Systematic reviews training for librarians: planning, developing and evaluating

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Abstract
This article covers the content provided in a workshop offered at the EAHIL 2017 conference in Dublin, Ireland, titled "Systematic reviews: models of training for librarians." Libraries are facing an increasing number of client requests for collaboration in conducting systematic reviews. Consequently, there is a high demand for librarians who are already skilled in this practice, accompanied by a desire to equip librarians who are less familiar with the skill-sets needed to conduct systematic reviews effectively. Several methods are available for consideration in training librarians, and this article focuses on the different components required by each method, so that libraries and librarians can better align training efforts with available library resources.

Key words: systematic reviews; librarians; in-service training; continuing education; program planning.

Introduction

As libraries continue to develop and expand their services to include consulting on systematic reviews (1), the creation of a realistic plan for meeting an increasing demand with limited resources becomes increasingly important. Additionally, as systematic review methods and tools continue to develop and evolve, and the practice of using systematic reviews crosses over into multiple disciplines, there is an increasing need to identify the means of support for the different levels of service that are in demand (2). Although there are several potential paths a library could take – ranging from not offering a systematic reviews service at all to hiring new staff members who are already skilled at the service – each comes with varying levels of cost to the library (3).

This article proposes a sequence of activities – Plan, Build, and Evaluate – for planning and implementing a systematic reviews service, and discusses different methods of training current library staffing and the resources, strengths, and limitations that are involved with each approach.

Step 1: Plan

The first stage focuses on organizational preparation. During this initial stage, one needs to determine the objectives of the training and to consider the current skill-sets, characteristics, and training requirements of the participants. In establishing the objectives, developers should reflect on the needs of the organization, clients, and staff. Before creating a training and development program, it is best to determine the long-term goal. Given that a great deal of variety exists in the types of services libraries offer on systematic reviews (4), it is critical to identify beforehand the level of service delivery expected at the conclusion of training, as this goal will determine the components of the training program. *Table 1* shows an example of four common levels of systematic review training services and the intended skills gained as an outcome of each level. Other models that could be considered in the categorizing of systematic reviews services include free or fee-based services, tiered services (different levels depending on client, such as undergraduate, graduate, clinician), or solo librarian or team-based services.

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Level 1	***Level 2***	***Level 3***	***Level 4***
	Level 1 plus:	*Levels 1 & 2 plus:*	*Levels 1 & 2 & 3 plus:*
Educate others on definition of systematic review and its overall process	Participate in planning the eligibility criteria for the search	Help clients select appropriate review method	Collaborate in all levels of the review process
Find and assess SRs	Develop and report the search	Participate in designing the review question	Teach the process to others
		Demonstrate and/or participate how to select studies	

Table 1. *Levels of systematic review services.*

The needs of the organization as it relates to training librarians on systematic reviews can vary based on the college or department clientele. Although it is common that a systematic review is done for publication and knowledge contribution factors, academic universities also trend towards having a particular interest in using such studies for the purpose of applying for and receiving grant awards. Depending on the ultimate goal of the clients, a higher level of systematic reviews training may be required by the organization in order to achieve a worthwhile outcome as perceived by the client. One point to consider at this point is that the higher level of training generally would imply that the librarian and organization involved is not only dedicating more time toward completing the training, but at its conclusion, that librarian will be involved with systematic review projects for a longer period of time, thus making them less available for other service opportunities. At the same time, those librarians who are participating in systematic reviews training may have certain strengths and weaknesses that better

Competency	**Skills/Knowledge required**
Conduct a thorough reference interview	Determining if a research question is appropriate for a systematic review Framing a research question Selecting appropriate eligibility criteria
Develop the main database search for a systematic review	Selecting search criteria and appropriate limits Retrieving and deduplicating citations Documenting the main search Meeting the standards of systematic reviews searching
Conduct the expanded searches (grey literature, reference searching)	Selecting appropriate resources/methods Documenting the expanded searches Meeting the standards of systematic reviews searching
Project/data management for systematic reviews	Selecting the best software to meet needs of the project Designing a data management plan Developing a timeline

Table 2. *Competencies and skills for building systematic reviews training.*

capacitate them for some stages of a systematic review while inhibiting them from others. It is an absolute strength if the librarian is already familiar with the faculty and the department objectives with whom he or she will be working. Regardless of the level of systematic review service that has been selected as the goal, the librarian participant must be strong in time management and must understand what the client will benefit from most and will deem as valuable.

Step 2: Build

Now that the overall objectives, impact to the organization, and participants have been considered, the specific competencies that need to be achieved and the delivery method(s) can be selected.

Overall considerations and competencies/skills alignments

First, in developing effective training, it is important to consider hallmarks of great training (5). Training should be transformative, practical, well designed, combined with plenty of interaction, and of course, fun. Careful development will help to ensure that the training meets these qualities.

Next, the competencies selected will depend on the level(s) of service to be offered. *Table 2* provides examples of skills or knowledge required to meet those needs for a sample set of competencies.

Potential delivery methods

Six potential delivery methods are identified here for delivery of systematic reviews training: independent study, webinars, short class, long course, mentoring, and shadowing. Each method has advantages and challenges.

- *Independent study.* Independent study could involve reading, watching, or working through asynchronous online modules. Advantages of this option include flexibility in scheduling and inexpensive costs; however, it offers no opportunities for participants to get quick feedback or answers to questions, and can potentially leave certain aspects of a systematic review to the reader's interpretation. Selecting the best materials can be an issue, along with resource limitations or access constraints. This method may work better if a group is reading/watching the resources together.
- *Webinars.* Webinars can offer a single or multiple method of exposure to the different aspects of a systematic review. One recognized benefit to a webinar is that in most cases the material can be easily recorded and watched again if needed. Also, this method allows for multiple participants to be trained at one time, making it cost-efficient. Potential drawbacks include technological barriers and limited interaction and feedback, as well as greater difficulty in addressing a wide range of variances that differ from the specific points being demonstrated.
- *Short Class (Face-to-Face).* The Short Class, in-person method provides an opportunity for interaction during the training, but can be expensive and time consuming. Participants may need to travel, or an expert may be brought in to train staff. An engaging workshop can provide a learning experience for multiple trainees at the same time. However, there is not always an easy way for follow-ups with questions later on.
- *Long Course (Face-to-Face).* The Long Course training method (in-person) can provide one of the most intensive learning experiences with many examples and even real-time practice, such as role-playing. This method also brings a big time commitment and more expense, depending on travel and the number of employees involved. Several long courses are currently available for librarians from various institutions, in a variety of styles. One example is from The University of Illinois at Chicago, whose librarians developed a flipped course, providing participants with materials before the class followed by face-to-face discussions and interactions (6).
- *Mentoring.* Supporting librarians while they are consulting with their own clients can be a valuable experience. Mentoring does require a significant and committed effort for the mentor and the mentee, and can be done internally between co-workers or with an external expert. This intense experience provides the mentee with guidance on an applied project, the mentor with an opportunity to serve and share expertise, and the client(s) with two librarians to assist with their review (adding to its validity). Challenges include scheduling, finding an expert, and finding the right project to work through. In their article describing a mentoring program, Fyfe and

Dennet detailed a pilot program of mentoring through a project a solo librarian with little systematic reviews experience (7). The Appendix of the article included 10 tips for mentoring, which included agreeing on the objective of the program, characteristics of a good review project to work on, how to collaborate on the search, and tips on providing feedback.

- *Shadowing*. Shadowing involves having participants follow experienced librarians as they meet with clients to consult on reviews. This training technique provides a rich educational experience with different systematic reviews. However, depending on the specific parameters implemented, this method generally requires a significant time commitment. Solo librarians would need to find an expert at another library to follow.

Implement training program

After deciding on the appropriate delivery method(s) for the desired level of service and competencies, the next step is to develop the systematic reviews training program. The program should include multiple training sessions with different delivery methods and individual goals. Each session will undergo an implementation stage which focuses on logistical arrangements, such as arranging speakers, technological resources, facilities, parking, and more. When applicable, it would be helpful to run a pilot training session to test its effectiveness with a small group of participants.

Step 3: Evaluate

The last step is determining how the training session(s) and/or program will be evaluated. Multiple levels of evaluation should be conducted to ensure that the training program is meeting the needs of the librarians, the library, and, ultimately, the clients. First, each part of the training should be reviewed and validated as appropriate. Next, an instrument to gather participants' immediate reaction to individual training sessions should be designed, and should include questions on how well did the participants like the training, were the facilities conducive to learning, and what could be improved. Third, the evaluation should include outcome measures that quantify changes in the participants' skills/knowledge after the training or at particular stages of the training program. This type of evaluation will require "pre- and post-" surveys, to get a baseline of participants' current understanding of systematic reviews and experience with expert searching, followed by an assessment of their knowledge and skills changes after the training sessions. Finally, the impact on the participants and on the organization should be considered. To assess impact properly, it will be helpful to select goals in the "Plan" stage to work towards. In setting goals, consider the SMART model (8), as described below:

- Specific: Is the goal explained with enough detail?
- Measurable: Can the goal be quantified/qualified?
- Attainable: Is the goal feasible given the resources available?
- Relevant: Does the goal align with organization's vision/mission/values for systematic reviews needs?
- Time bound: Does the goal have a completion date or time component?

For example, at the beginning of the training, a goal might be: To have 5 librarians trained in 6 months to conduct a reference interview and develop a MEDLINE search. When looking at impact on the librarians and/or organization, several measures can be followed, such as the number of consults requested and provided and the resulting numbers of posters, presentations, publications, and grants received. It is important that the organization recognizes the work of the librarians and that systematic reviews take time (averaging at least a year before publication), so focusing on publications alone will not be useful in the beginning of a service.

Combining all of the steps

Considering the training program as a whole, developers can combine all 3 steps – Plan, Build, Evaluate – into one table via a logic model. A logic model is usually presented as a table (as shown in *Table 3*), and is read as "Given these aims and resources, the following outputs will be accomplished (activities, deliverables, and more) to reach these outcomes." Planners can start with the aims and go forward, or start with the outcomes and plan backwards.

The strength of the logic model is that the overall program can be presented easily and goals easily tracked. As the service is developed and the training continues, it will need to be monitored and adapted

Aims	Resources	Outputs	Outcomes
To start a SR service To train librarians to provide SR consults	Librarians attend 3 day course Expert to consult on creating a service MLA Webinars	Service materials Training sessions	Librarians can consult on systematic reviews (Levels 1 & 2)

Table. 3. *Example of a logic model for a systematic reviews training program.*

as necessary. As systematic review methods continue to evolve with standards being updated, new synthesis types being created, and software being developed, the training program will need to be flexible and updated often.

Conclusion

Systematic reviews represent a growing opportunity for libraries to provide a useful service to their client communities. Careful and deliberate preparation for launching a systematic reviews service includes a focused training program for librarians to assure competencies and overall success.

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REFERENCES

1. Dudden R, Protzko S. The systematic review team: Contributions of the health sciences librarian. Med Ref Serv Q. 2011;30(3):301-15. doi:10.1080/02763869.2011.590425.
2. Nicholson J, McCrillis A, Williams J. Collaboration challenges in systematic reviews: A survey of health sciences librarians. J Med Libr Assoc. 2017;105(4). doi:10.5195/jmla.2017.176.
3. Knehans A, Dell E, Robinson C. Starting a fee-based systematic review service. Med Ref Serv Q. 2016;35(3):266-73. doi:10.1080/02763869.2016.1189779
4. Spencer A, Eldredge J. Roles for librarians in systematic reviews: a scoping review. J Med Libr Assoc. 2018;106(1). doi:10.5195/jmla.2018.82.
5. Arthur W Jr, Bennett Jr W, Edens PS, Bell ST. Effectiveness of training in organizations: a meta-analysis of design and evaluation features. J Appl Psychol. 2003;88:234-45.
6. Conte ML, MacEachern MP, Mani NS, Townsend WA, Smith JE, Masters C, *et al*. Flipping the classroom to teach systematic reviews: the development of a continuing education course for librarians. J Med Libr Assoc. 2015 Apr 103(2):69-73.
7. Fyfe T, Dennett L. Building capacity in systematic review searching: a pilot program using virtual mentoring. J Can Health Libr Assoc. 2012;33(1):12-6.
8. Set smart goal-setting strategies. Administrative Professional Today. 2014;40(12):5.