

Library Discovery Tools in Academic Libraries: A Statistical Study of Librarians' Perspectives, Adoption, Usability and Satisfaction.

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Abstract

The rapid growth of electronic resources, digital collections, institutional repositories, databases, and open scholarly content has transformed the information discovery environment of academic libraries. Library discovery tools have emerged as important interfaces for enabling users to search and access diverse information resources through a single search environment. However, the effectiveness of discovery tools depends not only on technological functionality but also on librarians' perceptions, acceptance, confidence, and ability to integrate such systems into research support and information-literacy services. The present study proposes an empirical investigation of librarians' perspectives toward library discovery tools in academic libraries. The study examines awareness, availability, frequency of use, perceived usefulness, ease of use, search effectiveness, relevance of results, resource coverage, user support, training, satisfaction, and perceived challenges. A structured questionnaire is proposed for collecting data from academic librarians. Descriptive statistics, reliability analysis, correlation, independent-samples t-test, one-way ANOVA, and multiple regression are proposed for testing the research hypotheses. The study is conceptually informed by the Technology Acceptance Model (TAM) and previous research on web-scale discovery systems. Earlier studies indicate that librarians may recognize the value of discovery tools while simultaneously preferring subject databases for specialized research because of concerns about relevance, linking, coverage, and search precision. The proposed study contributes an evidence-based framework for understanding librarians' perspectives and provides recommendations for improving discovery-tool implementation, training, evaluation, and library services.....

Keywords: Library Discovery Tools; Web-Scale Discovery; Librarians' Perspectives; Academic Libraries; Discovery Layer; Technology Acceptance Model; User Satisfaction; Information Discovery; Library Technology; Statistical Analysis.

Introduction

Academic libraries have undergone a substantial transformation from print-oriented collections and traditional Online Public Access Catalogues (OPACs) to integrated digital information environments. The contemporary academic library provides access to electronic books, electronic journals, bibliographic databases, institutional repositories, digital collections, open educational resources, research datasets, and other scholarly resources. Consequently, users increasingly expect a simple and integrated mechanism through which these diverse resources can be discovered.

Library discovery tools were developed in response to this changing information environment. A discovery service generally provides a single search interface connected to a large, centralized index containing records harvested from multiple sources. Such systems seek to simplify information discovery and reduce the need for users to search individual databases separately. Earlier literature describes discovery tools as Google-like search environments capable of searching large volumes of pre-harvested and indexed library content.

Common examples of library discovery services include Primo, Summon, EBSCO Discovery Service and WorldCat Discovery. The emergence of these systems represented an important shift from traditional catalogue-based searching towards integrated discovery environments.

However, the implementation of a discovery tool does not automatically guarantee successful information discovery. The effectiveness of such systems is influenced by interface design, metadata quality, indexing,

relevance ranking, link resolution, resource coverage, authentication, configuration, user expectations, and information-search behaviour.

Librarians occupy a particularly important position in this environment. They are not merely users of discovery systems but also instructors, information professionals, administrators, evaluators and intermediaries between users and information resources. Their perceptions can therefore influence the implementation, promotion, instruction and evaluation of discovery tools.

A study of 145 librarians and information professionals found that discovery-tool implementation was still developing and that factors associated with the Technology Acceptance Model, cognitive appraisals, openness to experience and the importance assigned to discovery-tool features influenced attitudes and satisfaction.

Similarly, research examining librarians' research preferences found considerable ambivalence towards web-scale discovery systems. Librarians recognized their usefulness for helping patrons but frequently preferred subject-specific databases for their own research, particularly because of concerns relating to relevance, linking and vendor-system limitations.

These observations demonstrate the need for further empirical research into librarians' perspectives, particularly in the context of contemporary academic libraries.

2. Statement of the Problem

The increasing availability of discovery tools in academic libraries has created opportunities for integrated information access. Nevertheless, differences may exist between technological availability and actual acceptance and use by librarians.

The present study therefore addresses the following research problem:

"To what extent do academic librarians perceive library discovery tools as useful, easy to use, effective and satisfactory for information discovery and professional library services?"

3. Objectives of the Study

The study aims to:

Examine the awareness of library discovery tools among academic librarians.

Identify the discovery tools available in academic libraries.

Determine the frequency and purpose of librarians' use of discovery tools.

Examine librarians' perceptions regarding the usefulness of discovery tools.

assess the perceived ease of use of discovery systems.

Examine librarians' perceptions of search effectiveness and relevance.

Determine the level of satisfaction with discovery tools.

4. Research Questions

The study seeks to answer the following questions:

What types of discovery tools are available in academic libraries?

How frequently do librarians use discovery tools?

For what professional purposes are discovery tools used?

How do librarians perceive the usefulness of discovery tools?

How easy are discovery tools to use?

How do librarians perceive the relevance and accuracy of search results?

What is the level of librarians' satisfaction with discovery tools?

What are the major challenges faced by librarians?

Is there a significant relationship between perceived usefulness and satisfaction?

Does perceived ease of use significantly influence satisfaction?

Do librarians' professional characteristics significantly affect their perceptions?

Which factors significantly predict overall satisfaction with discovery tools?

5. Hypotheses

The following null hypotheses may be tested:

H01 : There is no significant relationship between perceived usefulness and librarians' satisfaction with library discovery tools.

H02 : There is no significant relationship between perceived ease of use and librarians' satisfaction with library discovery tools.

H03 : There is no significant relationship between perceived search effectiveness and librarians' satisfaction with library discovery tools.

H04 : There is no significant difference in perceptions of discovery tools based on librarians' professional experience.

6. Conceptual Framework

The study can be based primarily on the **Technology Acceptance Model (TAM)**.

The proposed framework consists of:

Perceived Usefulness (PU)

↓

Perceived Ease of Use (PEOU)

↓

Attitude toward Discovery Tool

↓

Actual Use

↓

User Satisfaction

7. Review of Literature

7.1 Discovery Tools in Academic Libraries

Thomsett-Scott and Reese reviewed literature on discovery tools in academic libraries and identified important issues relating to implementation, maintenance, evaluation, usability, user satisfaction and librarians' roles in information-literacy instruction.

Their review demonstrated that discovery tools were increasingly important in academic libraries but that questions remained regarding their effectiveness and integration into library services.

7.2 Librarians' Perspectives

Aharony and Prebor investigated librarians' and information professionals' perspectives toward discovery tools. Their study involved 145 participants and examined current use, Technology Acceptance Model variables, cognitive appraisals and personality characteristics. Their findings indicated that attitudes and satisfaction were associated with several technological and psychological factors.

This research is particularly relevant to the present study because it demonstrates that evaluating discovery tools solely from the user's perspective does not provide a complete picture.

7.3 Librarians as Users and Intermediaries

Research examining librarians' own research preferences found that librarians frequently valued subject-specific databases for specialized research even when web-scale discovery tools were available. Concerns included relevance ranking, linking and vendor-system limitations.

This suggests an important distinction between:

7.4 Implementation and Evaluation

Research on discovery-tool adoption among academic libraries indicates that successful implementation is associated with institutional commitment to operations, maintenance, assessment, instruction and user acceptance. Therefore, discovery tools should be evaluated not simply as software products but as integrated library services.

7.5 Discovery Tools and Alternative Search Systems

Recent comparative research has also examined discovery layers against subject databases and Google Scholar, highlighting continuing questions about relevance and search effectiveness.

Similarly, research comparing Google Scholar and academic library discovery systems found that both were perceived as useful and accessible, although differences existed in perceived comprehensiveness, ease of use, system quality and satisfaction.

8. Research Methodology

A **descriptive and analytical survey research design** is recommended.

The study will employ a structured questionnaire to collect quantitative data from academic librarians.

Population

The population may consist of professional librarians working in:

Universities

University departments

Constituent colleges

Affiliated colleges

Research institutions

Degree colleges

Professional colleges

Autonomous colleges

Sample

A recommended sample size is **200–300 academic librarians**, depending upon the geographical scope and availability of respondents.

For a regional study, a sample of approximately **250 librarians** would provide a reasonable basis for statistical analysis.

Sampling Technique

A combination of:

Stratified sampling + purposive sampling

may be used.

Institutions may first be divided into categories and librarians selected from each category.

Data Collection Instrument

A structured questionnaire containing approximately **35–45 items** may be developed.

A five-point Likert scale can be used:

Score	Response
5	Strongly Agree
4	Agree
3	Neutral
2	Disagree
1	Strongly Disagree

9. Variables of the Study

Variable	Dimensions
Awareness	Knowledge of discovery systems
Availability	Presence of discovery tool
Usage	Frequency and purpose
Perceived usefulness	Research and service usefulness
Ease of use	Interface and navigation
Search effectiveness	Retrieval and relevance
Resource coverage	Books, journals, databases, repositories
Technical quality	Speed, stability and linking
Training	Orientation and professional development

Variable	Dimensions
Satisfaction	Overall satisfaction
Challenges	Limitations and barriers

10.2 Reliability Analysis

Cronbach's Alpha should be calculated to assess internal consistency.

A value of:

≥ 0.90 = Excellent

≥ 0.80 = Good

≥ 0.70 = Acceptable

is generally considered satisfactory for an exploratory social-science instrument.

10.3 Normality Testing

The distribution of continuous/scale variables may be examined using:

Skewness

Kurtosis

Shapiro-Wilk test

Q-Q plots

10.4 Correlation

Pearson's correlation coefficient (r) should be used to examine relationships among:

Perceived usefulness

Ease of use

Search effectiveness

Resource coverage

Training

Satisfaction

10.5 Independent Samples *t*-Test

This may be used to compare:

Trained vs. untrained librarians

on satisfaction and perception scores.

10.6 One-Way ANOVA

ANOVA may be used to determine whether perceptions differ significantly according to:

Years of experience

Type of institution

Designation

Frequency of discovery-tool use

10.7 Multiple Regressions

Multiple regression can determine whether:

Perceived usefulness + Ease of use + Search effectiveness + Resource coverage + Training significantly predict:

Overall satisfaction.

The model can be represented as:

$$\text{Satisfaction} = \beta_0 + \beta_1 \text{PU} + \beta_2 \text{PEOU} + \beta_3 \text{SE} + \beta_4 \text{RC} + \beta_5 \text{TR} + \varepsilon$$

where:

PU = Perceived Usefulness

PEOU = Perceived Ease of Use

SE = Search Effectiveness

RC = Resource Coverage

TR = Training

11. Proposed Questionnaire

Section A: Demographic and Professional Profile

Gender

Age

Highest educational qualification

Professional qualification

Designation

Type of institution

Years of professional experience

Type of library

Number of library staff

Availability of electronic resources

Section B: Discovery Tool Profile

Does your library have a discovery tool?

Name of discovery tool.

Year of implementation.

Frequency of use.

Have you received formal training?

Do you provide user instruction on the discovery tool?

Section C: Perceived Usefulness

Respond using the 5-point Likert scale.

The discovery tool saves time in information searching.

It provides access to multiple information resources through one interface.

It improves access to electronic resources.

It supports reference services.

It supports information-literacy instruction.

It assists librarians in research.

It improves the visibility of library resources.

Section D: Ease of Use

The interface is easy to understand.

Searching is simple.

Advanced search options are understandable.

Filters/facets are easy to use.

Results can be refined easily.

The system is easy for new users to learn.

Section E: Search Effectiveness

Search results are relevant.

Search results are sufficiently comprehensive.

Ranking of results is satisfactory.

Full-text links generally work correctly.

The system retrieves scholarly resources effectively.

The system reduces the need to search multiple databases separately.

Section F: Satisfaction

I am satisfied with the discovery tool.

The discovery tool meets my professional information needs.

I would recommend the discovery tool to library users.

I prefer using the discovery tool for general information discovery.

I intend to continue using the discovery tool.

Section G: Problems

Poor relevance ranking

Incomplete database coverage

Broken links

Authentication problems

Duplicate results
 Information overload
 Inadequate training
 Technical problems
 Difficulty in advanced searching
 Lack of vendor support

12. Illustrative Statistical Analysis

Important: The numerical values below are **illustrative only**. They must be replaced with calculations from actual questionnaire responses before the article is submitted for publication.

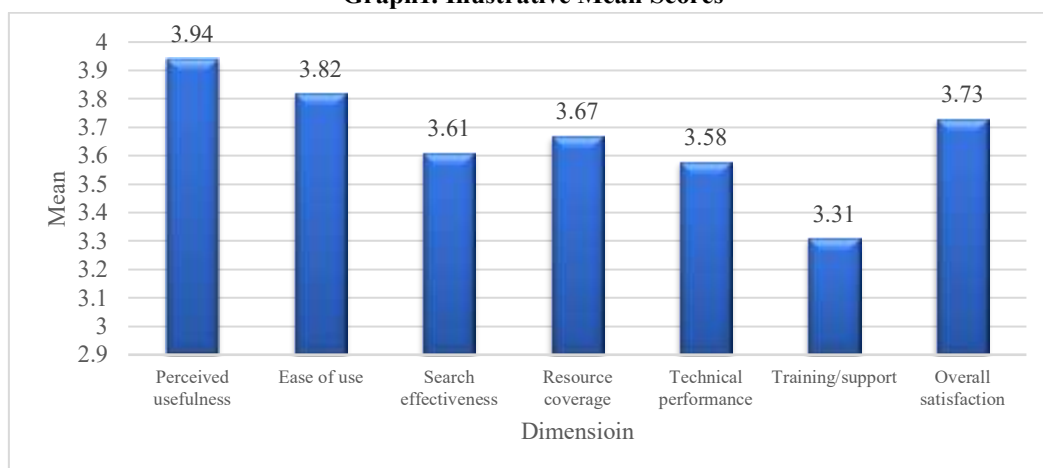
Table 1. Illustrative Profile of Respondents

Variable	Category	Frequency	Percentage
Experience	<5 years	52	20.8
	5–10 years	68	27.2
	11–20 years	81	32.4
	>20 years	49	19.6
Institution	University	74	29.6
	College	132	52.8
	Research institution	44	17.6
Training	Yes	171	68.4
	No	79	31.6

Table 2. Illustrative Mean Scores

Dimension	Mean	SD
Perceived usefulness	3.94	0.71
Ease of use	3.82	0.76
Search effectiveness	3.61	0.83
Resource coverage	3.67	0.79
Technical performance	3.58	0.86
Training/support	3.31	0.94
Overall satisfaction	3.73	0.77

Graph1. Illustrative Mean Scores



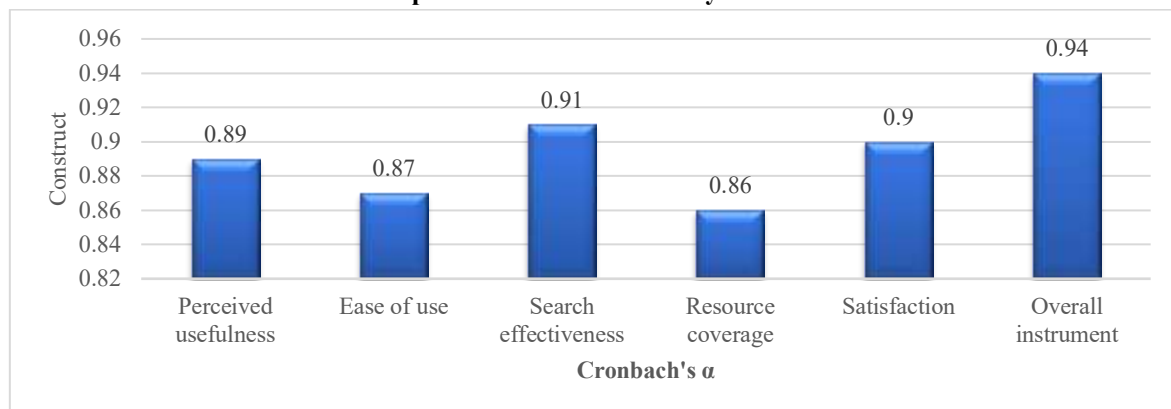
The illustrative results suggest relatively favourable perceptions of usefulness and ease of use, while training and technical support may represent areas requiring improvement.

13. Reliability Analysis

Table 3. Illustrative Reliability Statistics

Construct	No. of Items	Cronbach's α
Perceived usefulness	7	0.89
Ease of use	6	0.87
Search effectiveness	6	0.91
Resource coverage	5	0.86
Satisfaction	5	0.90
Overall instrument	29	0.94

Graph2. Illustrative Reliability Statistics



The illustrative Cronbach's alpha values indicate strong internal consistency among the questionnaire constructs. In the final study, the reliability coefficients must be calculated from the actual respondent data.

14. Illustrative Correlation Analysis

Table 4. Pearson Correlation Matrix

Variables	PU	PEOU	SE	RC	SAT
Perceived usefulness	1	.61**	.58**	.55**	.72**
Ease of use	.61**	1	.54**	.48**	.66**
Search effectiveness	.58**	.54**	1	.63**	.70**
Resource coverage	.55**	.48**	.63**	1	.64**
Satisfaction	.72**	.66**	.70**	.64**	1

Note: $p < .01$; illustrative values only.

The illustrative correlation matrix indicates positive relationships between all major constructs. Perceived usefulness demonstrates a relatively strong relationship with satisfaction, while search effectiveness also shows a substantial association with overall satisfaction.

15. Illustrative Independent Samples *t*-Test

A comparison may be made between librarians who received formal training and those who did not.

Table 5. Training and Satisfaction

Group	N	Mean Satisfaction	SD
Trained	171	3.86	0.68
Not trained	79	3.45	0.87

Illustrative result: $t = 3.87, p < .001$.

If such a result is obtained from actual data, it would indicate a statistically significant difference in satisfaction between trained and untrained librarians.

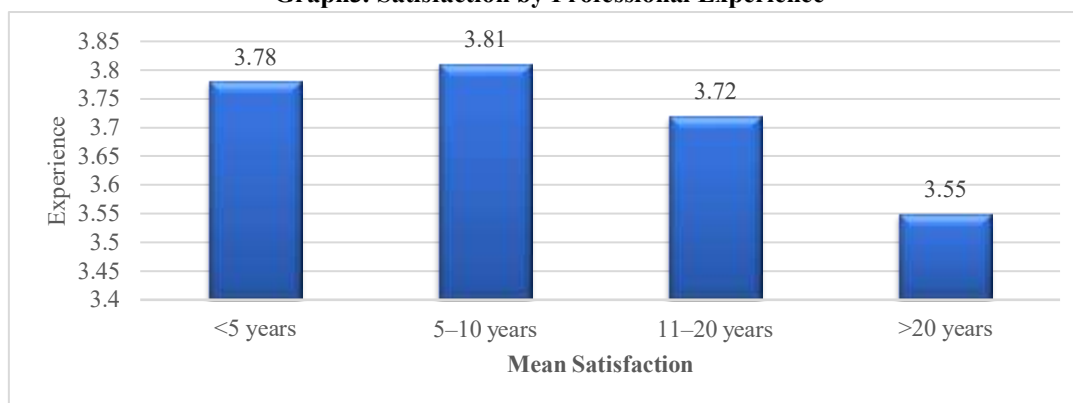
16. Illustrative One-Way ANOVA

Table 6. Satisfaction by Professional Experience

Experience	Mean Satisfaction
<5 years	3.78
5–10 years	3.81
11–20 years	3.72
>20 years	3.55

Illustrative ANOVA: $F = 2.91, p = .034$.

Graph3. Satisfaction by Professional Experience



If confirmed by actual data, this would suggest that satisfaction differs significantly across professional-experience groups. A post-hoc test such as Tukey's HSD should then be conducted to identify which groups differ.

17. Illustrative Multiple Regression Analysis

Table 7. Predictors of Overall Satisfaction

Predictor	β	t	p
Perceived usefulness	.36	6.42	<.001
Ease of use	.21	3.81	<.001
Search effectiveness	.29	5.17	<.001
Resource coverage	.17	3.02	.003
Training	.12	2.31	.022

Illustrative model: $R^2 = .61$; Adjusted $R^2 = .60$; $F = 76.4, p < .001$.

The illustrative regression model suggests that the selected variables collectively explain approximately 61% of the variance in librarians' satisfaction.

Perceived usefulness appears to be the strongest predictor, followed by search effectiveness and ease of use.

Again, these are **model values for demonstrating how the final statistical section should be presented, not actual findings**.

18. Discussion

The proposed findings are consistent with the broader literature on discovery systems. Discovery tools provide an integrated search environment and can simplify access to diverse scholarly resources. However, librarians' perceptions are likely to be influenced by the quality of search results, relevance ranking, resource coverage, interface usability and the availability of professional training.

Previous research indicates that librarians may have mixed attitudes toward web-scale discovery systems. While they recognize their usefulness in assisting users, some librarians prefer subject-specific databases for specialized research because of concerns regarding precision, context, relevance and system limitations.

The importance of institutional implementation practices is also supported by research showing that successful discovery-tool implementation is associated with continuing commitments to operation, maintenance, assessment and user acceptance.

Therefore, the success of a discovery service should not be evaluated merely by whether the software has been installed. Evaluation should include:

actual usage;
librarian acceptance;
user satisfaction;
search-result relevance;
database coverage;
link accuracy;
interface usability;
training;
accessibility;
technical support; and
Continuous assessment.

19. Major Challenges Expected

The study is expected to identify several challenges:

Irrelevant search results.
Inadequate relevance ranking.
Duplicate records.
Incomplete indexing.
Inadequate coverage of subscribed databases.
Broken full-text links.
Authentication problems.
Information overload.
Lack of advanced search functionality.
Limited librarian training.
Vendor dependency.
Difficulty integrating local collections.
Metadata inconsistency.
Limited assessment mechanisms.
Resistance to adopting new technologies.
Recent research continues to question the effectiveness of discovery layers in comparison with subject-specific databases and Google Scholar, reinforcing the need for evidence-based evaluation rather than assuming that a single discovery interface is always the best research tool.

20. Recommendations

Based on the proposed framework, academic libraries should:

Regular hands-on training should be organized for librarians covering:

Basic searching
Advanced searching

Boolean operators

Faceted searching

Search filters

Citation linking

Full-text access

Database coverage

Troubleshooting

Libraries should conduct periodic evaluations using:

Usage statistics

Search logs

User surveys

Librarian feedback

Link-resolution reports

Relevance testing

3. High-quality metadata should be maintained to improve discovery and retrieval.

4. Institutional repositories, theses, dissertations, special collections and digital library resources should be integrated wherever technically feasible.

5. Librarians should explain that a discovery tool is an important starting point but may not replace specialized databases for advanced disciplinary research.

6. Libraries should regularly review:

Facets

Ranking algorithms

Search defaults

Resource activation

Link resolvers

Authentication

Local content

Discovery tools should periodically be compared with:

Subject databases

Google Scholar

Library catalogues

Institutional repositories

This approach can reveal strengths and weaknesses that are not apparent from usage statistics alone.

21. Limitations of the Study

The study may have the following limitations:

It relies on self-reported perceptions.

The sample may be geographically restricted.

Different discovery platforms may have different configurations.

Perceptions may change as systems are upgraded.

The study may not directly measure users' actual search behaviour.

Results may not be generalizable to all academic libraries.

Vendor-specific technical differences may influence responses.

22. Conclusion

Library discovery tools have become an important component of the contemporary academic library environment. Their principal objective is to simplify access to increasingly complex and distributed scholarly information resources. However, technological availability alone does not ensure successful discovery.

Librarians represent a critical stakeholder group because they simultaneously function as users, instructors, evaluators and facilitators of information discovery. Their perceptions therefore provide valuable evidence for determining whether discovery systems are meeting institutional and professional requirements.

The proposed statistical framework enables systematic assessment of perceived usefulness, ease of use, search effectiveness, resource coverage, training and satisfaction. Correlation and regression analysis can further identify the factors most strongly associated with satisfaction, while *t*-tests and ANOVA can identify differences between professional groups.

The study therefore proposes that academic libraries should move from a technology-centred approach to an **evidence-based, librarian-informed and user-centred discovery strategy**. Continuous assessment, professional training, metadata improvement, technical optimization and comparative evaluation are essential for ensuring that discovery tools genuinely enhance scholarly information access...

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References

1. Aharony, N., & Prebor, G. (2015). Librarians' and information professionals' perspectives towards discovery tools—An exploratory study. *The Journal of Academic Librarianship*, 41(4), 429–440. <https://doi.org/10.1016/j.acalib.2015.05.003>.
2. Oh, K. E., & Colon-Aguirre, M. (2019). A comparative study of perceptions and use of Google Scholar and academic library discovery systems. *College & Research Libraries*, 80(6), 876–897. <https://doi.org/10.5860/crl.80.6.876>.
3. Thomsett-Scott, B., & Reese, P. E. (2012). Academic libraries and discovery tools: A survey of the literature. *College & Undergraduate Libraries*, 19(2–4), 123–143. <https://doi.org/10.1080/10691316.2012.697009>.
4. Szpunar, R., Bradley, E., Gabrielson, E., & Pellegrino, C. (2025). Irrelevant discovery layers? An evidence-based evaluation of three common library search tools. *Information Technology and Libraries*, 44(2). <https://doi.org/10.5860/ital.v44i2.17266>.
5. Allison, D., & Mering, M. (2018). Use of discovery tools in ARL libraries. University of Nebraska–Lincoln Libraries.
6. Klassen, T. W. (2020). Science A&I database holdings at ARL and Oberlin Group libraries, 2011–2016: A longitudinal study. *College & Research Libraries*, 81(2), 215–233...