The future of information science education in Canada: issues and discussion

Emma Cross, Cataloguing Librarian, Carleton University Library

Introduction.
This poster will present issues in the future of information science education in Canada. The poster will incorporate selected research completed for the development of the new Bachelor of Information Technology – Information Resource Management program at Carleton University, launched in Fall 2016. http://bitdegree.ca/

Methodological approaches.
This poster incorporates qualitative methods including literature review, review of labour market statistics and meetings.

Discussion.
The poster will address six key issues in information science education in Canada and identify possible strategies for future development.

Identifying and addressing skill gaps. The detailed study "Training gaps analysis: librarians and library technicians" (2006) examined skill gaps for both Master's of Library and Information Science (MLIS) and Library and Information Technology (LIT) graduates. In particular, employers report that the competencies considered most important and difficult to fill when recruiting include leadership potential, managerial skills, ability to respond flexibly to change and technology skills when hiring librarians and interpersonal /communication skills, ability to respond flexibly to change and information technology skills when hiring library technicians (Training gaps analysis 2006, 82, 98). Out of these requirements, one of the most prominent skill gaps is the lack of formal training in information technology such as programming, web interface development and database construction and development. On entering the workforce, graduates of both MLIS and LIT programs have growing demands placed on them and require expanded technology skills to manage digital information. Addressing this key skill gap will be important for the employment prospects of graduates. Review of statistics from Employment and Social Development Canada, Canadian Occupational Projection System (COPS) indicate that of five relevant occupation clusters, it is only technical occupations in libraries, archives and museums; information systems analysts and consultants; and computer and information systems managers which will have a projected shortage of qualified workers for the period of 2015-2024 with surplus demand projected to be 6.9%, 6.1% and 1% respectively. [Insert table 1 here]. As noted by Abels, Howarth and Smith (2016) there is "some urgency to re-vision LIS education" so graduates can take advantage of growing employment opportunities in information technology many of which will be outside the Library sector (Abels, Howarth, Smith 2016, 86).

Curriculum development and the development of student competencies. In her 2016 study of competency profiles developed by professional associations and employers, Fraser-Arnott suggests that the emerging role of information specialist requires a range of competencies drawn from the fields of information management, records management, librarianship, archives and knowledge management. This knowledge is necessary in order to prepare graduates for hybrid

roles which intersect different aspects of these fields (Fraser-Arnott 2016, 65-66). This is supported by Saunders (2015) who suggests that rapid changes in information technology have resulted in a "restructuring of traditional library jobs as well as the development of completely new positions requiring a host of different skills and competences" (Saunders 2015, 427). The study by Saunders used focus groups with practicing information professionals to develop a list of competences required in information science programs including technology skills and "soft skills" including communication, customer service, flexibility and a commitment to continuous learning (Saunders 2015, 427). Kim (2015) asserts that a competency-based approach to curriculum development is "emerging as a necessity" in LIS education to meet the changing needs of employer demand (Kim 2015, 294). In addition, Ed Cortez, chair of the American Library Association, Committee on Education suggests "the most important criteria for teaching for the future is to understand and adapt to different learning styles" (Cortez 2016, 222). Technology can be used in teaching to customize content, enable user-directed learning and support individual learning styles and speeds (Cortez 2016, 222). Innovations in pedagogy can also include following the example of some engineering programs which focus on problem solving to prepare graduates for the rapidly changing workplace and student involvement in curriculum (Abels, Howarth and Smith 2016, 89-90)

Experiential learning and practical work experience. This includes practicums, research projects and co-op placements which are designed and completed in consultation with faculty and external advisors. For example, Cortez in *Teaching for the future, not the past* suggests information science programs make increased use of advisory boards, alumni associations and build new partnerships with the private sector as well as other universities for these types of learning opportunities (Cortez 2016, 222). Experiential learning enables students to acquire practical skills which are relevant to the workplace and valuable in the employment market.

Program assessment. A robust structure of program assessment, including student learning outcomes, is central for curriculum development to address skill gaps in the information professions. Each institution has best practices to guide on-going program assessment, including: regular meetings to review learning outcomes; indicators for achievement and student performance; review of practicums and research projects which are rich sources of assessment; student focus groups and cyclical program review. As part of the program assessment process, Saunders (2015) asserts that the vitality of information science programs is dependent on regular consultation between faculty and practitioners on curriculum issues to keep in sync with current and emerging trends in the field. One participant in Saunders study observed that "employers and faculty should work like informal think tanks" and find ways to "come together around questions and brainstorm solutions" (Saunders 2015, 447-448).

Bridging educational gaps. There currently exists a number of education gaps in the field of information science. First, there is an education gap between LIT and MLIS programs as students with an LIT diploma are unable to continue into MLIS programs without a bachelor's degree. The Bachelor of Information Technology – Information Resource Management (BIT-IRM) program will allow students with expanded technology skills to continue into MLIS programs and provides a pathway for library technicians to move into professional positions. In addition, the BIT-IRM program is a unique joint program offered by Carleton University and Algonquin College which offers integrated learning built on co-operation between university and

college sectors to maximize institutional strengths. The integrated university / college joint program format has been recognized as offering an excellent educational experience as it produces graduates with theoretical understanding and practical skills which are relevant for the workplace (Anderssen 2012). Developing relationships between college, undergraduate and graduate programs in information science will help to bridge educational gaps. In particular, bridge the gap between LIT and MLIS programs which are traditionally separate in Canada, identified as "leading to two educational solitudes which must be reconciled in the workplace" (Training gaps analysis 2006, 13).

Recruitment and diversity. It has been reported that the demographic profile of MLIS and LIT students and recent graduates is on average overwhelmingly female with lower percentages of visible minority and aboriginal individuals than the larger Canadian labour market (Training gaps analysis 2006, 41-42). This demographic profile continues into the workplace for both librarians and library support staff (for example, Delong 2015, 12-15). As noted by Abels, Howarth and Smith (2016) a key strategy in educating for the information future is to find strategies to "dispel the stereotype and recruit a broader pool of potential students. There is a perception that the field is only about the book and we need to communicate the broader range of possibilities. We need to increase diversity" (Abels, Howarth and Smith 2016, 87). Having an information science program at the bachelor's level provides new opportunities to build what Dali and Caidi refer to as a refreshed "recruitment narrative" for information science (Dali & Caidi 2016, 524-525). Conscious efforts have been made to make the Bachelor of Information Technology – Information Resource Management (BIT-IRM) program attractive to a broad range of students by promoting the degree as an innovative new program which meets the needs of a changing information economy and is applicable to a range of occupations in both the private and public sector. One recruitment strategy employed by the program is frequent visits to local high schools to reach out to a wide variety of students.

Conclusion.

This poster is a pilot project to gauge if there is sufficient interest to have a panel discussion on information science education at a future CAIS conference. Presenting this information as a conference poster will be helpful to facilitate networking and discussion with faculty and instructors in information science.

Table 1

National labour market forecast by occupational category, 2015-2024

Occupational category	National Occupational Classification number	Projected new job openings	Projected new job seekers	Demand
Technical occupations in libraries, public archives, museums and art galleries	5210	7,700	7,200	+6.9%

Information systems analysts and consultants	2171	69,500	65,500	+6.1%
Computer and information system managers	0213	30,300	30,000	+1%
Librarians, archivists, conservators and curators	5110	5,200	5,400	-3.7%
Managers in art, culture, recreation and sport	0510	5,900	6,200	-4.8%

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