A quantitative review of LIS programs accredited by ALA and CILIP under contemporary technology advancement

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Abstract

Purpose – Advancements in technology have led to many changes in the field of Library and Information Science (LIS). As global communications and technology continue to become more available and sophisticated, LIS programs need to prepare students for employment in rapidly changing and globalized LIS professions.

Design/methodology/approach – Data from a total of 63 programs from the American Library Association (ALA) and 32 programs from the Chartered Institute of Library and Information Professionals (CILIP) was collected through openly accessible websites of these programs. Areas explored include program name, name and level of the academic unit offering the program, credit hours, required courses, percentage of required courses and capstone measurements used within the different LIS programs.

Findings – A majority of programs still preserve the keyword "Library" in their name, but not the academic units offering them. Most programs in ALA and CILIP follow a semester-based program. Research methods, internships, practical experience, combined with traditional library core and information technology requirements were found to constitute the major subjects in general. Comprehensive exams were replaced by e-portfolios among ALA programs while a dissertation remains the preferred choice of capstone requirement for CILIP.

Originality/value – Scant studies compare accredited LIS programs worldwide, motivating the study of the similarities, differences and trends of LIS programs under the current globalized technology-driven knowledge economy. This paper seeks to fill the literature gap and promote a global discussion and understanding of LIS curricula in different regions of the world, guiding potential students to select their suitable LIS programs.

Keywords Curriculum studies, Higher education trend, Accredited MLIS programs, Degree names, Quantitative study, Accreditation bodies

Paper type Research paper

Introduction

Advancements in technology in the past few decades have led to significant changes in the world of library and information science (LIS). With the widespread adoption of the internet followed by continual advancements in technology, LIS programs worldwide have been criticized for insufficiently preparing students for professional employment after graduation (Marco, 1994; Lo *et al.*, 2017b, c; Ho *et al.*, 2018). As global communications and technology continue to become more available and sophisticated, LIS programs need to prepare students for employment in rapidly changing and globalized LIS professions. To keep up with the changing job nature of library and information professionals, educational institutions that offer accredited programs in LIS have continuously been evaluating and updating their programs to equip students with the skills required for employment after graduation (Noh *et al.*, 2012; Yi and Turner, 2014). Aside from relying on the insights from experienced library professionals to improve their programs, LIS educators and researchers have

performed quantitative studies analyzing requirements from posted job advertisements to determine the relevancy of program contents (Reeves and Hahn, 2010; Stanton *et al.*, 2011). Studies have analyzed surveys and interviews from students to understand the expectations and satisfaction rate with current LIS programs (Lo *et al.*, 2015; Toshimori *et al.*, 2011).

As new courses integrating information technology are introduced into LIS programs, competition has increased not only amongst LIS programs, but also amongst other departments within the same institution, especially when cross-disciplinary skills and topics such as digital humanities, marketing, knowledge management, web design and database management become expected of LIS graduates looking for employment (Markey, 2004; Moazeni, 2015; Ng *et al.*, 2021; Li and Chiu, 2021). Although today's LIS programs have vastly been changed and such trends will continue, what constitutes current accredited programs or how accredited programs from different regions of the world differ from one another remains unclear (Tam *et al.*, 2007). Without such understanding within the globalized economy, LIS educators and professionals worldwide cannot collaborate to determine a clear path for LIS programs' future on a global scale.

However, upon inspecting the literature, such studies on LIS curricula are limited and restricted to specific parts of the world or specific organizations. For example, apart from some recent research on curricula of LIS institutions in North America and Europe, scant literature compares the LIS curricula of both. Thus, LIS educators may find it challenging to plan for a curriculum that can prepare students globally without understanding the status, trends or ideas of LIS programs globally (Lo *et al.*, 2017a). Similarities, differences and trends between different accreditation bodies across the world lack are not well-understood.

As such, this review addresses such issues by performing a quantitative comparison of the accredited programs in two of the world's leading LIS accreditation bodies, the American Library Association (ALA) and the Chartered Institute of Library and Information Professionals (CILIP). Program and curriculum information openly accessible through the websites of the accredited institutions were extracted and processed using a combination of methods referenced from past research to ensure results are comparable and to contribute to the literature of LIS curricula (Hall, 2009; Markey, 2004; Yi and Turner, 2014; Li and Chiu, 2021).

Due to significant differences between the regions such as culture and language, efforts to compare LIS curricula on an equal basis face considerable hindrance (Li and Chiu, 2021). Realizing that, this review aims to compare LIS programs from two leading English-speaking accreditation bodies of the world, ALA and CILIP, to determine similarities, differences and trends as a starting point for such literature. Furthermore, this paper seeks to fill the gap in the literature and to promote a global discussion and understanding of LIS curricula in different regions of the world, guiding potential students to select their suitable LIS programs.

Literature review

In response to rapid technology advancement, LIS educators have conducted much research on LIS curricula to ensure that LIS programs can equip students with the knowledge and skills needed for success after graduation. However, there have been many arguments regarding the ability of LIS curricula in accredited programs to sufficiently train students, since Marco (1994) described "the Demise of the American Core Curriculum" for LIS schools. Marco argued that since LIS schools did not require students to study all the "core" knowledge described in the ALA accreditation standards, students could not acquire the core knowledge of LIS to succeed as professionals. In response, Irwin (2002) built upon Marco's work using the same 1976 IFLA subject areas, and arrived at a very different conclusion that LIS schools accredited by ALA indeed covered the "core" subject areas in LIS. Since then,

much quantitative LIS curricula research has shown that Irwin was indeed right, but the LIS curricula still had much work to do.

For example, Beheshti (1999) analyzed course titles and descriptions from 44 LIS programs in North America and identified 57 significant concepts within LIS programs. As expected at that time, when technology experienced huge advancements with the global adoption of the internet, concepts such as technology, management, information organization and database development were already the focus of LIS programs. Although the methods used relied only on machine understanding without any manual classification of the collected data, Beheshti's results showed the significant change of LIS curricula from only teaching traditional topics such as cataloging to incorporating technology-related subjects into the curricula. His research identified that technology, management and organization were three key topics of the core courses then.

After Beheshti, further research was conducted analyzing the programs within an accreditation body and on certain specific aspects of curricula. Instead of relying on the computer-based intensity clustering methods used by Beheshti, Markey (2004) manually classified the course descriptions of the 56 LIS schools that were members of the Association for Library and Information Science Education (ALISE) in the United States. This study depended on human understanding of language combined with extensive experience in the LIS field to identify and classify major concepts within LIS programs. In agreement with Beheshti, Markey's research concluded that technology was a major driving force within accredited LIS programs, and new educational trends were mostly library user services centered on information technology. The result raised a warning to LIS programs to not only focus on the specific trendy niche of user services as other departments such as computer science and information technology that laid claim to these areas as well. Using brokers that were put out of business due to the internet, Markey strongly suggested LIS educators hold steadfast to the traditional LIS core subjects while incorporating technology into the curricula. Markey's research played a crucial role in reminding LIS educators to retain parts of the traditional identity of LIS without over-focusing on information technology, and subject areas of organizations, referencing and management formed most of the core courses.

Applying Marley's method on the information posted on the websites on ALA-accredited LIS programs, Hall (2009) discovered that traditional core library curricula have grown to include information technology, rather than keeping it as an optional elective. The study also concluded that LIS programs turned more specialized by offering different course choices based on the students' choice of career tracks. Hall's research showed that Markey's research did affect the decisions of LIS educators on curricula. Instead of changing the focus of LIS programs to information technology, LIS programs have made traditional LIS components compulsory with additional necessary information technology skills needed by the LIS workforce. Such design ensures that LIS programs retain their identity and uniqueness from other technology-related programs while preparing students sufficiently for LIS employment.

Another research was explicitly performed to analyze school librarianship educational programs in the US, mostly ALA-accredited programs. Following the method of Markey (2004), Hall (2009) and Yi and Turner (2014) collected course and program description data from the websites of master's programs that teach school librarianship accredited by ALA or the American Association of School Librarians (AASL). This study explored the differences between programs accredited by the two organizations and identified the trend of class offerings and information useful for LIS educators to design changes for improving their programs, and was one of the very few program comparison between different accreditation bodies.

Huckle (2003) reviewed the history of CILIP and described the practice and procedures of the accreditation of LIS curricula in the UK. This study pointed out that due to significant

developments in technology as well as the importance and use of information, CILIP was established in 2002, by the merger of the Library Association and the Institute of Information Scientists, to consistently review its accreditation policy to meet the requirements of the rapidly changing discipline. Lowe (2006) explored LIS education in Britain and identified 14 universities that offered LIS education, and "larger departments have around 500 full-time equivalent students with up to 25 academic staff, and smaller ones around 50 students and 6 staff." Both undergraduate and postgraduate programs were offered, and most LIS Master's programs had a Diploma exit between taught and dissertation stages. The entry qualifications, core and elective courses, costs, etc., were briefly reviewed in that paper.

Edwards (2015) outlined the changing environment for both LIS education and professionals in the UK. In response to the decline in LIS student numbers, CILIP created "The Professional Knowledge and Skills Base" (PKSB). An accredited program should cover the key knowledge and skills areas required by library and information workers, that is professional expertise, generic skills, ethics and values, wider library, information and knowledge sector context and wider organizational and environmental context.

Efforts to study LIS curricula have also been made outside of North America and the United Kingdom (UK). In 2004, the Royal School of Library and Information Science (RSLIS) and the European Association for Library and Information Education and Research (EUCLID) started the European LIS Curriculum Project (Kajberg, 2007). Considering the different understandings of what should constitute LIS curricula across Europe, the objective of the project was to gather European LIS educators to participate in organized discussions regarding LIS curricula to share their understandings. Smaller projects such as those conducted by Bawden (2007) identified possible topics to form the core of LIS curricula along with possible ways of designing LIS curricula using these topics. As Europe is vastly diverse in both language and culture, the European LIS Curriculum Project played a crucial role in starting conversations between different LIS educators in Europe and created a shared understanding of what should constitute the standards of LIS curricula along with future development implications.

As a result of education globalization, the number of LIS professionals working across countries is increasing, resulting in the need for a global standard of LIS qualification. A group of researchers and practitioners reviewed and examined the quality assurance systems of LIS education in Asia, North America, Latin America and Europe, seeking opportunities for regional and international cooperation (Miwa and Miyahara, 2014). Despite various research in the field of LIS curricula, there is a clear gap in the literature for reviewing LIS programs and curricula on a global scale. This review addresses the literature gap by performing a quantitative comparison on LIS programs accredited by two of the world's leading English-speaking LIS accreditation bodies, CILIP and ALA. Our methodology was adapted from the above-mentioned works on LIS curricula to allow smooth continual growth in the literature (Hall, 2009; Markey, 2004; Yi and Turner, 2014). This review also aims to identify the similarities, differences and trends between LIS programs accredited by ALA and CILIP, which is useful as the LIS community and potential students become more globalized with the continual advancement of technology and the changes in LIS professions.

Methodology
This review performs a quantitative comparison of the programs accredited by ALA with those by CILIP. The main criteria for data collection were the programs accredited by these organizations to explore the current diversity of LIS. The results from this research should provide a better understanding of the similarities, differences and trends regarding program features such as degree name, level and name of academic units offering the accredited programs, credit hours of programs, required courses within programs and capstone

requirements of programs. Furthermore, this review extends the comparison to other regions of the world, such as China and Japan, where the language of instruction may not be in English, thus increasing mutual understanding of LIS curricula among LIS educators from different parts of the world. By comparing the programs accredited by ALA and the programs accredited by CILIP, this review seeks to answer the following research questions:

RQ1. What are the current key features of programs accredited by ALA and CILIP in terms of the name of degrees awarded, academic units offering the programs, credit hours of the programs, required courses and capstone requirements?

RQ2. What are the similarities and differences between programs accredited by ALA and the programs accredited by CILIP in terms of the features above?

RQ3. What are the trends across programs accredited by ALA and those by CILIP?

Data were manually collected from the openly accessible websites of the educational institutions that offer the accredited programs. The lists of accredited programs were taken directly from the ALA (2022) and CILIP (2022) websites, as listed in Appendixes 1 and 2, respectively.

Data collection
Information from 84 institutions, 60 from ALA and 24 from CILIP, was collected based on the most updated lists available during this review. A summary of the data-collection process is highlighted further:

(1) An institution with an accredited program was identified from the ALA and CILIP lists.

(2) The names of the accredited programs displayed under the institution name were recorded.

(3) The website links provided by the lists were used to access the program websites. In the case of a broken link, the website of the program was accessed through Google and confirmed to be the same program before proceeding.

(4) Data required by this research were then extracted manually from each program's website and recorded into an Excel spreadsheet.

(5) Supplementary details such as program pamphlets and course syllabi were also recorded.

(6) Once complete, steps 1–5 were repeated for the next institution on the list.

Only programs that were actively accredited during the data-collection period were included in this review. Programs listed as under consideration for accreditation and programs that were no longer accredited were not included in this study. Since an institution may offer many programs on top of the accredited program with no clear indication of whether they were accredited or not, only the programs specifically listed within the ALA or CILIP accredited program lists were included. As this is one of the first few attempts to compare LIS curricula internationally, only required courses were analyzed in this study. Further studies are planned to explore the variety of all courses offered within the accredited programs.

As one of the primary purposes of this review was to compare the programs accredited by ALA and accredited by CILIP, not all the collected information was utilized in this study. Within the CILIP list, the accredited programs from Sultan Qaboos University (Oman), Sun Yat-Sen University (China) and Technische Hochschule Köln (Germany) were collected but not used in the data analysis of this study as their websites were either incomplete, not

written in English or their accredited programs were not offered in English. For the ALA list, the accredited programs from the University of Puerto Rico and the University of Montreal (Canada) were not used in this study as their accredited programs and websites were not in English. Since CILIP accredits both graduate and non-graduate level programs while ALA only accredits graduate-level programs, only the information for graduate-level programs was used in the comparisons. The data for non-graduate level programs accredited for CILIP were still collected for future studies.

This review extends previous LIS curricula studies by Markey (2004), Hall (2009) and Yi and Turner (2014). Their data analysis and presentation methods were used as a reference for designing the analysis and presentation within this study. Emphasis was taken on providing useful information for potential students to understand and select LIS programs. Furthermore, the data collected from ALA-accredited programs in this study were compared with data from Markey and Hall's results to explore the changes and trends in the ALA-accredited programs. However, to ensure data recency, no data from past studies were combined with the data collected in this study.

Data analysis
Data from each field were analyzed and presented side by side as two groups of columns for the programs accredited by CILIP versus those by ALA in each table together with percentage values for convenient comparison. However, it should be noted that some of the presented percentage values were rounded off.

When recording program names, both the acronyms and the full program names were recorded as found on the websites. If a program acronym was found to be generic and is not an acronym representative of the full name, the program acronym was recorded as is without manual alteration to reflect the actual scenario. For example, within CILIP, the program of MA in Information and Library Studies offered in Aberystwyth University was recorded as MA for its acronym, as no other acronym was found on the website. An academic unit is defined as the smallest unit that offers the accredited program to negate the effects of many LIS schools merging with other departments to form larger organization units.

For the comparison of credit hours, data from both CILIP and ALA programs were listed as they were found on the program websites to avoid conversion errors. Besides the fact that ALA and CILIP institutions might have very different definitions of credit hours, such definitions amongst individual programs also varied due to administrative decisions of the respective institutions. As it was impossible to completely understand such tacit rationale behind all these programs, rather than creating a standard conversion that may be erroneous, the term-base of each program was listed next to the credit hour groups within the results table to remedy for this. Terms that were either quarter-based or semester-based would be a more effective tool in providing a sense of weight and course distribution within these programs.

As many accredited programs offer flexibility in course choices, different course choices may lead to varying scenarios of graduation, such as credit hours that go over the provided minimum. For this review, similar to Hall (2009), data regarding the most general route to graduation was chosen for analysis in this study, which was the least number of credit hours required for graduation along the general LIS path, and if available, the non-thesis/ dissertation options. For some cases in which current required courses were listed alongside previous required courses, only the most current required courses were recorded. Furthermore, to provide a comparable measure of credit hours between ALA and CILIP, the ratio of required credits over total credits within each program accredited by ALA and CILIP was determined and presented as well.

The LIS research taxonomy list created by the Association for Library and Information Science Education (ALISE) was used in classifying the different required courses found within the paper. As the exact ALISE research area classification list used by Yi and Turner (2014)

in his study of school librarianship programs was no longer available, the latest version of the list provided by ALISE (2016) was used instead. The ALISE taxonomy comprised nine major classes and 94 subjects, and should not be much different from that used by Yi and Turner. The entire list, along with the access link, is provided in Appendix 3 for reference. As ALISE has a mission in LIS education, the validity of using the list in classifying required courses to perform research of LIS curricula could be strengthened. Further, this classification scheme was chosen instead of following Markey's and Hall's classification of core subjects due to the appearance of subjects not traditionally associated with LIS in the list of required courses in quite some universities. For example, "Foundations of Object-Oriented Programming" usually associated with Computer Science appeared as a required course in the CILIP accredited program at the University of Sheffield.

When analyzing required courses, with the addition of required electives or information technology requirements within LIS programs, just the core subject courses became inadequate to represent the required courses. Required electives offer students the choice to pick a course from a specific group of courses that usually belong to a particular theme, for example, information technology or management. In such cases, to account for the required credit hours, the required elective was classified using the theme of the courses within the elective pool. General management courses, research methods, dissertations and internships were grouped under the "Education of Information Professionals" (ALISE, 2016). Since internships usually offer experience and insight that cannot be learned from classrooms, it was understood as a learning opportunity for LIS students, thus explaining such classification. The required courses were analyzed individually with consideration of course details and syllabi, then assigned a subject and therefore a class within the ALISE LIS research taxonomy.

A capstone requirement is defined as the final requirement of students to demonstrate mastery of their studies and to be awarded the degree. Capstone requirements were found to have various names. For example, an e-portfolio is sometimes referred to as a portfolio. In such cases, after examining the definitions, similar capstone requirements were grouped for analysis. To avoid confusion, upon further analysis of the "thesis" option ALA programs and the "dissertation" option in CILIP programs, it was determined that "theses" within ALA is similar to "dissertation" within CILIP, both referring to the capstone research undertaken by graduate students to produce a substantial academic paper that demonstrates the student's ability at the program end. However, it should be noted that the dissertation word count expectation is often higher compared to that of a thesis in general. Furthermore, dissertations in CILIP programs are usually worth credit hours of three classes, while theses in ALA programs are usually worth one class equivalent.

Ethical issues, limitations and future studies

The entire data-collection process did not involve the collection of personal information from any persons. All data collected were solely extracted from the openly accessible program websites. In some cases, the information found was not clear or hidden from public view, usually requiring a login for access. Such cases required further communications or interviews with the institutions. We left such requests to access more data and ask more questions from those institutions as further studies.

The ALISE LIS research taxonomy list is under Creative Commons licensing terms with the specific requirements of attribution and no derivatives. As such, the taxonomy list used in classification was not changed in any way within this review. Appropriate measures to classify required courses that may not appear in the list were described under the Data Analysis section.

This review analyzed the required courses within each program on a total basis. It does not analyze the different unique combinations of options and requirements that might occur

among the programs. As such, future work can be done continuing from this study to further analyze the types, combinations and distributions of all courses within accredited programs, such as the archive and museum concentrations (Lo *et al.*, 2017a; Ng *et al.*, 2021).

The collected data were analyzed with descriptive statistics and presented in the form of tables within this study. Future studies with larger datasets, for example, analyzing all courses rather than just required courses, may expect more sophisticated methods such as Latent Semantic Analysis (LSA) and regression analysis to be employed.

Results

Name of degrees

Table 1 lists the names of degrees that are awarded to students upon completion of accredited programs. Although only 58 out of the 60 institutions from ALA and 20 out of the 24 institutions from CILIP have their collected data used in this study, some institutions such as Florida State University and the University of Sheffield offer more than one accredited program, thus explaining the total number of programs analyzed which is 63 ALA-accredited programs and 32 CILIP-accredited programs, totaling 95 programs. Overall, ALA-accredited programs offered a much larger variety of acronyms for their degrees compared to CILIP-accredited programs. ALA programs employed the use of 14 different acronyms spread over 61 programs, while CILIP programs were observed to have three acronyms spread over 32 programs.

The most popular acronym within ALA is the *MLIS,* with 24 programs using it, followed by *MLS* and *MSLIS*, which are both tied at 11 programs. Of the 63 ALA programs, 39 programs had both the words "Library" and "Information" in their degree names, 49 programs had the word "Library" in their names, 9 programs had "Library" only within their names and 13 programs did not have the word "Library" only within their names. Overall, all programs have either "Library" or "Information" or both in their degree names. The three most popular choices, *MLIS*, *MLS* and *MSLIS,* all employ the use of "Library" in their degree names.

Acronym of degree[*]	Programs in ALA	Programs in CILIP	Written-out names, beginning with "Master of . . ."
MA	7 (19%)	9 (28%)	Arts in Library and Information Science (3), Arts in Information (1), Arts in Library and Information Studies (1), Arts in Library Science (1), Arts (1)
MI	1 (2%)		Information (1)
MIS	4 (6%)		Information Science (1), Information Studies (2)
MLIS	24 (38%)		Library and Information Science (15), Library and Information Studies (9)
MLISc	1 (2%)		Library and Information Science (1)
MLS	6 (9%)		Library Science (6)
MMLIS	1 (2%)		Management in Library and Information Science (1)
MS	1 (2%)		Science in Library and Information Science (1)
MSc	1 (2%)	22 (69%)	Science in Information (1)
MSc(LIM)		1 (3%)	
MSI	1 (2%)		Science in Information (1)
MSILS	1 (2%)		Science in Information and Library Science (1)
MSIS	5 (8%)		Science in Information Science (5)
MSLIS	7 (10%)		Science in Library and Information Science (7)
MSLS	3 (5%)		Science in Library Science (3)
Total	63 (100%)	32 (100%)	

Note(s): [*]Acronyms are written as presented on the websites of the programs

Table 1.
Name of degrees awarded

The degree names in CILIP have a smaller variety of acronyms compared to ALA. A total of 22 programs (69%) used *MSc*, which stands for Master of Science, followed by the unique name of the program. Nine programs (28%) use *MA*, which stands for Master of Arts. Unlike ALA programs, most CILIP programs did not include specific elements of the full program name within their acronyms, as observed from reading the websites of CILIP programs. Among the 32 CILIP programs, 10 programs included both the words "Library" and "Information" within their degree name, 24 programs had the word "Library" in their names, 14 programs had the word "Library" only, 22 programs had the word "Information" only and 6 programs had neither "Library" nor "Information" within their degree names. This is a significant difference between ALA and CILIP programs as all ALA programs had the words "Library", "Information" or both within their degree names.

Academic units offering the programs
Table 2 summarizes the name of the academic units within the institutions that offer ALA or CILIP accredited programs. Notably, the total number of programs is different from Table 1. The academic unit at the University of Iowa is named "Graduate College" without any unique identifiers, while the University College London (Qatar) does not specify an academic unit. As such, they were included under "others" and recorded as blank. This table shows the number of programs under each academic unit, not the number of unique names.

Within ALA, a majority of the accredited programs (40%) were offered by academic units whose names start with the word "Information," followed by "Library and Information Studies" at 10%. Unexpectedly, there were no academic units with names of the single word "Library." Out of 63 programs, 31 programs were carried out by academic units having the word "Information" without "Library" in their names, while only 16 programs were held by academic units with both "Library" and "Information" in their names. Although 78% or 49

Name of academic unit (starting with)	Programs in ALA	Programs in CILIP	Written out[*]
Arts	2 (3%)		Arts and Sciences (2)
Business	2 (3%)		Business . . . (2)
Communication	5 (8%)		Communication . . . (4)
Computer		6 (19%)	
Education	5 (8%)	1 (3%)	Education . . . (5)
ILS	3 (5%)		Information and Library Science (3)
Informatics	2 (3%)		Informatics . . . (2)
Information	26 (40%)	11 (34%)	Information (8), Information . . . (6), Information Science (6), Information Studies (8)
Information Management, Library and Archives		4 (13%)	
Languages		2 (6%)	
Library, Archival and Information Studies	1 (2%)		
LIM	1 (2%)		Library and Information Management (1)
LIS	5 (8%)	3 (9%)	Library and Information Science (5)
LISt	6 (10%)		Library and Information Studies (6)
Others	5 (8%)	5 (16%)	Academics units without words "Library" or "Information," or blank
Total	63 (100%)	32 (100%)	

Note(s): *Complete list of names of academic units written out in Appendix 4. Long names without the combination of "Library" and "Information" are truncated here

Table 2.
Names of academic units offering the accredited programs

ALA-accredited programs had the word "Library" in their names and had library science as a focus, the academic units that offered such courses mainly focused on Information Science rather than being dedicated solely to Library Science. This is discussed further later in the article.

As for CILIP, the hosting academic units were not as clear as with the case of ALA programs. A total of 34% or 11 programs were held by academic units whose name begins with "Information," followed by "Computer" at 19% with six programs and then "Information Management, Library and Archives" at 7% with four programs. Similarly, there were no academic units whose names contained "Library" but without the word "Information" within the CILIP accredited programs. Nineteen programs (61%) were held by academic units with their name containing the word "Information" but without the word "Library," and only seven programs (23%) were held by academic units with names containing both words.

Based on these findings, it is strongly suggested that for both ALA and CILIP accredited programs, the field of Library Science is generally seen as a branch of Information Science. This may be due to the small size of LIS departments, which led to mergers with other departments to form the larger units as observed.

Levels of academic units offering the programs
Table 3 presents the levels of academic units offering the programs. Most accredited programs were offered by "Schools" within the ALA list, whereas those within CILIP were offered by "Departments." The high usage percentage of "Schools" may be due to the notion of *iSchools* (ischools.org) in the US. Furthermore, the use of "Schools" may be attributed to mergers of LIS departments with others to form larger units, which will be discussed further.

Credit hours of accredited programs
Unlike the study of Markey (2004) that excluded programs that were carried out in quarters, Table 4 presents the credit hours of all the accredited programs as is to provide a better understanding of the actual credit hours offered by programs accredited by ALA and CILIP. On top of showing the credit hours of these programs, the terms in which programs were offered were also included as a reference for educational planners. No conversion attempt was made between the definition of credit hours of ALA and CILIP to avoid conversion errors. In many cases within ALA, the term "Unit" was used in place of "Credit Hour," as a metric to measure the amount of student workload. However, in some cases, such as the University of Hong Kong, "Unit" is defined differently compared to the conventional system of "Credit Hours" in either ALA or CILIP and is thus listed out individually as seen in Table 4. A similar case occurs with the University of Toronto, which employs the use of "Full Credit Equivalents (FCE)."

"Terms" was found to be an umbrella term containing both "Semester" and "Quarter." Upon inspection of the definitions across all the accredited programs' websites, the general

Level of academic units	Programs in ALA	Programs in CILIP
University	0 (0%)	1 (3%)
College	15 (24%)	1 (3%)
Department	9 (15%)	20 (63%)
Faculty	2 (3%)	1 (3%)
Institute	0 (0%)	1 (3%)
School	37 (59%)	8 (25%)
Total	63 (100%)	32

Table 3.
Levels of academic units offering the programs

Number of credit hours	Term base (semester/quarter)	Programs in ALA	Programs in CILIP
16[*]	Semester (1)	1 (2%)	
36	Semester (33)	33 (51%)	
37	Semester (2)	2 (3%)	
39	Semester (7)	7 (10%)	
40	Semester (4)	4 (7%)	
42	Semester (3)	3 (3%)	
43	Semester (1)	1 (2%)	
45	Quarter (1), Semester (1)	2 (3%)	
48	Semester (7)	7 (15%)	
58	Quarter (1)	1 (2%)	
60[**]	Semester (1)		1 (3%)
63	Quarter (1)	1 (2%)	
72	Quarter (1)	1 (2%)	
180	Semester (30)		30 (94%)
240	Semester (1)		1 (3%)
Total	95	63 (100%)	32 (100%)

Note(s): [*]Full Credit Equivalent (FCE). Students must complete 8.0 FCE at the University of Toronto
[**]Units. Students must complete 60 units at the University of Hong Kong

Table 4.
Credit hours of
accredited programs

definitions were that "Semester" refers to the start of courses occurring three times a year
while "Quarter" refers to courses starting four times a year. However, we cannot conclude
whether courses in "Semesters" or "Quarters" are longer, as that depends on the actual
contact hours and student workload.

The 36 credit-hour semester-based program model was found to be the most popular
amongst ALA-accredited programs, while the 180 credit-hour semester-based program
model was the most popular among CILIP-accredited programs. Out of the 63 ALA programs,
only four programs were offered based on quarters, a number which has not changed since
16 years ago (Markey, 2004).

Classification of required courses
Table 5 shows the classification of required courses according to the ALISE (2016)
classification. A large proportion of required courses fall under the class of "Education of
Information Professionals," which is defined as "methods and strategies to provide learning
opportunities to information professionals". Since almost all accredited programs required
research methods while internships were required credit-offering courses in many programs,
these courses were grouped under the "Education of Information Professionals" class,

ALISE research taxonomy	Required courses in ALA	Required courses in CILIP
Data management	12 (3%)	23 (10%)
Data science	2 (1%)	11 (5%)
Human–computer interaction and design	3 (1%)	7 (3%)
Information organization and retrieval	66 (18%)	24 (11%)
Information practices	60 (17%)	17 (7%)
Education of information professionals	108 (30%)	78 (34%)
Information services	49 (14%s)	25 (11%)
Information technologies	41 (11%)	29 (13%)
Sociocultural perspectives	18 (5%)	14 (6%)
Total	359 (100%)	228 (100%)

Table 5.
Classification of
required courses

explaining their dominance. After that, "Information Organization and Retrieval" ranked second while "Information Services" ranked third. It is important to note that non-subject-specific management courses were grouped under the "Education" class, while subject-specific ones were grouped under the appropriate research classes, mostly "Information Services."

Internships as required courses were placed under the education of information professionals, as internships often provide experiences not covered by the academic theories within classrooms. Mandatory internships not contributing to the credit hours required to complete the accredited programs were not included here, as they did not remove a student's ability to choose electives.

Although technology courses have become a standard requirement among LIS courses, they did not take up a large proportion of required courses in ALA-accredited programs. Information technology courses directly related to traditional LIS subjects only ranked fifth. Subjects that were not traditionally related to LIS from other fields only made up a total of 5% of required courses, which shows that LIS programs accredited by ALA still preserve their emphasis on traditional LIS subjects.

The case was not the same with CILIP accredited programs. Similar to ALA, CILIP had the largest proportion of required courses under "Education of Information Professionals" due to the presence of research method courses, required internships, dissertations and general management courses. However, courses in "Information Technologies" came next at 13% of all the required courses, followed by the traditional LIS areas of "Information Organization and Retrieval" and "Information Services." This suggested a slight difference in focus between the accredited courses of ALA and CILIP.

To summarize, "Education of Information Professionals" ranked first in the number of required courses for both ALA and CILIP. "Information Organization and Retrieval" and "Information Services" ranked second and third for ALA while CILIP had "Information Technologies" for the second place.

Percentage of required credits in relation to total credits
Table 6 shows the percentage of required Credits concerning the total credits. Most programs in ALA had 41%–50% or slightly less than half of their courses as required courses. The lowest percentage of required courses recorded was 12%, with the highest being 93%. The average percentage of required courses among ALA programs was found to be 41%, while the average for CILIP programs was found to be much higher at 85%. This reflects that ALA programs are generally more flexible and diversify in their range of subjects.

Range % of required credits in relation to total credits	Programs in ALA	Programs in CILIP
11–20%	4 (6%)	
21–30%	7 (11%)	1 (3%)
31–40%	17 (26%)	
41–50%	25 (40%)	
51–60%	5 (8%)	1 (3%)
61–70%	3 (5%)	1 (3%)
71–80%	1 (2%)	7 (22%)
81–90%		9 (28%)
91–100%	1 (2%)	13 (41%)
Total	63 (100%)	32 (100%)

Table 6.
Percentage of required credits in relation to total credits

Capstone measurements offered by programs
In both ALA and CILIP accredited programs, the most commonly offered capstone measurement was found to be the dissertation/thesis option. However, ALA programs offered the use of a larger variety of capstone measurements compared to CILIP, especially featured by the use of e-portfolios (see Table 7).

Discussion

Building upon past work by Beheshti (1999), Hall (2009) and Markey (2004), this LIS curricula review may be one of the first few studies comparing ALA and CILIP accredited programs. Through analyzing the key parts of the curricula, the results of this research show that ALA and CILIP programs have significant differences in the aspects of names of degrees, levels of academic units offering the programs, credit hours, required courses, percentage of required courses and capstone measurement methods.

Names of degrees

For ALA-accredited programs, two programs were excluded as they were non-English programs with non-English websites. This means that a total of 63 ALA programs were analyzed in this study, which is a larger sample size compared to the study of 55 programs by Hall (2009). The increase of accredited programs over the years with new institutions seeking accreditation shows that ALA accreditation is still considered an essential accomplishment for LIS programs. For ease of discussion, the name of degrees instead of the full name of programs is discussed using the term program name.

Compared to Markey (2004)'s study of LIS curricula, there has been a change in the number and type of program names employed. Similar to the results in 2002, MLIS remains to be the most popular acronym used for LIS programs. The number and percentage of programs using this acronym have increased slightly from 35% or 20 programs in 2002 (Markey, 2004) to 38% or 24 programs as revealed in this study. This observation can be ascertained by the accreditation of new programs since 2002. In this review, Appendix 1 shows 39 programs had both "Library" and "Information" in their program names, ten programs had "Library" as the only keyword, while 14 programs did not have the keyword "Library" in their names. This is a significant change from 2002, during which only six programs did not have the keyword "Library" in their names upon examining the past data (Markey, 2004). These results demonstrate two points. The first is that "Library" is still given a strong emphasis among ALA-accredited LIS programs, despite all the pressure from advancements in information technology. The second point is that there is an increased emphasis on Information Science and technology that is not limited to the library viewpoint, as seen with the increase in the number of programs focusing on Information Science.

Capstone measurement	Programs in ALA that offer capstone measurement	Programs in CILIP that offer capstone measurement
Comprehensive examination	9 (10%)	
Dissertation/Thesis	29 (33%)	32 (97%)
e-portfolio	24 (27%)	
Internship	14 (16%)	
Project	12 (14%)	1 (3%)
Total	88 (100%)	33 (100%)

Table 7.
Capstone measurements offered by programs

This reaffirms Markey's statement more than a decade ago that LIS programs are continuing to extend their scope to include subjects that are outside of traditional Library Science.

Appendix 2 shows CILIP program acronyms are much more standardized than those of ALA, with only a few options used. However, the full program names with the CILIP list vary more compared to ALA. For CILIP, ten programs had both the keywords "Library" and "Information" in their names, 26 programs had both the keywords "Library" and "Information," 14 programs had the keyword "Library" only while 18 programs did not contain the keyword "Library." Out of the 18 programs, 12 had the keyword "Information" and three had keywords that may be related to Library Science such as "Archive," "Curation" and "Book," The remaining three programs were probably associated with other emerging fields, such as "Data Science." When comparing both ALA and CILIP, 78% (49 programs) of ALA programs and 75% (24 programs) of CILIP programs had the keyword "Library" in their names. This shows there is still a strong emphasis on Library Science among accredited programs in both organizations. Furthermore, although some may speculate that the word "Library" will be removed from program names, comparing past data with current data shows that "Library" has remained in these program names for quite a long period.

Names of academic units offering the programs
In both ALA and CILIP, accredited programs are mostly offered by academic units with names that start with "Information" as the keyword. This is a significant change from the results collected by Markey (2004), which showed that LIS schools were offering the majority of accredited LIS programs.

A grey area in the definition of Information Science is the problem of the scope of inclusion, which varies among practitioners until today (Aspray, 2011). However, historians have included the specialties within the field of Library Science as part of Information Science based on theoretical grounds (Buckland and Liu, 1998). Thus, the observed results of "Information" related academic units being the dominant ones to provide LIS programs should not alarm the reader as a sign that LIS is being phased out in favor of Information Science. Instead, these are the results of LIS academic units being merged with other academic units such media, journalism and education to form larger units in an attempt to simplify the organizational structure, provide synergy and improve governance, a trend starting as early as the 1980s (Hildreth and Koenig, 2002). One benefit of such a trend is the formation of more generalized application-based information-related courses for programs under such "Information" academic units, which are more beneficial and meaningful compared to offering technology courses traditionally associated with Computer Science. This is also seen with the increase of applied information technology courses as required courses. Furthermore, as results within this study regarding degree names and required courses have shown, most accredited LIS programs still retain their Library Science core subjects while successfully incorporating information technology into their curricula.

After "Information" academic units, "Communication," "Education" and "LIS" tied at second (8%, 5 programs) for offering ALA-accredited programs, while "Computer" was second (19%, 6 programs) for offering CILIP-accredited programs. This difference may be attributed to a few CILIP accredited programs that hold aspects from Computer Science with equal importance as Library Science. For example, although Northumbria University Newcastle offers two Information Science programs, one focusing on data analytics, the other on library management, with both placed under the Department of Computer and Information Sciences, causing the number of LIS programs being held by "Computer" related academic units to increase. However, as mentioned before, these results should not be taken as an alarming trend of "Library" being phased out, but rather as a result of the various mergers that occurred to make up for the small sizes of LIS departments (and classes) and to improve overall governance and operations at the institutions.

Levels of academic units offering the program
Notably, 37 of the accredited programs (59%) within ALA are offered by academic units at the "School" level, while academic units offered the majority of programs accredited by CILIP (63%, 20 programs) at the "Department" level. Upon further investigation, many of the programs offered by "School" academic units were also members of iSchools. For example, the Information School at the University of Sheffield in the UK and the School of Information at the University of Michigan are members of iSchools on top of their programs being accredited by CILIP and ALA, respectively. iSchools is an association with an intention being made up of Information Schools, meaning schools, colleges and departments in various universities, all dedicated to advancing the information field at a global scale ("iSchools"). Different from ALA, iSchools is a worldwide association. Although CILIP accredits programs outside of the UK as well, the number of globally accredited programs is small compared to iSchools. These results can be considered as a good sign that LIS programs are preparing students for a globalized career. For example, if a student graduates from a program that is ALA-accredited and recognized by iSchools, then the student's degree will be recognized both locally within the US and globally as well through iSchools. Detailed comparisons among iSchools, ALA and CILIP programs can be conducted as future research.

Credit hours of accredited programs
The most popular choice of credit hours required for completion was 36 credit hours (33 programs, 51%) for ALA-accredited programs, and 180 credit hours for CILIP-accredited programs (30 programs, 94%). Note that the definitions of credit hours between ALA and CILIP accredited programs differ widely due to academic and cultural differences between the US and the UK. Compared to the data collected on ALA programs in 2002, there has been little change in the credit hour situation for ALA programs. Among ALA programs, only 4 programs out of 63 adopt a quarter term system while the other 59 follow the semester-based term system. Programs that follow the quarterly system were observed to have a larger number of credits, except for the Master of Science (Library and Information Science) at Drexel University, which adopts a quarter-based term system while requiring only 45 credits. One may wonder if credit hours limit or reduce the number of courses students can take while studying for the degree. However, upon examining the courses in unique cases such as the University of Toronto that uses FCE as a measurement of student work, the number of courses required to be completed is the same as a 36-credit-hour program, which ranges from 12 to 15 courses.

A significant difference between ALA and CILIP programs could be highlighted on the number of classes. In most CILIP programs, a dissertation is required for graduation. Unlike the many thesis options in ALA programs that only take up one course equivalent of credit hours, the dissertation within CILIP programs often takes up the three-course equivalent of credit hours. This means that on average, students within CILIP programs take two fewer courses compared to students within ALA programs. However, when these results are compared with the percentage of required courses, one can argue that the coverage of programs in both ALA and CILIP is about the same, since course choices in CILIP are mostly ruled by the educators, who due to their experience, have better insight into what students need to learn. However, to answer this question, detailed analysis and comparison of the course contents between similar programs in ALA and CILIP may be performed in future studies.

Classification of required courses
In descending order, "Education of Information Professionals," "Information Organization and Retrieval" and "Information Practices" were found to be the most frequently occurring

required classes within ALA programs. For CILIP, "Education of Information Professionals" ranked first while "Information Organization and Retrieval" and "Information Services" tie for second place. Although the classification system used here is different from those used by Hall (2009) and Markey (2004), certain aspects can still be considered for comparison.

In contrast to this review, past studies on LIS curricula listed research methods, foundations and internships as separate classes for the classification of required courses. This is no longer possible due to the appearance of required information technology courses that could not be properly represented in past classification schemes. The inclusion of research methods courses and internships within the "Education for Information Professionals" class, combined with the classification of foundations courses into the "Information Practice" class caused these two classes to become the majority of required classes. The appearance of general management classes not related to LIS was also placed under "Education of Information Professionals." These results reflect the heavy emphasis placed by LIS educators on equipping students with tools of learning from research methods, practical experience and management skills, all combined with the LIS core to successfully start and progress their career as LIS professionals. This is a good sign as it would be impossible to prepare a student for the future LIS professions solely based on LIS theories and coursework (Lo *et al.*, 2015, 2017b). Students have to continuously learn new skills as technology continues to advance and the LIS environment changes in response (Lo *et al.*, 2017c; Ho *et al.*, 2018). Thus, the majority of required courses being classed into "Education of Information Professionals" is not a cause for worry. Instead, it shows that research methods, practical experience and management skills have been emphasized to strengthen students' ability to make use of LIS subjects and theories in the modern LIS workplace and leadership (Lo and Stark, 2021).

The result that can be best compared with past literature would be "Information Organization and Retrieval," which appeared within the top 3 classes of required courses for both ALA and CILIP programs. The topic of information organization and retrieval has consistently remained a significant required course in both the studies of Markey (2004) and Hall (2009) on LIS curricula. Combined with the current results, we can predict that information organization and retrieval will continue to be an important required course for LIS programs, especially in this age of information overload due to the widespread use of the internet (Lo *et al.*, 2017c).

Given the changing nature of work in LIS professions (Cullen and Kavanagh, 2006; Lo *et al.*, 2017b, c), LIS programs need to offer practical information technology courses and continually update them to match advancements in technology. Among ALA programs, the number of required information technology-related courses has almost tripled from approximately 22 courses in 2002 to 58 courses in the current study, including courses from "Data Management," "Data Science" and "Human-computer Interaction and Design" since courses within those classes were found to involve technology heavily (Markey, 2004). Within CILIP, "Information Technology" had more required courses than "Information Retrieval and Organization" and "Information Services." Obviously, information technology has become a common part of LIS programs in both ALA and CILIP and is expected to continue being part of the required core as technology progresses.

Percentage of required credits in relation to total credits
Notably, 25 programs or 40% of ALA-accredited programs offer their programs with two-fifths of their programs as required courses, with an average of 41% of all credits in ALA programs being required. Compared to past studies, this number represents a decrease in the percentage of required courses from 46% in 2009 to the current 41% (Hall, 2009). The trend of increasing the percentage of courses needed due to the expansion of LIS core subjects to include information technology, and other courses, as suggested by Hall, seems to have

reversed. However, unlike Hall, this study does not include "specialist" programs offered by the LIS schools that are not explicitly listed in the ALA-accredited list. Thus, the number presented in this study may be an underestimate of the required percentage of courses, if other programs that have elements of LIS but are outside the accredited lists are considered.

In stark contrast to ALA programs, CILIP programs are mostly filled with required courses, with only some programs offering students choices to pick elective courses: 41% or 13 programs within CILIP have 91–100% of their courses fixed. This is a true reflection of the belief that it is the LIS professional who is in the right position to decide what courses are appropriate for the student, not the other way around (Marco, 1994). Within ALA, students must pick some courses from a list of required electives, which may tempt readers to think that this would be even out the degree of freedom for students in both ALA and CILIP programs to select courses. However, this is not the case as most required electives usually fall into a singular theme or subject, leaving many credits open for students to decide for themselves. Thus, programs within ALA provide students with a greater sense of flexibility in choosing their courses compared to CILIP, but still, maintain some course guidance in the form of required electives according to their future career perspectives (Lo *et al.*, 2017b; Ng *et al.*, 2021).

Capstone measurements offered by programs
Thesis, e-portfolio, internships were found to be the top three methods offered as a capstone requirement for graduation among ALA-accredited programs. In CILIP, only two options were found, a majority being a dissertation as a capstone project.

The use of comprehensive examinations in ALA has seen a decline in the past decade, slowly being switched out in favor of e-portfolios (University of South Florida, 2018). E-portfolios, the current trend for capstone measurements, are an electronic compilation of works performed by the students during their LIS studies, usually taken from required core classes or specialty electives to showcase a student's mastery and ability. The appearance of internships as a capstone measurement shows the importance placed by ALA-accredited programs on gaining practical work experience before entering the LIS professional world. A total of 85% or 54 programs within the ALA list offered internships as a credit-hour course, while 24% or 15 programs required an internship to graduate. In contrast, 38% or 12 programs under CILIP accreditation offered internships as credit hour courses, while 22% or seven programs required an internship for graduation. This suggested that ALA-accredited programs were more willing to count practical experiences as part of a student's coursework towards graduation compared to CILIP-accredited programs.

From an academic viewpoint, the capstone measurements used in CILIP programs are beneficial for both the university and the students in the sense that research output in the form of academic papers can be guaranteed from each student. However, when it comes to an assessment of a students' ability to perform work as a LIS professional, the e-portfolios and project options adopted in ALA programs may be a better method to demonstrate ability compared to a dissertation/thesis, which is mainly directed at academia. For now, there seems to be no change in the capstone measurement for most CILIP programs. Among ALA programs, however, comprehensive examinations will continue to be phased out in favor of e-portfolios.

Conclusion
To conclude, this review has sought to understand and compare some notable aspects of LIS programs accredited by ALA and CILIP, especially from the interest of educators and potential students. Program information such as the name of degrees, names and levels of

academic units, credit hours required for graduation, required courses within programs and the percentage of required courses were collected from the websites of the accredited programs, analyzed and compared.

Based on the factors analyzed in this review, there were some changes in the LIS curricula in ALA compared to studies in the past. Many programs still have the keyword "Library" as part of their program names, while the core of library science was observed to be preserved with the addition of information technology courses as required courses. Significant differences observed were that academic units that traditionally held LIS programs have merged with other departments such as education and communication over the past decades to form "information schools."

In comparing ALA and CILIP accredited programs, this review is perhaps one of the few to attempt shedding light on the similarities and differences between the two. The acronyms of degrees used by CILIP programs were found to be much more uniform compared to ALA programs, which were found to have a large variety of acronyms. Similar to the trend of mergers in ALA programs, most CILIP programs are offered by "information schools" in association with iSchools, although the use of the word "Department" was found to be the most popular among CILIP programs. A majority of ALA and CILIP programs offer their courses based on semesters rather than quarters, with 36 credit hours and 180 credit hours, defined differently, being the most common among ALA and CILIP programs, respectively. Analysis of the required courses shows that research methods, management skills, practical experience, library core subjects and information technology courses formed the common core among most APA and CILIP programs. ALA programs were found to give more freedom to students in choosing electives compared to CILIP programs, of which around half leave no room for students to choose electives. Dissertations were found to be the dominant capstone measurement among CILIP programs, while options of thesis, internships and e-portfolios were found to be the most popular among ALA programs.

In comparison to past literature, it is expected that continued emphasis will be placed on incorporating information technology classes into LIS programs while still preserving LIS subjects as required subjects. Capstone requirements are expected to stay the same for CILIP programs due to academic culture, while continued change is expected for ALA programs with a focus on e-portfolios replacing comprehensive exams. Further studies from other accreditation organizations such as iSchools can be added to this comparison for a complete picture of the global situation of LIS curricula. Future detailed studies on specific aspects such as course content coverage among the different accreditation organizations can also be conducted to identify areas of improvement for current courses.

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Appendix 1

Name of institution	Program name	Professional degree awarded
Clarion University of Pennsylvania	Master of Science in Library Science	MSLS
Dalhousie University	Master of Library and Information Studies	MLIS
Dominican University	Master of Library and Information Science	MLIS
Drexel University	Master Science (Library and Information Science)	MSLIS
East Carolina University	Master of Library Science	MLS
Emporia State University	Master of Library Science	MLS
Florida State University	Master of Art in Information	MA
Florida State University	Master of Science in Information	MSc
Indiana University	Master of Information Science	MIS
Indiana University	Master of Library Science	MLS
Kent State University	Master of Library and Information Science	MLIS
Long Island University	Master of Science in Library and Information Science	MSLIS
Louisiana State University	Master of Library and Information Science	MLIS
McGill University	Master of Information Studies	MIS
North Carolina Central University	Master of Library Science	MLS
Pratt Institute	Master of Science in Library and Information Science	MSLIS
Queen's College, CUNY	Master of Library Science	MLS
San Jose State University	Master of Library and Information Science	MLIS

Table A1.
List of ALA accredited qualifications studied

(*continued*)

Name of institution	Program name	Professional degree awarded
Simmons College	Master of Science in Library and Information Science	MS
St John's University	Master of Science in Library and Information Science	MSLIS
St. Catherine University	Master of Library and Information Science	MLIS
Syracuse University	Master of Science in Library and Information Science	MSLIS
Texas Woman's University	Master of Library Science	MLS
Texas Woman's University	Master of Arts in Library Science	MA
The Catholic University of America	Master of Science in Library and Information Science	MSLIS
The State University of New Jersey Rutgers	Master of Information	MIS
The University of Southern Mississippi	Master of Library and Information Science	MLIS
University at Albany, SUNY	Master of Science in Information Science	MSIS
University at Buffalo, SUNY	Master of Science in Information and Library Science	MSILS
University of Alabama	Master of Library and Information Studies	MLIS
University of Alberta	Master of Library and Information Studies	MLIS
University of Arizona	Master of Arts in Library and Information Science	MA
University of British Columbia	Master of Library and Information Studies	MLIS
University of California Los Angeles	Master of Library and Information Studies	MLIS
University of Denver	Master of Library and Information Science	MLIS
University of Hawaii	Master of Library and Information Science	MLISc
University of Illinois at Urbana–Champaign	Master of Science in Library and Information Science	MSLIS
University of Iowa	Master of Arts in Library and Information Science	MA
University of Kentucky	Master of Science in Library Science	MSLS
University of Kentucky	Master of Arts	MA
University of Maryland	Master of Library and Information Science	MLIS
University of Michigan	Master of Science in Information	MSI
University of Missouri	Master of Library and Information Science	MLIS
University of North Carolina at Chapel Hill	Master of Science in Information Science	MSIS
University of North Carolina at Chapel Hill	Master of Science in Library Science	MSLS
University of North Carolina at Greensboro	Master of Library and Information Studies	MLIS
University of North Texas	Master of Science in Information Science	MSIS
University of Oklahoma	Master of Library and Information Studies	MLIS
University of Ottawa	Master of Information Studies	MIS
University of Pittsburgh	Master of Library and Information Science	MLIS
University of Rhode Island	Master of Library and Information Studies	MLIS
University of South Carolina	Master of Library and Information Science	MLIS
University of South Florida	Master of Arts in Library and Information Science	MA
University of Southern California	Master of Management in Library and Information Science	MMLIS
University of Tennessee	Master of Science in Information Sciences	MSIS
University of Texas at Austin	Master of Science in Information Science	MSIS

(*continued*)   **Table A1.**

Name of institution	Program name	Professional degree awarded
University of Toronto	Master of Information	MI
University of Washington	Master of Library and Information Science	MLIS
University of Western Ontario	Master of Library and Information Science	MLIS
University of Wisconsin Milwaukee	Master of Library and Information Science	MLIS
University of Wisconsin–Madison	Master of Arts in Library and Information Studies	MA
Valdosta State University	Master of Library and Information Studies	MLIS
Wayne State University	Master of Library and Information Science	MLIS

Table A1. **Source(s):** ALA list: http://www.ala.org/educationcareers/accreditedprograms

Appendix 2

Name of institution	Program name	Professional degree awarded
Aberystwyth University	Archive Administration	MA
Aberystwyth University	Information and Library Studies	MA
Aberystwyth University	Digital Curation	MSc
Aberystwyth University	Management of Library and Information Services	MSc
City, University of London	Library Science	MA
City, University of London	Information Science	MSc
City, University of London	Library Science	MSc
Cranfield University	Information Capability Management	MSc
King's College London	Digital Asset and Media Management	MA
Manchester Metropolitan University	Library and Information Management	MA
Manchester Metropolitan University	Information and Data Management	MSc
Northumbria University Newcastle	Information Science–Data analytics	MSc
Northumbria University Newcastle	Information Science–Library Management	MSc
Robert Gordon University	Information and library studies	MSc
Robert Gordon University	Information management	MSc
The University of Hong Kong	Library and Information Management	MSc
University College London	Library and Information Studies	MA
University College London	Information Science	MSc
University College London Qatar	Library and Information Studies	MA
University of Edinburgh	Book history and material culture	MSc
University of Glasgow	Information Management and Preservation	MSc
University of Sheffield	Librarianship	MA
University of Sheffield	Library and information services management	MA
University of Sheffield	Data science	MSc
University of Sheffield	Digital library management	MSc

Table A2.
List of CILIP accredited
qualifications

(*continued*)

Name of institution	Program name	Professional degree awarded
University of Sheffield	Health informatics	MSc
University of Sheffield	Information Management	MSc
University of Sheffield	Information Systems	MSc
University of Strathclyde	Information and Library Studies	MSc
University of Strathclyde	Information Management	MSc
University of Strathclyde	Information Management with Industrial Placement	MSc
University of the West of England (Bristol)	Information Management	MSc

Source(s): CILIP list: https://archive.cilip.org.uk/cilip/cilip-accredited-qualifications

Table A2.

Appendix 3

Area: data management	Area: data science	Area: human-computer interaction and design
Scope note: the development and execution of architectures, policies, practices and procedures to manage the information lifecycle needs of an organization in an effective manner	Scope note: processes and systems to extract knowledge, social and economic value in various forms, either structured or unstructured	Scope note: the relationship between people, groups and societies and computing and information systems
Subjects	*Subjects*	*Subjects*
Copyright	Altmetrics	Artificial intelligence
Data curation	Bibliometrics	Computer-supported
Information governance	Big data	collaborative work
Information policy	Cloud computing	Machine learning
Information privacy	Data mining	Mobile systems
Information security	Data visualization	Social computing
Intellectual property	Data warehousing	User interfaces
Knowledge management	Informetrics	Augmented reality
Records and information management	Machine learning	Ubiquitous computing
Risk management	Natural language processing	
	Webometrics	

Area: information organization and retrieval	Area: information practices	Area: education of information professionals
Scope note: processes and systems to effectively represent and organize, and retrieve information	Scope note: processes and systems that examine the dissemination and use of information	Scope note: methods and strategies to provide learning opportunities to information professionals
Subjects	*Subjects*	*Subjects*
Abstracting	Censorship	Accreditation
Archival arrangement and description	Education	Administration
Classification	Information ethics	Continuing education
Cataloging	Information literacy	Curriculum
Cross-language information retrieval	Information needs	Education programs/schools
	Information seeking	Online learning
	Information use	Pedagogy

Table A3.
ALISE research
taxonomy

(*continued*)

Area: information organization and retrieval	Area: information practices	Area: education of information professionals
Indexing Interactive information retrieval Linked data Metadata Multimedia information retrieval Taxonomies Ontologies Semantic web Social tagging	Intellectual freedom Print culture Reading and reading practices Reference transactions Scholarly communications Specific populations	Research methods Standards Students Teaching faculty

Area: information services	Area: information technologies	Area: sociocultural perspectives
Scope note: specific contexts in which information sources are collected for, and disseminated to, target populations	Scope note: the design, application and evaluation of computers, storage, networks and other devices to create, process, store, secure and exchange all forms of electronic data	Scope note: how individual behaviors are affected specifically by their surroundings, and social and cultural factors
Subjects Academic libraries Archives Children's services Collections development Community and civic organizations Community engagement Community-led services Digital humanities Libraries in the developing world Museums Public libraries Publishing Readers' advisory services School libraries Special libraries Young adult services	*Subjects* Database systems Discovery systems Information system design Library technology systems Open source software Social software Social media	*Subjects* Critical librarianship Information rights Political economy of the information society Social justice Sociology of information

Table A3.

Source(s): List taken from: http://www.alise.org/research-taxonomy (revised on 10/12/2016)

Appendix 4

Acronym of degree[*]	Programs in ALA	Programs in CILIP	Written-out names, beginning with "Master of . . ."[**]
MA	7 (10%)	9 (28%)	Arts in Library and Information Science (3), Arts in Information (1), Arts in Library and Information Studies (3), Arts in Library Science (2), Arts (1), Digital Asset and Media Management (1), Librarianship (1), Library and Information Services Management (1), Archive Administration (1), Information and Library Studies (1), Library and Information Management (1)
MI	1 (2%)		Information (1)
MIS	4 (6%)		Information Science (1), Information Studies (2)
MLIS	24 (38%)		Library and Information Science (15), Library and Information Studies (9)
MLISc	1 (2%)		Library and Information Science (1)
MLS	6 (9%)		Library Science (6)
MMLIS	1 (2%)		Management in Library and Information Science (1)
MS	1 (2%)		Science in Library and Information Science (1)
MSc	1 (2%)	22 (69%)	Science in Information (1), Book history and material culture (1), Data science (1), Digital Curation (1), Digital library management (1), Health informatics (1), Information and Data Management (1), Information and Library Studies (2), Information Capability Management (1), Information Management (4), Information Management and Preservation (1), Information Management with Industrial Placement (1), Information Science (2), Information Science–Data analytics (1), Information Science–Library Management (1), Information Systems (1), Library and Information Management (1), Library Science (1), Management of Library and Information Services (1)
MSc(LIM)		1 (3%)	Science in Library and Information Management (1)
MSI	1 (2%)		Science in Information (1)
MSILS	1 (2%)		Science in Information and Library Science (1)
MSIS	5 (8%)		Science in Information Science (5)
MSLIS	7 (10%)		Science in Library and Information Science (7)
MSLS	3 (5%)		Science in Library Science (3)
Total	63 (100%)	32 (100%)	

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