Effectiveness of Academic Library Research Guides for Building College Students' Information Literacy Skills: A Scoping Review

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Academic librarians invest significant time and effort in developing and maintaining research guides, yet the extent to which these tools effectively support college students' information literacy development remains uncertain. This scoping review aimed to comprehensively examine the existing literature on the effectiveness of academic library research guides in building students' information literacy skills. Following a rigorous screening process of 1,724 publications, 61 studies met the inclusion criteria for analysis. The review reveals that much of the research in this area stems from usability studies and exploratory single site case studies, many of which are characterized by limited methodological transparency and a lack of clearly defined outcomes related to student learning. These findings highlight both the growing interest in evaluating research guides and the need for more robust, outcome-based research that directly examines their impact on information literacy. This review provides a foundation for future studies that seek to assess and improve the pedagogical value of research guides in academic settings.

Introduction

The overwhelming information landscape has presented myriad challenges for society; information overload and increased exposure to mis- and dis-information have made it more important than ever to ensure that universities equip students with information literacy skills (IL). Working to ensure students information literacy has been a longtime concern for academic librarians; however, the need to develop effective IL practices and programs has become increasingly important due to a number of factors, including the damaging persistence of anti-intellectualism (Stewart, 2022); students' rapid evaluative heuristics, which often fail to detect misleading and false information (Wineburg et al., 2022); and increased pressures from employers to align new graduates' critical thinking abilities with workplace and workforce expectations (Head & Eisenberg, 2010; Taylor et al., 2022).

Over the past few decades, academic library research guides have become one of the most widely adopted devices through which librarians and other information professionals

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strive to teach students to navigate, select, locate, and use relevant sources of information for their academic and learning needs (Gardois et al., 2012; Hemmig, 2005; Hennesy & Adams, 2021). Also referred to as pathfinders, finding aids, subject guides, course guides, and topic guides (henceforth referred to as *guides*), guides are typically created for "a subject area, a type of user, a tool, or a class and contain links, videos, and handouts that are intended to help a user access a resource or learn something" (German et al., 2017, p. 162). Born from traditional bibliographic approaches to compiling information, in which librarians presented carefully curated topical collections to guide researchers (Dunsmore, 2002), the first guides were viewed as efforts towards scaling reference services, as "the librarian cannot always help and is not always asked" (Harbeson, 1972, p. 111). Today's guides continue to promote the idea of scalability of researcher support to an ostensibly global audience. In addition to their potential to educate en masse, numerous presumed benefits have helped to drive and sustain this approach, including beliefs that: guides attract a user base largely reluctant to seek help from librarians; they train students in fundamental information seeking skills and help introduce them to navigating academic libraries; and they assist in providing training in engaging with scholarly resources (Jackson & Stacy-Bates, 2016). Additionally, guides are considered an efficient and practical means for collaborating with instructors and appending IL into a course that might already be full of content (Kline et al., 2017).

Historically, research guides have enjoyed widespread acceptance as beneficial to learning (Dalton & Pan, 2014). Early proponents lauded their ability to teach information-seeking strategies and support disciplinary research practices, emphasizing the "immediate feedback" provided in real-world searches (Harbeson, 1972, p. 113). Despite this long-held belief in their effectiveness, critical research examining their actual impact lagged significantly. While extensive best practices literature exists on guide design (Goodsett, 2020), it's important to note that these recommendations lack strong underpinnings from actual research on student use. In 2005, Hemmig described a "continuity of pathfinder theory" upholding consistent design and evaluation criteria but could find "no published studies of actual research guide use, using actual research guide users" (p. 84).

This disconnect between assumptions about guide effectiveness, as well as the limited research available, calls for a more critical approach to understanding how students interact with research guides and how these interactions impact their learning. Without a comprehensive overview of guide effectiveness studies, assertions surrounding best practices cannot be validated as there is little to no consensus about content, audience, user engagement, placement, or the effectiveness of these guides for meeting established IL learning outcomes (Hemmig, 2005; J. Lee et al., 2021; Paschke-Wood et al., 2020). As we were unable to locate any other published or in-progress reviews on the effectiveness of guides for learning, the aim of this scoping review was to provide a comprehensive overview of the study design characteristics, evaluation and assessment methods, and a summary of findings regarding the effectiveness of guides in developing or improving the IL skills of college students. Our review was guided by the following research questions: (1) What are the IL-related learning outcomes that are associated with guides? (2) How are guides evaluated or assessed? and (3) What does the existing evidence say regarding their effectiveness at developing or improving the IL skills of college students?

Methods

This scoping review adheres to the Preferred Reporting Items for Systematic Reviews and

Meta-analysis extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018). Following the a priori protocol development guidance from members of the JBI Scoping Review Methodology Group (Peters et al., 2022), we preregistered our review protocol on November 3, 2022 with the Open Science Framework (DeFrain et al., 2022). In our review, we adhered to Arksey and O'Malley's (2005) five-stage framework for conducting a scoping study: research question identification; collection of relevant studies; study selection; data charting; and summarizing results.

Eligibility Criteria

The full inclusion and exclusion criteria (see Appendix A) were structured around the PICOS (Population, Intervention, Comparison, Outcomes, and Study Characteristics) framework (Thomas et al., 2023). Studies were eligible for inclusion if they were guided by an explicit or implied research question regarding the effectiveness of guides for developing college students' IL. Our definition of research was intentionally broad and inclusive: with no expectation that guides be examined in clinical or controlled environments, we sought to consider the full spectrum of "real-world practice" approaches characteristic of learning effectiveness studies (Singal et al., 2014, p. 1). Therefore, we considered any study whose author asserted the work as research or assessment. Our definition of IL was similarly broad. As we were interested in understanding the role that guides play in student learning, rather than a specific model of IL that was associated with any set of guides, we included conceptualizations of IL that were current or historic; individually, institutionally, or professionally generated; and locally or globally defined.

The study population must have included college students and gathered empirical data from or about this population as part of the study's assessment of research guide effectiveness. No publication date limiters were used, as pedagogical interest in and critiques of library guides go back decades (Vileno, 2007), and the purpose of guides as providing introductory academic research training has been an historically consistent objective (Dalton & Pan, 2014). Although the scalability of online dissemination can remove barriers to access, whether the content is delivered physically or virtually does not inherently alter its effectiveness for learning (Bowen, 2014); therefore, we included studies of online and print-based, guides. We did not actively limit results to any language, however the publications indexed within the included databases are predominately written in English, and, as we explain later, we ultimately made the decision to exclude the few non-English language studies found due to our own language limitations.

Information Sources

We searched five scholarly databases for comprehensive coverage and broad disciplinary representation: Academic Search Premier (EBSCO, multidisciplinary); APA PsycINFO (EBSCO, psychological and behavioral sciences); ERIC (ProQuest, educational research); LISTA (EBSCO, library and information science); Web of Science Social Sciences Citation Index (Clarivate). We searched three additional databases to capture relevant grey literature or in-progress works: Dissertations & Theses Abstracts & Indexes (ProQuest); EdArXiv; and LIS Scholarship Archive (LISSA). Full electronic search strategies for each of the included databases can be viewed in the preregistered protocol (DeFrain et al., 2022). The first search was conducted January 4, 2023, and rerun on January 12, 2024.

Selection of Sources

All citations were imported into Zotero, and citation metadata manually checked by a student research assistant for accuracy and completeness. Duplicates were automatically removed when imported into Covidence systematic review software, with an additional 19 manually removed during subsequent screening stages.

Two screeners worked in duplicate during both title and abstract and full text review stages applying the predetermined inclusion and exclusion criteria. Disagreements or discrepancies between screeners were resolved by discussion with the full research team. Once the initial corpus of literature was reviewed, the citations of included studies were scanned for additional literature that may not have been captured in the initial searches. Although this snowball search practice has been critiqued as a possible source of introduced bias (Vassar et al., 2016), when conducted carefully, hand searching can still be a valuable method for locating literature from outside a review's named databases (Craane et al., 2012). An additional 65 possible studies were discovered after duplicate studies were removed. These studies were then screened using the same multi-stage review techniques with two independent reviewers, adding a total of 12 studies into the final data extraction stage.

Data Charting Process

Through several iterations, we developed a data charting table in Covidence to gather study characteristics aligned with our original research questions. We used the Template for Intervention Description and Replication (TIDieR) checklist to improve completeness in the reporting of interventions in research studies (Hoffmann et al., 2014). Table 1 presents our approach to data charting and the features we considered necessary for identifying, summarizing, and mapping the outcomes, evidence, and effectiveness findings from the entire body of literature analyzed in this review. Two independent screeners charted study characteristics for each item meeting the inclusion criteria, and we worked as a team to resolve discrepancies.

Summary of Results

We followed a narrative review approach to describing and summarizing the body of studies in this review (Arksey & O'Malley, 2005). By gathering standard information from each individual study in a uniform way, we were able to identify dominant practices, novel approaches, and significant gaps. Our summary also includes basic numerical distributions of the studies aligned with our original research questions.

Critical Appraisal

As this scoping review sought to identify and compile the entire body of evaluation of guide literature, we did not critically appraise individual sources of evidence for methodological rigor nor evaluate claims. Because of this practice, it should not be assumed that the effectiveness findings reported by study authors can be understood as valid evidence towards the overall effectiveness of guides for learning.

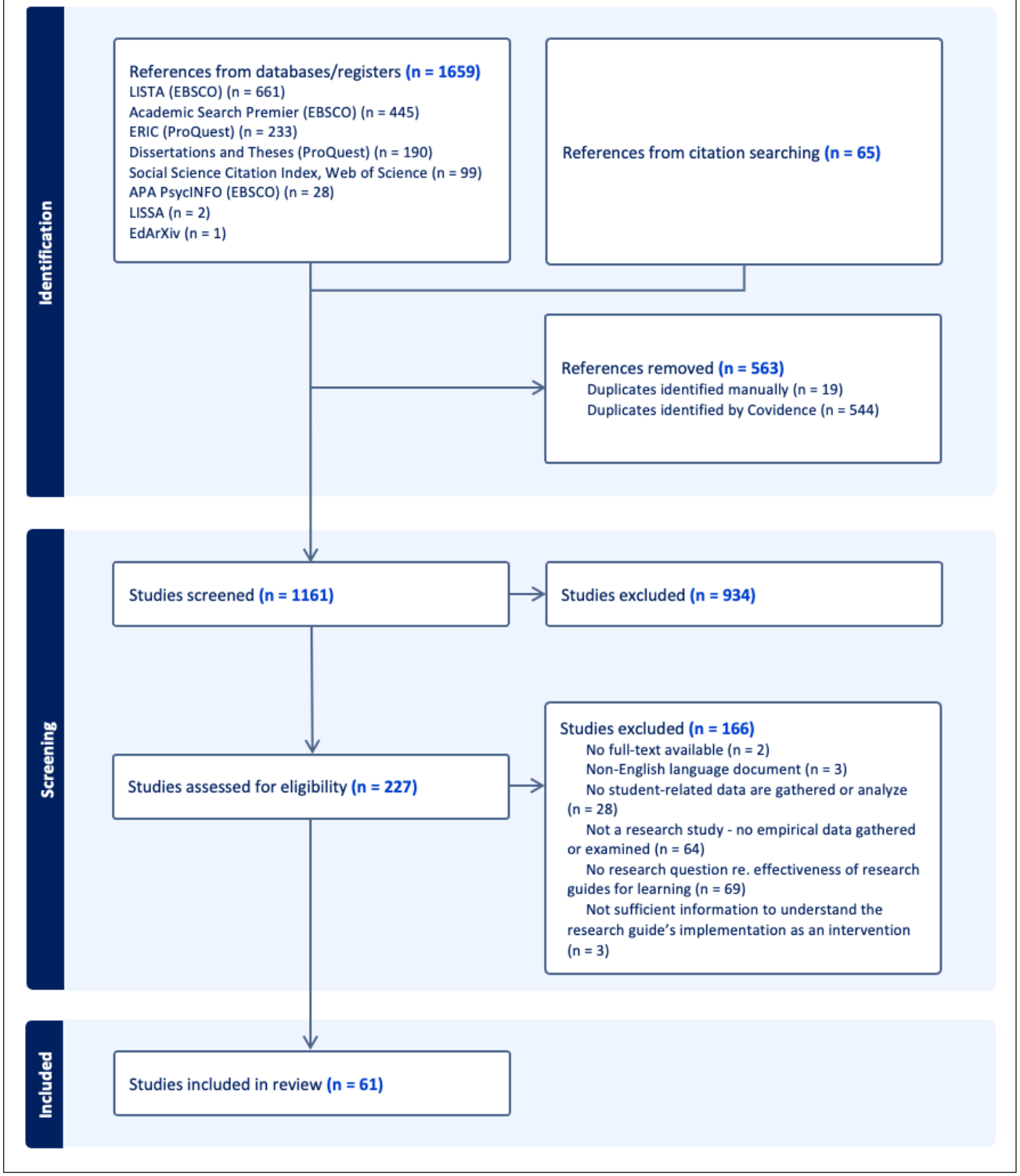
Results

The PRISMA flow diagram (see Figure 1) illustrates the search results and study selection process for each stage of screening. A total of 1,724 records were located through database and hand citation searching, 563 of which were identified as duplicates and removed. The review team screened titles and abstracts of 1,161 records, excluding 934 as irrelevant. During

TABLE 1
Explanation of Data Charting Process Aligned with Research Questions

Research Question	Field	Definition	Field input options
What are the IL-related learning outcomes associated with research guides?	Study purpose	Overall goal or reason for the study or publication	Open text
	Theory or framework	Knowledge systems or beliefs held by authors that assumed the validity of their study	Open text
	Outcomes measured	IL-related behaviors, attitudes, goals measured by authors	Open text
How are research guides evaluated or assessed?	Study location	Country where study was conducted	Open text
	Investigatory foci	Subject of study associating guides with learning	Usability; usage; satisfaction; utility; evidence of learning
	Guide integration	Type of guide and its use as intervention / within educational setting	Subject guide Course guide Embedded into LMS Supplemental to library instruction Print-based Other:
	(N) Population	Study sample / participant characteristics	Open text
	Data sources	Data gathered or provided as evidence; marked if used as pre/post	Survey; Web stats; Test performance; Usability testing; Assignment performance; Interviews; Citation analysis; Focus group; Content analysis Other:
	Study funding	Grants, awards, or internal funds supporting study	Yes; No; N/A
What does the existing evidence say regarding their effectiveness at developing or improving IL skills of college students?	Findings	Directionality of findings re. learning effectiveness	Positive; neutral; negative; mixed
	Explanation	Authors' explanation of findings	Open text
	Limitations	Study weaknesses per study authors	Open text

FIGURE 1
PRISMA Flow Diagram



full text screening, the study team sought 227 publications for consideration, although they were not able to retrieve the full text for two articles. The study team excluded an additional 164 studies during this stage, with 69 removed because no relevant research questions were expressed, and another 64 deemed as non-research. A total of 61 studies were determined as meeting the criteria for inclusion in the study (see Appendix B).

TABLE 2 Publication Characteristics of included Studies (N = 61)			
Publication decade	1970s	1	1.6%
	1980s	2	3.3%
	1990s	1	1.6%
	2000s	7	11.5%
	2010s	40	65.6%
	2020–January 2024	10	16.4%
Publication type	Journal article	58	95.1%
	Encyclopedia	1	1.6%
	Report	1	1.6%
	Thesis or dissertation	1	1.6%
Study location	Canada	5	8.2%
	Ireland	1	1.6%
	South Africa	3	4.9%
	Tanzania	1	1.6%
	United States	51	83.6%
	N/A	1	1.6%
Funding	Yes	4	6.6%
	N/A	57	93.4%

Characteristics of Sources of Evidence

As shown in Table 2, the full body of studies in the review were published between 1977 and 2023, with the first investigation of guides' helpfulness to its users reported within the entry of "Pathfinders, Library" in the *Encyclopedia of Library and Information Science* (Gardner, 1977). Most studies located were published since 2010, conducted in the United States, and published as journal articles. Only four studies attributed any source of funding in support of the research.

Study Purpose

Thirteen (21.3%) of the publications were conducted specifically to investigate guides as tools for learning (Bisalski et al., 2017; Bowen, 2014; Greenwell, 2016; Hansen, 2014; Hsieh et al., 2014; Lauseng et al., 2021; L. Lee et al., 2003; Y. Y. Lee & Lowe, 2018; Magi, 2003; Miner & Alexander, 2010; Paul et al., 2020; Pickens-French & Mcdonald, 2013; Rothstein, 1989; Stone et al., 2018). For most studies however, the research into the learning effectiveness of guides was a smaller component of a larger investigation. Several studies in this subset focused more broadly on the use and perceptions of guides as one element contributing to the overall value of the library and its services to its users (D. Becker et al., 2017; D. A. Becker et al., 2022; Bowen, 2012; Brewer et al., 2017; Carey et al., 2020; Chiware, 2014; Gerrish & Martin, 2023; Li, 2016; Mubofu & Malekani, 2021; Mussell & Croft, 2013; Tang & Tseng, 2014; Tomlin et al., 2017). Much of the remaining research focused more generally on the creation, use, usability, satisfaction, and preferences for guide design as a means of identifying and justifying their value as tools for learning.

Guiding Theories and Frameworks

Despite the importance of contextualizing and structuring research according to a methodological foundation, thirteen (21.3%) of the studies did not explicitly situate their examinations within any identifiable theory or guiding frameworks (Almeida & Tidal, 2017; Archer et al., 2009; Barker & Hoffman, 2021; D. Becker et al., 2017; Carey et al., 2020; Daly, 2010; Hsieh et al., 2014; Lauseng et al., 2021; Pickens-French & Mcdonald, 2013; Rafferty, 2013; Rothstein, 1989; Stone et al., 2018; Wharton & Pritchard, 2020). Though IL and other library generated professional standards are central factors in evaluating the effectiveness of library guides as learning tools, only seven (11.5%) of the studies explicitly discuss disciplinarily derived frameworks (D. A. Becker et al., 2022; Bowen, 2012; Gilman et al., 2017; Y. Y. Lee & Lowe, 2018; Little, 2010; Mubofu & Malekani, 2021; Scoulas, 2021). Of the studies published after the 2016 release of the *ACRL Information Literacy Framework*, only one (Y. Y. Lee & Lowe, 2018) discussed how the Framework was used to shape and inform their study.

Several theories and frameworks external to library science were referenced, echoing Lee and Lowe's (2018) drawing upon "decades of research on how students learn and impediments to learning … [especially] cognitive load theory, how students learn new ideas, and impediments to learning, specifically research anxiety" (p. 207). Eight (Bowen et al., 2018; Fagerheim et al., 2017; Gibbons, 2003; Lierman et al., 2019; Miles & Bergstrom, 2009; Mussell & Croft, 2013; Slemons, 2013; Thorngate & Hoden, 2017) focused on use and usability as a means of guiding their studies. This was seen in Thorngate and Hoden (2017), who wrote "If these guides are to support student learning well, it is critical that they provide an effective user experience" (p. 844). Several referenced constructivist theories (Bowen et al., 2018; Brewer et al., 2017; Hansen, 2014); three considered student mental models (Y. Y. Lee & Lowe, 2018; Leighton & May, 2013; Sinkinson et al., 2012); and two applied the Technology Acceptance Model (D. A. Becker et al., 2022; Sharrar, 2017). Six studies were informed by cognitive load theory (Baker, 2014; Bowen et al., 2018; Y. Y. Lee & Lowe, 2018; Metter & Willis, 1993; Miner & Alexander, 2010; Paul et al., 2020).

Outcomes Measured

Most of the studies measured outcomes regarding student satisfaction, preferences, engagement, and other affective states. Fifty-four (88.5%) of the 61 total studies measured such outcomes, 48 of which focused solely on these emotional outcomes. Forty-one (67.2%) included a question asking students whether they found guides helpful to their research needs. Fourteen (23.0%) studies explored knowledge and skills more directly related to IL outcomes (Archer et al., 2009; Bisalski et al., 2017; Bowen, 2014; Bowen et al., 2018; Greenwell, 2016; Hansen, 2014; Hsieh et al., 2014; Lauseng et al., 2021; L. Lee et al., 2003; Y. Y. Lee & Lowe, 2018; Miner & Alexander, 2010; Rafferty, 2013; Soskin & Eldblom, 1984; Stone et al., 2018). These studies generally sought to associate guide use with test performance and course grades, where outcomes included students' ability to find and use primary resources (Archer et al., 2009), students' self-reported skills on an exam (Bisalski et al., 2017), and knowledge checks testing students' advanced search techniques, such as understanding of Boolean searching (Bowen, 2014; Greenwell, 2016; Hsieh et al., 2014; Lauseng et al., 2021; L. Lee et al., 2003; Soskin & Eldblom, 1984).

At least one study reported challenges in setting measurable outcomes. Archer et al (2009) began their study as an evaluation of a guide's effectiveness for developing primary source research skills, but ultimately shifted when they struggled to operationalize relevant learning

outcomes: "As we interacted with the students and analyzed the results over the following months, it became clear that the most important outcome of the study was not so much what it told us about the effectiveness of the guide but rather how it helped clarify our understanding of what constitutes primary source literacy" (p. 411).

Investigatory Foci

We found that guide investigations could be characterized according to five central foci: usability (can students use the guides?); usage (do students use the guides?); satisfaction (do students like the guides?); utility (do students consider the guides useful?); and evidence of learning (are the guides effective tools for learning?). Though the latter two categories are most explicitly relevant to the scope of this review, the preceding foci were included when study authors directly tied approaches to findings associated with learning effectiveness. For example, Almeida and Tidal (2017) equated usability with learning by explicitly connecting "design features with cognitive practices" (p. 64); Barker and Hoffman (2021) concluded their review of the literature on usability studies by stating, "How well students are able to use guides has a direct impact on their ability to learn" (76); Smith (2007) suggested his meta-assessment model made it possible to associate web usage stats with student learning engagement, stating, "Ideally, it would be nice if everyone became fully engaged in each guide's content each time they visited, but the analysis model is still applicable even if they do not" (p. 91); and Hansen (2014) called students' perceptions "vital for developing [guides] into a successful learning tool" (p. 16).

Fourteen (23.0%) of the studies had a singular focus (Baker, 2014; Barker & Hoffman, 2021; Cobus-Kuo et al., 2013; Courtois et al., 2005; Dotson, 2021; Griffin & Taylor, 2018; Hsieh et al., 2014; Lierman et al., 2019; Miles & Bergstrom, 2009; Miller, 2014; Rafferty, 2013; Slemons, 2013; Soskin & Eldblom, 1984; Thorngate & Hoden, 2017), where the remainder employed two or more, including one that integrated all five (Bowen, 2014). Investigations focusing on guide usage were the most common (n = 37), followed by utility (n = 35), satisfaction (n = 31), usability (n = 17), and evidence of learning (n = 15).

Though mixing of investigatory foci is frequent throughout the included studies, not all areas of study are valued by all authors, and skepticism over other approaches is common. Griffin and Taylor (2018), for example, seem to argue against the controlled environment of usability studies in favor of gathering analytics data to understand "actual user patterns rather than idealized or hypothetical users" (p. 157). Similarly, Lee and Lowe (2018) criticized usability studies of guides as only gauging a student's ability to navigate, ignoring learning, writing:

> students can apply filters in databases for scholarly sources by checking a box without knowing what a scholarly source is … the findings of this study demonstrate that database navigability alone is not sufficient to improve students' learning experience as well as their interaction with the guide and resources linked from the guide (p. 223).

Library Guide Educational Integrations

Throughout the studies we reviewed, guides were introduced into educational settings in several ways. Most studies investigated guides created and delivered as online subject or course guides. Only five studies considered students' use of print-based guides, two of which (Magi, 2003; Mahaffy, 2012) looked at differences between the two mediums. The use of guides to

supplement library instruction was examined by several researchers (Archer et al., 2009; Hansen, 2014; Hsieh et al., 2014; L. Lee et al., 2003; Leighton & May, 2013; Magi, 2003; Miller, 2014; Olshausen, 2018; Rafferty, 2013; Soskin & Eldblom, 1984; Wharton & Pritchard, 2020). Soskin and Eldblom (1984) conducted a study to determine the effectiveness of a "Guide to Writing the Term Paper" sheet that was designed to "partially fulfill the bibliographic instructional objective [of helping] students locate sufficient quality information on their industries" (p.13). After concluding from their literature search that embedded guides were more likely to be used, Leighton and May (2013) developed a survey instrument to determine the helpfulness of a guide that was created to support students in a business class.

In tandem with research into the effectiveness of guides as supplements to instruction, many researchers devoted time to assessing how the placement of guides impacts students' learning and use of library resources. Several (Daly, 2010; Dotson, 2021; Gibbons, 2003; Gilman et al., 2017; Murphy & Black, 2013; Pickens-French & Mcdonald, 2013; Wharton & Pritchard, 2020) explore the function and effectiveness of guides that are embedded into campus learning management systems. In response to survey results suggesting library resources were underused, Duke University librarians looked to embedding guides into the campus learning management system in part because it "was obvious to librarians that students enrolled in courses with a research component could benefit from increased collaboration with librarians" (Daly, 2010, p. 209). In another study, Bowen (2012) uses responses to student survey data to argue that placing guides within the campus learning management system makes connections that "include improved learning and quality-of-research benefits to students, higher quality coursework turned in to instructors, and a maximized return on the investments a university makes in its library resources and its LMS" (p. 461).

Participants and Populations

Sample characteristics, including sample size, age, gender, or other demographic details of the participating populations in the studies, were inconsistently documented. Most offered only that their data came from "students," or perhaps a mix of groups, such as undergraduates, graduates, and distance students. Fifteen studies involved students enrolled in specific courses or programs (Baker, 2014; Brewer et al., 2017; Chiware, 2014; Hansen, 2014; Hsieh et al., 2014; L. Lee et al., 2003; Leighton & May, 2013; Magi, 2003; Miller, 2014; Miner & Alexander, 2010; Mussell & Croft, 2013; Rafferty, 2013; Soskin & Eldblom, 1984; Stone et al., 2018; Tang & Tseng, 2014). Additional demographic characteristics were equally underreported. Eight (D. A. Becker et al., 2022; Bisalski et al., 2017; Bowen, 2014; Carey et al., 2020; Greenwell, 2016; Mussell & Croft, 2013; Scoulas, 2021; Soskin & Eldblom, 1984) offered details on the gender makeup of their participants, and two offered sample information regarding race or ethnicity (Carey et al., 2020; Scoulas, 2021). Several others purposely opted not to gather such details deeming them irrelevant (Hansen, 2014; Lauseng et al., 2021; Y. Y. Lee & Lowe, 2018), and one did not summarize sample demographics despite gathering them via their survey (Thorngate & Hoden, 2017).

When sample sizes were provided, they ranged from five to 1,303, where smaller samples were more often from usability and qualitative studies involving interviews or focus groups, and larger samples captured data from student surveys. Eight of the 61 studies did not include any details on the number of participants in their study, however four of those were examinations of website traffic in which the populations were more generally associated with the college student population at large (Dotson, 2021; Griffin & Taylor, 2018; Slemons, 2013; Smith, 2007).

TABLE 3
Data Sources Identified in Library Guide Effectiveness Studies

Data source	Total studies	Single data source	Pre/Post
Survey	40	16	5
Website traffic	22	5	1
Test performance	17	2	5
Usability testing	10	5	1
Assignment performance	7	0	1
Interviews	6	1	0
Citation analysis	4	1	0
Focus group	4	0	0
Content analysis	1	0	0
Total	**111**	**30**	**13**

Note. Total studies value exceeds *N*=61 as most studies used multiple data sources

Data Sources

There were nine sources of data gathered or evaluated in the included studies (see Table 3). Most relied upon results from survey data (65.5%), either solely or in combination with other data sources. Quantitative data, such as from website traffic and test performance, were frequently considered alongside qualitative data from interviews and focus groups, indicating a preference towards data triangulation and mixed methods overall.

Data were primarily gathered using self-developed instruments, where only three studies reported on validation or reliability measures (Almeida & Tidal, 2017; Greenwell, 2016; Stone et al., 2018), and five referred to using commercially developed or standardized instruments (Bowen et al., 2018; Gilman et al., 2017; Murphy & Black, 2013; Sharrar, 2017; Tang & Tseng, 2014). Ten studies used data sources to gather pre/post measures (Archer et al., 2009; Barker & Hoffman, 2021; Bowen, 2014; Dalton & Pan, 2014; Hansen, 2014; Hsieh et al., 2014; L. Lee et al., 2003; Magi, 2003; Sinkinson et al., 2012; Stone et al., 2018).

TABLE 4
Overall Findings Relating to Guide Effectiveness

Directional	N
Positive	23 (37.7%)
Neutral	9 (14.8%)
Negative	3 (4.9%)
Mixed	26 (42.6%)
Total	**61**

Effectiveness Interpretations

Study authors' conclusions on the effectiveness of guides for learning varied, falling into four categories: positive, neutral, negative, or mixed (see Table 4). However, deciphering their interpretations of "effectiveness" proved challenging due to the broad scope of most investigations. Notably, few studies explicitly outlined their expectations for how guides might influence student learning, or the potential benefits they might offer. Only six studies (9.8%) employed a priori hypotheses or assumptions to guide their inquiry (Brewer et al., 2017; Greenwell, 2016; Griffin & Taylor, 2018; Hsieh et al., 2014; Magi, 2003; Sharrar, 2017), while the remainder lacked clear benchmarks against which to assess impact.

Of the 23 studies reporting positive findings, 17 were at least partially derived from affective measures gathered via student surveys (Baker, 2014; D. A. Becker et al., 2022; Bowen, 2012; Daly, 2010; Gardner, 1977; Gibbons, 2003; Gilman et al., 2017; Greenwell, 2016; Lauseng et al.,

2021; Li, 2016; Little, 2010; Metter & Willis, 1993; Paul et al., 2020; Rothstein, 1989; Sharrar, 2017; Stone et al., 2018; Wharton & Pritchard, 2020). When asked, students in these studies reported high satisfaction with guide content, or indicated that guides were helpful, relevant, or useful for their academic needs. In these studies, rates of satisfaction were resoundingly high. For example, Rothstein's (1989) study reported that 90% of the 77 survey respondents were satisfied with the research guides developed for their specific topics, and Daly's (2010) reported survey results found that "89 percent of the 106 respondents reported that course-specific guides were 'somewhat useful' or 'very useful' for their research" (p. 212). In Greenwell's (2016) study, the pre/post testing data yielded no significant differences, and these results were not considered in the discussion section. Rather, the author selected student survey results as evidence of guide effectiveness, where 83.9% of the 112 students surveyed reported that the guide was valuable and made it easier for them to locate resources for their assignments.

Not all studies of student perceptions reported such positive results, however (Courtois et al., 2005; Mubofu & Malekani, 2021; Mussell & Croft, 2013; Ouellelte, 2011; Pickens-French & Mcdonald, 2013; Scoulas, 2021). Courtois et al. (2005), for example, embedded a single question—"was this guide helpful?"—into all library guides for one semester. Of the 210 anonymous responses gathered, 52% rated guides as "Somewhat" to "Very Helpful," while 40% rated them as "Not Helpful" or "A Little Helpful." Some differentiation in satisfaction levels according to student characteristics were also revealed, such as in survey results from Scoulas (2021) suggesting that STEM students valued guides significantly less than non-STEM students, and nearly 70% of 33 distance students surveyed by Mubofu and Malekani (2021) study expressed feeling neutral or dissatisfied with research guides overall.

In examining the data presented regarding user perceptions, we found that across several studies, students frequently expressed high satisfaction with the guides while simultaneously indicating their own limited engagement with or need for them (Bisalski et al., 2017; Chiware, 2014; Leighton & May, 2013; Magi, 2003; Ouellelte, 2011; Rothstein, 1989; Sharrar, 2017; Tomlin et al., 2017). In Chiware's (2014) study, for example, though guide ratings were generally positive, a "significant number of students reported that they simply felt they did not need them" (p. 31). For example, Sharrar's (2017) summative usability study recorded the highest overall mean of 5.96 on a seven point Likert scale based on 47 undergraduate student survey responses to "It would be a wonderful idea for undergraduates to use library course pages," whereas questions regarding students' own intent to use guides received the lowest mean score of 4.49. Similarly, in Rothstein's (1989) survey, the students who responded negatively to research guides developed for them through a Term Paper Clinic still advocated for the service: "even those few students who had some doubts or denials about its value to themselves felt that the Clinic should be continued on behalf of others" (p. 279).

Usage reports led three study authors to reconsider the effectiveness and overall purpose of their guides (Griffin & Taylor, 2018; Mahaffy, 2012; Mussell & Croft, 2013). Despite early assumptions that student researchers were independently discovering and engaging with guide content, Griffin and Taylor (2018) failed to find evidence of this when exploring use. Interpreting high bounce rates as students hurrying to accomplish specific tasks, they advocated against "verbose, exhaustive library guides harkening back to the pathfinders of old" (p. 158). Four additional studies shared similar guidance in advocating against the type of pathfinder guides that point students towards lengthy lists of resources (Baker, 2014; Hansen, 2014; Hintz et al., 2010; Leighton & May, 2013). In Baker's (2014) comparative study of pathfinder guides

versus more instructional ones, they were surprised to find that most of the students enrolled in two First-Year Experience courses "reported a more positive learning experience with the tutorial guide and they were able to complete the assignment more quickly and with better results" (p. 114). This was echoed in Hintz et al.'s (2010) findings, where their survey of 55 students indicated "that they did not want to simply be pointed to a resource; they wanted to be told how best to make use of it" (p. 46).

Low evidence of use or engagement was not always interpreted as a need to change. Although the earliest study included in this review discontinued its pathfinder program due to low use (Gardner, 1977), several remained optimistic that an audience would be found (Dotson, 2021; Hsieh et al., 2014; Leighton & May, 2013; Magi, 2003; Miner & Alexander, 2010; Murphy & Black, 2013). This hope that students' curiosity could someday be piqued by guide content was relied upon as justification to continue investing tremendous amounts of time in developing and maintaining large numbers of guides. For example, despite much lower use than anticipated of the library guides created for 460 courses, Dotson (2021) concluded, "the hope is students will see specific items relevant to their course and explore more. They will use the ebooks and/or videos to better understand concepts and to explore search tools to go beyond these sources … Perhaps students will even bring up these sources with their instructor" (p. 256).

Students' struggle with or resistance to effectively using, applying, or transferring guide-based content was documented in several studies (Bisalski et al., 2017; Griffin & Taylor, 2018; Hansen, 2014; Magi, 2003; Mahaffy, 2012; Ouellelte, 2011; Soskin & Eldblom, 1984). In one study (Hansen, 2014), post-test data showed the international student participants were aware of expectations surrounding use of scholarly sources and could easily locate them, but unintuitive database interfaces and cumbersome search practices, including the use of Boolean logic, created frustrating barriers. In the words of one student, "'Before I [did] the library research, I only use the Google to do the research because it is very comfortable and convenient, especially using the Wikipedia. But after I knew how to use the library research, our teacher just ask us to use the library research and it's too difficult for an international student'" (p. 66). In another study, despite substantial time spent training students on course guide resources, when analyzing the number of sources cited in their subsequent research projects, Magi (2003) discovered that most students "relied heavily on free World Wide Web sites not demonstrated or recommended by the librarian" (p. 683). Soskin and Eldblom (1984), in their examination of 23 economics students' papers gathered during one fall semester, concluded that while the papers receiving higher scores cited more resources, it was the students' ability to analyze the information that influenced their overall score (p. 18). They also expressed concern that the students' skills transfer would be inhibited by the search strategies outlined in the guides, writing, "Although the flow-chart type of guide has the advantage of being economical of students' time, it has the potential disadvantage of prescribing a search strategy so narrow that generalization to future information seeking may be difficult" (p. 20).

Limitations Identified in the Studies

Twenty (32.8%) of the 61 studies did not identify any limitations or weaknesses regarding their research design or conduct that could influence outcomes and interpretations of the research. Thirty-three (54.1%) expressed limitations relating to the sample used for the research, with 16 studies identifying limitations due to a small participant pool (D. Becker et al., 2017; D. A.

Becker et al., 2022; Bisalski et al., 2017; Bowen, 2014; Bowen et al., 2018; Brewer et al., 2017; Carey et al., 2020; Cobus-Kuo et al., 2013; Gerrish & Martin, 2023; Hintz et al., 2010; Lauseng et al., 2021; L. Lee et al., 2003; Little, 2010; Mahaffy, 2012; Slemons, 2013; Stone et al., 2018). Other limitations included experimenter effect (Lierman et al., 2019), poor study design (Courtois et al., 2005), participants failing to follow instructions (Hsieh et al., 2014), and results being non-generalizable due to several circumstances (Bowen, 2014; Mubofu & Malekani, 2021; Ouellelte, 2011; Rothstein, 1989; Thorngate & Hoden, 2017).

Discussion

What are the IL Related Learning Outcomes Associated with Guides?

When we began this study, we expected that most learning outcomes associated with guides would be directly aligned with guide objectives, and therefore reflect traditional IL behaviors, skills, and dispositions around information acquisition and use. For example, for subject guides introducing students to disciplinary research practices, we expected to see learning outcomes surrounding dispositional knowledge acquisition. For course guides created to support completion of research assignments, we anticipated learning outcomes indicating how well guides assisted students in this work, including details on specific resources and strategies. While a smaller but noteworthy group of studies did present learning outcomes on knowledge and skills development related to IL, the majority focused instead on student satisfaction, preferences, and engagement.

Although understanding students' experiences remains crucial, it should be complemented by assessments of how guides translate into tangible learning outcomes more directly relevant to learning goals of guide creators. This could involve incorporating IL frameworks, utilizing learning objectives aligned with specific courses, or employing knowledge-based assessments beyond simple satisfaction surveys. That nearly a quarter of studies lack an explicit theoretical foundation—and even fewer point to professional frameworks such as the *ACRL Information Literacy Framework*—is striking, and points to the difficulties practitioners continue to face in trying to apply and assess IL concepts overall. Ultimately, a richer understanding of guides' influence on both immediate user experiences and long-term learning can be achieved through a more nuanced approach to outcome evaluation, embracing both affective and knowledge-based measures.

How are Guides Evaluated and Assessed?

There is no one way to evaluate learning, and the broad spectrum of approaches to guide assessment featured in this review reflects that. For the most part, guide evaluations are exploratory and open-ended. While study authors value mixed methods, often triangulating qualitative student feedback with quantitative website traffic statistics, very few control groups or baseline measures are used as comparators. Data are most often gathered to help practitioners quickly assess guide use and usefulness to students, where data are used to identify areas needing improvement. As such, evaluation practices are most often quick and simple, and rely on data that are easy to access, obtain, and understand: Surveys capture learner preferences and attitudes, web statistics reveal use and interaction, and usability observations are largely used to refine guide design. That most studies were published 2010 and later aligns with the transition to online technologies, including the 2007 release of SpringShare's LibGuides platform (Lilly, 2022). Where assessing use of physical pathfinders was limited to

observational and circulation data, access to web traffic data presented easy access to gauge site visits, resource selection, and user engagement.

Of note is that guide evaluation often does not require participation or support from course instructors. This is a pattern that is seen in the practice and implementation of guides within educational settings in these studies overall: although several studies provide details demonstrating highly participatory collaborations with course instructors, most of the studies indicate practices that occur with little to no instructor support or even awareness of the study. Though we did not gather enough information from the studies during our charting to fully characterize the nature and depth of librarian/instructor partnerships, the invisibility of guide assessment paints an uncomfortable picture that also keeps librarians at an arm's length from data that could otherwise be used to measure more higher order thinking skills.

Given the small number of studies that identified any source of funding, it's likely that this lack of financial support signals other resource barriers inhibiting more rigorous investigations. This is not a limitation unique to studies of library guides, but rather a common barrier experienced by librarian practitioners (Clapton, 2010; Smigielski et al., 2014). In Oakleaf's (2010) critique of library assessment research that formed the basis of the *Value of Academic Libraries* project, she acknowledged that while conducting rigorous research is out of reach for many practitioners, rigorous assessment is still critical and "should be well planned, be based on clear outcomes …, and use appropriate methods" (p. 31). Assessment activities are clearly valued within the profession, yet without funds, time, resources, and methodological training, it is difficult to conduct this work. Even a small amount of funding could help offset barriers to conducting research aimed at enhancing pedagogical successes.

What Does the Evidence Say?

This scoping review paints a complex picture of the effectiveness of library research guides in supporting student learning. While a significant number of studies highlight positive user perceptions, with students expressing satisfaction and finding guides helpful or relevant, the interpretation of "effectiveness" remains ambiguous due to the lack of clearly defined expectations or benchmarks for impact assessment. Notably, only a small portion of the studies employed specific hypotheses or assumptions, leaving the majority without clear measures to evaluate the guides' influence. This ambiguity is further compounded by the fact that very few study authors revealed limitations affecting their studies.

Though guide evaluations are primarily conducted to understand students' learning experiences in highly specific circumstances, effectiveness findings are often shared in ways that suggest broad applicability. Unfortunately, underreporting of sample demographics and study conditions poses a significant challenge to the robustness and generalizability of these studies. Without details on the participants in the study, it becomes difficult to understand whether the findings are being associated with all student populations or only specific subgroups, such as first-year undergraduates or graduate students. Without this crucial information, the findings remain incomplete and their applicability uncertain. To understand the impact of guides, researchers must strive for more comprehensive reporting of sample demographics, allowing for more nuanced interpretations and targeted interventions to cater to the diverse needs of student learners.

Limitations

Although we did not exclude non-English language publications in our search queries, our search terms and the sources of information searched disproportionately privileged English publications. While two non-English language documents provided abstracts in English which we identified as potentially relevant, due to our research team's own language limitations we made the decision to exclude these articles rather than pursue translation services. We did not want to misrepresent this study's scope given our own capabilities and the vastly incomplete representation of global literature that could therefore be discovered or considered. Additional limitations stem from the nature of scoping review methods, especially the possibility that relevant publications were possibly missed or omitted, and that critical appraisal of studies and more focused analysis of study findings are necessary to understand the effectiveness of guides for learning.

Future Directions

Focused Assessment of Learning Outcomes

While it is evident from these studies that guides are used to scale, supplement, and even substitute for librarian instruction, it is unclear what learning outcomes are best supported through these tools. Many studies in this review gathered students' feedback regarding guide helpfulness and satisfaction but given how individualized the guides are in these studies, more work is needed to determine *what* is or is not particularly helpful or satisfying about guides. Without in-depth exploration, it is challenging to understand what elements of research guides are especially beneficial in most contexts. If a student found a guide helpful, what exactly was helpful? If students report being satisfied with a library guide that was created with an instructional goal of increasing students' critical evaluation skills, is their satisfaction enough to conclude that the goal was achieved?

Interrogation of What Constitutes Best Practices

Without clarity, assertions surrounding best practices cannot be validated as there is little to no consensus regarding the effectiveness of these guides for meeting their established learning outcomes. Though we emphasize the need for improved assessment practices and greater attention to the use and impact of learning outcomes in this work, caution is also needed against developing cultures of bean counting, self-surveillance, and perpetual audit. Profession-wide decreed value agendas turn our energy toward anxiously, and often individually, demonstrating value rather than collectively contributing to student learning and uplifting librarian labor (Pagowsky, 2021). Nicholson provides an astute critique of value agendas in librarianship, in stating that "Audit culture creates a misalignment or a gap between our aspirations and our approaches. For example, we continue to rely heavily on quantitative methods, even when these may not be the most appropriate, because they are the most expedient" (2017, p. 17). Instead, Nicholson encourages library professionals to spend "more time inquiring into how students are learning and changing as a result of the time they spend with us and less into their customer satisfaction with these interactions" (2017, p. 19).

Deeper Examination of the Role of Guide Integration in Educational Settings

While this review did identify how guides were integrated—such as those embedded within learning management systems or used as supplemental to librarian instruction—it did not examine the relationship between educational integration and learning effectiveness. While

guides do offer libraries value in terms of scaling and reach, future research should focus on understanding what the limitations are regarding guides as standalone learning tools and whether or in which circumstances librarian instructional presence makes a difference.

Conclusions

The findings from this scoping review of guide effectiveness studies underscores the enormous presence these tools continue to have within academic libraries. The broad range of instructional applications, subjects covered, content included, and design features tested reveals the many, and varied, ways that practitioners have relied upon these guides in their teaching. The data sources relied upon in these studies indicate a valuing of student perspectives and experiences but restrict much of what we can know regarding the effectiveness of guides for deeper learning. More work is needed to identify and understand the factors contributing to students' learning, especially regarding specific populations and user groups and their engagement with and application of the information provided within the guides.

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Appendix A

Eligibility Criteria

Include:

1. Study includes an explicit or implied research question regarding the effectiveness of academic library research guides for college student learning.
2. The research guide must have been directly developed or compiled by an academic librarian or under the oversight of an academic library program or initiative.
3. Empirical data must have been gathered as part of the study's assessment of research guide efficacy or effectiveness.
4. The study population must include college students and provide learning outcomes-related data drawn from or about this population.
5. We are interested in all studies regardless of publication date.
6. It includes explicit or implied learning outcomes relating to any model or operationalization of information literacy.
7. There are no limitations on study design or study type. Study types will include experimental and observational (quasi-experimental, observational, case studies, non-quasi-experimental survey-based) primary studies. These can include peer reviewed articles and high-quality grey literature (e.g., dissertations, white papers, reports, conference proceedings, posters);
8. We will not actively limit results to any language.

Exclude:

1. A research guide cannot be identified as the primary intervention. Excluded from this study would be those in which a research guide is implemented or assessed as part of a broader suite of educational offerings, and the impact of the guide therefore cannot be understood.
2. Excluded from this review are studies investigating the usability or user experience of research guides as related to their functional design, in which no measures relating to student learning are provided.
3. No student-related data are gathered or analyzed. Excluded from this review are studies in which librarians or instructors comprise the sample population and student data were not gathered or assessed.
4. Non-empirical research, such as reflections, perspectives, editorials, opinion pieces, best practices, or professional guidance materials.
5. No sufficient information to understand the research guide's implementation as an intervention, or how its effectiveness for learning was defined or assessed is offered.

Appendix B

Extraction Table Aligned With Research Questions

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Almeida & Tidal, 2017	Identify student design and organizational preferences for guides	design and learning modality preferences	Usability; Satisfaction	Print-based, Subject guide	10 students in two- & four-year programs	Usability testing; interviews	Neutral No best layout identified from users
Archer et al., 2009	Evaluate utility of research guide for primary source literacy	knowledge of primary source literacy	Usability; Evidence of learning	Supplemental to library instruction, subject guide	17 undergraduates from different departments	Pre/Post survey; usability testing	Neutral minimal improvement in students' pre/post-questionnaire definitions of primary sources; students seemed confused over purpose of guides
Baker, 2014	Compare student preferences for pathfinder or tutorial style guides	design, content, and organizational preferences	Satisfaction	Course guide	N/A undergraduate students from 2 first-year experience sections	Survey	Positive students preferred tutorial guide and self-reported improved learning experience
Barker & Hoffman, 2021	Identify student content and design preferences for guides	design, content, and organizational preferences	Usability	Subject guide	18-40 undergraduate students	Pre/Post usability testing	Positive design updates based on first card sort showed improvements
Becker et al., 2017	Determine if and how students engage with the library as part of their studies and determine how well the library supports the academic activities of students	Use and awareness of resources; frequency of use	Usage; Satisfaction; Utility	Subject guide	394 Faculty, grad students and majority undergraduate students	Web stats; interviews; survey	Mixed Unaware of guides in survey, but use data shows that the guides were being accessed
Becker et al., 2022	Overview of institutional LibGuide implementation; assessment of whether creating LibGuides supported the information needs of students	students' perceptions and reported use of guide	Usage; Satisfaction; Utility	Subject guide	28 completed online questionnaire 13 for follow up interview	Survey; focus group	Positive Most students reported library guide to be useful

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Bisalski et al., 2017	Present a case study of pedagogy for implementing online study materials for the ETS MFT-B	self-reported test scores; students' perceptions on effectiveness and usefulness of guide	Usage; Utility; Evidence of learning	Course guide	55 students enrolled in strategic management course	Survey	Mixed about half of students used guide; most preferred internet resources
Bowen et al., 2018	Measure and compare students' use and satisfaction of different guide navigation designs	design, content, and organizational preferences	Usability; Satisfaction; Utility	Course guide	10 stage 1; 14 stage 2 - undergraduate students enrolled in COMM 430 class	Usability testing; Standardized survey	Mixed greater preference shown towards longer version of guide
Bowen, 2012	Describe current approaches and assess the value of placing course-level research guides into an LMS	students' perceptions on effectiveness and usefulness of guide	Usage; Satisfaction; Utility	Embedded into LMS; course guide	63 undergraduates in a communications course	Survey	Positive most students reported that assignment guide was beneficial
Bowen, 2014	Comparing students' performance between LibGuide versus website guide	knowledge-based test and affective measurement survey	Usability; Usage; Satisfaction; Utility; Evidence of learning	Embedded into LMS, course guide	89 undergraduate students enrolled in COMM 132	Pre/Post survey; Pre/ post-test performance	Mixed students able to access materials; both sets of students were confused in answering knowledge-based questions
Brewer et al., 2017	Look at how program level and the timing of the introduction of a Literature Review library guide within the program influenced online business students' perceived value of the resource	reported use and satisfaction with guides; usability and relevance of content	Usage; Satisfaction	Course guide	24 online undergraduate business students and online MBA students	Survey	Mixed students were satisfied and able to use the guide; usability could be enhanced; earlier introduction desired
Carey et al., 2020	Examine students' use, perceptions, and awareness of library guides	use, perceptions, and awareness	Usage; Satisfaction; Utility	Course guide, Subject guide	100 undergraduate and graduate health sciences students	Survey	Mixed Limited general awareness, limited general use; perceived as valuable
Chiware, 2015	Evaluate students' perceptions of a guide / determine how effective guides were in supporting students	use, perceptions, and awareness	Usage; Satisfaction; Utility	Course guide	1303 undergraduate ECON students	Survey	Mixed half of students used guide; most expressed appreciation for guide

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Cobus-Kuo et al., 2013	Investigate student preferences in terms of guide layout, organization, internal navigation, hierarchy, images and video, and content	design, content, and organizational preferences	Usability	Course guide, Subject guide	20 Students in user interface design and development course	Usability testing	Neutral when shown guides, students expect to find library resources, databases most useful, value design consistency across guides, but held differing opinions overall.
Courtois et al., 2005	Gather information on students' satisfaction with guides	single question survey was this guide helpful with 4 possible responses	Utility	Course guide, Subject guide	210 students	Survey	Mixed 40% of respondents rated a guide as Not Helpful or A Little Helpful
Dalton & Pan, 2014	Outlines the overall project management process involved in implementing LibGuides at UCD Library,	use, perceptions, and awareness	Usage; Utility	Course guide, Subject guide	58 students in the main Arts building	Pre/Post survey; Pre/Post web stats; Pre/Post interviews	Mixed low guide use overall
Daly, 2010	Assess the use of both automatically and manually linked Library Guides into the LMS / are guides useful to students' research; should they be embedded?	use, perceptions, and awareness	Usage; Utility	Embedded into LMS, course guide	106 Students who accessed the Library Guides menu item	Survey	Positive majority reported that course- specific guides were somewhat useful or very useful for their research and should be in LMS
Dotson, 2021	Process article of how author used pandemic time to create 460 course guides for his STEM liaison areas and a look at use stats on the guides	use	Usage	Embedded into LMS, Course guide	N/A looked at use stats only	Web stats	Negative data shows low use overall
Fagerheim et al., 2017	Student feedback on library guide design updates	use; design, content, and organizational preferences	Usability; Usage	Subject guide	16 Undergraduate students	Web stats; focus group	Mixed students liked clean layout with consistent template; home tabs highest use stats

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Gardner, 1977	Encyclopedia entry describing history of pathfinder development out of Project Intrex Model Library Program, M.I.T.	perceptions of usefulness	Usage; Utility; Satisfaction	Subject guide	71 users of MIT's Barker Engineering Library	Survey	Positive 48% used pathfinders for course paper research, and all sections of the Pathfinders were used. 90 found pathfinders very helpful or fairly helpful; 10% not helpful
Gerrish & Martin, 2023	Measure success of changes to remote field station library service in response to COVID-19	student willingness to use virtual library services	Usage	Embedded into LMS, subject guide	N/A annual guide stats of undergraduate use gathered 2017–2022	Web stats; instructor interviews	Positive guide visits spiked during pandemic despite fewer research assignments, fewer students, and decrease in reference questions asked
Gibbons, 2003	Pilot study evaluating course guides embedded into LMS	perceptions of usefulness; use	Usability; Utility	Embedded into LMS, course guide	53 students enrolled in 12 pilot classes	Survey; web stats	Positive students reported guides as highly useful to them; web stats showed repeat usage and lengthy engagement
Gilman et al., 2017	Overview of faculty / librarian partnership for developing IL to support first-year agricultural science students	perceptions of usefulness; use; task completion	Usage; Satisfaction; Utility; Evidence of learning	Embedded into LMS, Course guide	N/A First-year agricultural science students in AGRI 116	Standardized survey; web stats; assignment analysis	Positive students reported guides as highly useful to them though no association with assignment completion rates
Greenwell, 2016	Testing an instructional design model by comparing students' performance after using a guide designed using a systems approach with IL Standards as outcomes versus a guide designed using I-LEARN process as framework:	use; information searching behaviors and pathways; source use	Usage; Evidence of learning	Course guide	112 first-year undergraduate students enrolled in seven sections of the same composition and communications course.	Survey; IL skills test; web stats; citation analysis	Positive students find online library research guides valuable for finding sources

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Griffin & Taylor, 2018	Offers a methodology for using quantitative analytics data to evaluate guide usefulness and use	use	Usage	Course guide; subject guide	N/A Primary user population undergraduate and graduate students	Web stats	Negative limited engagement with content overall with little use beyond home page
Hansen, 2014	Examine effectiveness of ESL library guide	IL skills; academic language proficiency; academic research process; perceptions of usefulness	Utility; Evidence of learning	Course guide; supplemental to library instruction	142 ESL undergraduates enrolled in two sections of ESL class	Survey; Pre/ post test performance; focus group; pre/post assignment analysis	Mixed increased awareness of library resources and scholarly source types; no increase in students' ability to effectively use academic research
Hintz et al., 2010	Identify what students want from subject guides	rating of guide comprehension, visual appearance, and content usefulness; reported intention to use a guide	Satisfaction; utility	Subject guide	55 students	Survey	Neutral students want authoritative information and think guide design matters
Hsieh et al., 2014	Quasi-experimental study to assess effectiveness of four approaches to teaching IL skills, one of which required students to preview a librarian created research guide	test scores and performance measures	Evidence of learning	Supplemental to library instruction, Subject guide	107 undergraduate students in required FYW courses	Pre/Post test performance	Neutral No significant gains for research guide group
Lauseng et al., 2021	Measure the impact of the EBM guide on user learning experience and outcomes; and to gather evidence for staffing allocations and for conversion to an OER.	use; knowledge; confidence; perceptions, satisfaction level, recommendations, and future intention of referral	Usage; Satisfaction; Utility; Evidence of learning	Subject guide	119 students 64% and practicing health professionals 23%	Survey; web stats	Positive Participants reported finding what they needed and high satisfaction with guide content

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Lee & Lowe, 2018	Observe students' unmediated and outside of class interactions and learning with either pedagogical or pathfinder style library guides during simulated research assignment	assignment performance; perceived-learning experience; guide interaction and use; IL skills based on Framework	Usability; Evidence of learning	Course guide	22 students from first year to graduate in various majors	Survey; test performance; assignment analysis; usability testing	Mixed no difference on IL skills test; pedagogical guide preferred over pathfinder design
Lee et al., 2003	Evaluate course guides effectiveness for students' immediate information needs	knowledge of library resources	Satisfaction; Evidence of learning	Supplemental to library instruction, Course guide	89 students enrolled in three basic courses	Pre/Post test performance	Positive experimental group performed higher than control group on all questions
Leighton & May, 2013	Describe effectiveness of library instruction and course guide for preparing students for mock appellate exercise	use; perceptions of usefulness	Usage; Utility	Supplemental to library instruction, Course guide	24 undergraduate international business students	Survey; web stats	Mixed Few students used guide resources; most would recommend to a friend
Li, 2016	Evaluate how students use the library resources and services for completing their projects	use of library resources and services for completing projects	Usage; Utility	Course guide, subject guide	N/A undergraduate business students	Survey	Positive Majority of students used library resources to complete their projects, incl. databases 80%, course guides 63.3%, articles 33.3%, subject guides 23.3%, archives 16.7% and books 10%
Lierman et al., 2019	Describes multi-stage usability testing process used during and after migration to LibGuides v2.	design, content, and organizational preferences	Usability	Course guide, Subject guide	6 mix of students	Usability testing; survey	Neutral students grouped content according to type of task e.g. citing sources instead of users e.g. undergrads, athletes

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Little et al., 2010	Share information related to a faculty learning community and their instructional methods for teaching research skills	self-perceptions: ease of navigation; usefulness of info and resources	Usability; Satisfaction; Utility	Course guide	18 graduate students	Survey	Positive Authors conclude survey findings reveal "overwhelming success" of library guide as a tool to support student research
Magi, 2003	Quasi-experimental study comparing students' use of print pathfinder versus web-based research guide in library instruction	self-perceptions of guide usefulness; feelings, opinions, and attitudes; source use	Usability; Satisfaction; Utility; Evidence of learning	Supplemental to library instruction, Print-based, Course guide, Subject guide	84 Undergraduate students enrolled in two sections of first-year business course	Pre/Post survey; citation evaluation	Mixed high satisfaction; low use; no difference in resources used
Mahaffy, 2013	Explores students' independent interactions with research guides	use; design, content, and organizational preferences	Usage; Satisfaction; Utility	Print-based, Course guide	10 undergraduates in ART 101 course	focus groups; web stats	Mixed limited use reported; little familiarity with content
Metter & Willis, 1993	Overview of library handbook project to replace library instruction	Student perceived usability, utility, and satisfaction	Usability; Satisfaction; Utility	Print-based	85 students	Survey	Positive Most students reported greater comfort in using library and would recommend it to a friend
Miles & Bergstrom, 2009	Usability study on effect of the number of subject labels listed on research question response times	Response time to research questions and total number of subject headings	Usability	Other: Participants selected subject label in response to research questions	120 students and staff	Usability testing	Neutral No association between response time and number of subject categories
Miller, 2014	Examines custom library guide creation and use of library resources	course guide resource use and assignment performance	Usage	Supplemental to library instruction, course guide	318 technical college students in English and psychology classes	Web stats	Positive Relationship found between course guide creation and use stats

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Miner & Alexander, 2010	Investigates use of library guides for broad and narrow topics in lower- and upper-division POLI classes	Students' performance on theory papers and current events assignments; guide use	Usage; Evidence of learning	Course guide	75 students in an international affairs and political science course	Web stats; Assignment analysis	Positive Relationship between overall guide use and assignment performance
Mubofu & Malekani, 2021	Explore accessibility of library resources and services to distance learners	satisfaction, use, and access challenges re. library resources	Usage; Satisfaction	Course guide, subject guide	33 distance students	Survey	Mixed Most students reported using the guides but were neutral re. satisfaction with library research guides
Murphy & Black, 2013	Examined use and design characteristics of library guides embedded in LMS	Consideration of promotion, design characteristics, and student preferences for library guides	Usage; Utility	Embedded into LMS, Course guide, Subject guide	100 students	Standardized survey; web stats; content analysis	Mixed more students aware of guides than used them; most students described guides as helpful
Mussell & Croft, 2013	Evaluation of library resource use to aid resource allocation	Use, perceptions, and awareness	Satisfaction; Utility	Course guide, Subject guide	1,038 mix of undergraduate and graduate students	Survey; web stats	Mixed limited use of guides; clear preference for Google; less than half who had used guides found them helpful to essential
Olshausen, 2018	Examine use of course guides outside of classroom	Use, perceptions, and awareness	Usage; Satisfaction; Utility	Supplemental to library instruction, Course guide, Subject guide	5 students	Web stats; interviews	Mixed Little consistency in responses but most said guides seemed valuable
Ouellette, 2011	Qualitative project investigating students' use of and satisfaction with subject guides	Use, perceptions, and awareness	Usage; Satisfaction	Subject guide	11; mix of students from different class levels and disciplines	Interviews	Negative Students don't use guides as unaware, prefer Google, or have info strategies in place
Paul et al., 2020	Case studying examining whether online library guides helped prepare students to meet with reference librarian	student survey on guide usefulness, quiz and discussion post about guide content	Satisfaction; Utility; Evidence of learning	Course guide	30 online graduate students in education doctoral program	Survey; test; assignment analysis	Positive positive responses to design and content; content viewed as valuable

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Pickens-French & McDonald, 2012	Study effectiveness of library guides embedded into CMS	Surveyed students on guide usability and overall satisfaction	Usability; Satisfaction	Embedded into LMS, Course guide	34 undergraduate students in English class	Survey; web stats	Neutral low interest in instructional content; preference for fewer resources listed
Rafferty, 2013	To evaluate whether students used resources recommended in library instruction	Sources cited in students' research assignments	Usage	Supplemental to library instruction, Course guide	118; three years of first-year medical students enrolled in course	Citation analysis	Positive Students heavily cited library resources with 22% citing sources shared on course guide
Rothstein, 1989	Reflection on effectiveness of library school project having students create customized research guides for undergraduates	Questionnaire given to student recipients of custom research guides	Usage; Satisfaction; Utility; Evidence of learning	Subject guide	77 questionnaires given to all 260 undergraduate student recipients of custom research guides	Survey	Positive 90% of users reported being satisfied with custom research guides
Scoulas, 2021	Examine relationship between STEM and non-STEM students' library use, perceptions, and GPA	Students' overall experience with library use; frequency of visits and resource use; perceptions of resources; satisfaction with physical spaces	Usage; Satisfaction	Course guide, Subject guide	1,265 undergraduate students responding to library use survey	Survey	Mixed STEM students valued course/subject guides less than non-STEM, though small effect size
Sharrar, 2017	Understand how student perceptions of library course guides effect their intent to use them	Students' stated intentions to use a guide	Usage; Utility	Course guide	47 undergraduate students who use course pages	Standardized survey	Positive most found guides useful and relevant to their needs
Sinkinson et al., 2012	Open card sort study comparing undergraduate, graduate, and librarian perceptions and expectations of library guide content	User content expectations	Usability; Utility	Subject guide	30 included three groups: undergraduate, graduate, and librarians	Pre/Post survey; usability testing	Mixed differences detected between undergrad and grad student users
Slemons, 2013	Use of guides regressed against design and usability standards to understand relationship	Average guide page hits per month / per page	Usage	Course guide, Subject guide	N/A usage stats for 2 years	Web stats	Mixed more content = less use; use of design standards associated with use

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Smith, 2007	Overview of using meta-assessment to evaluate LibGuide annual use	Results from multiple regression analysis of guide use stats	Usage; Utility	Course guide, Subject guide	N/A examined annual use stats of guides per month	Web stats	Mixed Identified significant differences in use for some subject areas over others
Soskin & Eldblom, 1984	Problems and potential benefits of a term paper for an upper-division economics course are examined using 3 years of data	Informal assessment of effectiveness of library instruction and guide	Usage	Supplemental to library instruction, Course guide, print-based	N/A students enrolled in economics class	Citation analysis; Assignment analysis	Neutral Small relationship between number of sources cited and grade; No relationship between number of source types and grade on assignment
Stone et al., 2018	Comparative investigation between pedagogical and pathfinder guide designs and impact on student learning	Retention of learning; student perceptions of guide effectiveness;	Satisfaction; Utility; Evidence of learning	Supplemental to library instruction, Course guide, Subject guide	43 dental hygiene students	Survey; pre/ post test performance; web stats; assignment analysis	Positive students using pedagogical guide showed increase in perceptions, use, and grade performance over pathfinder
Tang & Tseng, 2014	Examine distance students attitudes towards library help services	Preferences and attitudes for receiving help; self-efficacy for online learning	Usage; Satisfaction; Utility	Subject guide, Course guide	220 distance students	Standardized survey	Mixed Library guides most common library assistance tool used but low use overall
Thorngate & Hoden, 2016	Compared students' use of three different guides to understand how guide layout and spatial distribution components affect interaction	student understanding of purpose of guide; task completion; satisfaction and preferences of content and layout	Usability	Subject guide	30 students representing wide range of demographic characteristics	test performance; usability testing	Mixed students had design and layout preferences
Tomlin et al., 2017	Understand students' use of library resources	students' use and perceived usefulness of library guides	Usage; Satisfaction; Utility	Course guide, Subject guide	182 survey; 30 interviews graduate and undergraduate students at two campuses	Survey; interviews	Mixed most students did not use library guides, but those who did reported strong satisfaction with them

	RQ 1: IL learning outcomes associated with guides		RQ 2: how guides are evaluated				RQ 3: evidence shared
	Study purpose	**Outcomes measured**	**Investigatory foci**	**Guide integration**	**N Population**	**Data sources**	**Findings**
Wharton & Pritchard, 2020	Assessment of LTI integration after three years of Canvas course integration	perceived usefulness, satisfaction with, and use of library guides integrated in the LMS	Usage; Satisfaction; Utility	Embedded into LMS, Supplemental to library instruction, Course guide, Subject guide	>500 survey of fully online students	Survey; web stats	Positive nearly half of students surveyed reported using guides; most found them helpful