptive metadata fields. Convention encourages catalogers to assert "neutrality" by using the language that appears on an item being cataloged to describe it. But what leads authors and publishers to use particular forms of language? Critical practitioners in our field largely acknowledge that choosing to conform to a particular "preferred" term to describe something often means participating in battles that are really about who gets to be seen, counted, and treated as human. But whose battles are they? Where do those battles play out? What are the legal and social routes by which this language finally makes its way to libraries through written and classifiable resources? And when we use state-sanctioned language and state-based criminal classifications to describe and organize our resources, are we aware of how the state derived that language? Do we understand the political and cultural forces that shape how we describe our own resources? Vogler delves deeply into that context in a way rarely explored in our own literature. This book can deeply inform how we think about the way sexuality is seen and understood in our own institutional contexts.—*Anastasia Chiu, New York University*

Reference

Stuart, R. (host). (2021, July 7). Stefan Vogler, "Sorting Sexualities: Expertise and the Politics of Legal Classification." Univ. of Chicago Press, 2021. [Audio podcast episode]. In *New Books in Gender*. New Books Network.

Jeff Sundquist, Julie Artman, and Douglas R. Dechow. *Your Craft as a Teaching Librarian : Using Acting Skills to Create a Dynamic Presence*, Chicago, IL: ALA Editions, 2022. 130p. Paper, $52.00 (ISBN: 978-0-8389-3917-8).
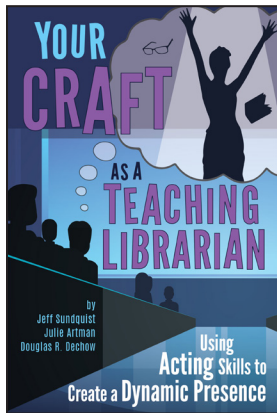
Your Craft as a Teaching Librarian is a revised and expanded edition of *The Craft of Librarian Instruction*, published in 2016. Authors Sundquist (Dean of the Library at Monterey Peninsula College), Artman (librarian at Chapman University with experience as a theatre director, producer, acting coach, and actor), and Dechow (digital humanities and science librarian at Chapman University) state on page one of the prologue that they "hope to demonstrate how acting techniques can sharpen your instructional skills and establish your teaching identity, enliven your performance, and create an invigorating (and stress-free) learning experience for your students." They maintain that the book is "intended for newly hired instruction librarians, librarians with little or no teaching experience, those dealing with shyness or stage fright, as well as more experienced librarians in need of a refreshed perspective" (p. viii).

The book is divided into three sections. Chapters in each section contain exercises related to the content, along with questions and answers related to instructional scenarios to "identify potential challenges, offer solutions and provide tips on deepening your teaching skills" (viii). Further reading lists for each chapter are also provided.

Section 1 addresses how to prepare and rehearse to greet your students and avoid "stage fright" when conducting library instruction sessions. This section begins with a short overview of the evolution of instruction in academic libraries and rightly points out that although there is a high demand for library graduates with teaching abilities, coupled with an expectation by employers that new hires possess the abilities required to begin formal instruction immediately, "unfortunately, Library and Information Science graduate programs continue to lag in providing pedagogical coursework.…" (p. 2).

This section then covers acting-related techniques and exercises including centering, visualization, awareness, memorization, and improvisation. These techniques and exercises "provide a method to calm your inner state of mind (p. 12)," and when practiced on a regular basis will "alleviate discomfort, shyness, and anxiety, replacing nervous thoughts with attention and resulting in a clearer presentation style" (p. 13).

Section 2 details "how to perform and connect with your student audience to provide the best possible educational experience" (p. viii). Included in this section are overviews of techniques employed by actors and directors that can be used by instruction librarians when teaching and planning to teach, including characterization, role-playing, script writing, motivation, teaching and learning cues, and super objectives (overarching objectives that can help sustain focus, engagement, and direction) (p. 67). Also included is a welcome discussion of the transition from the *Information Literacy Competency Standards* to the *ACRL Framework for Information Literacy for Higher Education* around 2015. The shift from a competency-based approach in the *Standards* to a theoretical approach in the *Framework* posed both teaching challenges and opportunities for information literacy instruction programs. The authors maintain that "the Framework and the mindset it encourages give us as teachers of information literacy the opportunity to explore a new role for ourselves in the classroom, one that also takes its inspiration from the theater" in the sense that it is "focused not on teaching, but on learning, not on the stage, but on the thresholds"

(p. 56). These "thresholds" are six information literacy-based concepts that present a way of understanding, interpreting, or viewing something without which the learner cannot progress.

The final and noticeably shortest section "helps you as the teacher/performer to reflect on development and sharpen your unique teaching presence" (p. viii). The authors encourage the reader to "think of reflection as involving both the class and the preparation undertaken before it: class outcomes in addition to all the preparation and performance exercises from previous chapters that you employed (or did not)" (p. 98).

Having spent nearly a quarter of a century in academic library instruction, I found this slim volume to be a worthwhile long afternoon read that will no doubt have a positive influence on how I practice my craft. If anything were to be added I would advocate for a section on dealing with persistent librarian stereotypes and approaches to disrupting them using acting techniques such as storytelling and humor. Finally, while it is productive and appropriate to consider acting techniques as we prepare to go before our student audiences, we must also remember how important and powerful it is to bring elements of our authentic selves to the classroom experience. —*David M. Dettman, University of Wisconsin at Stevens Point*

Fostering Student Success: Academic, Social, and Financial Initiatives. Sigrid Kelsey, ed. Chicago, IL: ALA Editions, 2022. 208 pp. Paperback, $59.99, (978-0-8389-3829-4)
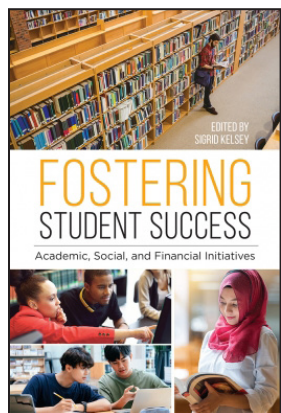
As a Student Success Librarian, I am heartened to see this book and its focus on the many ways that libraries can help college students succeed in an academic environment radically altered by current events such as "the pandemic, racial justice movements, and changing student demographics" (p. ix). As noted in the introduction, *Fostering Student Success* focuses on how college and university librarians can support students academically, socially, and financially. Vulnerable student groups are the focus of many of the chapters—that is, students who may have challenges such as racism, childcare difficulties, financial problems, or other barriers to overcome. These vulnerable populations, according to the American College Health Association, include Black, Latinx, Native American and First Nation, Asian American, first-generation low-income, LGBTQ+, international students, unauthorized students, disabled students, and any number of intersectional groups. These students have been identified as being especially affected by the pandemic (pp. ix–x).

It may seem daunting to try to address the potential issues that these students may be coping with. Fortunately, the contributing authors provide a wealth of suggestions and solutions.

The text is separated into three parts. Part I, "Support in Rapidly Changing Learning Environments," addresses permanent changes libraries will need to make in order to assist students in an academic environment that is constantly in flux. Part II, "Programming That Fosters Inclusion," provides ideas for outreach events that encourage inclusion and equity. Part III, "Libraries Providing Financial Support," looks at how libraries can remove physical and financial barriers that can keep students from succeeding.

All three sections acknowledge that academia has been irrevocably changed by the events of the past couple of years and recommend changes that libraries must make in order to support students on an academic level in this new context. Joyce Garczynski of the Towson University (Maryland) library created a makerspace geared toward providing access to the tools and skills needed to succeed in data careers. This effort responded to the university's

recognition that COVID-19 aggravated the extent to which Latinx and Black college students lacked access to reliable, high-speed internet and digital technology.

In another case study, Chicago State University's Rosalind Fielder-Giscombe and Gabrielle Toth write about supporting remote learners through remote, direct, face-to-face services. Their unique student body, which is about 68 percent African American and 10 percent Hispanic (52), could easily be considered a vulnerable population, and the students benefited from the library's efforts to transform reference services into high-touch experiences. At Rowan University, a public university in New Jersey, COVID-19 aggravated ongoing inequities at the institution due to economic stratification. While the university already emphasized open education resources (OER) and open access (OA) materials, the pandemic forced the library to move to remote learning. Librarians partnered with other university units to change the nature of their workshops and learning communities. Moving to virtual models allowed for students to remain more connected to the institution and its three libraries.

Part II, "Programming That Fosters Inclusion," focuses on innovations that benefit those who are in traditionally marginalized groups. Kristina Clement takes a look at first-generation students at the University of Wyoming (UW) who are "disproportionately affected by the lack of access to information in rural areas of the state" (p. 72). When rural first-generation students start college, they can be overwhelmed by their sudden access to such a wealth of information. To help these first-generation students, the UW libraries instituted the First Gen Scholars program in conjunction with the Librarian-in-Residence service, helping students navigate the sudden onslaught of information privilege.

Tariana Smith focuses on how empathy, support, and access should serve as foundational tools that all academic libraries should utilize when incorporating programs and attempting to create an inclusive culture. Jason Coleman, Lis Pankl, and Leo S. Lo take a similarly global look at how different libraries are involved in campus-wide efforts to tackle the well-being crisis affecting minoritized students, a crisis that, while already made precarious due to systemic racism, has been worsened by the COVID-19 pandemic.

Part III explores how different libraries have removed financial barriers and enabled students to continue learning. Zara Wilkinson writes about the Open and Affordable Text-books (OAT) program at Rutgers University. While the program was initially launched in 2016, it became more crucial due to the COVID-19 pandemic, which worsened the digital divide and unemployment rates. Jonathan Roy Wilson discusses how the need to conquer the digital divide in Appalachia led to a partnership between the library, information and technology services, the dean of students, and student life and enrollment at East Tennessee State University. The Lending Technology and Personal Librarian Program proved to be successful, even as it highlighted the need for increased support for a number of students. In a case study focusing on California State University, Los Angeles, Paizha Stoothoff writes about how nontraditional and historically underserved undergraduate students are offered paid work in the library, to the benefit of all.

While not every case study in this book may apply to a particular library's situation (some libraries may not be in the position to assemble large teams to execute initiatives, for example), there are ideas aplenty to inspire library personnel and assist their student patrons. For example, Heather VanDyne and Rachel Koszalka focus on challenges posed by the pandemic and how they affected rural community college students, yet their research can certainly apply to challenges facing students in similar straits in different environments.

Some of the solutions require the infusion of funds, which are in short supply for many institutions. However, Kelsey and contributors also describe successful initiatives that do not require libraries to rely on grants, funding from their institutions, or the use of money previously earmarked for employee lines deemed no longer necessary. The most useful chapters are those that acknowledge that things have, indeed, changed in the face of the pandemic. Some chapters are written about initiatives that took place before the struggles with COVID-19, and may be of more limited use. Overall, this book will benefit those looking for ways to help students overcome the challenges they face today.—*Ayanna Gaines, Woodbury University*

Hargittai, Eszter, ed. *Handbook of Digital Inequality*. Cheltenham, UK; Northampton, MA: Edward Elgar Publishing, 2021. 386 p. Hardcover $265.00 (ISBN: 9781788116565); ebook $65.00 (ISBN: 9781788116572). LCCN: 2021-946075.
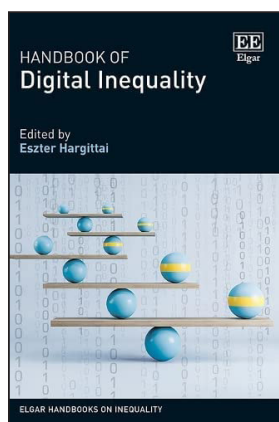
It's the 21st century, and the "digital divide" first noted by sociologists and political economists in the 1980s has not disappeared. It persists. In the United States, for example, over 30 percent of the Native American population lacks access to broadband infrastructure with even minimally adequate speeds.[1] Large parts of the Biden administration's Bipartisan Infrastructure Law and the American Rescue Plan target unequal access to high-quality internet, affecting the lives chiefly of rural and urban poor. These disparities also hold true across much of the world.

Today, however, as author Eszter Hargittai, chair of Internet Use and Society at the University of Zurich, argues, the world's larger concern is *not* access to the internet. In fact, as of June 30, 2022, there were more than 5.4 billion internet users worldwide, an increase of 1,400% over the last 20 years.[2] No, Hargittai calls the problem today a "second-level digital divide" or more succinctly: "digital inequality." Digital inequality refers not to unequal access to digital infrastructure, but to differences *among internet users themselves*, most commonly having to do with income, education, and the other usual markers for inequality across the social spectrum. Focusing on differences in actual internet use allows us to depart from the simplistic dyad—internet access, yes or no?—and look at a much more complex matrix of unequal skills and other inequalities we find in actual use of the Internet—for work, health, social and societal connection, and recreation.

For all its virtues, the title of this book is a clear misnomer. If the definition of a "handbook" is "a book capable of being conveniently carried as a ready reference" or "a concise reference book covering a particular subject," two applicable definitions to be found in Merriam-Webster, then this is not a handbook. Handbooks are, as the word suggests, portable: they are "handy." "Handbook" is the modern word for what scholars in early modern times called a *vade mecum*: Latin, roughly, "[you] go with me" Not that the book would not fit into a backpack or briefcase: I've tried, and it does! But the book's title appears to have been chosen mainly to fit neatly into the publisher's existing series, "Handbooks on Inequality."

Even if this isn't a "handbook," it is notable and worthy of serious attention. Hargittai has assembled a collection of twenty-four widely diverse articles written by knowledgeable contributors from all over the world—Canada, Chile, Germany, Italy, Singapore, Switzerland, the United States, and others—illuminating highly diverse aspects of the unequal use of the internet and enabling cross-disciplinary as well as cross-country comparisons. As we would

expect, the consequences of inadequate internet skills impact all aspects of modern life, among them health management, job prospects and job performance, social connectedness, creative output, participation in the political process, and (of course) academic achievement.

The contributions in this volume highlight disparities not only in skill levels, but also in *access quality*, a result of poor device quality, frequent breakdowns of equipment or networks, or instability of digital access stemming from economic factors such as exhausting prepaid access or an inability to regularly pay recurring ISP bills. One surprising and unsettling insight revealed in these pages is that landlines—low-tech but also traditionally low-cost and reliable—are increasingly being displaced by mobile-only communication in low-income households, often meaning frequent phone number changes and extended periods of disconnection (11, 62ff.).

While the first five chapters in this volume deal with these issues of access quality ("Part I: Infrastructure and Geographies"), those in Part II ("Digital Inequality throughout the Lifecourse") look at specific problems that children, youth, and older adults confront—here, too, with an international component, with authors from Poland and Canada looking at issues specific to their societies.

Those of us who communicate with our health providers largely through dedicated internet portals can well imagine the unintended obstacles confronting digitally disadvantaged patient communities. Research contributed in Part III ("Health and Disability") by Heinz Bonfadelli ("Digital Inequalities in Health Communication"), Xiaoqian Li and Wenhong Chen ("Inequalities in Digital Health Behaviors in American Disadvantaged Communities"), and Kerry Dobransky and Hargittai ("The Closing Skills Gap: Revisiting the Digital Disability Divide"), among others, show how inadequate computer literacy and communication tools have real life outcomes affecting health and longevity.

Finally, the ability and inability to protect one's information online is addressed in the six articles presented in Part IV ("Privacy and Trust"). Here, too, digital inequality manifests itself in increased vulnerability for those least able to cope with system weaknesses and security breaches. Those with inadequate skills are also the ones least able to recognize and defend themselves against spam, phishing, and spoofing attacks. As these articles reveal, susceptibility to privacy breaches correlates with age, education, and gender in often very complex ways.

The evidence and arguments in this volume should become known to policy makers (and their staffers) in both developed and underdeveloped countries. The policy implications are many, significant, but at the same time highly nuanced. It is simply not enough to put a smart phone in the hands of an individual experiencing homelessness or to give a laptop to a school child and declare them, suddenly, "connected." Digital equality requires more.

This volume, therefore, is highly recommended for college, university, and other research collections with strengths in sociology, political science, public policy research, and other social sciences, as well as for students of the political economy of information in graduate information science programs. Remember, though: it is not a reference book.—*Jeffrey Garrett, Northwestern University*

Notes

1. White House statement, August 11, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2022/08/11/fact-sheet-biden-harris-administration-brings-high-speed-affordable-internet-to-tribal-communities/.

2. https://www.internetworldstats.com/stats.htm