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Disciplinary Differences and Scholarly Literature: Discovery, Browsing, and Formats

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Abstract:

This study reports faculty experiences regarding the discovery of scholarly content, highlighting similarities and differences across a range of academic disciplines. The authors interviewed twenty-five faculty members at a public, high-research university in the Midwest to explore the intersections of discovery, browsing, and format from diverse disciplinary perspectives.

Although most participants rely on similar discovery tools such as library catalogs and databases and Google Scholar, their discovery techniques varied according to the discipline and type of research being done. Browsing is not a standard method for discovery, but it is still done selectively and strategically by some scholars. Journal articles are the most important format across disciplines, but books, chapters, and conference proceedings are core for some scholars and should be considered when facilitating discovery. The findings detail several ways in which disciplinary and personal experiences shape scholars' practices. The authors discuss the perceived disconnect between browsability, discovery, and access of scholarly literature and explore solutions that make the library central to discovery and browsing.

Introduction

Academic disciplinary practices—taught and refined through years of graduate school—have a profound influence on how scholars learn to consult, contribute to, and discover new literature. It would make sense that these practices persist as scholars transition from student to faculty member. How faculty identify scholarly literature is of great interest to librarians; by learning more about processes faculty follow with respect to discovery, librarians can tailor services and systems to the needs of their community.

This study seeks to understand and amplify faculty experiences with respect to their discovery, or identification, of scholarly content. The authors conducted interviews with faculty across disciplines at a public, high-research university in the Midwest. The research questions explore disciplinary differences in discovery, specifically: 1). which methods of discovering and keeping up with the literature are most valuable to scholars; 2). how does browsability factor into the discovery of scholarly content; and 3). which formats are most useful to faculty across disciplines?

Literature Review

Disciplinary differences in discovery, searching, and information use have been noted in numerous studies. The Ithaka S+R US Faculty survey has tracked questions related to the discovery and use of library and information resources across the broad areas of sciences, humanities, medical sciences, and social sciences for over a decade and was a useful springboard for developing interview questions and understanding trends at scale.¹ As in previous cycles of the survey, the most recent results show that faculty typically discover scholarly literature through scholarly databases and Google Scholar. Specifically, “In 2021, a third of faculty members indicated that they most often begin their discovery of scholarly materials using

specific databases, such as EBSCOhost, JSTOR, or PubMed, followed by 29 percent who search on Google Scholar, 17 percent on a general search engine and 14 percent on their college or university library's website or online catalog."² A benefit of conducting the study at hand via interviews is that the researchers could follow-up to ask more about how faculty proceed beyond these starting points.

Disciplinary cultures

A 2010 Center for Studies in Higher Education report reiterated disciplinary differences and suggested that "academic values embodied in disciplinary cultures" should be considered when examining scholarly communication patterns.³ The report found that tenure systems at many institutions continue to reward traditional peer-reviewed journal publications and books over other forms of scholarly output and that younger scholars do not appear to be blazing new trails with respect to seeking out and using information: "There is ample evidence that, once initiated into the profession, newer scholars, be they graduate students, postdoctoral scholars, or assistant professors, adopt the behaviors and norms of their mentors to advance their careers. ... we think it premature to assume that Web 2.0 platforms geared toward early public exposure of ideas or data, or open peer review, are going to spread among scholars at the most competitive institutions."⁴

Digital Resources

As electronic access to information has become increasingly widespread, faculty across all disciplines have grown to rely heavily on various means of online discovery of information needed for their research. Judith Brink, Fern Brody, Anne Koenig, and Berenika Maria Webster, noted that early career life science and engineering faculty used a variety of avenues for

discovery: Google, Google Scholar, Web of Science, conferences, and Twitter, with librarians not playing a large role.⁵ Allison M. Sutton and JoAnn Jacoby found that 81 percent of social science researchers said the library's collection was very or extremely important to their research.⁶ Bradley M. Hemminger, Dihui Lu, K.T.L. Vaughan, and Stephanie J. Adams noted that science and medical researchers primarily used bibliographic/citation databases, with Google and Google Scholar not far behind.⁷ Xi Niu and Bradley M. Hemminger later observed that researchers were split about evenly between preferring searching using Google versus library search interfaces.⁸ Shih-Chuan Chen found that humanities scholars in Taiwan used Google, Google Scholar, Google Books, and library catalogs and databases during different phases of the research process.⁹

Discovery platforms

A recent study of early career scholars offers a variety of relevant findings. For example, science and social science researchers typically do not rely on traditional discovery methods, such as searching specialized abstracting and indexing databases, and they often do not know or care about the route used to access needed information.¹⁰ Similar to other studies, the authors found that Google and Google Scholar were universally the most popular starting points for research but that PubMed, ScienceDirect, and multiple social platforms, most popularly ResearchGate, were also used for research. Google Scholar is thought to be particularly useful for locating Open Access content. Web of Science and Scopus are generally popular and trusted. Libraries were used but not as heavily as other resources, and libraries' role in providing access to electronic resources was emphasized although many were unaware that the library was involved.

Citation tracking

Tracking citations in published research can also be a popular technique for discovery. Line noted that social scientists found examining bibliographies/references in books or journals to be very useful for finding additional references.¹¹ This process was termed “chaining” by Ellis in 1993.¹² Lokman I. Meho and Helen R. Tibbo later noted that social scientists still followed citation trails to identify relevant research.¹³ The Ithaka S+R faculty survey reports setting alerts for citations among many tactics for keeping up with the scholarly literature, including: attending conferences, reading materials suggested by colleagues, skimming key journals or their table of contents, following the work of scholars, subscribing to email lists, using relevancy or personalized recommendations, and utilizing scholarly collaboration networks.¹⁴ Strong disciplinary differences surfaced in the utilization of these tactics, for example, in humanists’ reading of book reviews and medical sciences reading of pre-prints.¹⁵ Some scholars use formal notifications, although these are not common. In 2007, Hemminger, Lu, Vaughan, and Adams reported that researchers used diverse means to stay abreast of new literature – these included PubMed and individual journal alerts.¹⁶ Cahoy explored the viability of discovery within citation management software platforms, reporting the desirability to “multitask on one screen.”¹⁷

Formats

Historically, research showed that natural scientists used journals extensively, whereas social scientists used about an equal mix of books and journals, while informal communications were important to both.¹⁸ More recently, Hemminger, Lu, Vaughan, and Adams discovered that in the case of science and medical researchers, “Significant changes in information seeking behavior were found, including increased reliance on web-based resources, fewer visits to the library, and almost entirely electronic communication of information.”¹⁹ In the case of humanists, monographs are not only the expected publication output, they remain integral to

research and discovery: nearly three quarters of humanists indicated they are “dependent” on browsing print materials, for example, compared to 43 percent in social sciences and 28 percent in sciences.²⁰

A wide variety of types of information sources are used by scholars with some apparent disciplinary differences. Niu and Hemminger found that engineering and natural and medical science researchers preferred electronic sources over print and that they used journals, web pages, and personal communications daily; read books weekly or monthly; attended conferences annually; and rarely used preprints.²¹ Humanities scholars in Taiwan followed well-established disciplinary patterns by typically citing books more than journal literature.²² Gray literature was still very important to scientists as well.²³ Newer types of information are also more frequently being used by some scholars. Hemminger, Lu, Vaughan, and Adams noted the evolving nature of materials consulted in research given the ease of digital availability: “It is just as easy to retrieve a genetic sequence, a literature review, or a multimedia presentation as a journal article. Researchers are making increasing use of nonjournal content such as online scientific databases, like GenBank, or the Web pages of research labs.”²⁴

Social discovery

Conferences and word of mouth recommendations remain important for some scholars. Researchers across disciplines considered listservs, seminars, and conferences to be important for finding out about new developments in a field and for seeking feedback on new ideas; senior faculty members preferred smaller, subfield-specific conferences rather than large conferences.²⁵ Sharing of information, sometimes via social media networks, occurs often. A 2017 study of sharing among researchers found that the practice was considered by most scholars to be a natural part of the research process; channels for sharing include email, internal networks,

general social media, and newly emerging social media networks like Mendeley, ResearchGate, and Academic.edu.²⁶ In some disciplines like astrophysics, political science, and economics, scholars were more open to sharing earlier working versions of scholarship prior to formal publication.²⁷

Methods

The Illinois State University (ISU) Institutional Review Board approved the protocol and interview instrument as exempt. The authors conducted twenty-five in-depth, semi-structured interviews with University faculty. Participants represented all of ISU's academic colleges and twenty-two distinct departments/schools (see Appendix A). Faculty articulated research in diverse areas within applied sciences (criminal justice, family studies, geography, human development, information technology, and kinesiology); arts and humanities (film studies, history, literary studies, music education, and musicology); business (finance and management); formal and natural sciences (biology, chemistry, math, and physics); health sciences (communication sciences and disorders and nursing); and social sciences (anthropology, communication, economics, psychology, sociology, social work, special education, and teaching). Participants represented all faculty ranks, with ten assistant professors, seven associate professors, six professors, and two instructional assistant professors. Among the participants, one is currently serving in an administrative capacity, one is currently in a doctoral program, and one completed additional coursework beyond their master's degree. Participants completed their terminal degrees between 1987 and 2022, as reported in Appendix B.

The project team recruited participants via the ISU University faculty email list, and fifty-six faculty members expressed interest. The team reviewed all prospective participants and selected the twenty-five whose college, school/department, and rank promoted the most diverse

perspectives.²⁸ Two members of the team conducted interviews via Zoom in September and October 2022, receiving permission to record the interviews and enabling transcription. During the interviews, both team members took notes, which they afterward reconciled to ensure their interpretations matched and nothing was omitted. The interview questions are available in Appendix C; however, interviews took a “collaborative construction” approach, in that the responses of each participant and the active engagement of interviewee and interviewers shaped the direction, pace, and much of the substance of the interview.²⁹

The authors relied on their notes, transcripts, and recordings to analyze the data for the frequency, intensity, connections, and conclusions drawn in participants’ statements. The authors used inductive coding to organize the data into themes and subthemes and promoted the validity of the data and embraced several best practices for qualitative studies. John W. Creswell and Dana L. Miller discuss a variety of activities including triangulation, in which researchers search for convergence among multiple and different sources; member checking, in which researchers take the data and interpretations to participants for their input on the credibility of the information and account; the audit trail, in which professionals external to the project examine the account and consider its credibility; and thick, rich description which “creates verisimilitude, statements that produce for the readers the feeling that they have experienced, or could experience, the events being described in a study.”³⁰ This approach amplifies the voices of participants and conveys in their own words the spectrum of their preferences and experiences.

The authors collected several hundred pages of transcripts in this study and the richness of the data suggested dividing the findings into manuscripts thematically. The interview instrument included sections on discovery, format, access, openness, and cost. The authors used these sections to form four manuscripts: this article on disciplinary differences in the discovery,

browsing, and formats of scholarly literature; one on access, sharing, and immediacy with respect to serials; one on open access; and one that investigates faculty perceptions of academic publishers, as well as the costs and responsibilities of providing access to academic journals.³¹

Limitations

Although the data are discrete and the results are not repeated, there is nonetheless overlap in the methods used across the four manuscripts resulting from this study; this may be perceived as a limitation. The semi-structured nature of the interviews does not allow for formal quantitative analysis of the responses, which would suggest a level of precision the authors cannot claim. The sample size of twenty-five similarly does not allow the authors to claim that the results are generalizable; the data nonetheless provide great detail into the discovery processes of faculty members and useful insights to librarians working in academic contexts. Finally, the interviews were conducted by librarians at ISU, and participants may have been less likely to disclose some aspects of their practices and perspectives to institutional colleagues.

Results

RQ1. Which methods of discovering and keeping up with the literature are most valuable?

Participants articulated a variety of strategies for staying abreast of the literature. It is worth noting that although most described discovery mechanisms, a few focused instead on access methods. Perhaps this is because: “Usually I’m looking for something I already know about” and “If I’ve been working in the area, I know the literature already.” Many of these methods could be categorized broadly as independent (conducting searches, setting up and tracking down notifications, mining citations, or serving as a peer reviewer) or social (attending

academic conferences and interacting within professional associations, discussing literature with colleagues in a lab or professional context, participating in social media, or collaborating on research). Even fields in which single-authored papers are the norm are replete with examples of the social nature of discovery.

Searching

Searching – Google and Google Scholar

Searching takes on many guises, from a casual Google search—which a health sciences participant uses as an initial starting point when unfamiliar with an area and “gives me a ten-thousand-foot overview of what’s going on out there” —to a systematic search conducted with the goal of replicable procedures. Almost all participants noted using Google or Google Scholar at some point in the discovery or access phases and highlighted perceptions of their different strengths. Several participants use Google Scholar because it frequently surfaces freely available versions of articles. Someone in the health sciences shared: “I tend to use Google more [than Google Scholar] because I think some of the gray literature or some of the websites seem to show up better there.” For example, the Guidelines on the American Heart Association webpage are not formally published as an article, but they nonetheless help focus a research project. A humanities scholar uses Google Scholar to identify recent work and supplement monographic publications.

Participants are drawn to Google Scholar for the sake of convenience. A health sciences scholar uses it to identify search terms before conducting a more formal database search, while an applied sciences scholar uses it “if I want something super quick.” One person in the social sciences typically starts with it because the search algorithm is familiar, and the searches are successful, while another uses it when “I don’t feel like going through the library search process and the ordeal of logging into SSO.” Scholars were split in their awareness of the ability to add

Milner Library's link resolver to Google Scholar's "library links." Many participants have a Google Scholar profile, which generates citation alerts and other notifications. This allows scholars to conveniently go from a citation alert down the "cited by rabbit hole," as noted by a social sciences scholar. Someone in the natural sciences reported using Google Scholar to check citations of recently published papers and noted that knowing authors is often the best way to discover relevant literature: "information is fractal and is subdivided enough that knowing the authors to begin with is always the best way to chase it on the literature tree."

Although almost all participants reported having some use for Google Scholar, there are also concerns about relying on it for discovery. A natural science scholar reported using it less frequently in recent years because it often routes them through ResearchGate and Academia.Edu and "it takes me several clicks to find things." A social scientist primarily uses Google and Google Scholar to "jog my memory, or to very quickly help an undergraduate student with a low-level research problem." They followed up to express concerns that Google searches optimize results based on past searching: "Which means that if I used Google Search for a systematic literature review, I will be receiving suggested readings based on my past searches—and thus creating a selection bias and confirmation bias that is difficult to measure." They contrasted this with traditional databases in which the search results are the same for everyone—acknowledging biases in those toward research in English and from the global north. "Although Google Scholar is free and appears to be efficient, it is actually a bit dangerous to scholarship."

Searching – library databases

Most participants also spoke to the importance of library or disciplinary databases in their discovery process. Participants in both applied and health sciences fields stressed a need for their search to be replicable for other researchers. In those cases, a systematic process in a controlled database environment is essential. One person shared: "If I'm doing a formal integrated or

systematic review or research study, I use a more systematic process,” while the other indicated they use multiple databases for literature reviews, including IEEE Xplore and ScienceDirect, and they later merge the results.

Which databases are searched is also dependent on the aims of the researcher. A music education scholar favors the Sage and JSTOR platforms for scholarly literature and searches Répertoire International de Littérature Musicale (RILM) and Music Periodicals Database to discover practitioner literature: “It’s important for academics to be up on their field and know what’s going on [...] especially in education, there’s no shortage of things to read and there’s plenty of practitioner literature, it’s important that we read the scholarly research literature.” Several participants highlighted different practices depending on their familiarity with the literature or phase of a project. A geologist shared that they are new to Scholarship of Teaching and Learning (SoTL); this research has involved new literature searches and led them to use the library’s “Articles” discovery search whereas they had previously searched specific databases such as GEOBASE. A Chemist consults SciFinder Scholar and Cambridge Structural Database when writing or preparing a new project. A social scientist said, “If I have a particular question and I’m not familiar with it [the literature], I use JSTOR because of its full text; not as many journals, but highly regarded.” Some shared how their process had evolved over time. An applied sciences scholar, for example, indicated, “When I was a student, I searched multiple databases and needed to do a more comprehensive search. Currently, I use PsycINFO. Because I know the research better now, I can look at more targeted databases/journals.”

Participants articulated different techniques for searching databases as part of the discovery process. One health sciences participant who searches PubMed, CINAHL, and PsycInfo as part of the discovery process emphasized the importance of not limiting their search

with any facets: “I try to be as broad as possible, initially, because sometimes even the historic stuff that may not be fully applicable today still has important ramifications for how things have progressed in that research over time.” A person in applied sciences who also regularly searches PubMed, however, does limit their searches to the current and previous year (e.g. 2022 and 2021). Several people noted benefits and limitations of library databases in the discovery process. One social sciences scholar shared they find Web of Science easy to use, and that although the content is not comprehensive, it is truly interdisciplinary. The scholar is happier with the relevance ranking in Web of Science compared to Google Scholar and they appreciate the EndNote integration. An applied sciences scholar noted issues with the same EndNote integration.

Searching – other databases

Several participants indicated they use government or community-led databases. A natural scientist regularly searches arXiv and NASA’s Astronomical Data System. Several participants in health and natural sciences search PubMed or PubMed Central. Part of the attraction of PubMed Central is that it is openly searchable and much of the content is freely available. Those participants who identify as a practitioner or work in clinical or practitioner-based fields reiterated the importance of publicly available information. A teacher-trainer uses a local public library because that is what her student teachers have access to and what she used as a classroom teacher. A scholar in the health sciences asserted the importance of seeing what clinicians see when they search Google. They ask, “What are my clinicians seeing when they search? Because I think that’s really interesting and it informs the privilege that I have with Milner [...] sometimes I’ll use that as a touchstone of ‘How realistic is what I’m finding, and what I’m able to access versus what they’re able to access?’”

Notifications

Participants receive notifications from a variety of sources, but Google Scholar was identified most frequently, both with respect to citation alerts on one's papers and "Recommended Articles" that are related to one's papers and search terms.³² Most participants indicated they receive table of contents notifications from particular journals. A few scholars indicated they "look at them [journals in field] enough that I don't need to." For example, one social scientist periodically peruses the websites of five to ten journals and another who previously used RSS feeds now looks at five core journals by going straight to the journal's websites and sees Online First content.

Notifications may come via email distribution lists, Facebook, a journal platform, or emails from organizations and publishers. Scholars vary in how they follow up on such notifications. A business scholar subscribes to several email lists, on which numerous journals post new issues; they do this "to get a pulse on what people are interested in, what is of interest to me, and then get a specific article." A natural sciences scholar has set up a personal profile on some journal platforms indicating their topics of interest: "then when I get the emails, the papers are in that area." A humanities scholar searches publications of interest directly through Milner Library and often must request them via interlibrary loan. One person in the social sciences shared that because these are usually recent publications, they do not typically check library-provided resources immediately because the content is too new to be available.

With respect to journal notifications, participants noted a variety of concerns about getting from the point of notification to accessing the content. A social sciences scholar shared that they no longer use notifications as a springboard to browse journals on publisher platforms, indicating that the "APA has cracked down" on the information shared, such as advanced online

papers and even abstracts and references. “Journal websites are designed to make money, so they don’t always point you to the library.” A business scholar indicated that although they are aware of such sites as ResearchGate and Academia.edu, they are more commonly routed to the publisher’s website even though the full text may not be there.

Scholars in a variety of disciplines receive notifications from ResearchGate or Academia.Edu. An applied sciences scholar revealed: “I know people share on ResearchGate, but I’m not sure about the copyright issues. I have a ResearchGate profile, but I haven’t updated it for a long time [...] same with Academia.edu.” An arts scholar said, “I get emails from Academia.edu but I don’t engage with that site very much, they are repetitive and annoying—I’ve become dismissive.” A social scientist summed up responses to such platforms nicely by indicating that ResearchGate had “never led to a breakthrough” because “I’m a little bit faster than them. There’s a delay in when new research is posted there.” A participant in the health sciences noted that collaborators or others familiar with their work will share papers of potential interest. They may also receive articles of potential interest via ResearchGate.

Some participants received notifications through different channels. Scholars in the formal and natural sciences, for example, have received notifications from arXiv. One person indicated these were more helpful for past projects than in their current research area, while the other shared that arXiv has too many papers to read and their “hack” is to use automatic abstract indexing services such as NASA’s Astrophysics Data System (ADS). An applied sciences scholar subscribes to conference notifications but does so for calls for papers, not when new research is published.

A few participants addressed book discovery via notifications. An arts scholar shared “journals get information out more quickly on emerging research than books.” Books are

essential to their research, and they receive emails from several publishers announcing new monographic publications and that they read book reviews in relevant librarianship journals because “those book reviews are written by people invested in that subject.” A humanities scholar indicated that finding out about recent book publications is harder because there is a lag in book reviews, often two years delayed. A social scientist shared that notifications for books are typically unsolicited and of no interest. When a notification promotes a title they would like to read, however, they will send it to their subject librarian who is happy to order it if they have not already done so.

Press releases or headlines

A few participants highlighted the role of press releases in discovering new literature or notifying them that a study is now available to read. A scholar in the social sciences follows *The Chronicle of Higher Education* and *Inside Higher Ed* for topics related to their field and will do a Google search on authors quoted in those pieces. Similarly, an applied sciences scholar tracks down studies cited in *Inside Higher Ed* or similar. A natural scientist identified a unique use for press releases: “Headlines are sometimes convenient, because big observations and experiments will be under embargo, and they won’t release their results immediately. But they will sync the publication of the paper with their big press blitz.” When they receive a text from a family member asking them to interpret something, for example, they realize, “Oh, that experiment is finished, and I’m aware that the paper is out.”

Mining citations

Several participants across disciplines look at references and citations to discover works of interest. This is part of their reading process; they note interesting findings or references in materials as they are reading and try to track them down. “Treeing back” is a technique that an education scholar uses and shares with their students. A business scholar shared that they

specifically look for a well-cited, recent article on the topic and look at its reference list, while someone in the health sciences indicated that they look for guideline statements, such as those for chest pain from the American Heart Association: “I look at the reference list a lot and who they’re citing. Sometimes I see papers I haven’t seen before. I also look at citation trails in new, good papers and literature reviews. I usually find sources that I haven’t found in targeted searching in databases.” An arts scholar treats the whole work, not just the bibliography, as a source of references. They look at acknowledgements where they often find “breadcrumbs to scholars who have work forthcoming – I email those scholars and connect.” A humanities scholar is a “miner of people’s footnotes;” they go to a bibliography first and “if there is ‘the book’ on the topic, I will start there.”

Serving as a peer-reviewer

A few participants noted that serving as a peer reviewer facilitates their discovery of new literature. One social sciences scholar who is a prolific reviewer of journal articles acknowledged this is where they encounter new and trending ideas: “It gives you a kind of sense of cutting edge [and] what is selling.” Another noted that if one of the association’s flagship journals invites them to review, they always say “yes.” Not only does it allow them to see new research and what is of interest, “I’m potentially promoting my subfield within the discipline.” They also mentioned they have discovered journals through reviewing. A natural sciences scholar indicated they collaborate with someone who, like them, reviews a lot in discipline, and they “give each other a heads up on good papers.”

Collaborative or social nature of research

Several participants highlighted the collaborative and social aspects of research and discovery in their field. One scholar shared that a colleague with whom they collaborate handles much of the discovery for their shared work. They admit that this division of labor is because

they plan to retire soon, and their research partner is now more familiar with the literature. A natural sciences scholar with external collaborators indicated they have a weekly lab meeting and frequently advise each other on papers. According to participants, articles and new publications are shared among scholars with related research agendas: “things will circulate through informal channels, Slacks, emails.” An applied sciences scholar mentioned that word of mouth remains a powerful tool for discovery, with colleagues recommending scholars and publications.

Collaboration and social networks allow scholars to identify relevant research; when these networks are not in place, they can negatively impact discovery. Humanities scholars are eager to promote “circles of friends and colleagues.” An arts scholar highlighted the roles of librarians and archivists in the discovery process: “I’ve been a reader [at the British Library] since 2009; they will pull and share materials. The relationships established there have paid dividends.” The lack of opportunities for this social disciplinary interaction was also highlighted, for example, by a participant who noted: “This is not a major institute in my discipline, so I can’t rely on journal clubs with colleagues and [conversations with] excited students in the hallway to keep me up to speed.”

Society involvement and academic conferences

Conference attendance was identified as an important opportunity to keep up with research in one’s field as well as to find potential collaborators and colleagues. In business, conferences are helpful for encountering unpublished work and seeing what new research is out there. A health sciences scholar emphasized the importance of networking at conferences: “seeing this abstract published might lead me to somebody who’s doing research in my area, or I’m trying to find collaborators across the country, and I see ‘Oh, you just presented this poster at this conference about this.’”

Some scholars fulfill their needs for networking and discovery via their professional associations or societies. An applied sciences scholar indicated that a special interest group within the American College of Sports Medicine highlights articles that are published specific to their particular area of research. A scholar in the social sciences is part of a cohort in their professional society “where we’re doing research projects and have articles to use – if [I have] no access through Milner I will ask those colleagues for copies, [which are] shared on Google Drive.” A health sciences scholar looks to the American Speech and Hearing Association, in which they are also a member of some special interest groups and receive regular updates on relevant literature.

Participating in social media

Participants shared widely varying perspectives on the utility of social media for the discovery of scholarly research. Several participants do not use social media for their research, a representative reason for opting out is that it is “helpful for other people but I’m not that active.” A natural scientist said that their lack of work-related interest and engagement with social media was due to their career stage. “If I were younger, if I was looking for jobs, or I was looking for opportunities, and I was less established, that’s a good way to make networking and connections and find things. But I’m relatively well settled at this point.” Some participants conveyed skepticism. For example, a health sciences scholar shared that although they may follow a number of science organization on social media, they still access content through the library. “I want it to be a vetted source, so it matters to me where it’s coming from [...] using Milner as a filter for that makes it easier.”

A few participants shared the value of social media in the discovery process. A health sciences scholar follows major health organizations on Facebook and Twitter as well as some other researchers. Scholars in humanities and social sciences mentioned their use of Twitter.⁸ For

example, a scholar of social work said it was helpful when another scholar posted to Twitter an exhaustive list of articles related to their research area that were not necessarily in the canon. A social sciences scholar indicated that they follow people who publish in their areas, and that this is more effective for scholars in one of their subdisciplines versus another. Nonetheless, it has not necessarily been useful for finding new critical research, as much as conducting environmental scanning, keeping aware, and “seeing what’s up.”

A humanities scholar shared “I also find a lot of stuff online through what people are talking about on History Twitter, which is a very active world.” This person underlined the importance of “talking to people, having friends in the field, going to conferences, and being online.” An arts scholar indicated they sometimes “stumble upon something incredibly profitable via their sojourns down rabbit holes” prompted by content posted to Facebook, Twitter, and LinkedIn. Scholars in business, economics, and human development and family sciences mentioned LinkedIn, though with considerable skepticism: “my network is almost all higher ed—it’s narcissistic so people are into sharing their work. It’s rare that I’ve seen something and tracked it down” and “my students invite me to connect after they graduate but I don’t maintain that profile there, either. Maybe I should.” A social scientist shared that they only recently joined LinkedIn: “It’s been interesting because economics of the Internet is another research area—so I’m observing people I know. LinkedIn seems like exaggerated marketing, with peoples’ ex-students liking their work. It seems like a glorified professional Facebook.”

Discovery process

Several participants spoke about the process of discovery. A humanities scholar starts with an idea, interest, or hunch and engages with primary sources before searching: “that gives me keywords and after I find articles that are relevant and looking at reference lists.” Some

described the evolution of their practices. An arts scholar shared that as a student, “I was more in a hunting-and-gathering phase, but now I follow diligently what particular colleagues are producing.” A social scientist remembered visiting the library to look at citation indexes and journals in pre-Internet times: “something would excite me [...] It was tedious but not too challenging.” They no longer visit the physical library very often, but “After all these years I know leading authors, I try to follow them.” A natural sciences scholar also recalled trips to the library as a graduate student: “I’d go to the medical library on Mondays and read articles from 8 a.m. to noon.”

Some tied current discovery processes to their recent doctoral training, including a humanities scholar who emphasized the importance of learning about sources from friends and mentors. A health sciences professor tied discovery to their doctoral training and their evolution from student to author. Their training linked conducting in-depth literature searches to ensuring that their potential project addressed gaps in knowledge. They were taught to ask, “Have I really found everything, is my search detailed enough, and have I looked through the proper search engines? Is there another search engine I should be looking at to make sure that I’ve captured everything?” Asking these questions helped not only establish the background, context, and justification for the project, “but also provides that significance, so that people really understand the importance of why we are doing what we are doing, and it becomes part of what I call the story.” They also consider the journal in which the article is published and the target audience.

Some participants also discussed the overlaps between discovery for research and for teaching. A humanities scholar noted that looking back at syllabi for courses they took and sharing syllabi with colleagues or on online syllabi sharing sites has led to their discovery of texts. A social scientist highlighted the importance of the students’ discovery processes: “we

haven't had enough conversations in our department about when students need this experience. My students do a lit review and pitch a masters project. I ask them to enter search terms in [Milner's search tool for] Articles or go into GEOBASE and talk about limiters—this really matters to me, for students to understand differences between peer-reviewed articles and trade.”

A few scholars highlighted the pace of discovery, specifically the need to learn about new research as soon as it becomes available. A social sciences scholar quipped: “with the Internet, you know, everybody is little bit smart, so the key is to be novel and fast.” They indicated that this is particularly true for those who do not create their own data and rely on existing data sets and archival or other pre-existing sources. Some participants, including a business scholar, spoke to the cost of conducting surveys and generating data: “Surveys are expensive – my dissertation had three and it probably cost \$10,000.” For those who do not have large grants that cover research incentives and extensive data production, there was a sense that “I have to be fast.” The adage “If you want to go fast, go alone; if you want to go far, go together” may be relevant. Some participants spoke to disciplinary norms regarding collaboration. A business scholar, whose work is collaborative, never solo, summed it up by saying: “Top tier journals want so many things out of an article no one person can do it.”

RQ2. How does browsability factor into the discovery of scholarly content?

Most participants indicated that they do not typically browse journals by issue and would rather have a PDF of the article of interest: “I just want the PDF, anything else will distract me.” Some participants shared that there is not enough time to browse through issues and keep up with the literature in a comprehensive way. A faculty member in the formal sciences noted, “There are a lot of competing pressures on our time.” An applied sciences scholar sometimes browses a whole issue “to take a look and see if something is relevant” for leisure. A teaching professor

shared a preference for looking through the entire issue, as “articles can build on each other.” They gave an example of swapping out an assigned text with something more relevant after browsing. However, another education professor disagreed, noting that the context of other articles in an issue does not really matter to them, but the status of the journal is a consideration. A scholar in the natural sciences expressed nostalgia for browsing print journals: “I miss being able to browse an entire journal issue. The title and abstract don’t always convey the usefulness of an article—I feel guilty wasting library resources in those cases for interlibrary loan requests. Sometimes there is serendipity in browsing a journal issue.” They also hate reading online, which hurts their eyes, and prefer to print out a PDF to read through the whole thing. A humanist who recently completed their PhD noted “I don’t know that I’ve ever encountered a journal in print,” but “thumbing through” and “turning pages” were equated with browsing for scholars who received terminal degrees in the 1980s and 1990s.

Browsing may not be the norm, but it is still done selectively and strategically. A social scientist noted that they browse journals when considering publication venues: “I need to see what’s been published in this journal recently, so I can make sure I’m following the trend” and keeping up with literature published in the association’s flagship journals: “There are four top journals, and they are non-negotiable. My career will be better if I can publish in those journals.” A different social scientist offered another perspective, namely that they are less inclined to browse their association’s flagship journals: “subfield journals are closer to my research interests so there’s a good chance all the articles in an issue would be valuable to me. For these journals I need to be able to read the abstracts and get quick access to the full text.” Several participants noted browsing more comprehensively when considering where to submit manuscripts. A social science scholar shared that it is beneficial when a whole issue is available to browse in

preparation for manuscript submission: “I want to find a home for my manuscript, and sometimes I really want to get the sense of the research they publish.”

For several participants, the value of browsing is diminished by the disparate nature of articles grouped in an issue. Many of these acknowledged that they would be more likely to browse a special or topical issue dedicated to their research agenda, at least skimming multiple articles. For example, a social sciences scholar indicated they would be more likely to browse an entire issue in their area of racial diversity in their field and a health sciences scholar shared that although PDFs are desirable within their main research areas, they have been more inclined to read a whole issue related to SoTL research. Even though special, themed issues may be of interest, a humanist notes, “we are a hyperspecialized discipline, so I don’t need every article in the issue. I’m just curious.” A scholar in the natural sciences indicated that special issues with a guest editor are almost exclusively predatory in their field, “so you can almost always count on them to be unreliable. I actually consider that a point against them.” The only potential use for a special issue would be for older content, “the historical norms were different in the 1970s, and [if] I’m trying to understand something very early.”

Many participants indicated that in a digital world, browsing is more effectively done via journal websites than through the library, though both have limitations. One social sciences scholar stated that browsing journals in EBSCO, for example, is not user-friendly. Another social sciences scholar indicated, “I’ve never tried to browse a whole issue through Milner—I go through the journal home page directly. But the journal doesn’t let me read the whole thing.” Another scholar noted, “when browsing I’m usually looking for the abstract and marking to read it later.” Yet another social scientist regularly browses the table of contents for some of the key journals, while an applied sciences scholar noted that browsing without full text is irritating,

especially the lack of references, and a health sciences scholar shared that they only browse the journals they have access to as a member of their professional organizations.

Some scholars noted the desirability of browsing other formats of scholarship, including conference proceedings and books, and other outputs such as search results. An applied sciences scholar stated, “If I can’t attend a conference, then I look through titles and abstracts and then read through the proceedings.” A participant in the natural sciences noted that they would read the proceedings of a particular conference that meets every three years “cover to cover” and even buy them. A social scientist highlighted the browsability of keyword search: “I don’t usually need to look at a whole journal issue, but I do sometimes like to see like a whole list of relevant hits when I put in the search.”

RQ3. Which formats are most useful to faculty across disciplines?

Journal articles

With a few exceptions, participants identified journal articles as the most important format within their field. One natural scientist stated, “peer-reviewed journal articles are the currency of my discipline” and another shared, “95 percent of our research is journal articles. It is where we publish, where we get most of our information and follow other peoples’ work.” Scholars in biology, business management, chemistry, communications, communication sciences and disorders, economics, finance, geography, kinesiology, physics, psychology, music education, nursing, sociology, and special education indicated that theirs are journal fields, and scholars are expected to author and cite articles.

A scholar in the applied sciences indicated that journal articles are requisite in the field: “Articles are more up-to-date, and I can pinpoint the science of it, especially if I’m trying to find a gap in the literature.” A social sciences scholar discussed how journal articles are essential for

their process of developing an argument based on data and previous research. Similarly, another scholar indicated that journal articles are very important in providing background information and setting the context for empirical studies. An applied sciences scholar indicated, “in order to know if there’s a gap in the literature, you have to read a lot of articles. You need to make sure introduction and discussion are solid, well justified.”

Most participants indicated that research in their field is predominantly published as articles. A social scientist said, “[articles] are the only important thing,” both as an author and a consumer. A formal sciences scholar similarly noted that most of the resources they publish and cite are articles. Scholars in the health sciences highlighted the importance of journal articles in evidence-based practice: “the journal articles provide the evidence that we need to make meaningful changes. So, being able to have that journal article that addresses a specific issue and did clinical research on a particular intervention, it is incredibly helpful in creating those best standards of practice.” Another health sciences scholar reiterated why articles are critical: “In any of the research that I do, I’m looking at journal articles. The questions, the data, everything that we’re looking at, and considering in terms of what’s been published, how is my study going to contribute to the overall literature, and what impact is this going to make—all of that starts with understanding what’s been done, what’s out there. The majority of that is in journal articles.”

Scholars in varied disciplines highlighted some of the idiosyncrasies of their fields with respect to journal articles. Because business management is a newer discipline, “you can’t publish a short report like the sciences and mention an established theory. [You] have to include theory in the article, have to cite a lot of previous works to make your argument.” Peer reviewers expect authors to cite recent articles in top-tier journals, which requires authors to “stay on top of

those publications.” A natural sciences scholar shared that “In [my discipline’s main US-based society], there’s a culture of, ‘If you have something to say, you get to say it.’” They shared that some scholars simply deposit studies in arXiv without attempting to publish them elsewhere.

Although humanities are typically book disciplines, “articles are really important as waypoints in those projects.” Even if articles do not lead to a book, they nonetheless help scholars understand what people have in the works. One humanist also finds article production to be an important part of early career productivity, saying “having essentially what is part of your dissertation out as an article is pretty standard in the field.” Another participant admitted, “The book is still the gold standard, but everyone knows [about] the crisis in economic publishing and realizes that fewer and fewer people are publishing monographs—that journal articles are often how scholarship is disseminated.” For an arts scholar, certain areas of their research agenda come in and out of vogue in journals, and there are, accordingly, periods of feast or famine. The prestige and impact of journals was mentioned in several interviews. One social scientist shared, “There are ten to twenty top journals, and they are a little cliquish. They are associated with the top schools, and they are selective.” The topic was frequently mentioned in conjunction with the rating of journals in the tenure and promotion or annual evaluation processes. Participants, and particularly those on the tenure-track, reiterated department-specific expectations with respect to conducting and disseminating research. An applied sciences scholar whose department requires a minimum of one peer-reviewed article per year to achieve tenure and promotion noted that not only is conducting research an expectation for promotion, “it is also part of my interest and passion.”

Some departments maintain a list of top-tier journals for tenure and promotion committees to consider. One scholar shared a perception held by some that the ranking is biased

toward venues in which the committee members at the time published their own work. Other departments, particularly in the social sciences, acknowledge the diversity of subfields and do not have expectations that faculty publish in flagship or specific journals. A participant shared, “journals are our main academic commerce—we get most rewarded for them and they’re the most useful. If journals were \$1, conference proceedings would be a nickel.” A humanities scholar stated, “There is a hierarchy of journals and there are a lot of them because of specializations. Our department doesn’t have an official list, but anyone could tell you what they are if you asked them. [Flagship journal] publishes a wide range of topics—it is a big deal to get published there. But every subdiscipline has its own big journal and then a few more. [Our tenure and promotion committee] recognizes peer-reviewed articles but not particular titles.” In another humanities field, publishing articles in only the most respected journals could begin to approximate the value of a monograph: “If you publish a book, including an edited volume (it doesn’t have to be single-author monograph), you automatically earn ‘excellent’ in scholarship for three years. What I have noticed is that it is almost impossible to earn an ‘excellent’ in research in the absence of a book. I remember one year I had three [publications]: two articles and one chapter, all peer-reviewed, all single-author and I thought well, surely that would equal one year of ‘excellent.’” It did not.

Conference proceedings

An applied sciences faculty member noted that in their subdisciplines, conference proceedings are most often peer-reviewed and free to read. Accordingly, they are equally or more impactful and important than journal articles. The scholar also highlighted the value of networking and conference attendance and indicated that promotion in their department requires a balance of both proceedings and articles in high impact factor journals. They decide the format based on the size of the project: “conference proceeding if I can get a smaller paper out of it; if

it's a larger project, then I would go for a journal." A social sciences scholar noted that a technology-focused conference in their field is considered just as strong as peer-reviewed journals: "My peers would say that it's just as good and sometimes better because it comes out so much quicker; you're not in publication hell for two years because with [this conference], you submit, and then it's proceedings within four or five months. It is peer-reviewed, and it is excellent."

Although conference proceedings are less important than articles in health sciences, presenting at a major conference holds potential to impact public health. A scholar indicated that the American Heart Association, for example, has several associated journals and around conference time, the articles align with late-breaking content, the most important conference presentations will be published as journal articles almost simultaneously. These articles have gone through the peer review process and are embargoed until the conference date, and according to the scholar, "these are the types of announcements that make the nightly news."

In all other fields, participants indicated that proceedings are not published and are perceived of lesser quality than peer-reviewed articles, or simply not as valued. Conference proceedings in a natural sciences field "were more important prior to the Internet and the arXiv. Now they have largely gone extinct, and it's, you know, vestigial, it's historical." They are also uncommon in education, and only the abstract is available, not the full text. An education scholar expressed concerns that conferences accept proposals made before research is conducted and accordingly may have small sample sizes and questionable research methods: "Conferences in our field undergo much less peer review than journal articles." An applied sciences scholar stated they read conference proceedings more for generating hypotheses than research: "I don't cite them because they haven't gone through peer review." A business scholar noted they "got

dinged” for citing a proceeding, which are typically not prestigious, when they could not find an article in a top tier journal article to cite. A scholar in the formal sciences indicated that conference proceedings can be valuable if the topic is of interest, though the vetting and rigor of review varies considerably, but they “haven’t been using them lately, haven’t been attending conferences for several years.”

One social scientist expressed strong concerns about the rigor of peer-review, saying, “If I see proceedings on a CV in my field, I think they are naïve or overmarketing.” They indicated that proceedings in their area are not typically peer-reviewed and expressed skepticism about models in which payment is required: “But when I am saying, ‘Come to my conference, I will publish your proceedings. Give me five hundred dollars, and I will have them peer-reviewed.’ I might just slap your hand little bit, and then take your money.” Although they do not have experience with this, their suspicion is that the review will be less than rigorous.

In one natural sciences discipline, conference abstracts are due six to eight months before the meeting and are accordingly often quite vague. Proceedings are not published as full articles, usually just an abstract. A scholar in another natural sciences field similarly noted that most conferences do not publish proceedings, though they find meetings to be critical as a means to learn about new research: “by the time the paper is published, nine times out of ten I’ve heard of that work.” A social sciences scholar similarly noted that proceedings can be good, but they also look for the published article that follows. They also follow this process: “right now I’m writing a proceeding and I plan to develop it and write and submit a manuscript later.” In a humanities field, the trajectory of conference talk, article, book is still respected. Although conference proceedings are common, they are not as highly regarded: “I feel like everyone is told to proceed with caution because the quality of the publication is not usually as uniform, and the review

process is not as rigorous.” Another humanities scholar emphasized that publishers are not interested in monographic projects that include content presented at conferences, attributing this to the cost of publishing.

A participant in one health sciences field indicated that because everyone in the department is a clinical researcher, the applied nature of conference proceedings is seen as useful. “National and state level conferences are peer-reviewed, but they don’t hold the same weight as journal articles.” Other health science scholars similarly attend professional conferences and find them valuable: “I appreciate being able to see what other people are doing – people are often doing innovative things that can help me in my job. I would be interested in having access to conference proceedings.” One social scientist shared that although conference proceedings are not typically peer-reviewed, if they encounter something interesting in a conference format, they are not opposed to reading and citing the abstract. Another participant largely concurred, noting the utility of reading abstracts, which help them keep up with research being conducted. But they would never cite proceedings and, “I always discourage my students from using them because they are not formally peer-reviewed.” In a business field, official proceedings are uncommon, “If I want to see what’s out there that hasn’t been published, I look at a conference program on their website. Many papers are posted on the SSRN [formerly known as Social Science Research Network], which is a repository for working papers. So even if it’s not on the conference website, and sometimes a working paper can have hundreds of citations.”

Books

Humanists confirmed that the single-author monograph remains the most valued form of output in their respective fields, though participants shared details on the important role articles play in a “book field.” In one field, the average professor “will publish two to three books in their career.” A participant indicated that learning about different timelines for publishing from

friends in hard sciences “was kind of heartbreaking as a graduate student, but fascinating.”

Another humanities scholar confirmed the persistence of a “cloud of prestige around a book that there’s not around articles.”

Scholars outside of humanities fields generally do not find books as impactful.

“Groundbreaking books don’t get published very often” according to a scholar in the health sciences. A natural sciences scholar shared that people are more hesitant to post books to arXiv given their author agreements, but books in their field do not communicate original knowledge, rather, “they are almost like big review articles.” One social scientist shared that they had initially planned to publish an edited book but found out about an Open Access journal and decided to make it a special issue instead. An applied sciences scholar only infrequently cites books, doing so if “it’s well established in the literature.” A scholar in education looks at books but expressed the need to be more selective than with articles, noting concerns about the rigor of peer review compared to journals. Scholars in both social and applied sciences indicated that although they do not frequently use books for their research, they do assign chapters to students. A formal sciences scholar uses books for early stages of research as well as for course preparation and teaching.

One social sciences scholar explained that theirs is a practitioner field that relies primarily on journal articles. However, some of the seminal historic research on topics like interracial disparities, for example, tended to be published in books. Another said researchers in their field tend to author and cite book chapters rather than an entire book; this person noted although authoring chapters is common in their department, “R1 faculty focus on journal articles rather than book chapters, which are more likely editorially reviewed and haven’t gone through the spanking machine of peer review.” A social sciences scholar noted that books “have fallen by

the wayside” and when they receive invitations to write book chapters, they only do so as a personal favor “because they don’t get many citations irrespective of quality; they just don’t come on the radar.” Their department does not value book chapters in evaluation processes and from their perspective it is more work for members of the tenure and promotion committee to assess the value and significance of a book chapter because chapters are not as standardized as journal articles.

Although articles are understood to be the most critical form of disseminating scholarship, other formats hold opportunities. Scholars highlighted the opportunities to network provided by conferences and books. An applied sciences scholar noted that books may also open doors for networking when, for example, they are invited by colleagues to contribute a chapter. They currently have a book under contract. Although authoring a book is not an expectation for tenure and promotion, “I think there’s a gap.” Their desire to provide a theory-driven, research-based book [on a particular topic] geared toward practitioners and their knowledge that “there is no book like this,” emphasizes that conducting and disseminating research serves a variety of personal goals beyond tenure and promotion or other extrinsic rewards.

Discussion: Implications for Practice

Knowing how faculty in particular disciplines discover sources can empower librarians to improve their experience. This section outlines how librarians can understand, reflect, and act upon the findings of this study by offering suggestions about how librarians can work with researchers to optimize use of platforms, internet-based discovery, education of graduate students, and discoverability of non-journal print content.

Although nearly all participants in this study—regardless of discipline—use Google Scholar to some degree, many only use it as a starting point or as one of several tools. By helping

faculty optimize their use of platforms like Google Scholar—such as setting up a profile, creating citation alerts, and linking to their library—librarians can enhance the efficiency and comprehensiveness of scholars' discovery processes. When Google Scholar is used, it is almost essential for the user to have their profile linked to their institutional library's link resolver so they can most efficiently access the full text; several participants in the study were not aware of this integration option or how to choose it in their Google Scholar settings.

Librarians also have an opportunity to raise awareness of potential bias and filter bubbles in search results. Faculty in social sciences and applied sciences, especially, expressed concerns about the bias created by algorithmic personalized searching and the ramifications for their systematic literature review. This suggests an opportunity for librarians to emphasize the role of library databases in ensuring the replicability of search results and to promote library resources in research methods courses. Faculty members whose disciplines and research agendas require systematic and reproducible searching noted the importance of library databases to their processes. Collaborating with these faculty to provide explicit training on using databases for systematic and other disciplinary review processes would help ensure the centrality of the library to discovery among student scholars.

The more librarians can do to allow faculty to discover, browse, and access materials from their preferred starting point, the better library collections will be used. While discussing searching as a method of discovery, several participants spoke to a perceived disconnect between browsability, discovery, and access. For example, many participants browse a journal on the publisher's website because the interface supports browsing better than the library's electronic resources, and then they sometimes go to the library's website to obtain the full text. Librarians have new tools that facilitate closing this gap, such as ThirdIron's LibKey solutions,

OurResearch's Unpaywall browser extension, and OpenAthens' Wayfinder. Wayfinder enables users to begin their discovery on the internet, browse through articles of interest on a publisher's website, and then log in with institutional credentials to gain access.³³ Libkey.io powers a DOI and PMID search that allows users to track down desired articles while minimizing the likelihood of typos. LibKey Nomad is a free browser extension that provides access links to library-licensed and Open Access content from the users' preferred search platform. With the aim of improving discovery of and access to scholarly content, the authors have employed Wayfinder, LibKey Nomad, LibKey.io, and similar tools to integrate library resources into the workflow of the researcher, and not the other way around.

Librarians have diverse tools that may enhance the utility of notifications, for example, enabling patrons to connect to full-text access after receiving a notification. Alerts can be set up in many library platforms, such as PubMed, Scopus, Web of Science, and ThirdIron's BrowZine, and these platforms, as well as Google Scholar can be integrated with library holdings to provide users with the desired content. Notifications and mining citations are widely used to keep up with the literature, but their relative importance varies by discipline and individual. One participant quipped that ResearchGate had "never led to a breakthrough," and others agreed that they become aware of new research through more social channels. The practice of mining citations was prevalent across disciplines, however the particular method scholars used varied by format and discipline, with some treating the work more systematically than others. Librarians can demonstrate value by showing how some databases add value to the citation mining process by linking full-text, showing the number of citations, collocating the author's other and related works, and identifying where and how works have previously been cited.

Social methods of discovery similarly varied depending on one's level of comfort with social media, disciplinary engagement with social and interactive platforms, disciplinary expectations for conference attendance and society engagement, and career phase. Librarians facilitate social methods of discovery, for example, by holding networking events for students and faculty, hosting conferences or symposia in physical or virtual spaces, and highlighting local scholarship or unique collections on social media. The authors have collaborated with the Graduate School, Office of Undergraduate Research, faculty authors, and various others to hold events virtually and in-person that create a space for dialogue and discovery.

Librarians may strive to be more integrated into graduate students' search methods either directly—through student consultations or library instruction—or by proxy through conversations with faculty. Participants noted sharing their discovery approaches with their students, so it is reasonable to expect graduate students to use strategies and tools similar to their mentors'. A faculty member in natural science, for example, mentioned addressing the discovery process in their teaching and emphasizing common database features such as facets. The authors and other librarians at their institution have held workshops on diverse aspects of research and discovery for graduate students since these are the future scholars in academia.

Librarians can promote browsing by promoting services that bridge the gap between this print-based activity and an increasingly digital world. Scholars do not browse as frequently as they did in a print environment—not because browsing is not a useful process, but rather due to fundamental differences in print-based and digital information discovery and use. Some libraries subscribe to Third Iron's BrowZine product, which promises "Effortless journal browsing and reading" via iOS and Android applications or an internet browser.³⁴ BrowZine integrates with library authentication systems, synchronizes with a library's holdings data, and refers to

interlibrary loan and document delivery as desired. For users who value the opportunity to peruse whole issues, whether as a method of discovery or when considering a publication venue before submitting their own work, this product allows them to do so in a visually appealing way that approximates the analog experience of “thumbing through” a journal.

The embrace of articles as the primary scholarly currency in most disciplines is reflected in standard discovery tools, from citation indexes like Web of Science to “Articles” search boxes in library catalogs. Peer-reviewed journal articles are the primary format for scholars’ research across a variety of disciplines. They are even important for scholars in book-reliant humanities disciplines, who often publish articles as stepping stones toward a full monograph. Librarians can help make diverse formats of scholarship—like book chapters—more discoverable by creating detailed catalog records for monographs and leveraging options in discovery interfaces, such as the ability in Primo VE to relate book chapter records to the book’s record. Librarians can also provide access to databases which index book chapters in addition to articles and advocate with vendors for robust and granular metadata across licensed platforms.

Conclusion

This study confirms findings offered in survey-based research, namely that participants rely on similar discovery tools such as library catalogs and databases along with Google Scholar. By conducting in-depth interviews with scholars across the University, however, this study reveals some of the nuanced differences in discovery techniques that vary according to the discipline and type of research being done. The study also draws attention to ways in which the discovery of scholarly literature is social and interactive, and highlights activities—such as serving as a peer-reviewer, signing up for notifications, and mining citations—that although almost universally available across most disciplines, nonetheless exhibit differences by

individual and field. Browsing is not a standard method for discovery, but it is still done selectively and strategically by some scholars, especially when considering a particular journal as a potential publishing venue. Journal articles are the most important resource type across disciplines, but books, chapters, and conference proceedings are core for some scholars and should be considered when facilitating discovery.

Future research might explore the impact of the pandemic on faculty members' research approaches and their discovery of scholarly content. Specifically, several publishers and platforms provided expanded access to their resources through much of 2020 and 2021, and many physical libraries were closed to patrons during this period; how did this expansion of digital and reduction of physical access influence the expectations and practices of faculty members with respect to discovery? Additionally, conducting a survey or multi-modal study would allow for quantitative analysis of commonalities and distinctions in discovery process across various disciplines that was not possible with data from semi-structured interviews.

The discovery of scholarly content in library systems depends on a variety of factors, including the availability of content to be discovered, rich descriptive metadata, optimized integration of library discovery systems, link resolvers, and third-party platforms, and ongoing analysis to provide point-of-need access and reconsider services. Librarians can leverage both publicly-available and vendor-provided tools to improve scholars' discovery experiences. In addition to optimizing library systems, librarians can add value by providing instruction and consultation services to graduate students, especially, as they learn not only how research in their discipline is conducted, but also what information tools and resources will become essential for how they will conduct this work throughout their careers. Librarians can assert their value as

information professionals by understanding the discovery needs of their users and advocating to publishers and vendors for platform changes that better serve their community.

Appendix A. College and School / Department

College of Applied Science and Technology - Criminal Justice Sciences; Family and Consumer Sciences; Information Technology; Kinesiology and Recreation

College of Arts and Sciences - Chemistry; Communication; Communication Sciences and Disorders; Economics; Geography, Geology, and the Environment; History; Languages, Literatures, and Cultures; Mathematics; Physics; Psychology; Social Work; Sociology and Anthropology

College of Business - Finance, Insurance & Law; Management & Quantitative Methods

College of Education - Special Education; Teaching & Learning

Mennonite College of Nursing - Nursing (2)

Wonsook Kim College of Fine Arts - Music (2)

Appendix B. Year of Terminal Degree

1987
1993
1994
1999
2005 (2)
2006
2008
2009 (2)
2011 (2)
2013
2016
2017 (5)
2018
2020
2021
2022 (3)

Appendix C. Interview Questions

Demographic

- In which department(s) do you teach?
- Which subject area(s) do you research?
- In what year did you complete your terminal degree?

Discovery

- Please describe which methods of discovery scholarly literature are most valuable to you.
- How do you most often begin the process of accessing articles?
- How important is browsability? In other words, are you content to get a PDF of a single article, or do you want to skim the whole issue for context? Is this dependent on format (book, journal, etc.)?

Format

- Please describe the importance of journal articles and conference proceedings to research in your discipline. How has the importance of these format changed over time (if at all)?

¹ Melissa Blankstein, “Ithaka S+R US Faculty Survey 2021,” *Ithaka S+R*. Last Modified 14 July 2022. <https://doi.org/10.18665/sr.316896>.

² Blankstein, “Ithaka S+R US Faculty Survey 2021,” 13.

³ Diane Harley, Sophia Krzys Acord, Sarah Earl-Novell, Shannon Lawrence, and C. Judson King, *Assessing the Future Landscape of Scholarly Communication: An Exploration of Faculty Values and Needs in Seven Disciplines*, (Berkeley: University of California, Center for Studies in Higher Education, 2010), <https://escholarship.org/uc/item/15x7385g>.

⁴ Harley, Krzys Acord, Earl-Novell, Lawrence, and King, *Assessing the Future Landscape of Scholarly Communication*, 15.

⁵ Judith Brink, Fern Brody, Anne Koenig, and Berenika Maria Webster, “Discovery Practices of Early Career Life Sciences and Engineering Faculty: A Qualitative Approach,” *Collection Management* 47, no. 4 (2022): 286–99. <https://doi.org/10.1080/01462679.2022.2042448>.

⁶ Allison M. Sutton and JoAnn Jacoby, “A Comparative Study of Book and Journal Use in Four Social Science Disciplines,” *Behavioral & Social Sciences Librarian* 27, no. 1 (2008): 1–33. <https://doi.org/10.1080/01639260802152709>.

⁷ Hemminger, Lu, Vaughan, and Adams, “Information Seeking Behavior of Academic Scientists.”

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