

Impact of Library Collections on Faculty Teaching, Research, and Retention: A Mixed-Methods Study

Sarah LeMire and Shanna Bodenhamer

In recent decades, college and university libraries have been called to demonstrate their impact on their institutions' teaching and research missions. One way that libraries can demonstrate their impact is by evaluating how library collections can influence faculty recruitment and retention decisions. This study builds upon an existing study aimed at evaluating this impact. The authors apply a mixed-methods approach to an existing data set to identify differences in impact based upon faculty discipline and rank. The authors found that tenured faculty, as well as faculty in the Arts and Humanities were significantly more likely to include the library as part of their recruitment and retention decision making.

Introduction

Librarianship, as a discipline, focuses on information discovery, access, and usage. For centuries, libraries have been recognized as foundational to the academic mission of the university. Frequently found at the heart of campus, libraries collect the books and periodicals upon which faculty and students relied to conduct their own research. However, the contributions of the university library extend far beyond managing research collections. Library faculty provide significant support during the research process, contribute to higher rates of student and faculty retention, and play a key role in building a university's reputation.

The advent of the internet age has, in some ways, undermined libraries' central role in their campus' academic mission. Because many resources can be accessed electronically, faculty and students conduct research without once setting foot into the library building. The advent of online access has led to misconceptions about the continued need for libraries. It is a common misconception that libraries are not needed because everything is available online. This misconception represents a significant misunderstanding of today's information landscape. While Google can provide access to enormous amounts of information, the type of high-quality information used in higher education is typically proprietary. Though it is possible to access scholarly sources without using library facilities or databases, often researchers will encounter a paywall when they try to access the full text of those sources. Libraries, however, provide faculty, staff, and students with immediate and equitable access to this proprietary information to support the university's teaching and research mission.

* Sarah LeMire is Professor at Texas A&M University; email: slemire@tamu.edu; Shanna Bodenhamer is Research Assistant at Texas A&M University; email: sbodenhamer@tamu.edu. ©2025 Sarah LeMire and Shanna Bodenhamer, Attribution-NonCommercial (<https://creativecommons.org/licenses/by-nc/4.0/>) CC BY-NC.

The misconception about the continued relevance of libraries has left many libraries with a need to demonstrate their importance and impact. Indeed, the Association of College and Research Libraries' foundational *Value of Academic Libraries* report articulates that "Librarians are increasingly called upon to document and articulate the value of academic and research libraries and their contribution to institutional mission and goals" (Oakleaf, 2010, p. 6). This study is based upon previous research focused on establishing the impact of the University of Texas' (UT) library on faculty retention, research, and teaching. In 2020, librarians from the University of Texas published a Library Impact Practice Brief for the Association of Research Libraries' (ARL) Research Library Impact Framework initiative (Chiochios et al., 2020a). This report provided both qualitative and quantitative insights into UT faculty members' perceptions of the importance of the library to their employment decisions. This study builds upon the ARL Practice Brief by further analyzing the UT data set, which was published in the Texas Data Repository with a CC0 license (Chiochios et al., 2020b). This study extends the research by applying different statistical analysis within a mixed methods design that incorporates thematic analysis and examines variation among faculty recruitment and retention as it relates to university library collections.

Purpose of the Study

The purpose of this study was threefold. First, the study aimed to further explore university faculty perceptions of the library's collection on their research and which of the library resources faculty members consider vital to their research. Second, the researchers intended to examine the effect that library services have on the recruitment and retention of university faculty. Third, the study aimed to explore the relationship between university faculty perceptions of the library collection and faculty recruitment and retention.

Research Questions

1. Are there differences by discipline and rank on engagement with the library during faculty recruitment/retention?
2. Are there differences by discipline and rank in how faculty perceive the impact of library collections on their research?
3. Which library resources do faculty members perceive as most vital to their research and teaching?

Literature Review

Factors Affecting University Faculty Retention

The average university faculty attrition rate is estimated to be approximately 50% over the span of a 10-year period (Buller, 2021). For most colleges and universities this means that they will need to replace about half of their faculty every decade. In 2008, the financial costs associated with faculty turnover in higher education reached \$68 million (Figueroa, 2015). Attrition is not only costly, but it can place additional strain on the remaining staff members, increasing the likelihood of burnout. Another negative consequence of attrition can be the impact to a university's reputation when it loses respected researchers. Understanding factors that contribute to retaining quality faculty can assist universities in minimizing the negative impacts associated with attrition. Some predictors leading to faculty turnover are stress, job satisfaction, research productivity, support, and overall job fit (Figueroa, 2015; Ryan et al., 2011).

Balancing job responsibilities contributes to overall job satisfaction. While not all are required at every institution, the typical job responsibilities for academic faculty in higher education are teaching, research, and administration/management. Survey research examining faculty satisfaction with these responsibilities revealed that 80% reported satisfaction in teaching, 65% reported satisfaction with research, and 40% reported satisfaction with administrative responsibilities (Metcalf et al., 2005). Stress associated with these job responsibilities negatively impacts life satisfaction, which leads to emotional burnout.

The “publish or perish” mentality is especially overwhelming for junior faculty members who feel high levels of pressure to establish an academic reputation through research publications. Regression analysis found that research stress felt by junior faculty is positively correlated with emotional burnout, which is negatively correlated with life satisfaction (Xu & Wang, 2023). Another study examining publication stress for both tenured and tenure track faculty members found that 92% of participants reported feeling pressure to publish in peer-reviewed journals (Miller et al., 2011). This pressure was found to be positively correlated with publication burnout and negatively correlated with satisfaction related to publishing.

Universities can promote job satisfaction by balancing job responsibilities for their faculty and providing support in areas that contribute to high levels of stress and burnout. Supporting faculty research can lead to lower levels of stress and burnout, increased job satisfaction and feelings of productivity, and offset the negative impact of the “publish or perish” mentality within academia. A university’s library plays an important role in supporting its faculty’s research endeavors.

Impact of University Library on Faculty Research

One way that libraries can contribute to faculty retention is through their support for faculty research. Libraries have developed services in areas such as research data management, author rights management, and scholarly reputation (Del Toro et al., 2011; Lee et al., 2023; Xu, 2022). Despite the many services libraries provide to support faculty research, faculty typically identify collections as the library’s most important contribution to their research (Brown & Tucker, 2013; Hollister & Schroeder, 2015).

Librarians have been examining the impact of library collections on faculty research since the 1980s using metrics such as the number of publications, citations to those publications, and quality of publication venue (Rushton & Meltzer, 1981). At that time, library collections were almost exclusively in print format, meaning that faculty access to information was closely connected to their ready access to a substantial print collection. Indeed, researchers found that there was a positive relationship between the size of the library collection and faculty research productivity (Rushton & Meltzer, 1981).

In the 1990s, researchers began to reference the decreasing purchasing power of library collection budgets. The proliferation of publication venues combined with the rising costs of journals and monographs limited the comprehensiveness of library collections (Gardner, 1991). Despite these limitations, researchers found that faculty were still able to use library collections to access most of the journal and monograph sources they needed (Dykeman, 1994). In fact, research into faculty research productivity at this time indicated that “institutional expenditures for libraries were significantly related to departmental research productivity” (Dundar & Lewis, 1998, p. 624).

The advent of online journals and collections access in the late 1990s and early 2000s had a substantial impact on how faculty used library collections. Researchers found that, as access to online journals increased, usage of print journals decreased significantly (De Groote & Dorsch, 2001). However, the easy access to scholarly information afforded by electronic journals increased the number of articles that scholars cited in their research (De Groote et al., 2005). Researchers also found that, even as electronic journal articles became the norm, faculty overwhelmingly cited journal articles that could be found through their library's collections (Wilson & Tenopir, 2008).

Over time, researchers have found that faculty identified access to electronic resources as particularly key to their research productivity (Borrego & Anglada, 2015; Noh, 2012; Rawls, 2015). Qualitatively, researchers have found that faculty attribute online discoverability of research as having substantially increased their efficiency and productivity (Tenopir, 2010). In particular, faculty reported having accessed electronic resources in support of their research agendas (as opposed to teaching or other purposes) (Lupton & Davidson, 2013). Indeed, Tenopir quotes one of her faculty participants as asserting that they "could not do [their] research without the speedy and wide-ranging access to material provided through the electronic resources from the library" (2011, p. 11).

Some researchers have attempted to specifically measure the impact of library collections on faculty research through a return on investment calculation including additional metrics such as grant funding received. Scholars at the University of Illinois Urbana-Champaign calculated that the University's investment in the library paid dividends in terms of grant funding; they estimated that the University received "a return on investment of \$4.38 for every dollar invested in the library" (Kaufman, 2008, p. 433). Similarly, Rawls (2015) and De Groote et al. (2020) found that faculty research productivity is positively correlated with "the level of investment [the institution] makes in its libraries" (Rawls, 2015, p. 35).

Theoretical/Conceptual Framework: Resource Dependence Theory

In their 1978 publication, *The External Control of Organizations: A Resource Dependence Perspective*, researchers Pfeffer and Salancik presented a framework for understanding the relationship between an organization and its environment, known as the resource dependence theory (RDT). RDT posits that an organization is dependent upon external contingencies within its environment, and these external factors influence how an organization behaves. For example, external factors like power and money influence an organization's behavior because they control resources that are central to the organization's functioning.

Within educational organizations like colleges and universities, the RDT framework can be used to explain the effects funding has on public institutions of higher education. Because public universities rely on external funding for survival, they must balance the desires of multiple stakeholders (e.g., state policy leaders, student organizations, federal policy). Decreased government investment in higher education has forced universities to depend on tuition as a primary funding source (Fowles, 2013). Increased reliance on tuition as a revenue stream has led many institutions to reallocate resources that expand their instructional capacities at the expense of resources that support research activities. Additionally, the political belief that universities should primarily focus on producing the economic workforce further shifts resources towards instructional activities and away from research activities. A research study that examined the relationship between state funding and the expansion of master's degree

programs found a strong correlation between decreased state funding of higher education in the 1990s and a dramatic increase in the number of awarded master's degrees (Jaquette, 2019). This suggests that universities expanded master's degree programs to replace the lost revenue from state funding. While universities have found alternate ways to increase funding through tuition, this funding source is less likely to go towards funding research activities. An analysis of public university expenditures revealed that outside funding, like grants, had a greater impact on research expenditures than did tuition (Leslie et al., 2011). Decreased funding of public universities has impacted the funding of libraries and research activities, forcing many libraries to seek funding from outside sources (Rader, 2000).

Methods

Mixed methods is a research design that combines qualitative and quantitative methods. Because both qualitative and quantitative methods have limitations, combining both into a single study overcomes the weaknesses of both designs and provides a deeper understanding of the research problem (Creamer, 2017; Creswell, 2020). This study builds upon a previous multimethod design study and further examines how library collections impact different disciplines. This study uses a concurrent equivalent mixed methods design, which combines quantitative and qualitative datasets that were collected at the same time and given equal priority (Creamer, 2017). Qualitative data was collected by the original researchers via participant interviews to explore the relationship between university faculty perceptions of library collections and faculty retention and recruitment. To identify and analyze patterns within participant interviews, we conducted a thematic analysis. Quantitative data was collected by the original researchers from university faculty surveys to examine the relationship between library collections and faculty recruitment. We examined quantitative and qualitative data strands for corroborating themes.

Participants and Data Collection

This study employed an existing data set deposited in the Texas Data Repository and dedicated to the public domain (Chiochios et al., 2020b). The data set included quantitative survey results as well as qualitative interview codes with selected representative quotations.

Quantitative Data

Quantitative data was collected by the original researchers from a population of UT faculty members. The instrument was a 23-question survey consisting of multiple choice and Likert-style questions. The survey was divided into five sections. The first section focused on faculty members' experience when they were hired at the university. The second asked faculty about experience with library collections after they were hired. The third segment focused on faculty members' potential for transitioning to another institution. The last two sections of the survey were focused on demographics: the first on academic demographics such as discipline and rank and the second on personal demographic characteristics including gender, race, and age. The survey instrument is available in Appendix A.

Faculty members received an email survey solicitation if they were either hired or promoted at the institution between the years of 2013 and 2018. The survey was distributed to 991 faculty members and the researchers received 284 responses for a 29% response rate (Chiochios et al., 2020a). The disciplinary breakdown of respondents is available in Table 1.

Quantitative data was deposited in the Texas Data Repository in Excel format. The authors imported the Excel data file into Stata and transformed the data in several days. First, the authors converted nominal data into dummy and factor variables. The authors also combined six dummy variables, all focused on faculty recruitment, into a single factor variable to facilitate analysis.

Qualitative Data

Qualitative data was collected by the original researchers via one-on-one, semi-structured interviews. They prepared 15 interview questions, which were grouped according to four themes: 1) academic demographics, 2) research methods, 3) perceptions of library collections, and 4) recruitment and retention. Interview questions are available in Appendix B.

The original researchers used a purposive sampling methodology that prioritized diversity in terms of academic rank and discipline. The data set includes themes from 13 interviews with faculty. Interviews were transcribed and the researchers took a grounded theory approach to coding the data (Chiochios et al., 2020a).

Qualitative data was deposited by the original researchers in Excel format. The authors downloaded the Excel file and transformed the data by eliminating the previous researchers' themes and aggregating the sample quotes into a single data set. The authors then performed a thematic analysis of the resulting qualitative data set.

Data Analysis

The data for this study were analyzed using a convergent approach that combined qualitative and quantitative results after analyzing the strands separately. This approach was selected to triangulate findings and confirm results.

Quantitative Data Analysis

Quantitative data were analyzed using an analysis of variance (ANOVA) (Howell, 2012; Scheffe, 1959). Data was imported into Stata and string variables were converted into factor variables for the purposes of analysis. Variables related to recruitment were combined into a single dependent variable, while disciplines and faculty rank were independent variables.

Qualitative Data Analysis

The qualitative data were coded using a thematic analysis approach. Thematic analysis was chosen due to its flexibility (Nowell et al., 2017). After initial review of the data, the researchers developed codes which were iteratively tested and refined. Both raters scored 15% of the data set, after which intercoder reliability was established using Cohen's Kappa (O'Connor & Joffe, 2020). The intercoder reliability assessment revealed agreement on 97% of codes ($\kappa = 0.87$). The raters then divided up the remaining data set, with one coder scoring the STEM data, the other scoring the Social Sciences data, and each scoring half of Fine Arts and Humanities data.

TABLE 1	
Survey Respondents by Discipline	
Discipline	Number of Survey Respondents
Arts & Humanities	75
Social Sciences	101
STEM	99
Other	8
No response	1

Mixed Methods Analysis

Following quantitative and qualitative analysis, we examined each strand's results for either convergence or divergence. In particular, the researchers examined whether findings for research questions one and two were consistent across the two strands. Corroboration between the qualitative and quantitative strands would increase the validity of the study's findings.

Results

Quantitative Results

In an investigation of faculty use of the UT library collections in relation to recruitment, the descriptive statistics for the 4 x 4 factorial ANOVA are provided in Table 2. The first main effect, faculty rank, had four values: 1) lecturer, 2) assistant professor, 3) associate professor, and 4) full professor. The second main effect, faculty discipline, also had four values: 1) arts and humanities, 2) STEM, 3) social sciences, and 4) other. Sample means vary across academic discipline and across faculty rank with full professors ($M = 3.09$, $SD = 1.749$) scoring higher than lower ranking faculty, and faculty in arts and humanities ($M = 3.61$, $SD = 1.951$) scoring higher than other disciplines. Skewness across groups appeared to be normally distributed (i.e., within ± 1), except for lecturers in arts and humanities and assistant and associate professors in STEM, which appeared to be positively skewed. Kurtosis was somewhat normal for all groups with most values close to three.

TABLE 2
Descriptive Statistics by Group (N = 284)

	Group	N	M	SD	Sk	Ku
Arts and Humanities	Lecturers	11	1.91	1.81	1.09	3.35
	Assistant Professors	21	3.33	2.06	-0.21	1.74
	Associate Professors	24	4.04	1.73	-0.48	1.97
	Full Professors	19	4.37	1.61	-0.79	2.32
STEM	Lecturers	7	2.14	1.35	-0.27	2.12
	Assistant Professors	42	1.62	0.96	1.16	3.55
	Associate Professors	21	1.95	1.56	1.20	3.52
	Full Professors	28	2.61	1.64	0.50	1.87
	Other	1	1.00	—	—	—
Social Sciences	Lecturers	1	1.00	—	—	—
	Assistant Professors	44	2.14	1.27	0.57	2.31
	Associate Professors	28	2.43	1.50	0.78	2.62
	Full Professors	28	2.68	1.56	0.19	2.34
Other	Lecturers	2	0.50	0.71	0.00	1.00
	Assistant Professors	1	1.00	—	—	—
	Associate Professors	4	1.50	0.58	0.00	1.00
	Full Professors	1	5.00	—	—	—
No Response		1				

Research Question 1

To determine if the differences in group means were statistically significant, a 4 x 4 factorial ANOVA was conducted with alpha level set to .05. Before conducting the analysis, assumptions necessary for conducting a factorial ANOVA were examined. While the assumption of normality was violated for several of the groups, because the sample sizes of these groups were > 30, we opted to apply the central limit theorem and assume that the sample means of the population were approximately normally distributed. The other assumption of homogeneity of variances was met.

The calculated effect for the overall ANOVA was $\eta^2 = .26$, a large effect. This indicates that 26% of variance in faculty recruitment is explained by the overall model. The results of the two-way factorial ANOVA are presented in Table 2. The main effect for academic discipline was statistically significant, $F(3, 266) = 10.07$, $p < .01$, which indicates there were recruitment differences across faculty disciplines (arts and humanities, STEM, social sciences, and other). The effect for faculty rank was also statistically significant, $F(3, 266) = 5.02$, $p < .01$, which indicates that there were differences in recruitment across faculty rank (lecturer, assistant professor, associate professor, and full professor). The interaction effect was not statistically significant, $F(9, 266) = 1.38$, $p = .20$, which indicates that the observed differences in academic discipline area for high-ranking faculty are not different from the observed difference in academic discipline for low-ranking faculty. This indicates that within academic discipline type, the effect of library collections on recruitment would not differ across high-ranking faculty and low-ranking faculty. The partial η^2 for faculty rank, academic discipline and interaction were .10, .05, and .04, respectively, indicating that the effects for faculty rank and academic discipline were medium to large and medium, whereas the effect of the interaction was small. Thus, the observed interaction was small in size and not statistically significant, and the main effects of faculty rank and academic discipline were small in size and statistically significant.

To determine more precisely which groups differ from each other by a statistically significant amount, a Tukey test of all pairwise comparisons was conducted. The mean differences and confidence intervals around these differences are presented in Table 4. The results indicate that the arts and humanities groups differ a statistically significant amount from the other groups (STEM, social sciences, and other) and that the other groups do not differ by a statistically significant amount from each other. It was concluded that the effect of library collections on faculty recruitment is greater for faculty in the arts and humanities. Regarding faculty rank, the full professor group differs a statistically significant amount from the lecturer group and the assistant professor group and that the other groups (i.e., associate professors,

TABLE 3
ANOVA Results for Disciplinary and Rank Differences on Recruitment

Source	Df	SS	MS	F
Academic Discipline	3	68.237	22.746	10.07*
Faculty Rank	3	34.008	11.336	5.02*
Model	15	210.811	14.054	6.22
Academic Discipline# Faculty Rank	9	28.115	3.124	1.38
Residual	266	600.994	2.259	
Total	281	811.805		

Note: N = 282, *p < .05

TABLE 4
Pairwise Group Comparisons

Pairwise Group Comparisons Across Faculty Discipline			
Comparison	Standardized Mean Difference	Raw Score Mean Difference	Raw Score 95% Tukey CI
STEM vs. Arts & Humanities	−0.69	−1.62	−2.25 to −1.00
Social Sciences vs. Arts & Humanities	−0.54	−1.26	−1.88 to −0.64
Other vs. Arts & Humanities	−0.54	−1.99	−3.5 to −0.47
Social Sciences vs. STEM	0.17	0.37	−0.21 to 0.94
Other vs. STEM	−0.10	−0.36	−1.86 to 1.13
Other vs. Social Sciences	−0.20	−0.73	−2.22 to 0.76
Pairwise Group Comparisons Across Faculty Rank			
Comparison	Standardized Mean Difference	Raw Score Mean Difference	Raw Score 95% Tukey CI
Asst Professor vs. Lecturer	0.17	0.35	−0.67 to 1.36
Asso Professor vs. Lecturer	0.44	0.94	−0.11 to 1.99
Full Professor vs. Lecturer	0.59	1.28	0.23 to 2.33
Asso Professor vs. Asst Professor	0.36	0.60	−0.04 to 1.23
Full Professor vs. Asst Professor	0.55	0.93	0.30 to 1.57
Full Professor vs. Asso Professor	0.19	0.33	−0.35 to 1.02

assistant professors, and lecturers) do not differ by a statistically significant amount from each other. It was concluded that the effect of library collections on faculty recruitment is greater for full professors.

Research Question 2

In addition to examining the effect of rank and discipline on recruitment, we also wanted to know how these factors impacted faculty members' perceptions of the relationship between the library and their research. As with research question 1, we used a 4 x 4 factorial ANOVA to examine this impact.

The calculated effect for the overall ANOVA was $\eta^2 = .09$, a small effect. This indicates that 9% of variance in faculty recruitment is explained by the overall model. The results of the two-way factorial ANOVA are presented in Table 5. The main effect for academic discipline was not statistically significant, $F(3,266) = 2.86$, $p = .12$, which indicates there were no significant differences across faculty disciplines (arts and humanities, STEM, social sciences, and other) in how faculty perceived the impact of the library on their research. However, the effect for faculty rank was statistically significant, $F(3, 266) = 4.09$, $p = .04$, which indicates that there were differences in perception of research impact across faculty rank (lecturer, assistant professor, associate professor, and full professor). The interaction effect was not statistically significant, $F(9,266) = .67$, $p = .91$, which indicates that the observed differences in academic discipline area for high-ranking faculty are not different from the observed difference in academic discipline for low-ranking faculty. This indicates that within academic discipline type, the effect of library collections on faculty research would not differ across high-ranking faculty and low-ranking faculty. The partial η^2 for faculty rank, academic discipline and interaction were .02, .03, and

.02, respectively, indicating that the effects in all three areas were small. Thus, the observed interaction and main effect of academic discipline were small in size and not statistically significant, and the main effect of faculty rank was small in size and statistically significant.

To determine more precisely which groups differ from each other by a statistically significant amount, a Tukey test of all pairwise comparisons was conducted. The mean differences and confidence intervals around these differences are presented in Table 6. There are no statistically significant differences between academic disciplines. Regarding faculty rank, the full professor and associate professor groups differ a statistically significant amount from the lecturer group. The other groups (associate professors, assistant professors, and lecturers) do not differ by a statistically significant amount from each other. We conclude that the effect of library collections on faculty perceptions of the importance of the library for their research is greater for tenured (associate or full) professors.

TABLE 5
ANOVA Results for Disciplinary and Rank Differences on Research

Source	df	SS	MS	F
Academic Discipline	3	8.571	2.857	1.93
Faculty Rank	3	12.275	4.092	2.76*
Model	15	38.855	2.590	1.75
Academic Discipline Faculty Rank	9	6.031	0.670	0.45
Residual	266	394.634	1.484	
Total	281	433.489		

Note: N = 282, *p < .05

TABLE 6
Pairwise Group Comparisons

Pairwise Group Comparisons Across Faculty Discipline			
Comparison	Standardized Mean Difference	Raw Score Mean Difference	Raw Score 95% Tukey CI
STEM vs. Arts & Humanities	−0.54	−0.40	−0.88 to 0.09
Social Sciences vs. Arts & Humanities	−0.05	−0.04	−0.52 to 0.44
Other vs. Arts & Humanities	−0.97	−1.10	−2.28 to 0.07
Social Sciences vs. STEM	0.52	0.36	−0.09 to 0.81
Other vs. STEM	−0.62	−0.70	−1.87 to 0.46
Other vs. Social Sciences	−0.93	−1.06	−2.22 to 0.10
Pairwise Group Comparisons Across Faculty Rank			
Comparison	Standardized Mean Difference	Raw Score Mean Difference	Raw Score 95% Tukey CI
Asst Professor vs. Lecturer	0.52	0.57	−0.18 to 1.33
Asso Professor vs. Lecturer	0.85	0.94	0.16 to 1.72
Full Professor vs. Lecturer	0.78	0.86	0.09 to 1.64
Asso Professor vs. Asst Professor	0.43	0.37	−0.10 to 0.84
Full Professor vs. Asst Professor	0.34	0.29	−0.18 to 0.76
Full Professor vs. Asso Professor	−0.09	−0.08	−0.59 to 0.43

Qualitative Results

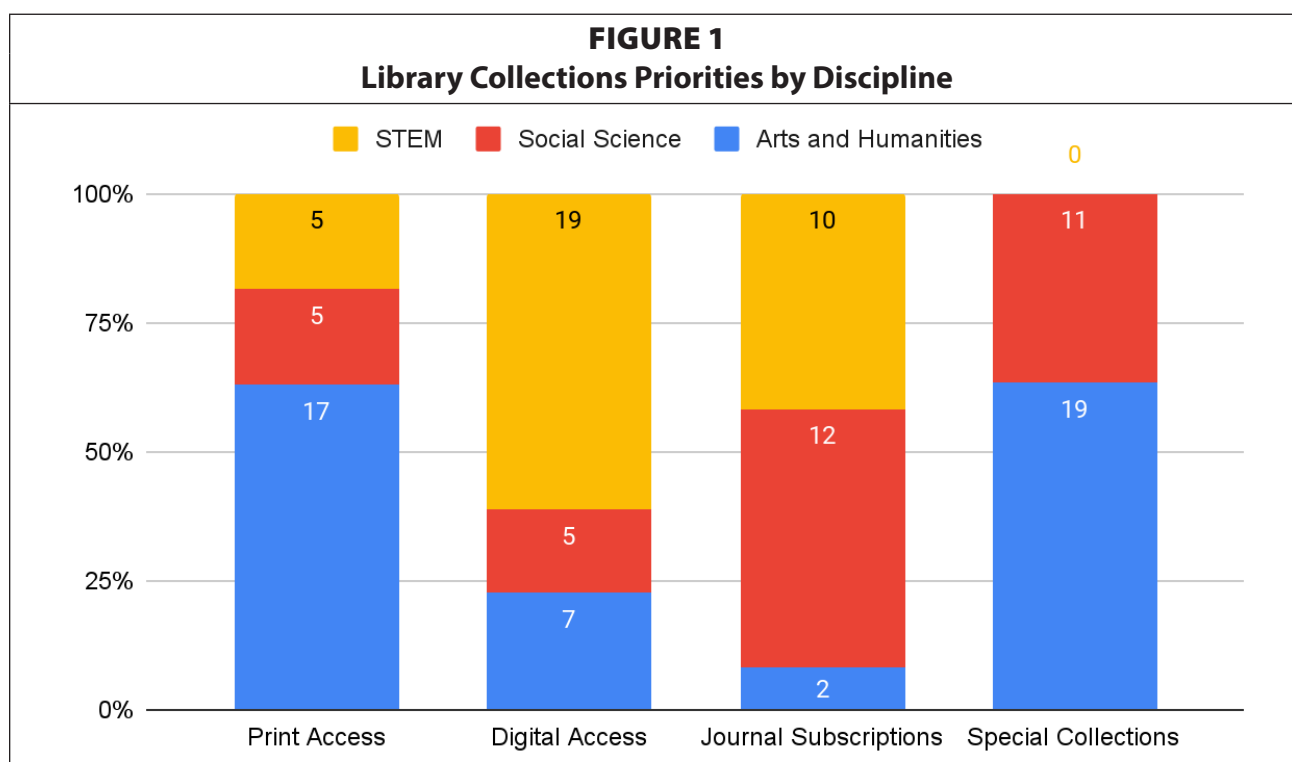
Analysis of the qualitative data set revealed that comments followed 10 themes. These themes, which represent the codes we used for the data set, are listed in Table 7 below. Some codes have a relationship to one another; for example, the general category “collections” is broad in scope and could naturally include several of the more specific categories such as “special collections.” To clarify relationships between comments, we opted to use the more specific codes in lieu of a more general code when appropriate. In the example above, a comment about UT’s archival collections would be coded “special collections” but would not also be coded “collections” unless the comment included mention of other, more general, collections.

TABLE 7
Codes and Example Comments

Code	Example Comment
Collections	“At top schools the expectation is just that what all these journal articles are going to be available, these books are going to be available. And, so I think there are—If that were not true, it would be a significant negative.”
Serendipity/Browsing Behavior	“The most important book that I have ever used in my research, I found from strolling the stacks.”
Budget/Investment in Library	“The library is one of the things that kind of, or the lack of attention to the library budget I think is one of the things that indicates to me that the university’s maybe not thinking broadly enough about what all is involved in maintaining the success of a research institution.”
Digital Access	“The single most important thing for me is access to online journals. I very very rarely ever come across a journal that I need that is not available online via the UT library. This is most impressive. I cant recall the last time what I needed was not available.”
Print Access	“I always take my students now physically into the library and walk them through the finding things on the shelf process, one of the arguments that we made is that in the humanities the libraries are laboratories. So we go in there and yes, I’m looking for ...source X or I’m looking for ...publication Y. I take that book, I look at it. I decide whether or not it’s useful, and then of course next to it thanks to the LC system there are of course dozens of other books on related topics. So that’s a primary research method, being physically in the stacks for a humanist I think. And I’ve actually heard scientists say this as well.”
Journal Subscriptions	“I came to UT with the expectation of having Tier 1 research university resources and my expectations were met. I could not function without our library resources and the specific to my work science journal subscriptions.”
Librarian Support	“Our assigned librarian is PHENOMENAL and does a great job of supporting faculty and students in our department. Thank you for providing such wonderful and knowledgeable individuals for us to work with!”
Interlibrary Loan	“I tend to go online journals. I can usually find what I need online. It’s easier. I have to do some inter-library loans every once in a while.”
Special Collections	“I have used the archives at UT in my research for decades. they are the best in the country for what I do, and that was a key reason I agreed to come here.”
Search Interfaces/ Web Design	“The need to log in before being able to see the [x database] is very frustrating and slow”

Research Question 3

Analysis of the coded comments revealed that researchers from different disciplinary groups prioritized different aspects of the library and its collections in relation to research, teaching, and recruitment (see Figure 1).



Faculty from arts and humanities disciplines were far more likely to mention the importance of print access, serendipitous browsing, and special collections. For example, one arts and humanities faculty member lamented, “it would be lovely to have more materials actually housed in the library rather than in the offsite center, because that just makes it a lot easier for those sometimes serendipitous discoveries to happen.” Faculty in STEM disciplines demonstrated an opposing viewpoint. These faculty were far more likely to express the importance of online access and journal subscriptions and to critique the library’s electronic interfaces. They also rejected the importance of physical library spaces on campus; for example, one STEM faculty member argued, “I think our library takes up a large space that could be better used for collaborative spaces. As far as I am concerned the library materials could be stored off site as long as they can be delivered in a reasonable time upon request.”

Similarly, faculty in STEM and arts and humanities disciplines demonstrated significant differences in the importance they placed on the library and its collections regarding their teaching, research, and recruitment. Thirteen (76%) comments from arts and humanities faculty mentioned concerns about a decreased library budget or the importance of investing in libraries. For example, one arts and humanities faculty member explained,

The quality of UT Libraries is fundamental to the quality not only of my research but of my general work experience at UT ... I am considering going on the market again in the next few years, and one of the factors that will be involved in my

decision at that point is whether the university has decided to invest more in the Libraries.

STEM faculty were much less likely to express concerns about investment in the library; only two (12%) comments from STEM faculty expressed concerns about budget cuts. For example, one STEM faculty member noted, "The availability of journals within our collection has been getting more and more limited, particularly in [x] area which has significantly impacted our teaching and research negatively." No STEM faculty expressed the importance of investing in libraries.

While arts and humanities and STEM faculty represent varying and, in some cases, opposing viewpoints about the library, social sciences faculty fall somewhere in between. Like arts and humanities faculty, social sciences faculty value special collections. For example, one social sciences faculty member explained,

The [x special collection] library is a very special resource and I appreciate it enormously. Other associated entities such as [x online resource] have international importance and are major components of UT's broader reputation and scholarly contribution. I would very much like to see more support going to these resources and to the library system in general.

Although social sciences faculty share the humanities' focus on special collections, social sciences faculty appear to align with STEM faculty in other important ways. Like STEM faculty, social sciences faculty were unlikely to express concerns about the importance of the library or the need for better library funding. Only two (12%) comments from social sciences faculty mentioned budget or funding, although the comments that the faculty made were passionately in favor of the library. For example, one social sciences faculty member exclaimed, "It upsets me as a faculty member to think that the libraries are under any kind of attack, to use words that are probably too charged. Or, would be seen as less valuable when they are single handedly the reason that we are here. And I cannot say that strongly enough."

Another point of similarity between STEM and social sciences faculty was the valuing of electronic journals and resources. Unlike arts and humanities faculty, who commonly emphasized the importance of books and other print materials, both social sciences and STEM faculty prioritized electronic resources for their convenience and currency. These resources, faculty explained, were crucial for both research and teaching purposes. As one social sciences faculty member explained, "I greatly appreciate the access to full-text versions of research articles. About 80% of the material I use for my research and about 50% of the material I use for teaching comes from journals we have access to."

Mixed Methods Results

Findings from the qualitative and quantitative results converge to reveal that the importance of the library in faculty recruitment and retention varies by academic discipline. Quantitative results revealed that the library was most important for faculty in the arts and humanities, with significant differences between arts and humanities and all other disciplines. The library was second most important in recruitment for faculty in the social sciences, with significant differences between social sciences faculty and all other disciplines. Similarly, quantitative

results revealed that arts and humanities faculty, followed by social sciences faculty, most strongly indicated the importance of the library to their research.

These findings converge with qualitative findings that suggest that the physical library, including print collections, was most frequently mentioned as an important resource by faculty in the arts and humanities. Social sciences faculty, although less likely to mention physical books and articles, similarly valued archival and special collections. Although findings indicate that STEM faculty are far less likely to value the physical library holdings or consider the library as part of recruitment, results suggest that faculty in STEM disciplines do value access to digital collections and resources.

Findings also revealed a point of divergence between qualitative and quantitative results. Although quantitative results indicated that there were no significant differences between disciplines in the importance of the library for faculty research, qualitative results suggested that the picture is more complex. Faculty from all three disciplinary groups valued library resources, but the types of resources they valued differed significantly. While some faculty called for easier access to print materials on campus, other faculty expressed the need for print resources to yield space for collaborative study. Some faculty expressed concerns about budget cuts and gaps in the library collection, while others expressed a sense of complacency about the ready availability of library resources in their area.

Discussion

Qualitative and quantitative findings converged to indicate that the library plays a different role at a research university in faculty recruitment by discipline and faculty rank. Faculty in the arts and humanities are statistically more likely to consider the library as part of recruitment and retention decisions. Further, faculty in the arts and humanities tout the importance of print collections and ready access to browsable physical collections. This may be because many arts and humanities disciplines, particularly those in the humanities, remain book disciplines that publish a substantial portion of their research in long-form monograph format.

On the other side, while faculty in the social sciences and STEM disciplines are less likely to consider the library as part of a recruitment or retention decision, qualitative results reveal that these faculty do value library collections for research and teaching purposes. STEM and social sciences faculty rely heavily on electronic journal subscriptions to provide immediate access to the latest research in their fields. In addition, social sciences faculty incorporate archival collections into their scholarship and teaching practices.

In addition to differences by discipline, findings also revealed significant differences in recruitment and research by faculty rank. Faculty at higher ranks were more likely to consider the library in recruitment and retention; indeed, full professors were significantly more likely than lecturers and assistant professors to consider library collections during this decision-making process. This may be, in part, due to research expectations. Lecturers are not typically expected to conduct research (although many do) and therefore may be less likely to prioritize library collections when making employment decisions.

Tenured faculty, including both associate and full professors, were also significantly more likely to express the importance of the library for their research. This, again, could be in part due to the level of research expectations; tenured faculty may have more established and robust research agendas at their career stage and may therefore place a higher premium on ready access to secondary research.

Implications for Practice

This study's findings have several implications for practice. This study suggests that there could be an increased role for the library in the faculty hiring process. Some libraries already make it a practice to engage with candidates during the faculty hiring process (e.g., Budzise-Weaver & Bales, 2019). However, other libraries may not have considered partnering with academic departments during the hiring process, especially in disciplines other than the humanities. Arts and humanities faculty are already likely to consider the library during their recruitment and retention process, while STEM and social sciences faculty are less likely to consider access to library resources. Indeed, at an R1 institution like UT, faculty are likely to assume that the library has the collections they need (Chiochios, 2020a). To reduce the reliance on assumptions, librarians may want to consider making availability of relevant collections an explicit part of the hiring process. This could be achieved by working with academic departments to develop boilerplate language that could be added or linked to job ads.

In addition, because disciplinary groups have different priorities, librarians should consider creating a few sets of promotional materials that can be shared with faculty. For example, a handout for arts and humanities faculty might spotlight special collections and the physical library while a handout for STEM faculty could prioritize digital collections and interlibrary loan. Library marketing departments could even create a brief flier that departments could link to or otherwise share with prospective faculty. Such a flier could include an overview of the resources for each department and how to access them.

Even outside the scope of the hiring process, this study's results suggest that there is a continued need to increase library outreach to faculty. Strategies such as hosting webinars and brown bag discussions and visiting department and faculty senate meetings remain important strategies for emphasizing the library's contributions to campus. Finally, the study reinforces the importance of making the library visible outside of the physical spaces. Many faculty, particularly in STEM disciplines, may have little reason to access the library's physical collections, and seamlessness in electronic discovery can mean that people don't realize that their access is provided via the library. Libraries need to continue to ensure that the library's role in providing access to electronic resources is clearly identified through consistent branding.

Implications for Policy

Additionally, advocating for changes in public policy that support increased access to knowledge and information can remove barriers to the dissemination of research. Currently, a large majority of peer-reviewed research is restricted behind a "paywall," meaning it is owned by the publisher and must be purchased. This can be expensive for the average practitioner that wants to stay up to date on evidence-based practices, making access to critical information unaffordable. The cost of purchasing access to academic journals is also expensive for large organizations, like universities, costing them a large portion of their overall budget. The annual price for digital access to electronic journal collections can cost a single R1 university millions of dollars. Despite increased digitization made possible by technology, which results in decreased production costs (i.e., printing and shipping costs), these savings have not benefited the consumer.

Other industries, like the music industry, have lowered consumer prices in response to the rising digital medium. However, the price of journal articles has ballooned, far outpacing the average rate of inflation (Lewis, 2020). This can be attributed to limited competition in the research publication industry, as a handful of companies control a vast majority of the market. As few as

five companies—Springer Nature, Elsevier, Wiley & Blackwell, Taylor & Francis, and Sage—dominate around 50% of the global market (Pandita & Singh, 2023). The largest publisher, Elsevier, controls 16% of the global market, which encompasses 3,000 journals and an additional 40,000 journals through its Scopus platform with profit margins that exceed powerhouse corporations like Microsoft and Google (Pandita & Singh, 2023). If profit margins were in line with comparable publishing companies, like magazines, the consumer could save an estimated \$1 billion annually (Lewis, 2020). When a large majority of research is controlled by a few, consumers—universities and libraries, funding entities, and readers—are beholden to current inflated pricing. Not only is this practice not sustainable, but it also actively harms the consumer (Lewis, 2020).

It is important to note that librarians have been advocating for new models in scholarly communications for decades. Because consumer conditions are not sustainable, the market has started to implement cost-saving measures through price negotiations and publishing via open-access methods, and this trend is likely to grow (Lewis, 2020). Open access advocacy is being led by organizations like the Association of Research Libraries (ARL) and the Scholarly Publishing and Academic Resources Coalition (SPARC), which support making information freely available to everyone. Policy changes from the federal government have helped the movement gain momentum as they advance the narrative that publicly funded research should be available to all (White House, 2022). Librarians and scholarly communications advocates can continue to work together to reduce barriers to information access for all.

Limitations and Future Directions

There are several limitations to this research. This data was collected at a single R1 institution and may not be generalizable to other institutions, especially those with different research levels. A second limitation is that only a partial data set was available for the interviews. Full interview transcripts were not included in the data set, and instead only de-identified example comments were made available. In addition, the example comments did not include demographic information beyond the disciplinary group, which precluded examination for differences in qualitative responses based on faculty rank.

Conclusion

The rising costs of academic information, coupled with a more challenging campus budget situation, mean that college and university libraries will continue to need to demonstrate their impact as they advocate for sustainable funding. Faculty impact is an important aspect of that value proposition. Libraries seeking to increase the impact of library collections should consider that faculty recruitment and retention can look different based upon faculty discipline and rank. For example, faculty in STEM disciplines may not respond well to library efforts to market new print volumes; however, those same faculty may be highly interested in efforts to promote underused databases. By examining how different faculty groups view the library's importance on their recruitment and research, libraries can better tailor their outreach efforts to inform faculty of relevant resources, identify and remove barriers and pain points, and ultimately increase their impact.

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Appendix A: Survey Questions

Online Survey Questions

ARL Practice Brief Study: Attracting and Retaining Top Researchers and Faculty

University of Texas at Austin, Fall 2019

We are conducting a study to assess the impact of libraries and their collections on the recruitment and retention of faculty members. The study is part of a larger assessment project being undertaken by the Association for Research Libraries and has been approved by the University of Texas at Austin's Institutional Review Board (IRB) under the study number 2019-08-0053.

Participation in this study is voluntary, there are no foreseeable risks to participating in it, and you will not receive any compensation for participating. All responses to this survey are anonymous unless you choose to waive your confidentiality.

By clicking here [link], you are agreeing to participate in the study.

The expected completion time is under 5 minutes.

Please tell us a little about your hiring experience when you came to UT:

1. I had an on-campus visit as part of my hiring process: Yes, No (LOGIC)
 - a. If yes, a tour of the library was included in my campus visit: Yes, no
 - i. If no, I did not have a library tour but I visited the library on my own: Yes, no
2. I was given information about the UT libraries (verbally, printed or online) during my hiring process: Yes, no
3. I had an opportunity to visit with library personnel during my hiring process: Yes, no
4. I reviewed library website (catalog, journal holdings, online collections, services, etc.) during my hiring process: Yes, no
5. The quality of the UT Libraries collections was a factor in my decision to accept UT's offer: Yes, no, blank fill-in
6. At the time of my hire, I assumed that the UT Libraries had everything I would need for my teaching and research: Yes, no, blank fill-in
7. At the time of my hire, I assumed that the UT Libraries would get anything I needed for my teaching and research on request: Yes, no, blank fill-in

Please tell us a little about your perceptions of or experience library collections since joining UT:

8. The library collections are important to my research efforts: Scale, blank fill-in
 - a. Extremely important–Very important–Moderately important–Slightly important–Not at all important–Not applicable
9. The library collections are important to my teaching efforts: Scale, blank fill-in
 - a. Extremely important–Very important–Moderately important–Slightly important–Not at all important–Not applicable
10. Compared to previous institutions where I worked (including graduate study), the quality of UT Libraries collections is: scale, blank fill-in
 - a. Much better–Somewhat better–About the same–Somewhat worse–Much worse

11. UT Libraries collections met the expectations I had before coming to UT: Scale, blank fill-in
 - a. Far exceeds expectations–Exceeds expectations–Equals expectations–Short of expectations–Far short of expectations

Please tell us a little about your future:

12. Since I came to UT, I have been offered positions elsewhere but have declined: Yes, no (LOGIC)
 - a. If yes, The quality of the library collection was a factor in my decision: Yes, no, blank fill-in
13. I am actively seeking a position at another institution: Yes, no (LOGIC)
 - a. If yes, The quality of the library collection will be a factor in my decision: Yes, no, blank fill-in

Please tell us a little about your professional work:

14. I am currently: non-tenure track, tenure-track, tenured
15. My current rank is: Lecturer, Senior Lecturer, Distinguished Senior Lecturer, Assistant Professor, Associate Professor, Full Professor, Emeritus Professor, Blank fill-in
16. When I was first hired as faculty at UT, I was: non-tenure track, tenure-track, tenured
17. When I was first hired as faculty at UT, my rank was: Lecturer, Senior Lecturer, Distinguished Senior Lecturer, Assistant Professor, Associate Professor, Full Professor, Blank fill-in
18. I identify the disciplinary focus of my work as: Arts & Humanities, STEM, Social Sciences, Blank fill-in
19. I regularly use international and/or foreign language materials in my research or teaching: Yes, No
20. I regularly use archival- and/or special-collections (ex. Ransom Center, Benson Latin American Collection, Alexander Archives, Briscoe Center, etc.) in my research or teaching: Yes, No

Please tell us a little about yourself: [a hover-over explaining “Why are we asking this?” “We are trying to explore how libraries are used as recruitment and retention tools and how that might relate to demographics. All answers on this survey remain anonymous.”]

21. I use these gender pronouns: she/her, he/his, they/their, prefer not to say, blank fill-in
22. I identify as: Asian, Black/African, Caucasian/White, Hispanic/Latinx, Native American, Pacific Islander, Prefer not to Answer, Blank fill-in
23. My age is: 30 and under, 31-40, 41-50, 51-60, 61-70, 71 and over, prefer not to say, blank fill-in

If you have comments on the questions we have asked or would like to share other comments related to library collections, please let us know in the box below: blank fill-in

If you would like to follow the results of this study, please provide us with an email so we can contact you. All answers on this survey remain anonymous. Your contact information will be disaggregated from the survey. Blank fill-in

Thank you for your time!

Appendix B: Interview Questions

In Person Interview Questions

ARL Practice Brief Study: Attracting and Retaining Top Researchers and Faculty

University of Texas at Austin, Fall 2019

Theme 1: Research & experience of the interviewee (discipline, rank, etc.)

Questions:

1. Please tell us a little about yourself.
 - a. How long have you been at UT?
 - b. What position were you first hired into here at UT?
 - c. What is your current title & rank?

Theme 2: Understanding of “collections”

Questions:

2. Please briefly describe your current research focus/projects.
3. What research methods do you typically use to conduct your research? (probe for library-related methods and extent of those methods)
4. What kind of information (primary or secondary) do you rely on in your research? (probe for collections and extent of use)
 - a. Do you use published materials, either online or in print?
 - b. Do you regularly use international and/or foreign language materials in your research or teaching?
 - c. Do you regularly use archives and/or special collections in your research or teaching?
5. How do you find and access that information? (is this library collections use? probe for local vs sharing)

Theme 3: Use of collections (how, when)

Questions:

6. When you first came to UT, what was your initial experience with the UT libraries and their collections?
7. How has your teaching and/or research benefitted or been hindered by libraries and their collections? (probe for UT collections)
 - a. If benefitted, how?
 - b. If hindered, how?
8. Do you usually find the books, journals, and other materials that you are looking for in UT's library (either physical or online)?
 - a. If not, how do you overcome this lack of access?
9. In general, how would you compare the quality of UT's library with that of your previous institution?

Theme 4: Recruitment & Retention decision making, including the role of collections in those decisions

Questions:

10. You said earlier that you have been at UT for XXX years. What factors helped you decide to seek employment at UT?
11. Knowing what you know now, would those same factors still take priority in your decision-making? If not, which would you consider now?
12. Please describe your knowledge or expectations of the libraries and its collections before starting at UT.
 - a. Potential follow-up: Did you receive any information about the library during your job search or interview process? During an on-site interview, was a tour of the library included in your itinerary? And/or did you visit the library on your own (either physically or online)?
13. What is your awareness and view of the libraries and its collections now?
14. Were you offered “start-up” or “research funds” as part of your hire? If so, what did you use them for?
15. Have you ever considered looking elsewhere for work or have you been recruited elsewhere? If so, what might lure you away and what might make you stay?
 - a. Potential follow-up: would the quality of the library have any impact on your decision?