Integrating information literacy in health sciences curricula: a case study from Québec

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Abstract

Objective: To portray an information literacy programme demonstrating a high level of integration in health sciences curricula and a teaching orientation aiming towards the development of lifelong learning skills. The setting is a French-speaking North American university.

Methods: The offering includes standard workshops such as MEDLINE searching and specialised sessions such as pharmaceutical patents searching. A contribution to an international teaching collaboration in Haiti where workshops had to be thoroughly adapted to the clientele is also presented. Online guides addressing information literacy topics complement the programme.

Results and evaluation: A small team of librarians and technicians taught 276 hours of library instruction during the 2011-2012 academic year. Methods used for evaluating information skills include scoring features of literature searches and user satisfaction surveys.

Discussion: Privileged contacts between librarians and faculty resulting from embedded library instruction as well as from active participation in library committees result in a growing reputation of library services across academic departments and bring forth collaboration opportunities. Sustainability and evolution of the library instruction programme is warranted by frequent communication with partners in the clinical field, active involvement in academic networks and health library associations, and reflective professional strategies.

Background

The reference team of *Bibliothèque de la santé* at Université de Montréal (UdeM) has developed over the last twenty years an information literacy programme showing a high level of integration in health sciences curricula. We have leveraged our past successes by introducing specialised workshops and innovative online guides. Originally focused on effective database searching, the teaching orientation now aims towards the development of lifelong skills in finding and appraising the literature.

Historical perspective

Integration of library instruction (LI) in UdeM's academic programmes in biomedical sciences began in the early 1990s and evolved one small step at the time, as a result of one-on-one discussions involving Health Library librarians with faculty members or library committees[1]. Workshops were eventually designed to meet the Information Literacy Standards created by the Association of College Research Libraries[2], with a strong emphasis on standard two, "the information literate student accesses needed information effectively and efficiently". In 2002 UdeM's medical librarian attended the intensive seminar *How to teach evidence-based clinical practice* at McMaster University[3] and designed her first cursus-integrated evidence-based practice workshop, as requested by the Faculty of Pharmacy.

The concurrent adoption of an information literacy education policy at UdeM was critical in promoting the integration process of LI to stakeholders[4]. Over this time period the Health Library also became involved in the regular evaluation or accreditation of academic programmes, providing LI statistics and hosting visits from external evaluators.

In particular, academic standards required by the introduction of the CanMEDS Competency Framework[5] played a key role in the integration of LI in medical curricula. Meanwhile, a 2003 survey among Québec's seven universities established that an alarming proportion of 1st-year students lacked basic information searching and appraising skills[6]. Most respondents could not characterise scholarly journals properly, were unable to identify the citation format associated with a journal article and were unaware of the need to quote sources when paraphrasing. Students also readily admitted their ignorance of the information research process. Between 2002-2003 and 2009-2010, LI statistics grew steadily in the province, with the total number of participants increasing from 75 926 to 96 605 and total hours of LI progressing from 3678 to 5133[7]. Yet, a new survey of Québec students' basic information searching and appraising skills is needed to determine if competency levels have improved.

However, the current literature reports that despite a generalised access to the Internet, college students lack many of the skills required to search, filter and appraise the torrent of information available[8, 9]. In particular, studies point out that college students from the health and medical professions would benefit from customised instruction improving eHealth literacy, which may be defined as "the ability of individuals to seek, understand, and evaluate health information from electronic resources and apply such knowledge to addressing or solving a health problem"[10]. Indeed, the appraisal component of online health information searching has gained more importance in our LI programme over the years, as demonstrated by the progressive integration of evidence-based practice workshops in ten academic programmes. Moreover, the most recent professor request for

a library workshop stressed the need to teach formal methods to evaluate the quality of freely available online health information.

Setting

UdeM is the largest French-speaking university in North America, with more than 45,000 registered students in the Fall of 2010[11]. A member of the Association of Research Libraries (ARL), UdeM Libraries is comprised of eighteen branches located on Montréal, Laval and St-Hyacinthe campuses. *Bibliothèque de la santé* or Health Library is part of a network of five Health Sciences libraries, which also includes Allied Health, Optometry, Kinesiology and Veterinary Medicine libraries. Health Library supports the teaching and research activities of the faculties of Dentistry, Pharmacy, and Medicine. These combined faculties enroll a total of more than 5700 students. For Medicine, the fundamental and clinical sciences departments are supported by the Health Library, whereas the Allied Health Library supports allied health and public health sciences departments. In addition, Health Library provides services to libraries in UdeM's affiliated hospitals and research centres such as interlibrary loans or bibliographic and citation tools training for librarian colleagues.

Health Library's reference and collection development service is staffed by a head librarian, three liaison librarians, three library technicians*, and an information technology (IT) technician. The latter is a precious member of the reference team, as this position is mainly dedicated to customer service. IT tasks include assistance for use of office applications suites, network access, EndNote installation and thesis submission to the institutional repository. Liaison activities are distributed among librarians in the following manner: undergraduate and clinical medical programmes; dentistry, optometry,

pharmacy and pharmacology; and fundamental research programmes from all three faculties.

Health Library is located in the main building of the Montréal campus, and its information commons is equipped with a computer laboratory that can seat 40 participants. The teaching language is French. As the majority of search interfaces and bibliographic tools are in English, we address the importance of using English search terms in most databases in order to get significant results.

Teaching philosophy

Reflective practice is a process where instructors understand and shape skills and abilities as they teach, instead of simply assessing their performance at the end of an interaction[12]. The core principles of this approach are integrated as much as possible in our setting. To begin with, as studies report the importance of personal relevancy to student learning[13], Health Library's instructors focus on concepts appealing to students such as addressing the benefits and drawbacks associated with conducting a more sophisticated search in a database (e.g. MEDLINE) compared to the rapidity and facility of a general search engine (e.g. Google Scholar). Search examples are also customised according to the students' discipline and set in a context of interprofessional practice.

Next, all Health Library workshops include a hands-on exercise component encouraging direct input from students. Instructional design is centered on building a profitable learning experience rather than teaching a succession of database functionalities or library resources. Workshops thus encourage the comprehension of threshold concepts. These differ from learning objectives in that they are gateways for student understanding that, once traversed, transform the student's perspective[14]. For example, once the concept

of Medical Subject Headings (MeSH) is assimilated, it is transposable to searching

another database using a different thesaurus.

A corollary to this teaching philosophy is that library instructors dealing with a high

frequency of workshops in their work calendar avoid the eventual sense of redundancy

associated with repetitive tasks and feel a greater sense of gratification, as every teaching

experience is tainted by unique feedback from students. Health Library reference staff

also take advantage of the occasions to integrate humor in their instruction as a means to

connect with participants and facilitate concept retention[15].

Objectives

- To describe standard curriculum-integrated workshops as well as specialised

  classes offered at Health Library, including the various learning assessments used.

- To discuss the positive outcomes of LI in our setting, such as opportunities to

  engage with faculty and students.

Methods

The following array of instructional offerings features various assessments of student

learning going beyond testing content knowledge and levels of competency[13].

Standard curriculum-integrated workshops

Table 1 summarises the integration of Health Library workshops in core curricula. The

coverage is especially comprehensive for undergraduate biomedical programmes.

Participation is generally mandatory. To motivate student participation in short, one-shot

sessions, most assignments are graded[16] and represent 5 or 10% of the course's final mark. Students, faculty and personnel are also invited to register on a first-come, first-served basis for PubMed, MEDLINE/Embase (OvidSP) and EndNote sessions that are offered throughout the academic year.

Table 1. Integration of Health Library information literacy workshops in biomedical sciences curricula.

Programmes	Library Resources	MEDLINE (OvidSP)	PubMed	Evidence-based practice	EndNote	Pharmaceutical Patents	Information Quality / Copyright
Undergraduate							
Medicine (MD)	X*	X*		X			
Dentistry (DMD)	X*	X*		X*			
Pharmacy (Pharm.D)	X*	X*	X	X*			X
Optometry (OMD)	X*	X*					
B.Sc. Biological Sciences, Microbiology and Immunology option			X*				
B.Sc. Biomedical Sciences	X*	X*	X*		X*		
B.Sc. Biochemistry	X*		X*		X*		
B.Sc. Bioinformatics	X*		X*		X*		
B.Sc. Biopharmaceutical Sciences	X*		X*	X		X	
Graduate							
Emergency Medicine residency			X	X	X		
Gynecology-Obstetrics residency			X	X			
Psychiatry residency			X	X			
Radio-Oncology residency			X	X	X		
Researcher-Clinician residency			X	X	X		
Surgery residency			X	X	X		
M.Sc. Biomedical Engineering		X			X		
M.Sc. Dentistry					X		
M.Sc. Optometry					X		
M.Sc. Pharmaceutical Practice					X		

*Graded assignment

Introduction to library resources

Workshop attendees are first given a general tour of the Health Libraries website, introducing guides, resources and library services relevant to their discipline. Emphasis is given on the availability and relevancy of reference help. Credentials of subject librarians are presented. A short video prepared by the IT technician outlines major computer issues to be dealt with during academic life. A brief presentation of the catalog is made more appealing by using the course's required reading material for searches. A graded assignment is finally performed in StudiUM, UdeM's Moodle-based virtual learning environment. Questions focus on searches for books, book chapters and journal articles. This 1.5-hour workshop is taught by a library technician and is systematically integrated in the first year of all biomedical sciences undergraduate programmes.

MEDLINE (PubMed or OvidSP interface)

This workshop consists of a 1.5 to 2-hour presentation and live demonstration of advanced searching in the MEDLINE database. The librarian uses examples adapted for each discipline and points out the advantages and limitations of both basic and advanced searches. When mandatory the assignment is performed immediately after the session and technical support is given. Health Library has developed for this purpose a series of 62 research questions (see an example in Supplementary Materials). Students are asked to identify the appropriate Medical Subject Headings (MeSH), use the Focus/Major Topic and Explode functions, and include the requested qualifiers in their search strategy. Prior translation of MeSH terms from French to English may be performed using the *Portail Terminologique de Santé* search interface (available at http://pts.chu-rouen.fr/). Numerous questions on document formats and access are raised as students attempt to locate the first five publications in the results list.

The PubMed training offered to 1st-year students enrolled in the B.Sc. Biopharmaceutical Sciences programme offers another activity where groups of four students working on their own search topic must submit their proposed search strategy to the librarian for review.

Evidence-based practice (EBP)

Objectives of this workshop are to present the different types of clinical publications and to introduce relevant resources in evidence-based practice including EBM Reviews databases (with an emphasis on Cochrane Database of Systematic Reviews), Clinical Evidence, as well as the use of clinical filters in PubMed or MEDLINE (OvidSP). To imitate situations in clinical practice the librarian demonstrates how to aim quickly for the greatest level of evidence. In their respective assignments Pharmacy (Pharm.D) and Dentistry (DMD) students are given a clinical question. They must identify appropriate MeSH terms, include them in a PICO form, inquire three relevant databases and provide the search history. Students must also appraise their results and submit a short list of pertinent references.

EBP is even more embedded in the Medicine (MD) and Psychiatry residency programmes, where the librarian also attends student oral presentations of literature searches and comments the strategies used[17]. Residents from other programmes are given an EBP advanced workshop enriched by references to their specific clinical context. Moreover, 3rd-year students enrolled in the B.Sc. Biopharmaceutical Sciences and Pharm.D programmes benefit from a customised version of the EBP workshop. They are introduced to specialised sources incorporating independent opinions and recommendations from outside experts, an essential constituent of the drug approval process by governmental regulatory agencies.

EndNote

This offering is notably embedded in a 2nd-year scientific communication compulsory course in the B.Sc. Biomedical Sciences programme. First, a 1-hour general introduction to reference styles and overview of the reference management software EndNote is given in class by a librarian. Students are invited to download EndNote and start exploring bibliographic management using an online tutorial.

Next, a 2-hour workshop is scheduled at the Health Library lab where participants follow a detailed worksheet including importation of specific references from various sources, adaptation of a bibliographic reference for a book chapter and insertion of references in a manuscript. Common pitfalls and optimal parameter settings for this complex tool are presented as well. The session is led by a librarian while a library technician provides assistance to participants as questions arise. We highlight that EndNote support from the IT technician is available post-workshop. Students hand in the final bibliography as well as a specific manuscript page. When integrated in graduate programmes the workshop format is a 3-hour session comprising the above elements, except there is no marking associated with worksheet completion.

Appraising the quality of online health information / Compliance to copyright law

The first edition of this 2-hour bipartite workshop was given in the Fall 2012 semester. First, the large group of two hundred 1st-year Pharm.D. students had to access various health-related websites on their personal laptop and evaluate the quality of the information provided based on authorship, content, update, usability and design. Next, a presentation outlined the practical implications of copyright law: fair use of licensed resources, plagiarism, citing references and using Vancouver style. Interactive polls were included in both parts of the workshop to stimulate

interest, participation and concept retention, as well as to assess prior knowledge of main concepts.

Specialised LI workshops

Introduction to pharmaceutical patents searching

This 3-hour training begins with an overview of intellectual property and the nature of patents with a focus on their importance for the pharmaceutical industry. The hands-on exercises introduce various searching techniques: keywords and patent classifications in USPTO and Espacenet databases, as well as chemical structure in Reaxys and SciFinder. Major free databases for searching approved drug products patents (The Patent Registry and The Orange Book) are also presented as students will eventually use them after graduation. Finally, the notion of legal status and patent family is introduced, in addition to searching techniques for locating patent document translations.

Additionally, in August 2012 this workshop was integrated for the first time to UdeM's Masters of Information Sciences programme as part of a course dealing with scientific information sources.

NCBI databases

Increasing library involvement in bioinformatics can help address information needs of a broad range of students, researchers and clinicians who must navigate through hundreds of publicly available applications, tools and databases[18]. In Canada, although no data was collected from Québec, a recent survey found that bioinformatics services such as workshops or online tutorials were provided by less than 20% of librarians[19]. To provide library services for this growing field, a Health Library librarian with past experience in molecular biology attended a continuing education course in bioinformatics[20].

As a result a 2.5-hour session was designed and first introduced in January 2010[21]. The instructor presents differences between primary data sources and value-added databases from the National Center for Biotechnology Information (NCBI) such as Gene, OMIM, Conserved Domains and Biosystems. Emphasis is put on practical exercises in order to facilitate database discovery. A "Practical bioinformatics" online guide complements the workshop.

International collaboration in Haiti

Between 2007 and 2009, UdeM Health Sciences Libraries were involved in the Canadian Health Management Capacity Building Project (*Projet d'appui au renforcement des capacités en gestion de la santé en Haïti* : PARC), a collaboration between Haiti's Public Health and Population State Department and the Faculty of Medicine and Pharmacy from Université d'État d'Haïti, along with UdeM's International Health Unit and Health Administration Department. One objective of PARC is to offer graduate programmes in health administration in Haiti.

UdeM health librarians contributed to this project by teaching a week-long series of information literacy workshops in Port-au-Prince, as there are no local health librarians providing reference services[22]. Sessions were a mix of lecture and practical exercises, and included an outline of relevant UdeM online resources, building effective search strategies, advanced searches in health databases, as well as raising awareness to local resources such as the Health InterNetwork Access to Research Initiative (HINARI). Librarians also provided support in a research methodology course and taught a session for the professors of the Faculty of Medicine and Pharmacy.

Librarians professionally grew from this experience, as they adapted their teaching style and workshop contents to a clientele showing diverse levels of information literacy and technological abilities. The impact of their contribution to the education of future health professionals was also

more tangible in this particular setting. Sadly, the January 2010 earthquake has greatly affected

the project. In addition to email reference, an online course guide was developed to ensure

virtual library support to PARC students[23].

Virtual library instruction

Online guides are an important component of Health Library's LI programme. In StudiUM each

course page comprises a library module linking to its corresponding subject guide. Guides are

accessible at www.bib.umontreal.ca/SA/guides.htm. Most were developed using *Library à la*

Carte, Oregon State University Libraries' open source research guide management system[24].

Along with fourteen subject guides, Health Library has designed health literacy-oriented

webpages and videos to assist students with more in-depth aspects of their literature searches.

Topics are listed in Table 2 and include standard offerings such as finding practice guidelines or

consumer health information.

Table 2.   Page views of online LI guides designed by Health Library librarians (2012).

Guide	Page views
Building a search strategy	634
Citing using Vancouver style	27 258
Comparison of PubMed and MEDLINE (OvidSP) interfaces	1623
Configuring filters in PubMed (video)	179
Consumer health information	407
Critical reading of medical articles	5143
EMBASE features and comparison with MEDLINE	1617
Evidence-based practice in MEDLINE	231
Finding documentation upon becoming a health professional	391
Grant applications	266
Images in health sciences	468
Information for health sciences professionals trained outside Québec	2260
Health statistics	587
Impact factor of journals in Journal Citation Reports (video)	1488

Institutional citations in Web of Science (video)	25
Keyword searching in MEDLINE	190
Laboratory research (protocols, methods and techniques)	1006
MeSH: mapping, explode, focus, scope and subheadings	818
Mobile applications in health sciences	2596
Personal article citations in Web of Science (video)	136
Pharmaceutical information	14790
Practice guidelines	1134
Reference works (dictionaries, encyclopedias, directories and literature reviews)	6101
Scientific communication	3485
TOTAL	**72833**

Some guides are unique among Québec academic libraries. The "Laboratory research" guide, for example, outlines useful sources to find protocols and methods as well as a section on laboratory management. A popular guide focuses on resources available for foreign health professionals who wish to practise in Québec, while another helps students to transition to other specialised health information sources after graduation. A guide focusing on mobile health applications was published in September 2012 and another on interprofessional collaboration is currently under development.

Results

Table 3 presents attendance to both curricula-integrated and open workshops for the 2011-2012 academic year. A sum of 143 independent sessions totaled 276 hours of library instruction and reached 3551 participants. These indicators have been in constant progression since the beginning of the LI programme. For instance, we counted 2150 participants in 2008-2009, when there were 229 hours of library instruction distributed in 141 workshop sessions.

Table 3.   Health Library workshops attendees for the 2011-2012 academic year.

	Curriculum-integrated workshops	Other workshops
Library resources	794	3
MEDLINE (OvidSP)	701	29
PubMed	672	24
Evidence-based practice	827	N/A
EndNote	289	156
Pharmaceutical patents searching	38	N/A
NCBI databases	N/A	18
TOTAL	**3321**	**230**

N/A: not applicable.

Programme evaluation

Measuring the actual impact of LI on participants can be achieved through various means. A

frequently used method is to ask students to carry out a literature search that is then marked

using a score for features of the search, such as the ability to use subject headings[25]. Most

curricula-integrated Health Library workshops rely on this approach. For example, as an

indication of the effectiveness of the MEDLINE session, the average grade for 1st-year medical

students was 9.7/10 in the Fall 2011 session. As students are invited to show their search strategy

to reference staff before handing in their assignments, concepts that were not well assimilated

during the session may be further explained during a one-on-one interaction.

But this particular assessment does not guarantee that notions acquired during the workshop will

be retained over a long-term period. Accordingly, a study found that although 71% of students

successfully completed workshop exercises, two weeks later very few demonstrated that they

could utilise new tools and apply new search skills to a new topic, or that they could incorporate

new knowledge of resources and searching techniques into their final projects[26]. To reinforce the learning process, Health Library collaborates with faculty to ensure that whenever possible, LI precedes an individual research project. In the Pharm.D programme the gain of knowledge and skills is facilitated by encouraging students to remain proficient throughout the entire curriculum, as several pharmaceutical information sources and articles must be referenced in assignments. Another popular appraisal option is to survey participants using a questionnaire focusing on their perception and satisfaction of the training received, such as duration, relevance to the academic programme and difficulty of the hands-on portion of the workshop[25]. Health Library relies extensively on this method when assessing newly introduced offerings. Constant adjustments are thus performed on content and exercises to meet the needs of users.

For instance, based on the comments from evaluation forms completed by attendees of the "Introduction to pharmaceutical patents" workshop, the design changed considerably from a 2-hour presentation in 2009-2010 to a 2.5-hour hands-on format in 2010-2011. The content now deals more closely with pharmaceutical patents and is more targeted at information sources and databases accessible via UdeM libraries or freely available. When asked whether or not they would benefit from this workshop in their work or studies, 50% of the participants agreed and 47% fully agreed. Similarly, most participants in the "NCBI databases" sessions were previously unaware of the resources presented and estimated that they were relevant to their studies. They also agreed that the workshop should be integrated in an undergraduate course.

Using additional reliable assessment tools would increase the validity and reliability of our results, such as the Fresno test used to assess competency in evidence-based practice[27]. Supplementary evaluation of training activities in our particular setting could rely on critical incidence analysis, a qualitative method showing readily the impact of training[27]. Another

avenue to consider is the assessment of searching and evaluation skills in library-trained students a few years after graduation.

Lastly, although Bottoff and Todd [28] report that assessing the impact of Web-based LI activities is difficult, this should not be overlooked. Web page metrics using Google Analytics is a simple way to determine the popularity of these guides, as shown in Table 2. One possible limitation to the success of some of these pages is their linear and static format: upgrading them into interactive guides is a long-term project. Updating the guides with current information is another challenge for a small reference team; feedback from users also contributes to content evolution. For example, faculty comments prompted a complete revision of the Drug Development subject guide in order to better reflect the steps involved in the drug development process.

Discussion

Evident outcomes of library instruction include numerous EndNote-specific reference questions and regular requests for individual consultations aiming to review literature search strategies or to choose appropriate bioinformatics databases. Additional side benefits of our LI programme include collaboration with various stakeholders.

Once a library workshop is firmly established in a course, the door is open for additional involvement and this is where regular interactions with the course instructor come into play. A good example is the progressive embedding of LI in the B.Sc. Biomedical Sciences programme in the mandatory course SBM2006 – Analysis of Scientific Communication. Students choose a research article and summarise it in both an oral presentation and a poster with the purpose to become familiar with the scientific publication process.

Integration of LI in this course began a few years ago, when PubMed training was requested by the course instructor. As it was later noted that the bibliographies in 2nd-year internship reports were far from acceptable, the course instructor approached the library in 2010 to include a demonstration of reference management software in one of his lectures. Health Library proposed the integration of a full EndNote workshop instead. The research librarian also reviewed course notes relevant to citation and bibliography, and prompted that she could grade student posters as well.

In 2011 the librarian was granted editing rights in StudiUM and added links to relevant guides and reference documents. Further, she provided four information literacy questions for the midterm exam. Afterwards, another library involvement in UdeM's health research community stemmed from this course collaboration. As several UdeM departments organise an annual research day showcasing a student poster competition, the research librarian approached event coordinators to become a member of the jury. This initiative resulted in stimulating networking with researchers, including many who are located off-campus in affiliated research centres, and requests for individual consultations.

Privileged contacts between librarians and faculty ensure a growing reputation of Health Library services across departments. For example, the medical librarian was invited by a course instructor to join the Curriculum Renewal Committee of the undergraduate medical programme[29]. As a consequence, students will benefit from an optimised integration of LI throughout the medical curriculum. Another interesting outcome of LI is that Health Library librarians are becoming more involved in professional continuing education programmes. Last year, family physicians attended workshops given by the medical librarian on evidence-based practice as well as consumer health information resources. Likewise, the Faculty of Dentistry's

liaison librarian will participate in the design and teaching of a one-day evidence-based dentistry workshop for oral health professionals to be offered in February 2013.

Finally, librarian searching expertise prompts faculty and clinicians to seek support for their evidence-based research, such as the design of systematic review search strategies in medicine, pharmacy and dentistry.

Health Library is also keeping an eye out for opportunities, as new academic programmes are instituted or existing ones are modified. For instance, Health Library discussed LI options with the Pharmacy Library Committee long before the introduction of the B.Sc. Biopharmaceutical Sciences programme in the Fall term of 2009. One more example of involvement in this particular curriculum is the recent addition of a 30-minutes session in an analytical chemistry class, offered spontaneously as the need arose. The pharmacy librarian presented an overview of information sources and techniques for locating spectral and physical properties of drugs, as part of a graded assignment.

Leveraging librarian-specific skills is also part of the equation. The integration of the pharmaceutical patents searching workshop was made possible because the liaison librarian has extensive past experience in the field, and the same applies for the development of the bioinformatics reference service.

Building such relationships based on commitment and trust requires time and effort. Promoting a service such as LI may be coupled with frustration with faculty who do not wish to partner with librarians or who are reluctant to give up class time[30]. We overcame this problem over the years by constantly adapting Health Library's action plan to the individual stakeholders in place.

Conclusion

Success and sustainability of Health Library's LI programme is dependent on a number of factors, the first being the constant search for proper anchoring within its faculties and their academic programmes. Active participation in library committees and frequent interactions with key stakeholders ensure the library's relevance and impact. Beyond Health Library's activities on campus, being in tune with the clinical practice field is also essential. Information needs of students, clinicians and researchers from affiliated hospitals and research centres must be sought and understood through regular communication with partner libraries.

Health Library takes advantage of its involvement in academic networks, such as the *Association of Faculties of Medicine of Canada*, as well as provincial and national health library associations. Lastly, a sustainable LI programme is based on a team of competent librarians whom the library supports by encouraging their professional development through continuing education and participation to library association meetings and national as well as international collaborations. The daily contribution of library and IT technicians is also significant for the consolidation of knowledge and competencies acquired during all components of our LI programme.

Despite a strong base and a dynamic reference team, the constant progression of Health Library's LI programme will eventually reach its peak, considering the actual team's restricted size and the library's implications in other ventures. Although virtual LI solutions are already in place, awareness to and effective use of emerging technologies will allow the library to reach out to its users and fill their information and learning needs by using the diffusion channels that they favour, may those be social networks, mobile applications or other media.

*In Québec, library technicians hold a post-secondary diploma (three-year programme) in Information & Library Technologies.

Keywords

Information Literacy; Students, Health Occupations; Educational Measurement; Resource Guides

Key messages

Implications for policy:

- This case study illustrates how information skills can be successfully embedded into health studies curricula and discusses positive outcomes of an extensive library instruction programme.

- Professional development of health library and information personnel is essential to maintain current awareness of instructional topics as well as technologies.

Implications for practice:

- Integration of information literacy in health sciences curricula is an iterative process requiring time, resources and close collaboration with faculty.

- Using a learner-centered approach engages both instructor and trainees.

- Online health information literacy guides are an important component of library instruction.

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Example of MEDLINE (OvidSP) assignment

Use the Advanced Ovid Search mode to perform the search.

QUESTION:

Can **bottle feeding** of infants cause **dental caries**? (1946 to 1995)

- Include, if present, all the more specific terms included under the selected MeSH terms.

- Put the focus on selected MeSH terms.

- Restrict the "dental caries" subject to the etiology qualifier.

- Limit the search to children from 0 to 23 months.

- Limit the search to articles published in French or in English.

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1) Print the search history and the bibliographic references from the five first results using the "citation" format (title, author and source).

2) For each article, please indicate by YES or NO if UdeM libraries have or already had access to the journal (either in print or online versions). It is not necessary to take the year of publication into account or to indicate which branch holds the subscription.