Evidence Based Library and Information Practice

Research Article

Evidence Synthesis Instructional Offerings in Library and Information Science Programs

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Abstract

Objective – The goal of this study was to determine the extent to which evidence synthesis (ES) is incorporated into American Library Association (ALA)-accredited master's level Library and Information Studies (LIS) programs. The study considered the depth of coverage, interest in additional curriculum content, and preferences for expanding existing coverage.

Methods – A cross-sectional survey was implemented. Program administrators and instructors currently involved with ALA-accredited master's level LIS programs in Canada and the United States were eligible to participate. Recruitment emails targeted faculty and administrators from a directory of institutions offering ALA-accredited MLIS programs.

Results – 26 eligible responses from 20 unique institutions were obtained. Most respondents reported that ES is incorporated into the curriculum, albeit only briefly in most cases. Most of the respondents expressed interest in incorporating more ES content into the curriculum, specifically as a portion of a course. A greater number of respondents would prefer to bring in external guest speakers to teach the ES content, but a small percentage were interested in training for existing LIS instructors.

Conclusion – In-depth instruction on ES in LIS programs is currently limited. However, there appears to be interest in increasing ES content in curricula, primarily in the form of guest lecturers.

Introduction

Evidence synthesis (ES) is an umbrella term referring to a range of methodologies such as systematic reviews, scoping reviews, and meta-analyses that use "transparent and reproducible methods to exhaustively search for information on a topic and select studies based on well-defined predetermined criteria" (Eldermire & Young, 2022, p. 17). ES methodologies are common in the health sciences as the basis of evidence based practice (Beverley et al., 2003) and have seen increased adoption by other disciplines in recent years (Chapman, 2021; Kallaher et al., 2020; Lê et al., 2023; Premji et al., 2022). As academic librarians supporting a range of disciplines, the authors of this paper have experienced first-hand the growing demand to support ES in agricultural sciences, environmental sciences, engineering,

business, education, and social sciences as well as the established demand for these services in the health sciences.

In 2020, Institute of Museum and Library Services (IMLS) grant-funded Evidence Synthesis Institute (ESI) was launched by librarians at the University of Minnesota Libraries, Cornell University Libraries, and Carnegie Mellon University Libraries to provide training in ES support for librarians and information specialists – particularly those serving disciplines outside the health sciences. Since its launch, the ESI has held seven training sessions with 50 participants each, and three group training sessions for institutions. It has also helped launch similar institutes in Canada and Sub-Saharan Africa. Through their experience in administering and instructing in the ESI, the authors of this paper have witnessed a steady demand for this type of training with 100-150 applicants per event.

Academic librarians are the primary applicant group to the ESI, but several students and faculty from Library and Information Studies (LIS) programs have participated and/or applied, leading us to ask what training is already available for ES support or methods in LIS programs, what awareness LIS faculty have of ES, and what level of interest and capacity they have to add it to programs in order to meet growing demand. We know that LIS education program offerings can lag behind the needs of the current LIS workforce (Kousha & Abdoli, 2008). Knowing more about ES-related offerings in LIS programs can inform decision-making about LIS programs' need for more of such instruction as well as training opportunities for new librarians.

Literature Review

LIS Curricula

Throughout the history of LIS education, practitioners, faculty, and professional organizations have spent considerable time debating what the curriculum should include and whether LIS programs themselves are even necessary (Bertot et al., 2015; Smith & Warner, 1990). LIS curricula have evolved continuously as technology, libraries, and the roles of librarians have changed. In their 2022 study of Association for Library and Information Science Education (ALISE) statistical reports from 1997 to 2020, Chung et al., (2022) found that there was a large increase in the range of topics addressed in LIS curricula, particularly over the last decade. Newer areas of emphasis included cultural heritage, data science, digital humanities and curation, and many areas related to information technology (Chung et al., 2022).

There are many tensions at play in expanding LIS curricula. Practitioners and employers consider a wide range of skills necessary for LIS graduates, not all of which can be addressed given the amount of time available in the curriculum of a professional master's degree (Kousha & Abdoli, 2008; Saunders, 2019).

LIS practitioners also disagree as to the importance of specialized skills compared to core competencies, whether they should be learned in LIS graduate programs or on the job, and even what can be considered core (Saunders, 2019). When LIS programs add new courses, they tend to address gaps in their curricula with elective rather than required courses (Chung et al., 2022).

LIS programs are preparing students to work in a wide range of environments. Training needs for work in academic and research libraries (Koizumi & Widdersheim, 2019) can differ significantly from those working in public (Pandolfelli et al., 2022; Williams & Saunders, 2020) or special libraries (Davis & Saunders, 2020). Practitioners in different types of libraries often rank different groups of skills as core (Saunders, 2019).

In addition to preparation for academic librarianship more generally, many authors have explored whether LIS programs adequately prepare students for positions in specific subfields of academic librarianship such as data management and curation (Rod, 2023; Stanton et al., 2011; Thomas & Urban, 2018), liaison librarianship (Bright & Colón-Aguirre, 2022), and library instruction (Dodson, 2020; Lund et al., 2023; Valenti & Lund, 2021). In practice, those positions are often not mutually exclusive.

Librarian Involvement in ES

Although the early history of ES involved many disciplines (Chalmers et al., 2002), until recently ES methods have been primarily used in the health sciences (Hong & Pluye, 2018). It is no surprise, then, that most of the related library science literature has also focused on health science librarianship. Nevertheless, as ES methods have been adopted beyond the health sciences (Chalmers et al., 2002), a broader body of literature has developed which examines librarian roles supporting ES in disciplines beyond the health sciences. Examples include a broad review of the sciences, humanities, and social sciences (Lê et al., 2023), mathematics education (Kogut et al., 2022), conservation biology (Boice, 2019), sustainable development (Ghezzi-Kopel et al., 2021), psychology (Fehrmann & Thomas, 2011), business (Premji et al., 2022), social work (Marsalis, 2020), and engineering education (Borrego et al., 2015).

Studies across many disciplines have established that ESs are of higher quality when librarians are involved (Aamodt et al., 2019; Fehrmann & Thomas, 2011; Koffel, 2015; Kogut et al., 2019; Marsalis, 2020; McGowan & Sampson, 2005; Meert et al., 2016; Pawliuk et al., 2024; Rethlefsen et al., 2015). In addition to contributing to the quality of published reviews, librarians co-authoring ES reviews may reinforce their status and value to their institution, as well as demonstrate alignment of the library with the institution's mission and strategic priorities (Borrego et al., 2015). Guidelines from several organizations that fund or commission ES reviews, including The Campbell Collaboration (Methods Group of the Campbell Collaboration, 2019), Cochrane (Higgins et al., 2023), the Institute of Medicine (IOM, 2011), and JBI (Aromataris et al., 2024), require or recommend including a librarian on the review team.

With wider adoption of ES across disciplines, knowledge of ES methods and the ability to support them are increasingly expected of academic librarians. A survey of library supervisors in Canadian health science libraries found a strong expectation that librarians would be involved in this work (Desmeules et al., 2016). A survey of librarians in the sciences, humanities, and social sciences indicate that demand for librarian support is increasing, with 70% of respondents stating they had received requests for support in the past 5 years, and 55.9% stating that requests had increased during that period (Lê et al., 2024).

A team of librarians at Taubman Health Science Library at the University of Michigan developed a framework of six core competencies required of information specialists supporting systematic reviews. Each competency is elucidated with cognitive and behavioral skills. These competencies are:

- Foundational understanding of systematic review methods and their uses;
- Process management and communication;
- Research methodology, including standards and best practices;
- Comprehensive, replicable searching;
- Data management;
- Reporting (Townsend et al., 2017).

By identifying these core competencies and the component knowledge and skills, Townsend et al. (2017) document the level of methodological complexity in ES and depth of specialized knowledge required to support them. This is further reinforced by Spencer and Eldredge's 2018 scoping review which identified 18 skills performed by librarians supporting systematic reviews. Adequate training is critical for librarians doing this work.

ES Training Options and Preferences

Three recent studies are of primary importance in relation to our study. Lê et al. (2023) surveyed librarians in Canada and the United States regarding their needs and preferences for training in supporting ES outside the health sciences. Premji et al. (2021) scoped the existing literature regarding in-person training for conducting ESs. Parker et al. (2018) identified and evaluated online training resources focused on conducting ES reviews.

Parker et al. (2018) identified 20 online training resources, searching the internet with a broad Google search, as well as YouTube. They also searched the websites of organizations that conduct or commission reviews, such as Cochrane, as well as North American medical schools. Their approach primarily focused on health science resources, and although published only six years ago, significant changes to the landscape have occurred since then, including an overhaul of Cochrane's training (Champion, 2018), as well as the creation of [workshop] and Systematic Reviews and Meta-Analysis: A Campbell Collaboration Online Course (Valentine et al., 2022).

Premji et al.'s (2021) scoping review looked at what and how knowledge synthesis methods are being taught in higher education settings. They focused on published papers, and their inclusion criteria required the instruction to be in-person or hybrid. They identified 12 credit-bearing courses, four of which were aimed at undergraduates, and eight towards graduate students. The disciplines varied, including some outside the health sciences. None were for programs in information science. Nevertheless, their findings do suggest reasons why ES, including librarian support, might be better suited to longer, credit-bearing courses than the limited time frame of workshops,

> "Overwhelmingly, the articles in our scoping review advocate active learning and hands-on practice. Skills such as searching, objectively applying inclusion/exclusion criteria, data extraction, assessing risk of bias, and others need to be practiced in order for learners to fully understand the messiness and complexity involved. (p. 133)

Lê et al. (2023) report on a survey of librarians working at Association of Research Libraries (ARL) and Canadian Association of Research Libraries (CARL) institutions identifying the training needs and preferences of librarians who support systematic reviews, targeting librarians who support sciences, humanities, and social sciences. When asked to rank their preferred mode for training in ES methods, the vast majority listed self-directed learning and online courses as their first choice, while a post-secondary course was least often ranked first, perhaps reflecting that the population being polled were already working librarians. Nevertheless, a post-secondary course was the mechanism most frequently ranked as their second choice. Free-text comments also revealed that those librarians who had received some kind of formal training lauded its benefits (Lê et al., 2023).

Aims

The purpose of this research is to provide a cross-sectional survey of the current LIS program offerings related to ES at American Library Association (ALA) accredited programs in the United States and Canada. It also aims to assess the need for course materials, training, and support to grow these offerings as reported by LIS faculty and program administrators.

Methods

This study surveyed faculty and administrators currently working with ALA-accredited LIS programs. A content analysis of publicly available MLIS course outlines would have been a complementary source of information for identifying the level of ES content in MLIS programs. However, we determined that it was out of scope for this study. A web-based (Qualtrics) survey (Appendix) was emailed to individuals at all institutions offering ALA-accredited LIS master's programs. We report the survey results based on the Checklist for Reporting Results of Internet E-Surveys (CHERRIES) (Eysenbach, 2004).

The Directory of ALA-Accredited and Candidate Programs in Library and Information Studies (ALA, n.d.) was used to identify all 64 LIS master's programs in the United States and Canada. General information email addresses for programs were identified and collected using the directory and program websites. Program administrators/directors and instructors' names and email addresses were identified and collected by searching program websites. When possible, instructors who teach research methods, health sciences librarianship, or related courses were identified and sent the survey invitation directly.

No direct personal information was collected or stored as part of the survey. An electronic consent form was included as part of the survey instrument. This included the estimated length of time of the survey (5-10 minutes), the names of all investigators, the purpose of the study, and an eligibility statement. Eligible participants included those who currently teach at least one course, or are an administrator for, an ALA-accredited LIS program. Participants were informed that identifying information for their institutions was being collected but would not be shared with others outside of the group conducting the research study. All reporting of the results from the survey was de-identified (i.e. the names of the institutions were removed) prior to sharing the results or data from this study.

Ethics approval was sought at each investigators' institution. The Institutional Review Board at the University of Minnesota determined that this project is not human research under the U.S. federal regulations on human research. The University of Victoria Human Research Ethics Office approved this research study (protocol number 23-0157). The raw and cleaned data will be stored for 7 years in secure storage at the University of Minnesota.

Participants were also asked to share the survey invitation with other administrators or instructors in their program for whom this survey may be of interest. In total, 178 emails were sent out.

About the Survey

The email inviting people to participate in the survey was sent to targeted participants on May 11, 2023. The survey closed on June 9, 2023, with reminder emails sent one week and one day prior to the closing date.

The first page of the survey provided context: describing the purpose of the survey, definitions, and eligibility. The second page provided informed consent information: survey completion time, contact and question information, statements about confidentiality, voluntary nature of the study, IRB approval, and

data storage. Participants checked a box to provide consent and continue. The main body of the survey consisted of six pages, each containing 1-4 questions. There were 12 questions total; pages averaged 2 questions each. Adaptive questioning was used to reduce the number and complexity of questions. Using back and forward buttons on the survey pages, respondents were able to review their answers up until the first adaptive question, at which point the survey forked to different pages containing different, contextual questions. A summary to review and change answers for the entire survey was not included. A final page thanked participants and asked them to share the survey with colleagues.

There were no incentives provided to participants for completing the survey.

Data Cleaning and Merging

During analysis of survey data, we encountered several issues, including incomplete surveys and multiple surveys from individual respondents at the same institution (a desired, expected, and planned outcome).

Before beginning the process of merging and cleaning response data, we anonymized institution names (respondent names were never captured) by randomly assigning letters to each institution.

In instances where multiple people responded from the same institution, we merged data to a single answer for each institution. In situations where at least one *Administrator*, *Instructor* and one *Instructor* responded, we used the *Administrator, Instructor* category. There were no instances where an *Administrator* responded in addition to a second category (*instructor* or *administrator, instructor*)

In situations where a positive (e.g., *Yes*) and a negative (e.g., *No*) or an indeterminate (e.g., *unsure*) response were given by respondents from the same institution, we used the positive response.

For the question about familiarity with ES, we used the answer indicating the greatest degree of familiarity (Use *Very Familiar* over *Familiar* over *Moderately Familiar* over *Vaguely Familiar*).

For follow-up text responses, we included text responses that corresponded to the selected/combined answer to the previous question (e.g., If there was a *Yes* and a *No* response, and we used *Yes*, we used the text response that accompanies that response). If there were multiple text responses corresponding to multiple positive responses, we kept both text responses.

Results

We received 28 responses to the survey. Two responses did not provide responses to questions beyond the consent question and were therefore eliminated. The 26 remaining responses were cleaned, and responses from the same institutions were merged according to the method above, leaving 20 responses from unique institutions.

Demographics

Our survey only had one demographic question in addition to the name of the institution field, which was only used to merge data and then deleted, to determine who was responding to the survey. The options were *instructor*, *administrator*, or *other*; respondents could select multiple options. A greater number of respondents indicated they were an *instructor* (n = 10). The remaining respondents selected

either *administrator* (n = 1) or selected both *instructor* and *administrator* (n = 8). One respondent selected *other* but did not provide additional details.

Existing MLS/MLIS Program Elements

The first three questions were about the existence of research methods or database searching courses or health sciences librarianship courses or tracks within the programs being surveyed. The results are shown in table 1 below.

Table 1
Responses to the Question, "Does your ALA accredited LIS master's-level program offer a 1) course in research methods, 2) course devoted solely to database searching, or 3) course or track for health sciences librarianship?"

Response	Does your ALA accredited LIS master's-level program offer a course in research methods?	Does your ALA accredited LIS master's-level program offer a course devoted solely to database searching?	Does your ALA accredited LIS master's-level program offer a course or track for health sciences librarianship?
Yes	19	16	9
No	0	3	10
Unsure	0	1	0
Other	1	0	0
No response	NA	NA	1

Research methods courses were common, and no respondent selected *No* for this question. Courses devoted solely to database searching were slightly less common with 16 respondents selecting *Yes*, three selecting *No*, and one respondent being *Unsure*. Health sciences librarianship courses or track were almost split, with nine respondents selecting *Yes*, and ten respondents selecting *No*.

A final open-ended question was included in this section of the survey to allow for additional comments on the previous three questions. Three respondents used this field to give more context on their program's health science librarianship offerings (directed study, concentration, certificate, elective courses). One respondent clarified that database searching is no longer taught within a specific course but rather embedded in other courses throughout the curriculum.

Familiarity With ES

The next question asked about respondents' familiarity with ES (Figure 1). Only 10% (n = 2) of the respondents were *vaguely familiar*. The remaining respondents were *moderately familiar* (n = 7), *familiar* (n = 6) or *very familiar* (n = 5). No respondents chose the *not familiar* option.

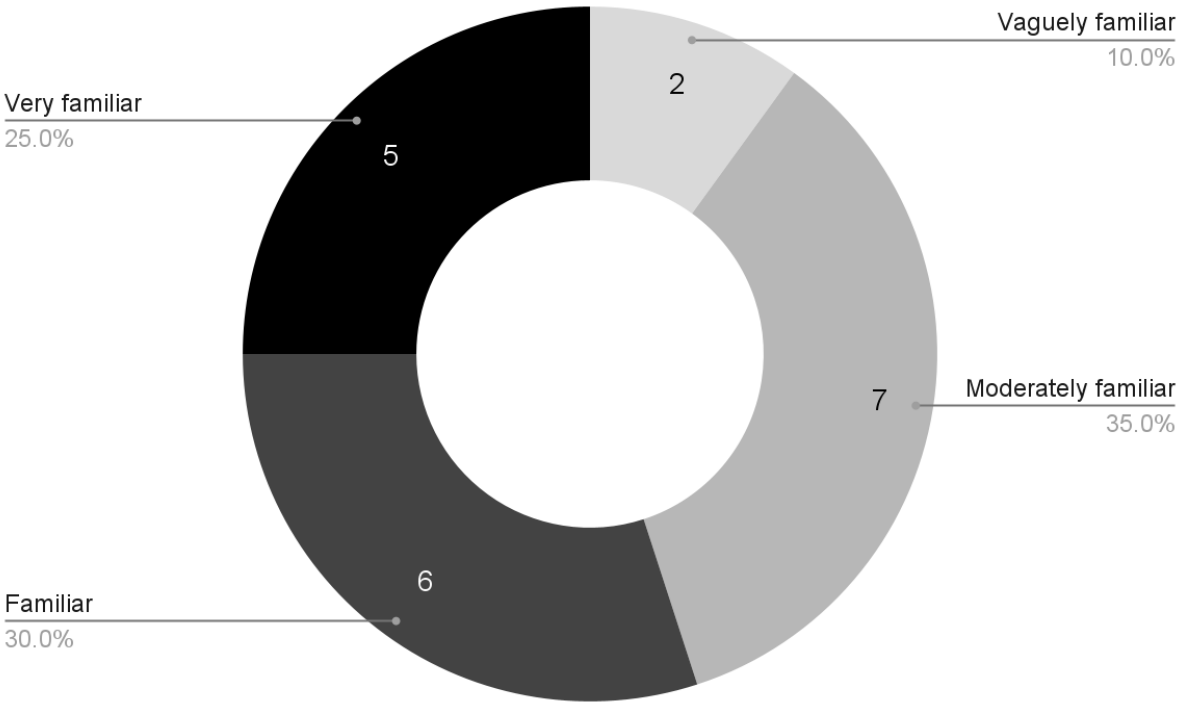

Figure 1
Responses to the question, "How familiar are you with evidence synthesis (e.g., systematic reviews, scoping reviews, meta-analyses)?"

ES Inclusion in the Curriculum

The next section sought to determine whether ES content is included in the curriculum, how it is included, or why it is not included. When asked if ES content is currently included in the MLIS curriculum, 75% (n = 15) of the respondents said *yes*, and the remaining respondents said *no* (n = 2) or *Don't know/not sure* (n = 3) (Figure 2).

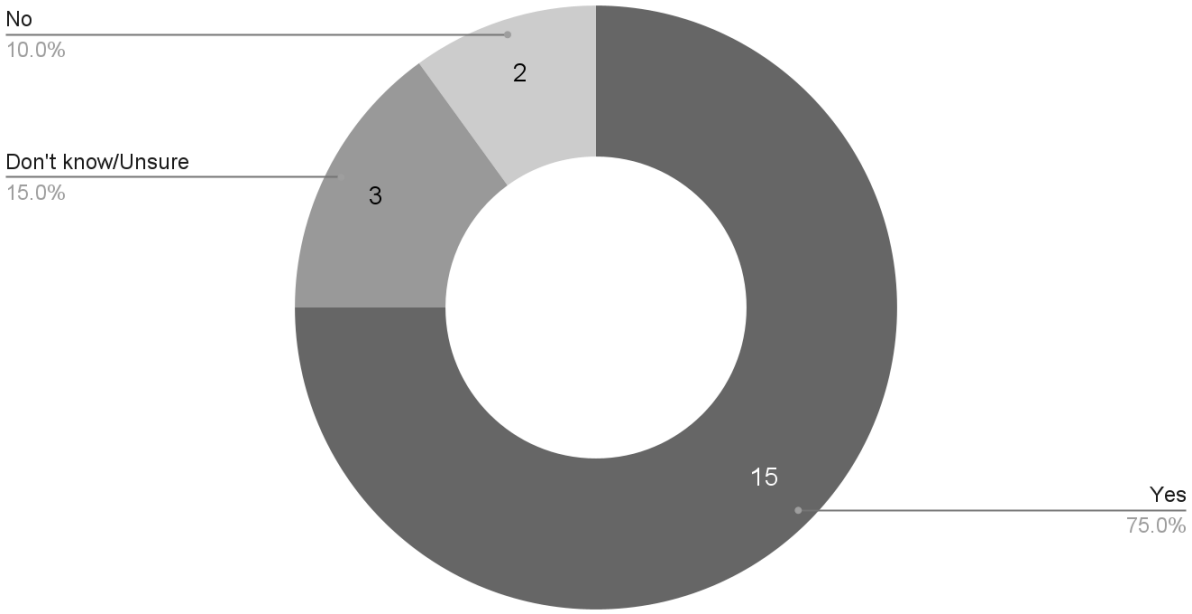

Figure 2
Responses to the question, "Is evidence synthesis (e.g. systematic reviews, scoping reviews, meta-analyses) included anywhere in your master's-level LIS curriculum?"

The respondents who selected *no* were asked why ES wasn't currently included. One respondent selected both the lack of instructor expertise on this topic and the lack of demand from students. The other respondent clarified that ES was covered in a course that is not exclusive to the LIS program.

The respondents who indicated that ES was included in the curriculum were asked to describe the extent of the coverage. Of these, 57% (n = 8) indicated that ES content was included briefly in one or more courses, 36% (n = 5) indicated in-depth inclusion in one or more courses, and the remaining (n = 1) respondent stated that there was one or more whole courses devoted to ES (Figure 3).

Of the 45% (n=9) of respondents who stated that their MLIS program had a health sciences track or course, 67% (n=6) selected yes, 11% (n=1) selected no, and 22% (n=2) selected don't know/unsure when asked whether ES was included in their MLIS curriculum. The relative percentage of respondents of this subgroup who indicated that ES was included in their curriculum is somewhat greater than that for the total respondent pool (57%). However, given the small number of respondents, the difference is likely within the margin of error. It would be difficult to draw definitive conclusions about noticeable increases in ES content based on whether the program had a health sciences track or course. Interestingly, the one respondent who stated that there was one or more courses devoted to ES in their program did not have a health-sciences track/course in their program.

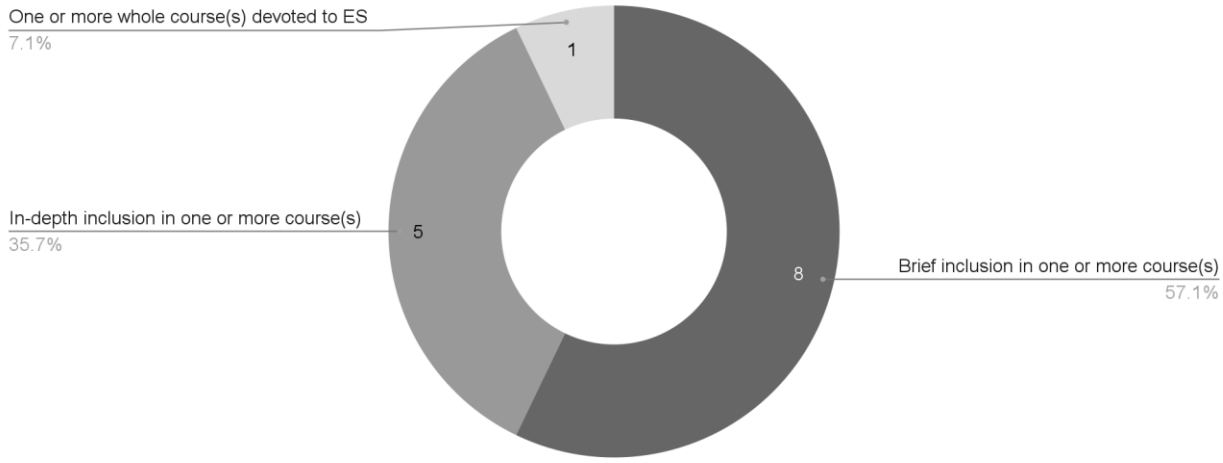

Figure 3
Responses to the question, "To what degree is evidence synthesis (e.g., systematic reviews, scoping reviews, meta-analyses) covered in your curriculum."

An additional open-text question asked respondents to describe how and where ES is included in LIS program curricula. The responses were highly varied. The most common place for ES to be covered was in research methods courses (n = 4), followed by health sciences librarianship courses (n = 2) and capstone courses (n = 2). Other respondents indicated some coverage in user experience (n = 1) and database searching courses (n = 1). When length or depth of coverage was addressed, brief assignments (e.g., a reading, a guest lecture, a one-week assignment) were indicated for the most part. One respondent indicated that it was part of a semester-long project.

The next two questions were related to interest in incorporating new content on ES into their master's-level LIS programs. Sixteen respondents selected *yes*, one respondent selected *no*, and one respondent selected the *other* option but did not provide any additional detail. Of the respondents who selected *yes* (n = 16), majority (n = 15) chose *yes - as a portion of a course*, and only one respondent selected *yes - as an entire course*. The respondent that selected *other* as an option did not provide any additional information in the corresponding open text field.

When asked about the ways in which they would be interested in incorporating content on how librarians support ES into their curriculum, a greater number of respondents selected *Bring an external expert to guest lecture in a course* (n = 13) and a few respondents selected *Have training for existing LIS instructors in your program* (n = 5). Of these responses, two respondents selected both options.

Discussion

Based on the results of our survey, ES is still primarily learned on the job or via continuing education rather than during LIS education. This was demonstrated by the extent to which in-depth instruction about ES is currently included in LIS curricula, a level reported by fewer than half of respondents (6 of 14). However, there did seem to be interest in incorporating additional ES content into the curricula (16 of 18 responses) which indicates that this is a growing area in LIS education.

These findings have implications for several stakeholder groups involved in teaching, learning about, conducting, or helping others conduct studies that use ES-based research methods. Those groups include LIS program administrators, faculty members and instructors, LIS students, and practicing academic and research librarians.

Implications for LIS Program Administrators

As program administrators are decision-makers about what goes into the curriculum, their familiarity with ES can significantly impact the availability of this type of content in the MLIS program curricula. There is room to expand the degree of familiarity with ES content among LIS administrators as 66% of administrator respondents indicated only *moderate* or *vague familiarity* with ES content. The centrality of ES methods in health sciences for both researchers and librarians and their upward trend in many other disciplines, are compelling reasons to increase LIS administrators' familiarity with ES. Furthermore, evidence based practice, of which ES is a key component, is a core competency of librarianship according to ALA (2023) and CARL (CARL Competencies Working Group, 2020).

Likewise, there is opportunity to grow the depth of ES information included in LIS curricula, as only 5 of 14 respondents indicated in-depth inclusion of ES content in one or more courses. By contrast, most (8 of 14) respondents indicated only brief inclusion of ES content in one or more courses. Brief inclusion likely means different things for different programs, but ES includes a robust range of research review methods and is sufficiently extensive and complex as to require in-depth treatment to conduct or participate in a systematic or scoping review or meta-analysis. Brief inclusion of ES concepts can introduce students to the basic concepts of ES methods but falls short of preparing students to support ES studies or be directly involved with them.

There is a strong indication of interest in expanding or including new ES information in LIS curricula among respondents, which shows demand for ways to incorporate or impart this knowledge. Most respondents indicated interest in incorporating ES content into part of a course, rather than a full course on the topic. Only one respondent stated interest in offering ES as an entire course, indicating that there may not yet be an administrative appetite for semester-long courses on ESs. Yet, a recent survey by Lê et al. (2023) showed that post-secondary courses were either the first or second preferred choice for ES training for 57% of librarian respondents, indicating that there may be a desire for this type of course in library school curricula. Introducing or increasing the amount of ES content in existing courses, particularly those that are frequently required or for which there is broad interest among students pursuing health sciences and/or academic careers, such as research methods, is a good place to start or build on the existing ES content being taught. Where the preference is for inclusion as part of a course, inviting an external speaker to talk about ES as part of a course or enlisting expert-led training for instructors are both good options to introduce this type of knowledge among students.

There may also be an opportunity for LIS programs to offer a continuing education short course or in-depth workshop for librarian practitioners that focuses on ES training taught either by faculty or expert practitioners. Based on demand over the past three years, there is sufficient need among practicing academic librarians to warrant more offerings of this type.

Implications for LIS Faculty/Instructors

More than half of faculty/instructor respondents have a good understanding of ES methods, but 44% have only a *moderate* or *vague familiarity* with this information. This limited familiarity, along with the lack

of familiarity among LIS administrators, suggests that students may not be gaining the familiarity and skill with ES that would benefit them in careers in health sciences and academic librarianship. Health sciences libraries are seeking librarians who have knowledge and experience with ES content, as more researchers adopt ES methods in their research (Reed & Carroll, 2020). We expect similar demand for ES skills among other academic and special libraries to follow this trend. Furthermore, greater familiarity with ES content among faculty/instructors could be a potential boon to the corpus of LIS research using these methods. When done well, systematic reviews and other ES review types tend to have more citations and greater impact than many other study types (Patsopoulos, 2005; Royle et al., 2013). Researchers will benefit from greater familiarity and increased utilization of ES methods in their own research. A 2015 study (Xu et al., 2015) showed that LIS systematic reviews suffer from quality issues, which could be improved by training and education. This needs to start with LIS researchers who are often LIS program faculty or instructors.

Implications for LIS Master's Students

The inclusion of ES content in LIS curricula is most relevant to students pursuing careers in academic, health sciences, or special librarianship, as those are fields in which this knowledge will be used most frequently. With only 5 of 14 programs indicating that they offer in-depth treatment of ES, most students will only receive brief introductions to ES methods in their formal LIS education. Because most respondents to our survey were open to increasing the amount of ES content in the curriculum, students could advocate for its inclusion to prepare them for academic, special, or health sciences library careers. Through ES training, students will gain expert database search skills, greater familiarity with databases and their content coverage, citation management skills, and knowledge of reporting standards and principles of reproducibility.

Any amount of familiarity with ES content, however minimal, will benefit students in job searching and as they become practicing librarians. Only one respondent indicated that they had an entire course for ES. This is an option that LIS program administrators should consider offering, especially one targeting students in an academic librarianship program track. Similar to instructional design courses that prepare MLIS graduates to teach, a course on ES would allow new librarians to start a job ready to support this expanding area of service. If courses are not available, students on an academic librarian track might supplement their ES knowledge through channels outside of the formal course-based curriculum, such as internships, training opportunities, or expert mentorship.

Implications for Practicing Academic Librarians and the Profession

Our findings suggest that most LIS students graduate without thorough knowledge of ES research methods. Practicing academic librarians looking to hire new librarians should not expect recent graduates in the job pool to have ES skills. However, most practicing librarians did not have ES knowledge when they graduated and gained this knowledge through some type of continuing education or on-the-job training and mentoring as shown in the findings of Lê et al. (2023) where only 5.6% of respondents gained ES training from a post-secondary course (including MOOCs).

If a librarian's LIS education has not prepared them to support, collaborate on, or conduct an ES research study, there are several avenues to pursue ES training beyond the LIS curriculum (Table 2). Some of these options are geared at librarians or the information retrieval stages of ES, while others are targeted at researchers who are involved in the entire review process. For librarians, a multi-faceted approach to

training is recommended based on a survey of business librarians involved in ES reviews (Premji et al., 2022).

Table 2
Examples of ES Training Programs Currently Available

Training Program	Website	Mode
The Evidence Synthesis Institute an academic librarian-led training program aimed at library staff supporting ESs in topics outside of the health sciences. From 2020-2024 was fully funded by the Institute of Museum and Library Services (IMLS)	https://www.lib.umn.edu/about/evidence-synthesis-institute	Synchronous
Evidence Synthesis Institute Canada A Canadian adaptation of the US Evidence Synthesis Institute, that has been offered annually since 2022, and is currently offered in partnership with the Canadian Association of Research Libraries.	https://libguides.uvic.ca/ESICanada/	Synchronous
Introduction to Systematic Review and Meta-Analysis a Massive Open Online Course (MOOC) offered through Coursera. Covers information necessary to complete all stages of systematic reviews and meta-analyses	https://www.coursera.org/learn/systematic-review	Asynchronous
Cochrane Interactive Learning provides tutorials for performing systematic reviews on health-related topics	https://training.cochrane.org/interactivelearning	Asynchronous
Systematic Reviews and Meta-Analysis: A Campbell Collaboration Online Course this free and open course provides an overview of the steps involved in conducting a scientific systematic review of results of multiple quantitative studies	https://oli.cmu.edu/courses/systematic-reviews-and-meta-analysis-o-f/	Asynchronous
The Collaboration for Environmental Evidence provides free-to-access, open educational, training courses in ES. The courses cover ES methods, including systematic review and systematic mapping, stakeholder engagement in ES, and ES technology. These are self-paced, online courses	https://synthesistraining.github.io/	Asynchronous

Training Program	Website	Mode
The Medical Library Association offers a two-level professional development certificate program, Systematic Review Services Specialization, which is best suited for health sciences librarians, for a modest fee	https://www.mlanet.org/p/cm/ld/fid=1893	Asynchronous/ Synchronous
University of Michigan Systematic Reviews Workshop a mix of online and in-person instruction aimed at providing librarians with a solid foundation in conducting and communicating systematic reviews. Focus is health sciences	https://www.lib.umich.edu/research-and-scholarship/library-workshops-and-credit-courses/systematic-reviews-workshop	Asynchronous/ Synchronous

When evaluating training programs, it will be helpful to consider the topics covered as they relate to competencies, in the context of one's needs, as well as learning preferences. To help determine what types of ES knowledge will be most useful for librarians who are learning how to support ES studies, Townsend et al. (2017) have developed a set of core competencies for librarians who are involved in systematic reviews. Lê et al. (2023) surveyed librarians who support systematic reviews about their training needs and preferences, providing evidence for preferred training methods and needs in focused areas.

Limitations

While we attempted to survey all 64 ALA-accredited LIS programs, we only received responses from 20 institutions, which is a 30.7% response rate. Due to the limited sample size, the extent to which these results can be generalized to all LIS programs may be limited.

Our survey was further limited by geography, including only ALA-accredited master's-level LIS programs in the United States and Canada. Results cannot be generalized beyond those countries.

Another limiting factor may be that some survey respondents who are less familiar with ES methods may have limited awareness of the inclusion or lack thereof of ES content in their LIS programs and/or may have conflated ES methods with other techniques resulting in a mischaracterization of their offerings.

Finally, the survey does not ask about the numbers or proportions of students in each program that are pursuing relevant career paths (i.e., academic, health sciences, or special librarianship). For programs that have relatively fewer students pursuing these paths, ES topics may be a poorer fit for inclusion or expansion within the curricula.

Suggestions for Future Research

Additional research is needed to determine LIS students' perceptions of their "readiness to support" ES and what they have learned about it through their programs' curricula.

To gain a better understanding of the different types of educational activities (e.g., lecture, discussion, small group work, assigned reading, hands-on activities, etc.) and learning objectives used in LIS curricula, further research into these questions will help develop a more complete picture of ES education approaches and preferences. Blanco et. al. (2014) conducted a study of medical education programs that provides a useful survey guide.

We did not conduct a content analysis of publicly posted LIS course listings or course outlines to supplement our survey, and this is a further area of research that could contribute to building a more complete picture of the ES offerings in MLIS programs.

Additionally, research that investigates barriers to ES inclusion in LIS curricula, or factors affecting LIS educator perceptions, will advance educators' understanding of the reasons ES may or may not be covered, shedding light on challenges to teaching ES concepts that face LIS program instructors, administrators, and students.

Conclusion

Our research shows that there are currently limited levels of in-depth instruction on ES in LIS programs which indicates that librarians tend to receive training in ES post-MLIS. The case for additional ES instruction in LIS programs would be bolstered by research on student perspectives on preparedness to support ES. Respondents showed interest in increasing ES content in curricula, primarily by means of guest lecturers. It may be worthwhile targeting programs which train more health sciences, academic, and special librarians.

Author Contributions

Meghan Lafferty: Conceptualization, Investigation, Methodology, Project administration, Writing - original draft, Writing - review & editing **Zahra Premji:** Conceptualization, Data curation, Investigation, Methodology, Project administration, Resources (supporting), Visualization, Writing - original draft, Writing - review & editing **Philip Herold:** Conceptualization, Data curation, Investigation, Methodology, Writing - original draft, Writing - review & editing **Megan Kocher:** Conceptualization (lead), Investigation, Methodology, Writing - original draft, Writing - review & editing **Scott Marsalis:** Conceptualization, Investigation, Methodology, Resources (lead), Writing - original draft, Writing - review & editing

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Appendix
Survey

Introduction

This survey seeks to solicit information regarding any training currently included in master's level Library and Information Science (LIS) curricula regarding support for evidence synthesis.

As academic librarians in a wide range of fields, we have experienced a steadily increasing demand for librarians to support and participate in evidence synthesis projects (e.g. systematic reviews, scoping reviews, meta-analyses). In 2020, the University of Minnesota Libraries partnered with Cornell University Libraries and Carnegie Mellon University Libraries to implement an IMLS-funded Evidence Synthesis Institute to meet the growing demand of librarians for training in this area. As of Fall 2022, the Institute has trained over 250 librarians. The purpose of this survey is to identify relevant course offerings for LIS students in order to inform future training opportunities.

By **LIS** we mean any ALA-accredited LIS programs in the United States, Canada, and Puerto Rico. The program may offer degrees with names such as Master of Library Science (MLS), Master of Arts, Master of Librarianship, Master of Library and Information Studies (LIS), and Master of Science.

Evidence synthesis – also called "knowledge synthesis" — is defined as a "review of what is known from existing research using systematic and explicit methods in order to clarify the evidence base" (Evidence Synthesis International - position statement, 2020).

There are many different evidence synthesis types, including systematic reviews, scoping reviews, meta-analyses, and so on. All types of knowledge syntheses follow **rigorous, explicit, and transparent methods** guided by authoritative conducting guidelines, and reported following established reporting standards.

For the purposes of this survey, we are **excluding traditional or narrative literature reviews** as they do not typically follow any particular methodology, whereas evidence synthesis reviews are expected to follow methodological guidelines. Likewise, while evidence synthesis work includes developing comprehensive search strategies or teaching the advanced search skills required to conduct thorough, clearly reported searches, we are excluding instruction regarding information retrieval or information literacy more generally (e.g., basics of database searching, navigating information sources, etc.).

Eligibility: You are eligible to participate in this survey if you currently teach at least one course or are an administrator for an ALA-accredited LIS program.

Information Sheet and Instructions

You are invited to be in a research study of the coverage of evidence synthesis support in LIS education in the United States, Puerto Rico, and Canada. The survey is being sent to all master's-level programs of Library & Information Science in ALA's database of accredited programs. This study is being conducted by: Meghan Lafferty, Philip Herold, Megan Kocher, and Scott Marsalis University Libraries, University of Minnesota, and Dr. Zahra Premji, University of Victoria Libraries.

Procedures

The survey is brief and should take less than 15 minutes of your time to answer.

If you agree to participate, we ask that you answer only those questions you feel confident in doing so, and refer us to others at your institution who are more familiar with the curriculum for those questions you are unable to answer. We will combine answers from each institution.

Confidentiality

This survey will collect the names of institutions to allow for combining answers from single institutions. Only the research team will have access to information that identifies your institution. Identifying information for your institution will not be shared with others outside of this research study. All reporting of the results of the survey will be de-identified (i.e., the names of the institutions will be removed) before we publish any report or share the results or data from this study.

Voluntary Nature of the Study

Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota or the University of Victoria.

Contacts and Questions

The researchers conducting this study are: Philip Herold, Megan Kocher, Meghan Lafferty, and Scott Marsalis, and Zahra Premji. You may address any questions to Meghan at mlaffert@umn.edu.

The Institutional Review Board at the University of Minnesota has determined that this project is not human research under the federal regulations on human research.

The University of Victoria Human Research Ethics Office has approved this research study. You may verify the ethical approval of this study, or raise any concerns you might have, by contacting the following research ethics body: the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Please be advised that this research study includes data storage in the U.S.A. As such, there is a possibility that information about you that is gathered for this research study may be accessed without your knowledge or consent by the U.S. government in compliance with the U.S. Patriot Act.

Demographic Information

1. Name of your institution (relating to your role in an ALA accredited LIS program)
   _____

2. What is/are your role(s) in the ALA accredited LIS master's-level program? Choose all that apply.
   - Administrator
   - Instructor (any type as long as you currently teach at least one master's-level course in an ALA accredited LIS program)
   - Other (please specify) _____

Research Methods & Searching

3. Does your ALA accredited LIS master's-level program offer a course in research methods?

    - Yes
    - No
    - Unsure
    - Other: _____

4. Does your ALA accredited LIS master's-level program offer a course devoted solely to database searching?

    - Yes
    - No
    - Unsure
    - Other: _____

5. Does your ALA accredited LIS master's-level program offer a course or track for health sciences librarianship?

    - Yes
    - No
    - Unsure
    - Other: _____

6. Please share any comments related to your answers to either of the previous three questions:

_____
_____
_____

Familiarity

7. How familiar are you with evidence synthesis (e.g., systematic reviews, scoping reviews, meta-analyses)?

    - Not at all familiar
    - Vaguely familiar (have heard of evidence synthesis)
    - Moderately familiar (am familiar with concepts but no active engagement)
    - Familiar (am familiar with concepts and have had some engagement such as offering consultations, receiving training, and/or participating in an evidence synthesis project)
    - Very familiar (have had sustained engagement such as regularly teaching, offering consultations, and/or participating in an evidence synthesis projects)

Inclusion of Evidence Synthesis in Curriculum

8. Is evidence synthesis (e.g. systematic reviews, scoping reviews, meta-analyses) included anywhere in your masters-level LIS curriculum?

    - Yes
    - No
    - Don't know / Unsure

If respondent replies yes, they continue to question 9. If respondent answers no, they go to question 16.

Degree of Inclusion of Evidence Synthesis in Curriculum

9. To what degree is evidence synthesis (e.g., systematic reviews, scoping reviews, meta-analyses) covered in your curriculum. Choose as many as apply.

    - Brief inclusion in one or more course(s) (mentioned in readings or lecture)
    - In-depth inclusion in one or more course(s) (at least one week or 3 contact hours spent on it and/or an assignment)
    - One or more whole course(s) devoted to evidence synthesis

10. Please describe how and where evidence synthesis is included in your program's curriculum (e.g., assignment in a research methods class, course in health sciences librarianship track, etc.)

_____
_____
_____

Interest in Incorporating Evidence Synthesis into Curriculum

11. Academic and medical librarians are often asked to serve as search and methodology experts on evidence synthesis projects (e.g., systematic reviews, scoping reviews, meta-analyses.) Are you interested in incorporating new content on evidence synthesis into your master's-level LIS program?

    - Yes, as a portion of a course (e.g., guest lecture)
    - Yes, as an entire course
    - No
    - Other: _____

12. In what way(s) would you be interested in incorporating content on how librarians support evidence synthesis (e.g., systematic reviews, scoping reviews, meta-analyses) into your curriculum?

    - Bring an external expert to guest lecture in a course
    - Bring an external expert to teach an entire course
    - Have training for existing LIS instructors in your program
    - Other: _____

Training Follow up

13. Would you like to be contacted if training for LIS instructors on how librarians support evidence synthesis (e.g., systematic reviews, scoping reviews, meta-analyses) is developed?

    - Yes
    - No

Final comments

14. Please share any further comments you may have regarding the topics covered in this survey in the space provided below.

_____
_____
_____

15. Are you interested in adding content on evidence synthesis (e.g., systematic reviews, scoping reviews, meta-analyses) to your curriculum?

    - Yes
    - No
    - Maybe

Respondents who have answered questions in this branch then go to the Final Screen of Survey

Reasons for Not Including Evidence Synthesis in Curriculum

16. If you do not include evidence synthesis (e.g., systematic reviews, scoping reviews, meta-analyses) in your LIS program curriculum, why not? (choose as many as apply)

    - Do not feel the topic is of sufficient importance
    - None of our instructors have expertise on this topic
    - This topic is more appropriately taught once student is in a professional role
    - No room in the curriculum for this topic
    - No demand from students on this topic
    - No administrative/program support for covering this topic
    - This topic is covered by another department (e.g., public health)
    - Other _____

Respondents who have answered questions in this branch then go to the Final Screen of Survey

Final Screen of Survey

If there are other faculty or staff at your institution we should survey regarding the inclusion of evidence synthesis in the curriculum please share this survey with them.