Evidence Based Library and Information Practice

Article

Academic Librarians' Conception and Use of Evidence Sources in Practice

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Abstract

Objective – The objective of this study was to explore and understand how academic librarians use evidence in their professional decision making. The researcher aimed to gain insights on the relevance of the current EBLIP model to practice, and to understand the possible connections between scientific research and tacit knowledge within the practice of LIS.

Methods – A grounded theory methodology was used, following the approach of Charmaz (2006). Participants were 19 academic librarians in Canada. Data was gathered via online diaries and semi-structured interviews over a six-month period in 2011.

Results – Two broad types of evidence were identified (hard and soft), and are generally used in conjunction with one another. Librarians examine all evidence sources with a critical eye, and try to determine a complete picture before reaching a conclusion. As well, librarians use a variety of proactive and passive approaches to find evidence.

Conclusions – These results provide a strong message that no single evidence source is perfect. Consequently, librarians bring different types of evidence together in order to be as informed as possible before making a decision. Using a combination of evidence sources, depending upon the problem, is the way academic librarians approach decision making.

Introduction

Evidence based practice (EBP) is a relatively young movement, which began in medicine (Guyatt, 1991) and has since spread to other fields, including library and information studies (LIS). In LIS, very little research has been undertaken on the evidence based library and information practice (EBLIP) model that was directly adapted from medicine, despite the fact that LIS is a social science discipline. This direct adaptation, without reflection on the differences between LIS and medicine, has been a noted criticism of the current EBLIP model (Given, 2006; Hunsucker, 2007). With roots in evidence based medicine, does the focus on quantitative research evidence apply to librarians whose questions often demand explanations rather than judgments on the effectiveness of interventions? Can the current model address academic librarians' questions and assist with decision making in a meaningful way? The current model may be alienating some librarians who feel that the forms of evidence they are using are not being recognized as important.

This research study examined the foundation of EBLIP by exploring how academic librarians use evidence in their practice. The definition of evidence used within this study was from the *Oxford Dictionary* – "the available body of facts or information indicating whether a belief or proposition is true or valid" (2010) – while keeping in mind that within EBP, evidence is generally considered to be research. The study sought to examine whether this was the case in LIS practice or whether librarians have a broader interpretation of evidence.

The research presented in this paper describes evidence sources used by academic librarians, as well as the reasons these sources are used. It also examines how academic librarians view different sources of evidence, and the differences between what is used in practice and what is conceptually considered to be evidence.

Literature Review

Evidence Sources in Evidence Based Practice

Evidence based library and information practice is strongly modelled on the original evidence based medicine (EBM) process. The most widely cited and accepted definition of EBLIP was adapted from McKibbon, Wilczynski, Hayward, Walker-Dilks, and Haynes's (1995) definition of EBM, keeping all the same components and basic meaning, but inserting "user" in place of "patient" and "librarian" in place of "clinician":

> An approach to information science that promotes the collection, interpretation and integration of valid, important and applicable user-reported, librarian-observed, and research-derived evidence. The best available evidence, moderated by user needs and preferences, is applied to improve the quality of professional judgements. (Booth, 2000)

The EBM movement has generally focused on research studies as the primary source of evidence. EBM has produced many tools for practitioners, to assist them with critical appraisal of research evidence and with determining the strength of the research evidence. There has been criticism that evidence based models do not account for other forms of knowledge that are a vital part of professional practice (Brophy, 2009; Clark, 2011; Davies, Nutley, & Walter, 2008).

Built into the EBM model is a hierarchy of evidence (Howick et al., 2011; SUNY, 2004) which EBLIP has also mirrored (Eldredge 2000a, 2000b, 2002). In the hierarchy of evidence, research methods such as randomized control trials are at the top of the hierarchy because they are more likely to be free of bias. While the levels of evidence are a well-known aspect of EBLIP, they are not something that the EBLIP community has wholeheartedly accepted. The application of such a hierarchy has been a concern for many within the field (Banks, 2008; Booth, 2010;

Crumley & Koufogiannakis, 2002; Given, 2006; Koufogiannakis, 2010).

Beyond Research Evidence

In the evidence based medicine model, scientific research is the main concept explored in relation to practice. However, there are other evidence sources beyond research that impact professional practice and decision making. In this study, practice theory was used as an alternative lens to view the EBLIP model. Practice theory explores what people actually do in practice, and examines how the active doing of a practice leads to knowledge that is important to that practice.

Schatzki's (1996) book, *Social Practices*, was the first to wholly focus on the practice concept. In that seminal work, Schatzki outlines the theory of practices and the necessity of action within practice. A key element of practice theory is the concept of *knowing* in practice. In practice, knowing has two elements that cannot be separated; these are "knowing how" and "knowing that," phrases first coined by Ryle in 1945. Knowing *that* relates to the mind, and how to do a particular thing, so that it is explainable. Knowing *how* relates to doing the thing, or action, even if one does not know how to explain how one has done it (tacit knowledge). Polanyi (1966) was the first to delve into tacit knowledge, explaining it as "we can know more than we can tell" (p. 4).

Schön, building upon the work of Polanyi, writes in his influential 1983 work, *The Reflective Practitioner: How Professionals Think in Action*, that "our knowing is *in* our action" (p. 49). For Schön the work life of a professional depends on this tacit knowing in action. Schön says: "Even when [the practitioner] makes conscious use of research-based theories and techniques, he is dependent on tacit recognitions, judgements, and skilful performances" (p. 50). The two aspects, research and professional knowledge, must go hand in hand.

Looking beyond theory, several professions are beginning to embrace a practice-based evidence approach in addition to an evidence based practice one. In the fields of medicine and nursing, Gabbay and Le May (2011) have done ethnographic research to reveal how clinicians acquire and use their knowledge. They convey the importance of "knowledge-in-practice-in-context" (p. 65), and note that medicine is an art in addition to a science. It requires judgment and decision-making skills in addition to scientific knowledge.

Many professional fields have also examined the importance to professional practice of evidence sources other than scientific research (Clark, 2011; Fox, 2003; Rolfe, Jasper, & Freshwater, 2011; Usher & Bryant, 1989), not rejecting research but widening the conception of what is required to make good decisions in practice. For practitioners, learning occurs via doing (Schön, 1983). Within communities of practice (Lave & Wenger, 1991), the focus of this learning is on the social nature of the community. Practitioners learn from others within their community, and likewise contribute to that learning. Communities of practice occur whether one is conscious of them or not. In an unconscious format, practitioners rely on their internal networks to assist with learning tacit dimensions of their work, via conversations with colleagues, interactions in groups, and verification from peers. Duguid (2005) explains that in becoming a practitioner, one needs to "learn to be," which is part of Ryle's concept of "knowing how," embodying the art of practice and tacit dimensions that are not easily made explicit.

Communities of practice have the potential to allow for individual practitioners to bring their practice-based knowledge to a conversation within their practicing community. Practice-based knowledge is therefore made more explicit, and learning occurs within the group, ultimately influencing practice decisions. How academic librarians function within their communities of practice, and how these communities affect their knowledge and decision making, are of interest to this study because it is within such communities that tacit knowledge is formed.

Aims

The aim of this study was to explore and better understand how academic librarians use evidence in their professional decision making. The purpose was to gain insights on the applicability of the current EBLIP model for LIS practitioners, and to understand the possible connections between scientific research and tacit knowledge within the practice of LIS.

The following research questions were posed:

- What forms of evidence do academic librarians use when making professional decisions? Why do they use these types of evidence?
- How do academic librarians incorporate research into their professional decision making?

Methods

The study used a grounded theory methodology, following the approach of Charmaz (2006). The methods used to collect data were online diaries (blogs) and semi-structured interviews. Ethical approval was received from both Aberystwyth University, where the researcher was a student, and the University of Alberta, where the researcher is employed as a librarian.

The study used a purposeful sample of Canadian academic librarians who had some interest in exploring the use of evidence in relation to their professional decision making. Although the research was targeted at academic librarians, a wide variance was sought, and so an open invitation to participate was sent out on mailing lists that are used by academic librarians, such as the Canadian Association of College and University Libraries mailing list, and the Evidence Based Librarianship Interest Group of the Canadian Library Association. The invitation was also sent out on Twitter.

Twenty-one librarians initially agreed to participate in the study. Two librarians later dropped out, due to time constraints, leaving a total of 19 participants. This number was sufficient to reach saturation of the data, and included variance amongst participants including demographics, work types within academic libraries, and knowledge of EBLIP. The 19 participants were geographically dispersed across Canada and were all English-language speakers. All worked in academic positions, identified themselves as academic librarians, and worked in a variety of roles and subject areas. The participants' number of years of experience as librarians varied widely, ranging from less than two years to more than 30 years. They represented all levels of experience, from new librarians in their first job, to senior librarians nearing retirement. Some librarians had many years of experience but had recently begun new positions, while others had been in the same position for many years. Each participant's familiarity with evidence based practice was assessed based on an analysis of comments in the diaries and interviews, and it was determined that eight participants were very familiar with EBP, three were moderately familiar, and eight had very little to no familiarity with EBP.

The process of data collection occurred over a period of nearly six months, simultaneously in conjunction with data analysis. Data collection occurred in a theoretical manner; as concepts emerged and patterns were discovered, the researcher followed up on those emerging concepts with the later participants. The study aimed for depth and richness of information rather than higher numbers of participants; the data is not meant to be generalized, but will be used to provide insights that may aid in the development of theory regarding evidence based approaches in librarianship.

Participants wrote in their online diaries for a period of one month. They were asked to note questions or problems that related to their professional practice and how they resolved those issues (see Appendix A). Participants used WordPress.com online blogging software, which allows for blogs to be kept private. All participants who completed the diary portion of the research agreed to a follow-up interview. The semi-structured interview process (see Appendix B) allowed clarification

and deeper analysis of specific aspects that participants may have noted in their diary entries, and allowed participants to look holistically at their experiences and to comment on the overall process.

Given the wide geographic distribution of participants across Canada, most interviews were conducted via telephone or Skype. All interviews were taped using a digital recorder. Audio tapes were transcribed by a professional transcriptionist and checked for accuracy by the researcher.

Analysis of the diaries began as each was completed, using the constant comparison method to closely analyze the text and discover and group concepts related to the decision-making process of participants. This process of comparing each incident in the data with other incidents, and doing so continually as the data is gathered, allows the researcher to determine analytic similarities and differences (Charmaz, 2006; Corbin & Strauss, 2008). As additional diaries and interviews were completed, the information gained from the earlier data was used to refine concepts and discover new ones, as is the norm within the grounded theory method. Memo-writing was used to keep a reflective record of the approach to the research as well as emergent concepts. An open coding approach was used on a printed copy of the diary and interview transcripts, and later transferred into the NVivo software program, which was used to assist with the management of data analysis. Very specific codes were later grouped into categories, as analysis was refined and a picture of the findings began to emerge. Saturation of the data was reached by the 16th interview, when no new theoretical insights arose from the data and no new categories emerged when coding.

Findings

The Concept of Evidence

While the interviews in this study were semi-structured with a focus on following up on situations that participants had raised in their blog diaries, participants were asked a direct question about what they considered to be evidence. Other than one participant, all who responded to the question about what they considered to be evidence were very open to the possibility of what evidence could be within librarianship. Responses that exemplified this outlook included "*there are lots of things that are evidence*" (Librarian 10) and "*I consider every information source to be evidence*" (Librarian 14). Most participants named several sources of evidence, and usually put those in context. For example, they chose different evidence sources depending upon the problem faced.

All participants noted research literature, or simply "literature," as evidence, often qualifying this source in terms such as "obviously" or "of course." However, there were some caveats put on the inclusion of published literature, due to the participants' discomfort with the quality and relevance of literature they have found in the past. This is exemplified by Librarian 10 who said "*obviously research is another kind of evidence although it is not totally implacable*" (Librarian 10, interview).

Another concept mentioned very frequently as evidence was "looking at what other libraries do." This evidence may come from the literature in the form of descriptive articles about an innovative service at a particular library, but may also be found by examining other libraries' websites or catalogues, speaking with librarians at other institutions, or hearing about other library experiences via a conference presentation or an electronic mailing list. This type of evidence provides ideas and insights relating to a problem that a librarian may be working on. As Librarian 20 noted:

> *I do find that hearing the experience of other librarians, getting some of their ideas – maybe it's not what you would term hardcore evidence, but I do find that that really just generates ideas, better ways of doing things or more interesting things.* (Librarian 20, interview)

"What other librarians do" also provides a starting point and guidance when approaching a problem one has not encountered before, or when trying something new. There is a reassurance in knowing how things worked for someone else, particularly peer-sized institutions that have similar populations. Such insights provide the level of detail that inquiring librarians need, as they are able to ask specific questions.

Data, or what is commonly referred to as statistics, was another key area mentioned by participants when asked to discuss what they thought of as evidence. Keeping statistics on reference transactions, circulation of books, usage of electronic journals, interlibrary loan requests, and so on are very common in libraries. Hence, it is not surprising that academic librarians are looking to those sources as evidence to help with their decision making. As Librarian 11 pointed out:

> *I think my gut reaction is that I want numbers of things. I want quantitative information. I want numbers of transactions, numbers of uses, and so on. I think that's probably a fairly shallow interpretation of evidence, but that's the kind I like.* (Librarian 11, interview)

As with the literature, most librarians were also cautious about statistics and often qualified their statements by noting that there were problems with this type of evidence, and that it could not simply be viewed in isolation.

Very often, librarians referred to the need to look at many types of evidence, particularly depending upon the situation. This is exemplified by Librarian 14, who stated:

> *I consider every information source to be evidence. And I guess I mean that in the very broadest category, so it could be someone's opinion or it could be a report. I feel confident in my ability to judge whether evidence is credible or not. So, I think I would look at everything. I wouldn't discount anything.* (Librarian 14, interview)

Regardless of whether they felt certain that some sources really were "evidence" or not, participants did mention experience, opinion, and anecdote. These seem to fall into a grey area, as most people who mentioned them did not feel absolutely comfortable or certain that they were evidence sources. One person was very certain that they were not, and another that they were. But most were unclear about these sources, acknowledging that they were used, but uncertain about whether they could or should be considered evidence.

Academic librarians generally have a very wide view of evidence, while at the same time, they are for the most part unsure of what constitutes evidence. They want to consider evidence carefully and are willing to take into account whatever may help them with decision making. They also consciously weigh evidence in an effort to make a good decision with the available evidence. For this, they rely on their own professional judgment and knowledge of what is most important in a particular situation.

Evidence Sources Used

The evidence sources used by academic librarians were numerous and detailed. In order to best convey this information, the evidence sources were grouped into two overarching types, hard evidence and soft evidence, at a final stage of the coding process in order to make a distinction between the types of evidence that were used or mentioned by participants. There were a total of nine categories of evidence, which are listed in Table 1.

"Hard" evidence sources are usually more scientific in nature. Ultimately, there is some written, concrete information tied to this type of evidence. A librarian can point to it and easily share it with colleagues. It is often vetted though an outside body (publisher or institution) and adheres to a set of rules. These sources are generally acknowledged as acceptable sources of evidence, and are what a librarian would normally think of as evidence in LIS.

The other type of evidence can be thought of as "soft" or non-scientific evidence. These evidence sources focus on experience and accumulated knowledge, opinion, instinct, and what other libraries or librarians do. This type of evidence focuses on a story, and how things fit in a particular context. Soft evidence provides a real-life connection, insights, new ideas, and inspiration. These types of evidence are more informal and generally not seen as deserving of the label "evidence," although they are used by academic librarians in their decision making.

Hard Evidence Sources

Published Literature

An important source of evidence consulted by academic librarians is the published literature. The published literature includes journal articles from both LIS journals as well as non-LIS journals, and can include both research articles and non-research articles, and quantitative and qualitative studies. It also includes books, databases, guidelines, bibliographies, and any other similar source

Table 1
Sources of Evidence Used by Academic Librarians

Evidence Source	**Definition**	**Examples**
Hard Evidence		
Published literature	Scholarly publications that have been vetted via a publication process	Journal articles (research and non-research), books, databases, conference papers, etc.
Statistics	Data pertaining to the use of a particular product or service	Usage statistics, reference statistics, circulation statistics, etc.
Local research and evaluation	The evaluation and assessment of services	Course evaluations, surveys, focus groups, etc.
Other documents	Non-scholarly publications that provide information about a service, event, or person	Policies, Web pages, blogs, course materials
Facts	Things that the majority of people agree to be true	Cost of a product, date of a publication
Soft Evidence		
Input from colleagues	Going to colleagues to ask their advice or feedback, or for information about a program or service that they may know about	Discussions, feedback, brainstorming, conference presentations
Tacit knowledge	Knowledge that is embodied by an individual and difficult to transfer to another person	Experience, intuition, "common sense"
Feedback from users	Individual feedback received from users on products or services	Comments, discussions, email
Anecdotal evidence	"Information obtained from personal accounts, examples, and observations. Usually not considered scientifically valid but may indicate areas for further investigation and research" (Jonas, 2005).	Stories, observation

that has been published. Participants noted that the literature provides them with a wider context, background information, and theoretical models. It also reinforces certain principles and reassures them of what they are doing. As the following comment illustrates, the literature reassures that one is on the right track:

> *So, the lit search, I think it was useful, at least in terms of giving me confidence that I wasn't overlooking anything major. That the stuff I had figured out was about right.* (Librarian 1, interview)

The literature is rarely consulted in isolation. It is considered as just one piece of evidence in a decision and is often used for background information gathering when one is faced with a new problem. However, the literature does not always offer sufficient answers. Librarians find the literature somewhat useful, but at the same time disappointing. They wish that the quality of the library literature was higher and that it was more relevant to their practice. Sometimes, they do not find anything in the literature, or what they do find is not useful. However, no participant was ready to completely disregard the literature. While participants noted different types of literature and occasionally mentioned types of studies or the lack of good research, they detailed differences between specific types of research literature.

Statistics

Data in the form of library statistics is a very common source of evidence among academic librarians. Participants frequently mentioned using information such as usage data, circulation statistics, reference statistics, interlibrary loan data, room bookings, and Web usage data. This type of evidence is most common when problems arise relating to collection management, and also reference services. Participants generally felt that such statistics provide an overall picture of the general situation as it pertains to use of a particular collection or service. For example, in comparing journals in a particular field, usage statistics would be looked at in order to determine what journals are being most heavily used by faculty and students. This would be considered very strong evidence when faced with decisions about possible cancellations. As Librarian 8 commented: "*I can't quite think of a way to assess a resource without usage statistics*" (Librarian 8, diary). Echoing this, Librarian 5 noted: "*From my perspective, I need to be able to support positions for or against purchases, cancellations, etc. I tend to base these on usage stats and acknowledge this*" (Librarian 5, diary).

However, while participants used this type of evidence in their decision making and were frustrated if it was not easily available, they also pointed out that such information could not be used in isolation since there are limitations to relying on such data. Participants emphasized that data and statistics were only one part of the story, and that context and other forms of evidence were also required before making a final decision.

Local Research and Evaluation

Academic librarians frequently incorporate evaluation and assessment of services into their work. Many also take on research projects that are connected in some way to the work they do. While empirical research projects may be more scientifically rigorous, this type of work is usually not undertaken as frequently as local evaluations of projects or teaching. Such evaluation is a source that academic librarians find useful in the ongoing improvement of their services. For example, when referring to instruction decisions, Librarian 7 stated, "*I find, probably, evaluations are the most – the best evidence that we have*" (Librarian 7, interview).

Sources in this category that were cited by participants include total market surveys such as LibQUAL, university surveys that include the library, time audits to measure workload, staff surveys to generate feedback on workload, in-house surveys, testing how something works, evaluation of instruction, SWOT analysis, workplace climate surveys, individual research projects, pre- and post-

assessment instruction surveys, and Web usability testing.

Such tools are useful to academic librarians who want input from the communities they serve, or from the staff that work at an institution. For example, Librarian 8 had looked to the literature and discussed the situation with her colleagues, but still did not feel that she had all the evidence required to make her decision about a reference project. She concluded: "*I'm convinced that I need to hear the voices of actual users. So, I've planned to undertake 3 focus groups next week*" (Librarian 8, diary)

Other Documents

This category includes non-scholarly sources that participants used, such as job postings, position descriptions, brochures, mandate documents, safety standards, collection policies, websites (particularly those of other libraries), collective agreements, internal procedure documents, blogs, Twitter, and consultants' reports. These types of documents are not scholarly or research based, but they provide pertinent information that may be useful in making decisions. For example, policy and procedure documents will guide what librarians decide in order to conform to the goals of the overall mission of the institution: "*Is the decision consistent with our policies and procedures?*" (Librarian 2, diary).

Overall, this category of evidence is a broad one, ranging from the official publications of a university, to those documents that are "on the fly" as pointers or tidbits of information, from sources such as Twitter. Despite this, all these types of "other documents" are a source that librarians draw upon, and are relevant depending upon the situation.

Facts

Facts are what the majority of people, if not all, agree to be true. In academic librarianship, some of the things that can be placed in this category include the cost of products, physical condition of materials, citation or publication information, what items are in the catalogue, license terms, the amount of physical space available, and hours of operation. Facts are generally not disputed, although they may be occasionally. Academic librarians use facts in their decision making in order to place certain realities around the decision, or to verify details before making a decision. For example, if a library has a $10,000 budget for a new resource but it costs $15,000, the fact of the budget amount in conjunction with the cost of the project may alone determine the decision (unless one or both are negotiable). Another example would be deciding when to keep or cancel a subscription:

> *Checking the catalogue record confirmed: we have only a couple of issues of either publication – with so few issues, I questioned the usefulness of having them in the collection at all; they are not available electronically, they are not indexed, one of the titles appears to be the continuation of another title – which we do not have.* (Librarian 6, diary)

Soft Evidence Sources

Input from Colleagues

Advice, feedback, and information from colleagues about a program or service are very common sources of evidence for academic librarians. Almost all participants mentioned this as part of their decision making, whether they conceptualize it as evidence or not. "Colleagues" were generally considered to be other librarians, but this was not always the case. Getting input from colleagues, both from within and outside their institutions, provides academic librarians with a way to learn from others who have more experience in a particular area. It also provides confirmation of direction and support for the decision. This type of interaction combines the evidence of experience and knowledge with factors relating to the politics of the institution. It gives the librarian a sense of what other librarians do, and becomes a confirming experience. For many, it is also a way to obtain different viewpoints from one's own, ensuring that the full picture is considered:

> *I never want to sort of leave something with just my opinion. I want to see if I can find a couple of other varying opinions to inform what I'm doing. So, maybe it is evidence that informs me because at that point once there is an absence of anything that's documented, I still think it's valuable to then go and talk to peers or experts.* (Librarian 4, interview)

Ways of gaining such input from colleagues include one-on-one conversations, attending conference presentations, asking someone to critique teaching or writing, networking at group events (including conferences), corresponding via email or phone, and getting informal feedback from a number of people. This is usually undertaken in conjunction with other forms of evidence (hard sources), but this type of input is considered very valuable for providing insights and knowledge that cannot be gained from the more concrete sources of evidence. Hence, combining what is found in the literature, or what statistics demonstrate, with the professional experience of colleagues puts other sources of evidence in context, provides insight, and highlights any potential problems.

Tacit Knowledge

As explained in the literature review, tacit knowledge refers to what we know but cannot easily explain (Polanyi, 1966). Participants mentioned their own professional knowledge acquired via experience and education, professional judgment, intuition, and reflection as elements they draw upon to guide their decision making.

Participants generally combined this type of evidence with other sources in order to strengthen and verify their decision making, but do not discount their knowledge and experience as irrelevant. As Librarian 6 reflected in her diary:

> *Now I'm finding – as a result of more experience, confidence, knowledge, maturity – how important those initial gut reactions/instincts are and I've learned how to trust them and work with them and pay attention to them – however insignificant that may be. I've learned to bracket those instincts and look to the evidence – but in a way that is realistic and appropriate to the situation/question/issue.* (Librarian 6, diary)

The academic librarians in this study used tacit knowledge very heavily in their decision making. This is evident in the number of references to tacit knowledge that arose in both the diaries and interviews. What is interesting is that tacit knowledge reveals itself when participants describe how they made decisions and the sources upon which they draw, but when they are directly asked what they consider to be evidence, tacit forms of knowledge are rarely mentioned. Most librarians combine the tacit knowledge aspects of what they know as individual professionals and use it in conjunction with external evidence in order to make decisions.

Feedback from Users

Obtaining feedback from library users arose in this study as a minor source of evidence. When it is more rigorous (as part of a study or planned evaluation), it can be placed in the category of local research and evaluation, which usually focuses on users of a service. However, it is included here as the individual feedback that librarians receive on products or services. This type of feedback is used most frequently in collections management, and also teaching and instruction activities. Faculty feedback that is related to collections is most often looked favourably upon as a source that holds a great deal of weight in decision making.

Student feedback is also important to academic librarians, particularly as it relates to information literacy instruction, since librarians want to ensure they are helping the students be successful. In addition to formal evaluations, the informal feedback received following an instruction session is a valuable tool for reinforcement or as an indication that something needs to change. It may result in

changes being made to a presentation or style of teaching for the following session.

Anecdotal Evidence

Anecdotal evidence is "information obtained from personal accounts, examples, and observations. Usually not considered scientifically valid but may indicate areas for further investigation and research" (Jonas, 2005). Most academic librarians would not include this in a conceptual discussion of what they consider to be evidence; however, it is a source of evidence that is often drawn upon when making decisions. Librarian 16 mused about the usefulness of anecdotal evidence in relation to a collections and access issue:

> *I guess even anecdotal evidence can be – to look at where it confirms or differs from available evidence and then go from there and try to figure out what's happened and why; why all the librarians think everybody wants to have circulating current issues of journals and there's no evidence showing that people are asking for this.* (Librarian 16, interview).

Anecdotal evidence may be the prompt that sets investigation of a potential problem into motion, and it is often used in group conversations when determining a course of action. This type of evidence is most frequently frowned upon as not being worthy, but in the absence of anything else, it is certainly used. Most often, librarians will look to other sources of evidence to confirm or deny anecdotal evidence; as Librarian 15 points out, "*anecdotally I know about things like that. But you know, having some actual evidence would be helpful*" (Librarian 15, interview).

How Academic Librarians Find Evidence

Data from the diaries and interviews was also coded according to how the participants obtained the evidence they used to make a decision. This coding resulted in five categories relating to how academic librarians find evidence when faced with a problem or question related to practice. The examples in Table 2 come directly from the participants' actions, and the grouping of these into broader methods of information finding was done by the researcher.

Table 2
How Academic Librarians Find Evidence

Method	How	Examples
Pull	Proactive and specific	Literature search in databases; Google (Internet) search; gathering statistics for circulation or journal usage; looking up facts; asking colleagues questions related to their experience or sources of information
Push	Passive, general awareness	Notifications via TOC services; Twitter; RSS feeds; attending conferences and listening to presentations; colleagues passing on information; getting feedback from users; anecdotal evidence (hearing stories)
Create	Proactive and specific	Including evaluation with instruction; doing a research project related to the problem; conducting in-house surveys or focus groups; keeping reference statistics
Reflect	Proactive examination of knowledge and experience	Carefully considering context and what is known about the situation; tacit knowledge (unique for each person)
Serendipitous discovery	Passive, by chance	Coming across an article or some other document or piece of evidence that is related to your decision, even though not directly looking for it (for example, picking up a journal and while flipping through it, finding something relevant); seeing something in the news that points to a source that is relevant

The first and most obvious method of finding evidence to help with decision making is what is known as pulling the information required from various sources ("pull") (Cybenko & Brewington, 1999). This is a very proactive way of obtaining information, and allows librarians to be specific about their needs. As Librarian 4 commented: "*I searched, I looked, I asked*" in her quest to locate evidence. Doing a literature search is a well-known way of pulling evidence on a particular topic. Other ways of using the pull method would be searching Google (Internet), gathering statistics for circulation or journal usage at the point of need, looking up facts, and asking colleagues questions related to their experience. While discussing the management of approval plans with a monograph vendor, Librarian 15 commented:

> *I also use the vendor's database site so I can see what the effects of adding a particular variable to a search would be. For example if I want to see how many slips would be received annually by our Education selector in the LC section G73 (Geography – study and teaching) I can run a search for that LC class, limiting it to appropriate readership levels and one calendar year. This way I can determine whether or not the slips are appropriate in content and if the number of slips is reasonable.* (Librarian 15, diary)

A passive way of obtaining evidence is to have it pushed to you ("push") (Cybenko & Brewington, 1999). Setting up table of contents alerts or RSS, following individuals or organizations on Twitter, attending conferences, and listening to presentations are all ways in which evidence sources are pushed to librarians. Since these sources are not the result of a specific search for information on a topic, much of what the librarian receives and filters through may not be directly relevant to the problem at hand, but often such sources provide an early indication of trends or aspects of practice that are changing, or new innovations. As one participant noted: "*I have a lot of notifications coming over my desk so I see what sort of the trends are typically in the field so I feel like there are lots of things to learn*" (Librarian 10, interview). Upon learning of new things via this method, an academic librarian may then further move to the pull method for more information.

Academic librarians also create their own evidence sources. This is very proactive and is usually in reaction to addressing a specific need. It includes situations where librarians conduct research or evaluation in relation to their work. Some examples are including formal evaluation with instruction, designing a research project related to a problem, and keeping reference statistics so that trends in the use of reference service can be monitored over time. Evidence sources that are created are generally used in-house for local decision making, but may also be published and fed back into the evidence base used by others:

> *We – library administration – are looking for ways to improve productivity, efficiency and engagement within the unit, and are considering adding an additional layer of supervision to the existing structure. It has been challenging getting enough staff members to participate in frank discussion on the topic, and to articulate what they see as the major areas in need of improvement in the area. To help with this, we administered a survey to staff which yielded some helpful qualitative evidence with respect to how staff members view a variety of issues within the area and how they might be improved. Opinions we suspected might be held broadly by staff members ended up not to be, and vice versa, which has helped to crystallize some of the planning initiatives we had in mind.* (Librarian 11, diary)

"Reflection" is another way that academic librarians find evidence, by taking time to carefully consider the problem at hand and draw upon their past experiences and knowledge in relation to the problem. Considering the context of the problem, and what a librarian knows about the circumstances and people involved, is often very important for how to best approach a given situation. Schön (1983) argues that such reflection allows practitioners to better deal

with situations that are uncertain or unique. Reflection on what is done, and how, strengthens the soft forms of evidence discussed earlier:

> *I like to reflect, you know, when I've gathered the evidence I like to reflect, depending on how complex the situation is. But I'm finding more and more that taking some time to reflect is extremely useful and whether that's – even if that's half an hour or overnight, I like to give myself time to think about all the evidence that I've collected and let it ruminate, let it kind of come together and it helps me with seeing a direction. It helps me if I miss anything. You know, have I missed anything, or misread anything? Because sometimes I'll go back again to the evidence and look at it again and then I realize oh, actually this person said this and I took it to mean this, but actually now that I read it again I see that it means this. This changes things. So I've found that to be very useful, that reflection as part of the evidence.* (Librarian 6, interview)

A final way that academic librarians find evidence is by obtaining it serendipitously. "Serendipitous discovery" happens almost as if by accident, when librarians find something they weren't expecting to find as a pleasant discovery. Foster and Ford (2003) conclude from their research that "serendipity would appear to be an important component of the complex phenomenon that is information seeking" (p. 337). In the case of academic librarians this may mean coming across an article or some other document or piece of evidence that is related to a decision, even though they were not directly looking for it. Such discovery is passive, although subconsciously one may be looking for things that relate to the problem at hand. Librarian 3 titled one of her blog posts "Serendipity!" and went on to state:

> *I knew that ACRL had Guidelines for Instruction Programs in Academic Libraries but I also knew that they are fairly out of date – 2003. I was just reading the latest issue of College and Research Libraries News (usually they sit for months on my desk before I have get to them but for some reason I opened the February 2011 issue) and I see that they have updated draft guidelines out! I looked at the ACRL site, and they also have a new draft of Characteristics of Best Practices of Programs of Information Literacy! These are going to be very useful as we figure out what to do with our program.* (Librarian 3, diary)

Discussion

Evidence Sources

This study showed that there are benefits to both broad types of evidence that were identified. Hard evidence sources are generally more scientifically rigorous; they confirm or add to what librarians may already know based on past experience and professional knowledge. They also increase confidence, and other people place more value in hard sources of evidence. Hard evidence can be used for convincing purposes, and ultimately increases the depth of professional knowledge. Soft evidence sources are also important; knowledge and experience allow librarians to judge situations and make quick decisions when necessary. Soft evidence enables the necessary analysis and reflection on hard evidence sources, and facilitates putting problems into context.

It is important to consider whether both types of evidence are equal and whether soft types of evidence should really be considered valid evidence. This study showed that both types of evidence were used and valued by academic librarians. However, it was only the hard evidence sources that were truly thought of as evidence by participants. This makes sense, as many of the soft sources of evidence stem from already-acquired internal knowledge; evidence is viewed as something that is external and gathered as proof to assist with solving problems and making decisions. For evidence based practice, which seeks to apply the best documented evidence, the evidence focus turns to the hard sources of evidence, which

need to be gathered and critically evaluated. EBLIP must also remember the role of the soft evidence, however, and note its importance. Evidence sources vary depending on the type of problem. For example, as Agor (1989) and Dane and Pratt (2007) point out, there are situations when expert intuition is useful and best used. These include situations with significant time pressures and high uncertainty, in which a quick judgment needs to be made. In these situations, consulting an experienced practitioner (expert) in the field is best to make the decision, and intuition can be effective. Such scenarios occur in libraries when there is an emergency situation, a problematic patron, or a difficult human resource issue, to name a few examples. Decisions have to be made quickly and the soft sources of evidence very much come into play by helping librarians make good decisions in such circumstances. However, for decisions that are more planned and have time for investigation, the soft evidence offers a basis of knowledge from which to work and assist with the process of decision making. In these cases, the librarian would use the hard evidence sources to develop a more complete picture based on data, facts, and research in order to come to a logical conclusion about the best decision. The evidence sources used would be those that are most appropriate depending on the question. For example, in the case of designing an information literacy service for a university, the group working on the strategy would look to the research literature, seek out articles about what other institutions have done, examine any past information literacy evaluation that had taken place at the institution, consider learning outcomes tied to the curriculum, talk with faculty, and so on. Many sources of evidence would be weighed to enable the team to come to a decision on the best way to provide service in that particular library.

This study confirms that in academic librarianship, the forms of evidence are much broader than just research. Both soft and hard evidence sources are used in conjunction, bringing together the science and the art of practice. The art of the craft allows librarians to embrace messy situations, find ways to be creative, and put professional judgments to use in order to find the best solutions to meet the needs of individual users. This is achieved by applying the best of what is found in the research literature together with the best of what practitioners know is likely to help a person. The science allows for certainty and confirmation, and builds the overall knowledge base.

The findings show that research is valued by academic librarians and is used as an evidence source in decision making. However, academic librarians do not automatically assume that research is good or beneficial just because it has been published. They look at research with skepticism and want to ensure that the research is applicable to their own situations. The research literature alone rarely provides specific answers to the questions that practitioners have. It is almost always used in conjunction with other forms of evidence, including soft sources such as professional knowledge and intuition. Librarians also incorporate other evidence sources such as statistics, local research and evaluation, and input from colleagues, in order to look at many variables prior to making a decision.

Implications for Evidence Based Library and Information Practice

While the definition of EBLIP noted earlier (Booth, 2000) includes professional judgments, it does so only in a way that indicates that application of evidence to those professional judgments will improve them. It does not clearly account for the place of professional knowledge, nor is professional knowledge accounted for in the EBLIP model. LIS professionals must reconsider this exclusion. Based on the findings of this study, it is clear that professional knowledge and evidence sources are used together, and they are important aspects of the decision-making process. If broadly interpreted, the EBLIP definition covers much of what this study has found to be used by librarians in their decision making, but has a specific focus on research. The concept of "evidence" should be broadened to include more than the traditionally recognized research article

(Figure 1). EBLIP should include other types of data and recognize local circumstances. Being "moderated by user preferences" is an important part of the definition, but is rarely explored in the EBLIP literature. User preferences are necessarily local and can be found through the evidence sources of usage statistics, feedback, local evaluation, research, and even anecdotal evidence.

Figure 1
Evidence sources in librarianship

While the need to produce high-quality research that is applicable to practice remains (and this goal of the EBLIP movement should in no way be discouraged), this study shows that there are other forms of evidence beyond research that are also necessary for librarians to make decisions in their daily practice, regardless of the quality of the research literature. Many professional librarians' questions require local sources of evidence that cannot be obtained from the literature. For example, if the problem or question relates to reference service, then reference usage statistics should be considered, as should local feedback and potential local service evaluations. The EBLIP model should account for these as legitimate sources of evidence and should provide assistance for librarians in determining the best way to use these sources, similar to critical appraisal tools that have been developed for research articles. The EBLIP movement needs to discuss and debate the topic of what counts as evidence and how librarians can weigh different forms of evidence. In the future, EBLIP could focus on how to do better project evaluations, how to interpret user statistics, the best methods for collecting reference statistics, and so on. EBLIP was built on the EBM model, but in LIS many different forms of evidence are used that also need to be considered.

As noted, research found in the literature is often not directly relevant to the situation at hand. Input from colleagues provides confirmation and support from those who know the local situation and the nuances of why things may or may not work within a specific context. Hence, both aspects are important in academic librarians' decision making. This is in keeping with the literature of practice-based evidence which stresses the importance of soft evidence sources. The same can be seen in other professions. In health care, for example, Gabbay and LeMay (2011) found similar results in their ethnographic study on the acquisition and use of knowledge by health care professionals. They developed the concept of "mindlines" and observed that judgment and "knowledge-in-practice-in-context" (p. 65) are essential. The mindlines concept demonstrates the importance of skills and knowledge beyond what is found in the research literature, and its contribution to decision making.

A model of EBLIP could take a holistic view of evidence, including that which is driven by practice as well as research. Proponents of EBLIP should consider how evidence may be used in practice, and tie research and practice together rather than separating them. A first step is to recognize that what practitioners do is of utmost importance. Obviously, without the practitioner, there is no practice, and practitioners are the ones who know what is happening within their contexts. Practitioners use and create evidence through the very action of their practice. The local context of the practitioner is the key, and research cannot just be simply handed over for practitioners to implement. Practitioners can use such research to inform their decisions but need to consider other components. The concepts found in practice theory, focusing on the practitioner and their knowing in practice – both local evidence and professional knowledge – help to provide a more complete picture of decision making within our profession. The importance that participants placed on learning about what other libraries do, and the high emphasis on gaining input from colleagues, show that practitioners are working within communities of practice for enhancement of their own knowledge and for reinforcement before moving ahead with new ideas. A community of practice may exist within the workplace, where local context is very important, or at a broader level amongst colleagues at other institutions. This broader community is built through conference attendance, as well as committee work on issues of shared interest, and references from colleagues.

Future Research

It would be beneficial for LIS researchers or researcher-practitioners to explore and recommend the best evidence sources based on the type of question. This would not be a hierarchical list, but would serve as a guideline on what sources of evidence librarians should consider consulting for a given type of question. For example, for a collections problem, the research literature should be consulted, but other sources of evidence that would provide good information include usage statistics for e-products, circulation statistics, faculty priorities, tools such as OCLC collection analysis, interlibrary loan and link resolver reports, and the publication patterns of faculty. Researchers could determine the most relevant sources for each area of practice, and in what circumstances they are best used.

It would also be very beneficial for practitioners if researchers would develop guidance on how to read the results of different evidence sources. This could include what practitioners need to consider when looking at reference statistics, or what elements librarians should consider when conducting an evaluation of their teaching. Some of this information will be found in existing literature, and a scoping review of what has already been documented would be a good start.

Limitations

This study is not intended to be generalized to all academic librarians. The purposeful sample allowed for depth and richness of information, and saturation in the data was reached, but not all academic librarians would necessarily fit within these findings. In addition, other academic library systems outside of Canada may operate differently. Academic librarians are generally regarded as academics or faculty in Canada, and at many institutions they can obtain tenure. These factors may create a very different work environment and professional outlook from those working in other library sectors. Doing similar research on other librarian groups would strengthen the key findings and applicability of this study.

The data collection methods included diary keeping by the participants for a period of one month. The very act of having to keep the diary was something that was not a normal part of their practice, and thus may have impacted their behaviour. For example, they may have felt pressure to do more and be more methodical in their decision-making processes than normal. It is unlikely that false reporting occurred, however, since the follow-up interviews with participants allowed for in-depth probing of the actual decision-making

process, confirming what was previously reported.

Conclusion

This paper has detailed research findings regarding types of information that academic librarians consider to be evidence, and the evidence sources that they use in practice. It answers the research questions, "What forms of evidence do academic librarians use when making professional decisions? Why do they use these types of evidence?" Two broad types of evidence were identified (hard and soft), which are generally used in conjunction with one another in order to ensure that all possible evidence sources applicable to the problem at hand are considered. Neither type of evidence is sufficient on its own. Librarians look at all evidence sources (hard and soft) with a critical eye, and try to determine a complete picture before reaching a conclusion. Information about how librarians find evidence emerged from the data, showing that both proactive and passive approaches are used.

This paper also answers the research question, "How do academic librarians incorporate research into their professional decision making?" It is clear that academic librarians do value research and do look for it to assist with their decision making. However, the published research is insufficient on its own. It may not be directly applicable, and the specifics of the question or problem which librarians are trying to solve take them to sources beyond the research literature. Librarians value research literature, but do not use it in isolation. It is only one part of the overall evidence that a librarian needs to consider.

Both hard and soft types of evidence instill confidence but from different perspectives, and taken together have the most strength. These results provide a strong message that no evidence source is perfect. As a result, librarians bring different types of evidence together in order to be as informed as possible before making a decision. Using a combination of evidence sources, depending upon the problem, is the way that academic librarians approach decision making. These results suggest that current practice does not fit with the most commonly used definition of EBLIP or the EBLIP model as noted in the literature. A change within EBLIP does not require a full rejection of the name, but rather a realization that more types of evidence can be included within the concept of evidence, and that doing so brings the EBLIP model closer to one that has truly considered the needs of librarians.

Acknowledgement

This paper is the first from a doctoral study. Future papers will look at how evidence sources are used in decision making, obstacles and enablers to evidence based decision making, and a fuller consideration of possible changes to the EBLIP model itself.

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Appendix A

Blog Diary Instructions for Participants

Over the course of the month that you keep this diary, please write about any incidents where questions arise relating to your professional practice as a librarian. Questions/problems could vary widely. Please make note of each question, your thoughts about it and how you might approach solving the question.

Explain any action you took to answer the question, and what, if anything, you did about it. Some questions may be answered immediately, while others may take days or weeks, or not be answered during the diary-keeping period at all. That is ok. Just detail as much of the process you used in your decision making as possible. How did you come to make the decision you did?

At any point in the process, please feel free to reflect on the decisions you made and whether they seem to be working. Remember, there are no right or wrong responses. As a researcher, I am looking to understand the process that academic librarians go through in reaching decisions, and what types of evidence may be part of that decision.

Examples of professional questions/problems a librarian may be working on:

- Today I am deciding which print journals we might be able to safely weed from the collection.
- I've been asked to determine the most appropriate hours of operation for the fall term.

- We are going to be doing renovations to the building this year and I'm on a team looking into what changes would be best.
- I am planning a one-hour information literacy session for first year biology students and am trying to determine the best method of delivering the information.
- I was wondering how Scopus journal coverage compares to that of Biosis. Do we need both?

Key elements to include in your diary blog entry:

- The professional question/problem arising in practice.
- Things you did in working through the question/problem. What types of evidence did you use, if any? Who or what did you turn to in this process to help you?
- Any roadblocks you encountered in your problem-solving process, and what you did as a result.
- The end result/outcome if a conclusion was reached; or, steps you plan to take to reach a conclusion.
- Reflection on your decision making process. How do you feel about what you did; what would you change? Were your sources of evidence sufficient?

Please write in your diary as professional practice questions occur. If no entries are received within the period of one week, you will be prompted with a reminder by the researcher. You may contact the researcher at any point, to either ask questions, or drop out of the study if you wish. There is no obligation on your part to participate, all participation is voluntary, and there are no repercussions for dropping out of the study. The blog you are using is private, so only you and I can access or read the content.

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Appendix B
Interviewer's Guide

Guiding questions (to be adapted to each situation and allowed to flow from the context of what the participant feels is important to discuss):

- Thinking back on the diary keeping period, were their any specific incidents that stood out for you?
- Would you say that the things you recorded in your diary were fairly typical of a normal month for you? Why/why not?
- In your diary entry, one of the things you discussed was [X]. Can you tell me more about your thoughts on this and what it means to you as an academic librarian?
- You mentioned a question that arose in your practice (name the specific question/incident). Can you tell me about this in a bit more detail?
- What were some of the barriers or difficulties you encountered during the diary-keeping period?
- What types of things do you consider to be 'evidence'?

Can you tell me how important or not research is to you as a practitioner? How do you use research? What do you consider to be good research, and how do you use it?