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Bridging Disciplines: A Systematic Review of Interdisciplinary Studies in Library and Information Science¹

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Abstract

Statement of the Problem. Interdisciplinary collaboration has become increasingly central to Library and Information Science (LIS) as the field confronts complex, multi-dimensional problems. This study assesses the status of interdisciplinary LIS research, examining annual publication trends, leading sources, research design, and contributing disciplines, and identifies the barriers and challenges that impede such collaboration.

Methods. A systematic literature review and bibliometric analysis of 147 peer-reviewed journal articles published between 2013 and 2023 was undertaken.

Results. Findings show a clear upward trajectory in interdisciplinary output, with peaks in 2021 and in 2023. Computer science and education emerge as the most active contributing disciplines, evidencing the reliance of LIS on technological innovation and pedagogical theory. The Journal of Documentation is the leading publication venue, underscoring its role as a primary outlet for cross-disciplinary scholarship within LIS. Methodologically, studies rely predominantly on qualitative and quantitative designs, while mixed-methods remain comparatively underutilized. Six recurrent impediments to interdisciplinary research were uncovered: conceptual misalignment among collaborative fields; institutional and structural barriers that limit support and incentives; gaps in cross-disciplinary skills and knowledge; communication and terminology differences that hamper mutual understanding; obstacles in publishing and peer review; and time and resource constraints linked to extended coordination and limited infrastructure.

Originality. This research contributes a comprehensive, decadal synthesis of the LIS interdisciplinary landscape, bridging the gap between theoretical necessity and practical execution. The findings mirror broader interdisciplinary literature and highlight the need for policy reforms, targeted professional development, and more inclusive publishing models to advance integrative scholarship. Future work should include scoping reviews, network and text-mining analyses, and the development of metrics that capture the societal impact of interdisciplinary LIS research.

Keywords: Systematic review; Interdisciplinary research; Bibliometric analysis; Barriers

¹ Paper presented at PLAI Congress 2024

Introduction

The growing complexity of contemporary research problems has led to a heightened emphasis on interdisciplinary research (IR), particularly in fields like Library and Information Science (LIS). As the challenges facing the LIS community evolve, there is an increasing need to integrate knowledge from multiple disciplines to effectively address these issues. Researchers from different disciplines may choose to collaborate for various reasons: complementary skills can accelerate problem-solving, interdisciplinary teams are better equipped to tackle multifaceted problems, and such collaborations often provide opportunities for researchers to learn new skills and expand their methodological range (McNicol, 2003).

Interdisciplinary research (IR) is conceptualized in various ways, with a focus on integrating knowledge from multiple disciplines to address complex issues. Julie Thompson Klein and William H. Newell emphasize that IR combines disciplinary perspectives and expertise across disciplines and integrates insights to achieve outcomes beyond the reach of single-disciplinary approaches (Klein & Newell, 1997, pp. 393-394). The National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine (2005), building on Klein and Newell's definition, stated that IR is the integration of data, techniques, tools, and theories from different disciplines to advance understanding or solve complex problems. Repko (2008) highlights that interdisciplinary studies address questions and problems too complex for a single discipline, requiring a synthesis of insights to achieve a more comprehensive understanding. This approach involves four key elements: process, disciplines, integration, and comprehensive understanding, with both a "what" and "how" aspect that guides the practical application of these concepts.

Recent studies emphasized how important interdisciplinary research is becoming to the subject of library and information science, and how important it is to the creation of theoretical and practical knowledge (Nahotko, 2020; Wang, Chen et al., 2023; Zeng et al., 2023). This is one of the elements improving the caliber and significance of LIS research. Notwithstanding these acknowledged benefits, little is known about the condition of interdisciplinary research in the field of library and information science now, particularly with regard to publishing patterns, study designs, and disciplinary contributors.

This study addresses these gaps by focusing on three key research questions:

1. What is the status of interdisciplinary research in LIS in terms of publication trends per year, sources, research design, and contributing disciplines?
2. What are the barriers and challenges in interdisciplinary research in LIS?

This study conducts systematic literature review and bibliometric analysis using the Scopus database to explore patterns in interdisciplinary research within LIS. By analyzing publication trends, citation connections, keyword co-occurrences, and author collaborations, the study aims to uncover the structure and evolution of interdisciplinary research in this field.

While the study strives to provide a comprehensive analysis, certain limitations should be acknowledged. Relying solely on the Scopus database may overlook relevant

research published in other sources, thus limiting the breadth of the review. Despite this limitation, the study offers valuable insights. It can guide future research and policymaking in LIS by highlighting current trends and the state of interdisciplinary research. The analysis also sheds light on the dynamics and structure of interdisciplinary networks, enhancing our understanding of how knowledge is integrated across disciplines within LIS.

Review of Related Literature

With interdisciplinarity as the focus of this research, it is important to recognize what makes research interdisciplinary. Interdisciplinarity has been gaining momentum as a significant and influential paradigm in the creation of modern knowledge. Its emergence and significance are a testament to the globalization of knowledge and the increasing interconnectedness of our society. As pointed out by Klein (2010, p.2), “Interdisciplinarity is associated with bold advances in knowledge, solutions to urgent societal problems, an edge in technological innovation, and a more integrative educational experience.”

Universities are also seeing the value of prioritizing interdisciplinary research to drive high-impact discoveries, maintain economic relevance, and advance scientific knowledge. This approach facilitates solving complex problems, fostering external collaborations, and even generating new revenue streams. Institutions that have made a strategic commitment to supporting interdisciplinary research, as manifested in their organizational structure, have often demonstrated interdisciplinary productivity (Leahey & Barringer, 2020).

Nature of Interdisciplinary Research

Looking closely at the term interdisciplinary, the prefix inter means “between, among, in the midst.” Disciplinary, on the other hand, means “of or relating to a particular field of study.” Therefore, studies that span two or more fields of study provide a framework for understanding interdisciplinary research. Interdisciplinary studies build upon disciplinary knowledge that already exists while constantly going beyond it through integration. As articulated by Repko and Szostak (2017, p. 50), “Interdisciplinary studies is a process of answering a question, solving a problem, or addressing a topic that is too broad or complex to be dealt with adequately by a single discipline, and draws on the disciplines with the goal of integrating their insights to construct a more comprehensive understanding.”

There has been a growing emphasis on the application of interdisciplinary research across various fields. Its main characteristic is the integration of ideas, techniques, and information from other disciplines to address complex problems that cannot be effectively tackled by a single discipline alone. As defined by the team of Vajaradul et al. (2021), interdisciplinary research is a collaborative approach that combines insights and methods from two or more disciplines to address complex research problems more effectively. With integration at its core, an essential characteristic of the interdisciplinary approach, the strategy is built on active involvement and interaction between various disciplines all throughout the research process. For example, as evidenced in the systematic review of Piggot et al. (2018), sports science opened its doors to integrated research that combines multiple sub-disciplines to better

understand sport performance. The same conclusion is also evident in shaping the future of healthcare, that was noted in the study of Smye and Frangi (2021), recognizing how interdisciplinary research can develop stronger and deeper collaborations between medicine and other disciplines, as complex problems in healthcare cannot be solved successfully by a single discipline. Clearly, manifesting the essence of interdisciplinary research with its ability to transcend traditional disciplinary boundaries, incorporating knowledge, and the development of new methodologies to leverage the strengths of various domains.

A cornerstone of interdisciplinary research is the establishment of shared goals among team members from diverse disciplines. This collaborative endeavor necessitates effective communication and a mutual understanding of each discipline's terminology, methodologies, and epistemological frameworks. The collaborative efforts of researchers from multiple domains, combining varied approaches and views to address difficult challenges or solve a scientific problem, are frequently assumed as a hallmark characteristic defining an interdisciplinary study. While this is true to a certain extent, these collaborative engagements are not exempt from challenges and complexities. For instance, researchers involved in interdisciplinary projects have documented a range of challenges faced by interdisciplinary researchers. The most common difficulties articulated include integration of knowledge across disciplines (Pischke et al, 2017), disciplinary traditions and cultures (Daniel et al, 2022; Siedlok & Hibbert, 2017); language (Pischke et al, 2017), and significant time constraints (Christensen et al. 2021; Leahey, 2018).

In addition, while diverse methodologies and expertise from various fields can broaden perspectives beyond the limitations of individual disciplines, interdisciplinary research can also occur within the same field of researchers. By combining concepts, ideas, or methods from diverse related subjects or sub-disciplines, researchers can enhance their understanding of a given problem and inform their research strategies. For instance, according to the study of Feng and Kirkley (2020), despite the anticipated advantages of collaborating with researchers from diverse academic backgrounds in interdisciplinary research, the study revealed a preference for working with like-minded individuals among collaborators, with researchers tending to partner with others who share similar research backgrounds. These findings suggest that collaborations between researchers with similar backgrounds are common in interdisciplinary research, even when they come from different primary disciplines. This highlights the importance of considering the diverse research experiences of individuals involved in such collaborations. Hence, interdisciplinary research can be successful even without a diverse mix of disciplines at the group level. Instead, disciplinary diversity can be reflected at the individual level, where researchers possess expertise in multiple fields.

Interdisciplinary research, characterized by its collaborative nature, integration of diverse methodologies, and shared research goals, offers immense potential for innovation and comprehensive problem-solving. As attested by Zhou et al. (2022), being committed to the interdisciplinary approach exposes researchers to a variety of knowledge and information sources that may help them in their work or encourage creative problem-solving, but it does not mean that their specialization will be eclipsed.

As the world grapples with increasingly complex challenges, the importance of interdisciplinary research will only continue to rise. Although it may present significant

challenges that must be addressed to foster successful collaborations and solutions, successful interdisciplinary research needs well-defined responsibilities for the researchers and well-defined objectives. To maximize its effectiveness, supportive structures and frameworks must be established to facilitate such collaborations.

Interdisciplinary Research and LIS

Recent interdisciplinary studies in library and information science (LIS) have highlighted the evolving nature of the field, particularly in relation to health informatics, digital technologies, and educational frameworks. These studies underscore the importance of integrating knowledge from various disciplines to enhance the effectiveness of its library services and programs. One significant area of research is the intersection of health informatics and library science. Tian and Wang (2023) explored how library and information science contributes to health informatics research, revealing a structured framework that outlines the evolutionary trends in this interdisciplinary domain. By identifying key concerns and contributions, the study provided valuable insights for researchers seeking to understand the evolving landscape of health informatics research within LIS.

With this, health informatics practitioners can enhance policy development and program implementation, fostering greater interdisciplinary collaboration between these two fields, ultimately improving the quality and accessibility of health information. The interdisciplinary nature of LIS is also evident in the bibliometric analysis conducted by Zeng et al. (2023), which assessed the characteristics of Chinese research in LIS, highlighting the integration of knowledge elements from various fields. The study examined eight research topics in the Chinese LIS field. It was found out that over the past decade, there has been a growing trend towards interdisciplinary collaboration.

There were also previous efforts to measure the research trends from non-LIS departments from 2002-2006 and compare them in areas within LIS that they engage in research. A significant portion of the research showed intersection with fields like business and management, computer science, education, communication, and journalism (Prebor, 2010). Interdisciplinary influence is also evident in a comparative study using direct citation analysis from 1978 to 2007, where it was revealed that library science researchers frequently cite publications from library and information science (LIS), education, business/management, sociology, and psychology. The outcomes verify that there is a growing tendency in library science and information science toward interdisciplinarity (Huang & Chang, 2012). In a more recent study, library and information science and information science literature involving Quartile 1 journals from 2010-2019 were also analyzed in a bibliometric study by Wijewickrema (2023). Six major research areas were identified: IS and management, information theory, communication, information retrieval, geographic-based IS, and bioinformatics. In addition, with the growing emphasis on interdisciplinarity, even an information studies program, primarily focused on librarianship, has now become involved in a range of interdisciplinary topics, including data science, bioinformatics, and user-experience design, among others (Bartlett & Dalkir, 2020).

These studies emphasize how the landscape of LIS is changing and show the potential associated with promoting cross-disciplinary integration and collaboration.

Methodology

The quantitative research design was employed using bibliometric analysis and systematic review of the literature to determine the status of interdisciplinary research in library and information science. The updated Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines for the collection of documents was adopted. PRISMA follows this model: identification, screening/eligibility, and inclusion (Page et al., 2021).

Scopus was chosen for document extraction due to its comprehensive coverage and high-quality data (Baas et al., 2020). The data used in this study was extracted on 23 August 2024. Scopus was searched for relevant articles using the search string `librar* AND "information science"` in the Title, Abstract, and Keywords fields, yielding a total of 9,484 entries.

Specifically, journal articles published from 2013 to 2023 and written in English were included. Following the identification stage, records with no keywords, abstract, references, or author affiliation were excluded, and duplicate records were removed. The suitability of extracted papers was assessed based on their interdisciplinary nature. Documents that did not meet this criterion were eliminated. In total, 147 documents were selected for analysis, as shown in Figure 1.

A spreadsheet was employed to condense the descriptive data of the 147 papers (see Appendix A for the list of included studies), encompassing the key characteristics commonly examined in bibliometric studies, namely trends and sources (Atsız et al., 2022). All documents were disseminated among the authors for coding and validation. This procedure of coding and cross-checking was implemented to verify conformity and coherence with the established eligibility criterion, hence enhancing the reliability of the study and addressing potential bias in the screening and analysis of prospective studies.

In addition to the descriptive bibliometric analysis, the coded data were used to identify the barriers to conducting interdisciplinary research in LIS. These barriers were derived, using an inductive thematic coding approach and consensus among the authors, from the thematic coding of abstracts and author keywords in all 147 studies, with a close inspection of a purposive subset of 14 articles that explicitly discussed limitations, conceptual tensions, or structural constraints in interdisciplinary contexts. This subset was used to refine and illustrate the initial codes and to ensure that the emerging barrier categories were grounded in the way authors themselves described their interdisciplinary experiences. The number of studies reviewed in depth corresponds with Gray's (2020) assertion that a sample of around fifteen studies is often sufficient to extract meaningful patterns in systematic reviews.

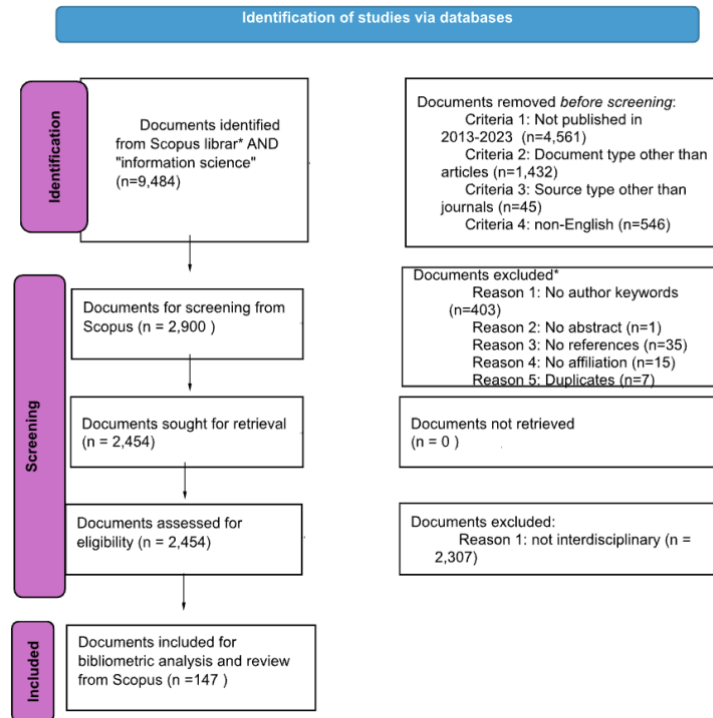


Figure 1. PRISMA Flowchart

Results

The result of this study uncovers the structure and dynamics of interdisciplinary research within library and information science.

Status of interdisciplinary research in LIS in terms of publication trends (year), sources, research design, and contributing disciplines

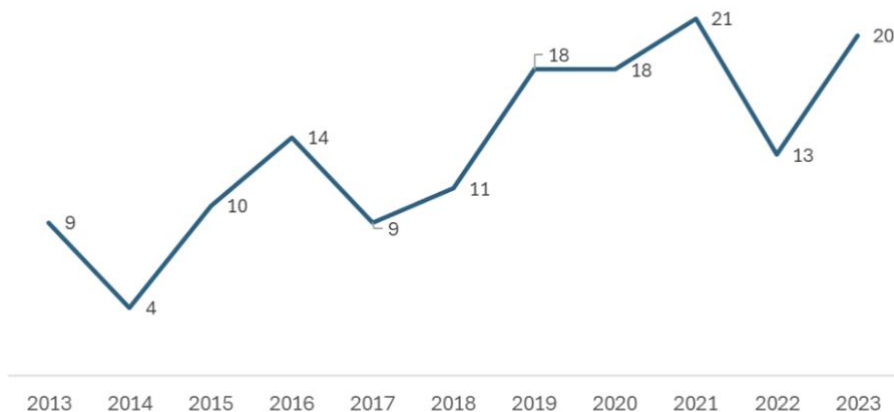


Figure 2. Publication trends of interdisciplinary research in LIS

The line graph illustrates the trend in interdisciplinary research publications within the field of Library and Information Science (LIS) from 2013 to 2023, showing a general

upward movement with some fluctuations. In 2013, the number of interdisciplinary publications began at 9, followed by a sharp decline to 4 in 2014. However, this decline was temporary, with a recovery to 10 publications in 2015. The period from 2016 to 2018 saw a steady increase, peaking at 14 publications in 2016, a slight dip to 9 in 2017, and a modest rise to 11 in 2018, reflecting a growing recognition of interdisciplinary research within LIS during these years.

The most significant surge in interdisciplinary publications occurred in 2021, reaching a peak of 21, the highest in the observed period. This peak suggests a heightened emphasis on interdisciplinary approaches, likely driven by an increased need for collaborative solutions to complex challenges in LIS. During this period, the intersection of digital humanities and LIS offered new opportunities for libraries to contribute to scholarly research and innovation. However, this was followed by a drop to 13 publications in 2022, before rebounding to 20 in 2023, indicating a renewed and sustained interest in interdisciplinary research.

Overall, the trend from 2013 to 2023 demonstrates a clear growth in interdisciplinary research within LIS, rising from 9 to 20 publications over the decade. This growth highlights the expanding role of interdisciplinary approaches in addressing complex information challenges. The fluctuations observed, particularly the peak in 2021 and subsequent rebound in 2023, may be influenced by external factors such as shifts in funding, global events, or changing academic priorities. The resurgence in 2023 suggests that interdisciplinary research will continue to play a vital role in the future of LIS, influencing both scholarly inquiry and the development of innovative practices in the field.

Leading journals publishing interdisciplinary articles in LIS

The analysis of the top 10 journals publishing interdisciplinary articles in Library and Information Science (LIS) highlights the key sources contributing to the field's advancement. Among the 66 source titles analyzed, these top 10 journals represent the most significant platforms for interdisciplinary research, collectively driving the integration of diverse disciplines within LIS and shaping the future of research and practice (see Table 1).

Table 1. Top 10 journals publishing interdisciplinary articles in LIS

	Source Title	No. of publications	Cumulative Percentage
1.	Journal of Documentation	15	10.20%
2.	Library Philosophy and Practice	13	8.84%
3.	Scientometrics	8	5.44%
4.	DESIDOC Journal of Library and Information Technology	5	3.40%
5.	Journal of Education for Library and Information Science	5	3.40%
6.	Library Hi Tech	5	3.40%

7.	Proceedings of the Association for Information Science and Technology	5	3.40%
8.	Education for Information	4	2.72%
9.	International Journal of Information Science and Management	4	2.72%
10.	Knowledge Organization	4	2.72%
11.	Library Management	4	2.72%

Leading the list is the Journal of Documentation, which accounts for 10.20% of the total interdisciplinary articles. Its broad scope and focus on both theoretical and practical aspects of documentation make it a critical resource for researchers, bridging gaps between various disciplines. This journal's prominence highlights its role as a key platform for interdisciplinary scholarship, encouraging cross-disciplinary work. Library Philosophy and Practice follow with 8.84% of the total publications, reflecting its influence in exploring philosophical, theoretical, and practical issues in LIS that intersect with other fields. Scientometrics, which ranks third with 5.44% of the total publications, underscores the growing importance of quantitative approaches in LIS research. Its focus on bibliometrics and informetrics highlights the intersection of LIS with data science, broadening the methodological tools available to researchers.

Four journals—DESIDOC Journal of Library and Information Technology, Journal of Education for Library and Information Science, Library Hi Tech, and Proceedings of the Association for Information Science and Technology—each contribute 3.40% of the total publications. These journals reflect the diverse facets of interdisciplinary research in LIS, from the integration of technology and education to emerging trends in information science. Lastly, Education for Information, International Journal of Information Science and Management, Knowledge Organization, and Library Management each represent 2.72% of the total publications, showcasing a broad spectrum of interdisciplinary topics in LIS. These journals emphasize the intersection of LIS with education, management, and the classification of knowledge, highlighting the field's potential to integrate insights from multiple disciplines.

The results emphasize these journals' key role in shaping interdisciplinary research in LIS. Their prominence reflects their ongoing influence in advancing the field, promoting cross-disciplinary collaboration, and expanding LIS research into areas like technology, education, management, and quantitative sciences. While articles are spread across 66 journals, the top 10 are crucial in driving progress. This trend impacts both academia and practice, influencing the development of curricula, policies, and library services. As interdisciplinary research grows in importance, these journals are likely to remain vital sources for innovation and progress.

Most cited publications

Table 2 presents the top 10 most cited publications in the field of Library and Information Science (LIS). These publications represent significant contributions to various aspects of LIS, from the integration of digital humanities to the application of artificial intelligence and the study of misinformation. The high citation counts of these works reflect their impact and influence within the academic community and beyond.

Table 2. Top 10 Most Cited Publications

	Research Title	No. of Citations
1	Doctoral dissertations of Library and Information Science in China: A co-word analysis	119
2	A scoping review identifies multiple emerging knowledge synthesis methods, but few studies operationalize the method	99
3	Digital Humanities and Libraries: A Conceptual Model	89
4	Disinformation and misinformation triangle: A conceptual model for fake news epidemic, causal factors and interventions	81
5	Digital competences, computer skills and information literacy in secondary education: mapping and visualization of trends and concepts	74
6	Convergence of digital humanities and digital libraries	51
7	Artificial intelligence tools and perspectives of university librarians: An overview	47
8	From knowledge organization to knowledge representation	47
9	Artificial intelligence(AI) application in library systems in Iran: A taxonomy study	40
10	Factors influencing viewing behaviour on search engine results pages: a review of eye-tracking research	39

The most cited publication, "Doctoral dissertations of Library and Information Science in China: A co-word analysis" (119 citations), is crucial for understanding trends in LIS research in China, particularly in scholarly communication and education. Its high citation count underscores its impact on subsequent research. "A scoping review identifies multiple emerging knowledge synthesis methods, but few studies operationalize the method" (99 citations) stands out for its contribution to improving methodological approaches in LIS, demonstrating wide relevance across disciplines. "Digital Humanities and Libraries: A Conceptual Model" (89 citations) and "Disinformation and misinformation triangle: A conceptual model for 'fake news' epidemic, causal factors, and interventions" (81 citations) are pivotal in exploring the integration of digital humanities in libraries and addressing contemporary issues like misinformation, respectively. Both have been widely adopted and referenced in ongoing research.

The "Convergence of digital humanities and digital libraries" (51 citations) publication reflects the growing trend of merging digital humanities with library services, emphasizing its strategic importance in the digitization of cultural resources. AI's role

in libraries is highlighted in "Artificial intelligence tools and perspectives of university librarians: An overview" (47 citations) and "Artificial intelligence (AI) application in library systems in Iran: A taxonomy study" (40 citations), both of which are essential for understanding AI's application in academic settings. "Archives, libraries, and museums in the Nordic model of the public sphere" (30 citations) explores the role of cultural institutions in the public sphere, while "Factors influencing viewing behaviour on search engine results pages: A review of eye-tracking research" (39 citations) significantly contributes to our understanding of user behavior in digital environments. Finally, "Disciplinary, national, and departmental contributions to the literature of library and information science, 2007-2012" (38 citations) provides a valuable analysis of LIS literature, offering insights into the field's evolution during a critical period. These publications represent the most impactful and frequently referenced research in LIS, highlighting key areas such as digital humanities, AI, misinformation, and the evolving role of libraries in society.

Research methods used in interdisciplinary studies

Table 3 provides an analysis of the research methodologies applied across 147 interdisciplinary studies. The data indicates that nearly half of the studies (48.30%) employ qualitative methods. This preference suggests a significant inclination towards methodologies that provide in-depth, subjective insights, such as interviews and case studies, allowing researchers to explore complex phenomena comprehensively. Conversely, quantitative methods are utilized in 44.90% of the studies, reflecting a robust reliance on numerical data and statistical techniques to produce empirical, measurable results. This substantial proportion highlights the continued emphasis on data-driven research within the interdisciplinary domain. The use of mixed methods, which combine qualitative and quantitative approaches, is relatively limited, comprising only 6.80% of the studies. This lower proportion may indicate that the integration of diverse methodologies, while potentially valuable, presents challenges or complexities that are less frequently addressed.

Table 3. Distribution of Research Methods Used in Interdisciplinary Studies

Research Method	No. of Studies	%
Qualitative	71	48.30%
Quantitative	66	44.90%
Mixed	10	6.80%
Total	147	100.00%

The predominant use of qualitative and quantitative methods underscores methodological diversity within interdisciplinary research, reflecting both exploratory and empirical approaches. However, the relatively low adoption of mixed methods suggests potential areas for further investigation. The challenges associated with

mixed methods warrant attention, as they could offer a more comprehensive perspective by integrating multiple data types.

Table 4. Most Common Research Methodologies in Interdisciplinary Studies in LIS

Rank	Research Methods/Techniques	Count	Percentage
1	Bibliometric Analysis	31	21.08%
2	Conceptual Analysis	18	12.24%
3	Literature Review	15	10.20%
4	Survey Research	15	10.20%
5	Content Analysis	12	8.16%

Table 4 provides an overview of the frequency and distribution of various research designs and methods used in the studies reviewed. Bibliometric Analysis emerges as the most prevalent method, with 31 occurrences, representing 16.21% of the total. This suggests a strong preference for this method, likely due to its effectiveness in analyzing citation patterns and research trends. Conceptual Analysis and Literature Review are also prominently used, each appearing 18 times and accounting for 9.42% of the total. This indicates a significant emphasis on theoretical and background analysis, which are crucial for understanding existing research and framing new studies.

Survey Research and Content Analysis each appear 15 times, making up 7.85% of the total. These methods are commonly employed for collecting empirical data and analyzing textual content, respectively. The moderate use of Case Study and Citation Analysis, with 12 and 8 occurrences, respectively, reflects their value in detailed examination and tracking citation trends. The Interview method, appearing 7 times, highlights its moderate use for gathering qualitative insights directly from participants.

Methods such as Qualitative Analysis, Theoretical Analysis, Comparative Analysis, and others, with counts of 3 or fewer, indicate their less frequent application, potentially due to their more specialized nature or niche focus. Many methods, including Semi-structured Interview, Environment Scan, Keyword Analysis, and others, each occurring only once, are less commonly used and may reflect their specific application or less widespread use in the reviewed studies.

The data reveals several key trends: the dominance of Bibliometric Analysis suggests its critical role in assessing research impact and trends; the significant use of theoretical and background analyses underscores their importance in framing research; and the prevalence of empirical methods like Survey Research and Content Analysis highlights their essential role in validating hypotheses and exploring phenomena. The diverse range of methodologies employed demonstrates the flexibility and depth of research designs, ensuring a comprehensive approach to addressing various research questions. Overall, the distribution of research designs illustrates a balanced use of both qualitative and quantitative approaches, with a notable emphasis on bibliometric and conceptual analyses.

Contributing disciplines

Figure 3 presents the contributing disciplines to Library and Information Science (LIS) research, highlighting the field's interdisciplinary nature, with significant influences from various academic areas. Computer Science emerges as the leading contributor, with 77 instances, underscoring the field's reliance on technology for digital libraries, information retrieval, and data management. This reflects the growing integration of technological advancements into LIS.

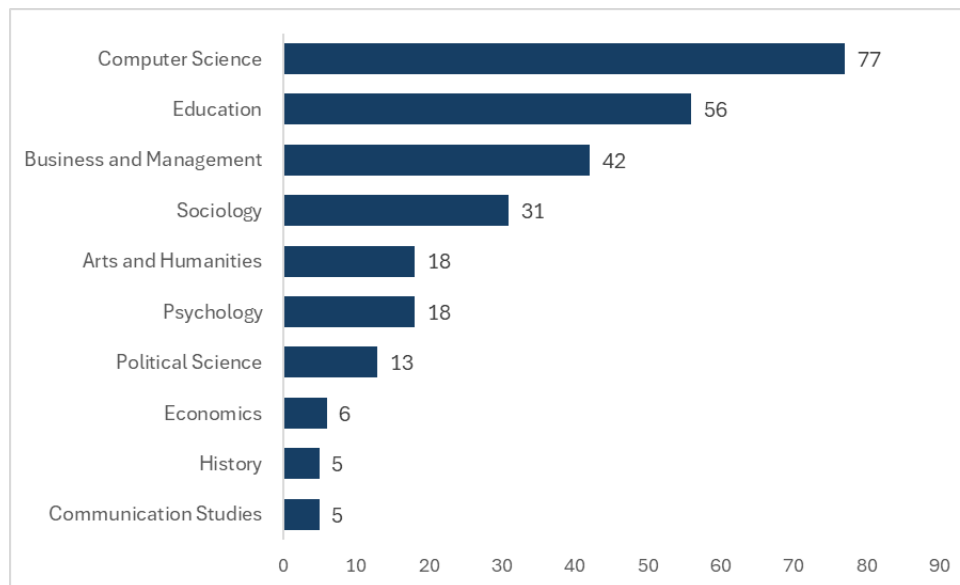


Figure 3. Top contributing disciplines in interdisciplinary research in LIS

Education ranks second, contributing 56 instances, which emphasizes the critical role of pedagogical theory and practice in LIS, particularly in information literacy and user education. This strong link suggests that educational strategies are essential components of LIS curriculum and practice. Similarly, **Business and Management** contribute 42 instances, indicating the importance of management principles in library operations, including strategic planning and leadership.

Social sciences, particularly **Sociology** (31 instances) and **Psychology** (18 instances), also play a crucial role, highlighting the need to understand social behavior and cognitive processes in information use. These contributions suggest that LIS research is not solely technical but also deeply concerned with the human aspects of information interaction.

The inclusion of **Arts and Humanities** (18 instances) in the data underscores LIS's engagement with cultural studies, history, and philosophy, pointing to the field's role in preserving cultural heritage and addressing ethical concerns. While disciplines like **Political Science** (13 instances), **Economics** (6 instances), and **Health Sciences** (4 instances) contribute less frequently, their presence indicates the breadth of LIS

research, which spans policy analysis, economic evaluation, and health information management.

Disciplines such as **Law**, **Anthropology**, and **Physics** show minimal representation, reflecting their specialized but still relevant contributions to specific areas of LIS. Overall, the data illustrates that LIS research is deeply interdisciplinary, requiring a blend of technical, educational, and social science expertise to address the complex challenges of the modern information landscape.

Barriers and challenges in interdisciplinary research in LIS

The systematic review revealed six themes representing the challenges encountered in conducting interdisciplinary research within LIS. These were derived from the thematic coding of abstracts and author keywords in 147 studies, with a close inspection of 14 articles that explicitly discussed limitations, conceptual tensions, or structural constraints in interdisciplinary contexts.

1. Conceptual and epistemological misalignment.

A major challenge involves the integration of diverse theoretical frameworks and epistemologies across disciplines. Wang, Feng, et al. (2023) emphasized difficulties in conceptual alignment when visualizing knowledge networks that span LIS and other domains, particularly due to varied definitions of core constructs such as “knowledge” and “structure”. Das et al. (2023) noted that introducing digital humanities into LIS curricula confronted resistance due to a lack of shared conceptual language and differing learning paradigms. Wojcik (2022) identified epistemic tensions between LIS’s user-centered philosophy and the systems-driven approach of brain-computer interfaces. Wang, Gui, et al. (2023) observed that disciplines differ in how they define and evaluate “novelty” in research, complicating mutual understanding in interdisciplinary peer review. Yueh et al. (2022) further demonstrated that even within LIS, professional groups diverge in their understanding of ethical frameworks, pointing to a lack of internal conceptual cohesion.

2. Institutional and structural barriers.

Several studies highlighted organizational constraints that hinder interdisciplinary engagement. Velez-Estevez et al. (2022) found that although international collaborations in LIS yield higher citation impact, structural support for such collaborations remains insufficient at the institutional level. Naseema and Sevukan (2022) observed that research data management efforts were often undermined by administrative and policy-related bottlenecks. Kaffashan Kakhki et al. (2022) revealed that despite librarians’ willingness to engage with IT-driven innovation, institutional mechanisms to support upskilling and integration were lacking.

3. Skills and knowledge gaps.

A recurrent barrier was the lack of cross-disciplinary training and technical proficiency. Rahaman et al. (2023) pointed out that implementing cloud computing within LIS frameworks was hampered by limited technical know-how and digital infrastructure. Das et al. (2023) highlighted skill deficits in digital humanities, particularly around

metadata, visualization, and programming. Wojcik (2023) reported that robotics adoption in libraries was impeded by staff unfamiliarity with engineering systems and integration models. Wang, Feng, et al. (2023) emphasized that knowledge mapping and interdisciplinary modeling required data literacy and computational skills absent in many LIS programs. Similarly, Kaffashan Kakhki et al. (2022) linked knowledge absorptive capacity with librarians' limited ability to engage in IT-supported innovation.

4. Communication and terminology differences.

Terminological inconsistency and lack of shared language also impeded interdisciplinary collaboration. Saha and Ghosh (2023) noted that keyword modeling in LIS was constrained by varied terminologies that made cross-field analysis difficult. Yang et al. (2023) found that citation practices and terminology vary substantially across fields, leading to reduced recognition of LIS contributions in interdisciplinary domains. Wang, Feng, et al. (2023) highlighted ambiguities in how terms like "label networks" were interpreted across fields. Das et al. (2023) noted a mismatch in understanding when teaching digital humanities to LIS learners due to linguistic and conceptual gaps. Wojcik (2022) emphasized that developing shared vocabularies was essential when introducing advanced computing technologies into LIS workflows.

5. Challenges in publishing and peer review.

Authors frequently expressed frustration with the peer review and publishing process. Rahaman et al. (2023) explicitly cited difficulties in publishing scientometric analysis of LIS-cloud computing intersections due to limited editorial expertise. Wojcik (2023) similarly reported challenges in publishing robotics-related LIS research due to perceived misalignment with the thematic priorities of core LIS journals. Saha and Ghosh (2023) implied that articles using computational methods such as topic modeling, faced scope mismatches and complexity during peer evaluation, as reflected in the thematic inconsistencies and term ambiguity they encountered. Meanwhile, Wang, Gui, et al. (2023) discussed how divergent understandings of "novelty" across disciplines can affect reviewers' evaluations and publication outcomes

6. Time and resource constraints.

Time-intensive coordination, infrastructure limitations, and delayed timelines emerged as limiting factors. Reed and Johnson (2023) explicitly highlighted that projects grounded in cultural capital theory required prolonged negotiations with institutional stakeholders, delaying implementation timelines. Xu et al. (2023) emphasized the technical and infrastructural strain posed by big data research in LIS, citing challenges in data cleaning and system limitations that impeded project execution. Rahaman et al. (2023) similarly pointed to deployment delays in cloud computing initiatives, which were exacerbated by staffing shortages and insufficient digital infrastructure.

These findings are consistent with broader literature (Pischke et al., 2017; Daniel et al., 2022; Leahey, 2018) and affirm that while interdisciplinary LIS research holds significant promise, it is frequently constrained by conceptual misalignments,

institutional rigidities, and operational challenges. Addressing the identified barriers will require institutional policy reforms, cross-disciplinary training initiatives, and more inclusive publishing models that appropriately recognize and reward interdisciplinary scholarships.

Discussion

This review sets out to understand how interdisciplinarity is taking shape in LIS and what makes it difficult to sustain. Looking across the findings, these main points emerge: interdisciplinarity is becoming embedded in LIS but in uneven ways; the barriers that surface is systemic rather than individual; and combining bibliometric analysis with thematic coding helps recover some of the missing context often associated with quantitative reviews.

First, interdisciplinarity is moving toward the mainstream of LIS, but its development is uneven. The steady increase in interdisciplinary publications from 2013 to 2023, with clear surges toward the end of the period, shows that cross-disciplinary work is no longer peripheral to LIS but part of its core research agenda. At the same time, the concentration of output in a small number of key journals, alongside a long tail of occasional venues, suggests that not all areas of LIS enjoy the same level of visibility or support for interdisciplinary work. The dominance of computer science and education as contributing disciplines highlights how strongly LIS is anchored in technological innovation and pedagogical practice, while smaller but visible contributions from business, management, social sciences, and the humanities indicate that LIS is also engaging with organization, social and cultural questions. Together, these patterns suggest that LIS is well positioned as a “meeting point” for multiple knowledge domains, yet opportunities for interdisciplinarity remain clustered around certain topics and partnerships rather than being evenly spread across the fields.

Second, the barriers to interdisciplinary LIS research are embedded in structures and systems, not just in individual capacity. The six themes identified in the review show that the main obstacles to interdisciplinary work arise from misaligned concepts, institutions, skills, communication practices, publishing systems, and resource conditions. Conceptual and epistemological misalignment illustrates how difficult it is to reconcile different theoretical languages and standards of evidence, even when researchers share an interest in the same problem. Institutional and structural barriers, together with skills and knowledge gaps, point to organizations and training systems that are still largely designed around single disciplines. Communication and terminology differences, along with challenges in publishing and peer review, reveal that even when projects progress, they can struggle to find journals and reviewers who recognize their contributions. Finally, time and resource constraints highlight the additional coordination and infrastructural demands that interdisciplinarity projects carry. Taken together, these findings suggest that strengthening interdisciplinary LIS research will require changes in policies, curricula, and evaluation practices, rather than relying solely on the motivation or creativity of individual researchers.

Third, pairing bibliometric analysis with thematic coding extends what a systematic review can say about context, while also revealing its limits. Bibliometric reviews are often criticized for focusing on counts and co-occurrence at the expense of lived

experience and context. The present study partly addresses this concern by combining quantitative mapping with inductive thematic coding of all 147 articles and closer reading of a purposive subset of studies that explicitly discussed limitations and constraints. This mixed analytic strategy allowed the review to move beyond describing where and how often interdisciplinarity appears and to unpack how authors themselves talk about conceptual tensions, institutional rigidities, skills gaps, and publishing difficulties. At the same time, the design retains important limitations: it relies on a single database and focuses on English-language journal articles. These choices mean that the patterns reported here are suggestive rather than exhaustive. Even so, the combination of bibliometric indicators and thematic analysis shows that systematic reviews using bibliometric data need not be “only numbers”: when treated as a starting point for interpretive work, they can illuminate both the structure and the lived challenges of interdisciplinary research in LIS.

Conclusion

The review shows that interdisciplinary research in LIS has grown steadily between 2013 and 2023, signaling that collaboration across fields is becoming a core part of how the discipline approaches complex information problems. Interdisciplinary work now spans ties with computer sciences, education, business, the social sciences and other domains, reflecting LIS’s role as a meeting point for multiple perspectives.

At the same time, the study makes clear that this growth is constrained by persistent barriers. Conceptual and epistemological misalignments, institutional and structural limitations, skills and knowledge gaps, communication and publishing challenges, and time and resource pressures all shape whether interdisciplinary initiatives can be launched and sustained. These are not simply individual shortcomings but features of the systems in which LIS researchers and practitioners work.

Addressing these barriers is essential if LIS is to realize the full potential of interdisciplinarity. Institutional reforms that recognize cross-disciplinary outputs in evaluation, greater investment in cross-disciplinary training, and more inclusive scholarly communication models can help create conditions where such work is expected rather than exceptional. Future research can build on this review by conducting exploratory or scoping studies to map emerging themes in greater depth, examining successful interdisciplinary case studies, tracing collaboration networks, and applying mixed method approaches such as network analysis and text mining. Developing ways to capture the societal and policy impacts of interdisciplinary LIS research is a further priority and would provide a stronger basis for demonstrating the value of this work beyond the academy.

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Appendix A. Included Studies

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