

Challenges in LIS Education in China and the United States

Chunxiang Xue, *Nanjing University of Science & Technology*
xuechunxiang@njjust.edu.cn

Xiuzhi Wu, *Nanjing University of Science & Technology*
wuxiuzhi515420@163.com

Lei Zhu, *Nanjing University of Science & Technology*
zhulei9105@163.com

Heting Chu, *Long Island University*
hchu@liu.edu

For decades, library and information science (LIS) education has been producing LIS professionals to serve people in all walks of life. But there are challenges to LIS education as society advances. This study performed quantitative and qualitative content analyses of data collected about LIS education in China and the United States. Four categories of challenges in LIS education are identified: (1) identity and accreditation, (2) survival and thriving, (3) curriculum update and enhancement, and (4) course delivery format and content. The challenges that each country encounters in LIS, as expected, are not the same, although some appear similar. All the challenges are discussed and contrasted in the context of each country's traditions and practices in LIS education. Some suggestions are also made regarding how to successfully meet the challenges this study has explored. The findings of this study can help all constituencies (i.e., educators, practitioners, and students) to better understand the challenges of LIS education in China and the United States so that feasible measures can be developed to meet them. In addition, each country can benefit from this study by learning from what its counterpart has done in LIS education with regard to barriers and challenges.

Keywords: accreditation, information management, iSchools, online learning, student enrollment

Library and information science (LIS) education has been experiencing challenges on many sides as society advances and technology develops. These challenges range from keeping the identity of LIS to evolving curricular specifications. Although challenges in LIS education are not a new topic, as numerous researchers have addressed this theme in the past (Chawner, 2015; Chu, 2010; Kaur, 2015), it is worthwhile and always timely

Key points

- LIS education in China and the United States has been facing multiple challenges, although the two countries differ in education system, program structure, curriculum, and more.
- Taking a comparative approach, this study identifies four categories of challenges in LIS education in China and the United States.
- Findings of this study not only help all constituencies of LIS education in both countries to gain a better understanding of the identified challenges but also suggest some measures for coping with them.

to revisit it in order to further prepare ourselves to meet today's new and different challenges. In this report, we focus on comparing and contrasting the challenges of LIS education in China and the United States. We also suggest some measures for coping with the challenges based on analyzing what has been collected in this study.

Undoubtedly, huge differences exist between LIS education in China and the United States. [Pei \(2016\)](#) identifies the differences and similarities in LIS education among several countries and regions (see Pei's Table 6-1). We briefly describe and annotate these before addressing the challenges that the two countries encounter in LIS education.

LIS education in China consists of three types of degree programs (i.e., undergraduate, master's, and doctoral) in addition to various correspondence and short-term training programs. In the years before 1999, undergraduate

programs were the mainstay of LIS education in China and typically included requirements for both the arts and sciences college student and the LIS major. At the turn of the twenty-first century, not only was the master's degree program expanded but the Ph.D. program was also introduced into top LIS schools such as Peking University and Wuhan University ([Yang, 2004](#)). Many other institutions followed suit. In addition, LIS master's programs in China are of two kinds: professional and research. The former is similar to the MLIS program in the United States, while the latter does not have an American equivalent. Further description about LIS education at the graduate level in China can be found in a research report by [Chen, Chen, Si, Zan, and Feng \(2017\)](#). Beginning in 1992, almost all LIS schools in China replaced "library and information science" with "information management" in their names.

The MLIS program in the United States forms the backbone of education in library and information science. It is a professional degree that is a requirement for anyone who wishes to become a librarian in any kind of library. Undergraduate programs were created in the 1980s by some universities (e.g., Drexel University, Syracuse University) with an orientation in information technology. They differentiate themselves from the undergraduate programs in China in that their graduates are usually employed in the IT sector, both inside and outside libraries. The Ph.D. program in the United States, devoted to

educating researchers, has a much longer history than in China. Veteran LIS schools (e.g., Illinois and Pittsburgh) normally offer a doctoral program in the same field, while newly created Ph.D. programs at other institutions (e.g., Long Island University) typically feature interdisciplinarity, with degree names such as information studies. The interdisciplinary nature of those programs is also reflected in their collaboration, explicitly (e.g., courses taught by non-LIS faculty) or implicitly (e.g., students taking courses outside of the home school), with other academic units on campus. Many LIS schools may have removed the word “library” from their names in recent decades. However, the master’s degree that is accredited by the American Library Association (ALA) still keeps the L(ibrary) word in the degree name.

Although LIS education in China and the United States is apparently not uniform, even according to the brief description above, each country does face some common challenges. It is the purpose of the current study to identify such challenges after a review of prior research in the field.

Literature review

Challenges in LIS education are not an issue for only a single country or several countries to address. Rather, researchers from many different countries try to meet such challenges by first gaining a full understanding of them. For example, [Chawner \(2015\)](#) explored this issue of challenges in LIS in New Zealand and Australia. Similar studies have been conducted in Australia ([Partridge et al., 2011](#)), China ([Deng & Ling, 2014](#); [Ge & Sun, 2014](#); [Xiao, 2016](#); [Yu & Qu, 2015](#)), India and southern Asia ([Kaur, 2015](#); [Pradhan, 2014](#)), Kenya ([Rukwaro & Bii, 2016](#)), Nigeria ([Nkanu, Iyishu, & Ogar, 2013](#)), and the United States ([Chu, 2010](#); [Jank, Chu, & Koenig, 2013](#); [Rosa, 2016](#)). It is true that LIS education is facing a unique set of challenges in different countries because of their respective education systems, program structures, and other factors. However, learning about other countries’ problems in LIS education does help one become better informed about what could be done in order to develop measures for coping with the challenges taking place in one’s own country. The challenges identified and reported in prior research can be summarized under three subheadings: programs and curricula, faculty, and students.

Programs and curricula

LIS programs have normally been offered in departments, schools, and in recent years within a college that includes the LIS department/school¹ along with other academic units, such as education and communications in the USA ([Jank et al., 2013](#)) and management and business in China. Compared with other larger academic units, the LIS school constantly faces an identity crisis and might be unable to receive the same treatment as others within the college or on campus ([Pradhan, 2014](#)).

Some authors (e.g., [Kaur, 2015](#)) express their concerns about the lack of an accreditation system in India and southern Asia. Similar

apprehension is echoed in New Zealand and Australia (Chawner, 2015) and other countries (e.g., Kenya [Rukwaro & Bii, 2016]). LIS programs in Canada and the United States do have an accreditation body—the Committee on Accreditation (COA) of the ALA—to handle the accreditation and re-accreditation process. This practice nevertheless raises more questions than performing quality control of LIS programs (e.g., Hartley & Virkus, 2003; Mulvaney & O'Connor, 2014; Wozniczka-Paruzel, 2003).

The LIS school being a smaller unit within a college or on campus certainly affects its ability to get adequate resources for operating an LIS program (Chawner, 2015). Moreover, if the LIS school is in a developing country, its infrastructure is often substandard on the whole because of the economic situation in the home country (Kaur, 2015; Nkanu et al., 2013; Rukwaro & Bii, 2016). The marketing of LIS schools likewise can be minimal or non-existent if the upper administration does not pay sufficient attention to those units (Kaur). As a result, LIS professionals are often regarded as merely “keepers of books” in Nigeria (Nkanu et al.) or described using other similar images.

Inconsistency among different programs in a country imposes a challenge to LIS education as well (Chawner, 2015). A certain degree of variation in curricular requirements enables students to take advantage of the unique expertise and features of each LIS program. However, too much deviation from the fundamentals in LIS education could lead to the situation where students are not equipped with proper knowledge and skills to become a well-prepared LIS professional. This is particularly true with the broadening scope of the LIS domain (Chawner) when the curriculum includes courses beyond the traditional core (e.g., cataloging, references) and LIS graduates start working in non-library environments (e.g., in the information sector of social media and other companies) or taking job titles such as UX (user experience) or data-science librarians.

One challenge that is unique to LIS education in China is the parallel offering of the professional and research degrees at the master's level (Ge & Sun, 2014; Jiang & Zheng, 2013; Sun & Zuo, 2013; Xiao, 2016). The professional master's degree program was not introduced until 2010 and has as its primary purpose to educate LIS professionals in a similar way to the MLIS program in the United States (Duan & Wang, 2016; Li, Yan, & Ke, 2011). Although all students are required to take the same entrance examination before being accepted into a master's program, the professional master's students need to complete a given number of courses and a thesis, plus a mandatory six to twelve months of internship in a library or similar institution. This type of program more or less resembles the MLIS program in the United States. The research master's program, on the other hand, requires students to publish at least one article in a peer-reviewed journal while working on their master's degree, in addition to the course work and a required thesis. Some of those students are likely to pursue a Ph.D. degree in the same field upon graduation. This dual

offering of the master's degree in LIS prompts discussion or debate on the balancing or collaboration between the two.

In addition, approximately 16 (22%) of the 73 master's programs in China (China Higher Education Information and Career Center, 2016) are run by university library staff in collaboration with research institutes and LIS schools (Ge & Sun, 2014; Jiang & Zheng, 2013; Sun & Zuo, 2013). Whether university library staff are prepared for operating and teaching full-time in the master's program is another challenge to LIS education in China, even if those staff members assume research responsibilities as part of their job descriptions (Xiao, 2016).

The curriculum remains central in LIS education regardless of country. Some researchers (e.g., Kaur, 2015) point out the challenge of having no standard curriculum in LIS programs, while others (Chu, 2010; Pradhan, 2014) suggest updated and balanced syllabuses for all. But the biggest curricular problem in LIS appears to be either that what has been taught in the classroom does not meet the expectations of students and practitioners in the field (Pradhan) or that the curriculum is not in tandem with the job market (Rukwaro & Bii, 2016; Xiao, 2016). Furthermore, Kaur indicates that IT development alters the needs and expectations of users. How the curriculum can be adapted to better meet the users' needs and expectations poses one additional challenge to LIS education.

Faculty

As in any other discipline, the quality of faculty ultimately determines the quality of LIS education. There is an inadequate number of teaching faculty in some countries, especially in developing ones, where there is an overreliance on part-time faculty (Chawner, 2015; Rukwaro & Bii, 2016). In addition to the lack of qualified LIS educators, another related challenge is how to ensure that LIS educators can update themselves in emerging technologies and applications when IT becomes an inseparable part of the LIS curriculum (Kaur, 2015). It is in this context that Nkanu et al. (2013) suggest that Nigerian LIS faculty should acquire IT-related knowledge and skills in order to stay current in their pedagogy.

LIS faculty are expected to conduct research besides teaching and giving service, which seems to be a serious challenge to many due to the lack of funding and support (Chawner, 2015) and the relative isolation of LIS educators in developing countries (Kaur, 2015; Pradhan, 2014). Pradhan reports that research by LIS faculty in India is mainly in the form of dissertations and M. Phil. theses. The unsatisfactory research status of LIS faculty in some countries further affects the well-being of LIS education.

Students

No form of education would exist without a critical mass of students. Small numbers of students and difficulties recruiting more of them make LIS schools an easy target for merger and elimination (Chawner, 2015). On

the other hand, as [Kaur \(2015\)](#) states, students lack interest and understanding of LIS because they have had little exposure to libraries while in grade school. Many students choose to pursue a degree in LIS simply to get a job instead of as a result of their passion for the field.

Online or distance education is gradually gaining momentum across disciplines in the United States and other countries. How to engage LIS students in online and/or blended environments presents a new challenge to both students and faculty ([Chawner, 2015](#); [Chu, 2010](#)). Many researchers have already examined the benefits and challenges of online education in LIS ([Aharony, 2011](#); [Buchanan, Xie, Brown, & Wolfram, 2001](#); [Smith, Lastra, & Robins, 2001](#); [Yukawa, 2010](#)) while Chawner specifically points out that the online environment provides no opportunity for socializing and guest speakers. The absence of face-to-face interaction between the instructor and students or among the students themselves all can have a negative impact on teaching and learning in LIS education.

Data collection and analysis

Data collection for this study was completed in two phases in order to obtain all the data needed for comparison between China and the United States, as well as longitudinally. First, ten LIS schools representing the top, middle, and lower tiers were chosen from each country using a purposive sample plan, although the selections were done at different time points. Tier categorization of US LIS schools is based chiefly on the *U.S. News & World Report's* annual ranking of MLIS programs (*U.S. News & World Report*, 2018), while that of LIS schools in China is according to the assessment performed by the Center for Degree Granting and Graduate Education (China Degree and Graduate Education Information Network, 2017²). The present study's authors' observation and knowledge about LIS schools in both countries also supplement the final selections of LIS schools.

The same 10 LIS schools in the United States chosen for a previous study ([Chu, 2012](#)) were again selected for the current study so that part of the data collected then could be utilized in this investigation for longitudinal contrast. [Chu \(2012\)](#) compared the MLIS programs between the five iSchools and five non-iSchools listed below. They represent schools at the top, middle, and lower tiers in addition to the iSchool and non-iSchool criterion applied in the previous study. Some of the chosen non-iSchools (e.g., Kent State University) have since become iSchools, but this criterion of school type was not considered in the data collection for the current study.

1. Catholic—Catholic University of America, School of Arts & Sciences, Department of Library & Information Science
2. Drexel—Drexel University, College of Computing & Informatics, Department of Information Science
3. Kent—Kent State University, College of Communication & Information, School of Library & Information Science

4. Long Island—Long Island University, College of Education, Information & Technology, Palmer School of Library & Information Science
5. Maryland—University of Maryland, College of Information Studies
6. Michigan—University of Michigan, School of Information
7. North Texas—University of North Texas, College of Information, Department of Library & Information Science
8. San Jose—San Jose State University, College of Applied Sciences & Arts, School of Information
9. South Carolina—University of South Carolina, College of Communications & Information, School of Information
10. Washington—University of Washington, Information School

In the case of China, the following 10 LIS schools were chosen to include institutions at the top, middle, and lower tiers of China's ranking system described above:

1. Anhui—Anhui University, College of Economics and Management, Department of Information Resource Management
2. China Agricultural—China Agricultural University, College of Information Science & Technology, Department of Information Management
3. Fuzhou—Fuzhou University, Library
4. NJU—Nanjing University, School of Information Management
5. NJUST—Nanjing University of Science & Technology, College of Economics & Management, Department of Information Management
6. Nankai—Nankai University, College of Business, Department of Information Resource Management
7. Shanghai—Shanghai University, Department of Library, Information & Archival Science
8. Shanxi—Shanxi University, College of Economics & Management, Department of Information Management
9. Sun Yat-Sen—Sun Yat-Sen University, School of Information Management
10. Zhengzhou—Zhengzhou University, School of Information Management

The second phase of data collection involved gathering the main data of interest to the current study. Specifically, student enrollment numbers for the 10 selected US LIS schools were taken from the *ALISE Statistical Report 2015* (Albertson, Culbert, Snow, Spetka, & Hollenkamp, 2015) and the *ALISE Statistical Report 2016* (Albertson, Spetka, & Hill, 2016). As there is no such report available in China, the current authors gathered student enrollment data by contacting related individuals (e.g., the dean or director) of the 10 chosen LIS schools. In comparison, curricular

data collection for LIS schools in both countries was easier, as such data were obtained from each chosen school's website. Websites for all the 20 selected LIS schools actually serve as the major sources for this study, supplemented by personal communication and related publications. Additional data (e.g., the four-tier system of iSchools) were also collected where needed. Both quantitative and qualitative techniques were adopted to analyze all the data gathered to achieve the research objectives of this study.

Challenges in LIS education in China and the United States

China and the United States are two vast countries, each with a large number of LIS departments and schools. Although LIS education in these two countries is different in many ways, an examination of the challenges they encounter would not only facilitate a better understanding of their respective systems of LIS education but also enable those who are interested in this theme to benefit from this exploration. The challenges that LIS education faces in China and the United States to be considered in this study include those in identity and accreditation, survival and thriving, curriculum update and enhancement, and course delivery format and content. Comparison and contrast will be made where appropriate.

Challenges in identity and accreditation

The identity of library and information science on campuses and in society has been an issue over the decades in spite of the recurrent name changes that encompass librarianship, library services, library science, library and information science/studies, information management (mostly in China), and schools of information, or iSchools for short (mostly in the United States). LIS schools' name changes in China appear quite uniform in that almost all relevant units now adopt "Information Management" as part of their formal names. However, the same cannot be said about the name changes in the United States, for two reasons. One is that few LIS schools eliminate the L word from the master's program name, mainly because MLIS (Master of Library and Information Studies) is the program accredited by the ALA, even if the school's name has already become "School of Information." The other reason is that the iSchool movement that began in the late 1980s is still evolving on a scale far beyond the expectations of its founders. A brief history of the iSchool movement is provided in [Chu \(2012\)](#).

The iSchools consortium (2017) at present categorizes its members into four tiers—Tier 1, Tier 2, Tier 3, and Associated Members (i.e., Tier 4)—chiefly based on individual schools' sponsored research and how established their Ph.D. programs are. Of the ALA-accredited MLIS programs in the United States and all the LIS schools endorsed by China's Ministry of Education, there are 27 and 4 LIS schools, respectively, from each country that are iSchool members. [Table 1](#) lists these schools, along with their corresponding tier category.

Table 1: iSchool members from China and the United States

Tier	School
1	<p>University of California, Los Angeles, Graduate School of Education & Information Studies, Department of Information Studies</p> <p>Drexel University, College of Computing & Informatics, Department of Information Science</p> <p>Florida State University, College of Communication & Information, School of Information</p> <p>University of Illinois, School of Information Studies</p> <p>Indiana University, School of Informatics & Computing, Department of Information & Library Science</p> <p>University of Kentucky, College of Communication & Information, School of Information Science</p> <p>University of Maryland, College of Information Studies</p> <p>University of Michigan, School of Information</p> <p>University of North Carolina, School of Information & Library Science</p> <p>University of North Texas, College of Information, Department of Library & Information Science</p> <p>University of Pittsburgh, School of Information Science</p> <p>Rutgers, The State University of New Jersey, School of Communication & Information</p> <p>Syracuse University, School of Information Studies</p> <p>University of Texas at Austin, School of Information</p> <p>University of Washington, Information School</p> <p>Wuhan University, School of Information Management (China)</p>
2	<p>University of Missouri, School of Information Science & Learning Technologies</p> <p>Nanjing University, School of Information Management (China)</p> <p>Sun Yat-sen University, School of Information Management (China)</p> <p>University of Tennessee, College of Communication & Information, School of Information Sciences</p> <p>University of Wisconsin, Madison, School of Library & Information Studies</p> <p>University of Wisconsin, Milwaukee, School of Information Studies</p>
3	<p>University of Arizona, College of Behavior & Social Sciences, School of Information</p> <p>Dominican University, School of Information Studies</p> <p>Kent State University, College of Communication & Information, School of Library & Information Science</p> <p>Long Island University, Palmer School of Library & Information Science</p> <p>Renmin University of China, School of Information (China)</p> <p>Simmons College, School of Library & Information Science</p>
4	<p>University of Colorado, College of Education, Department of Information Science</p> <p>Pratt Institute, School of Information</p> <p>University of South Carolina, College of Communications & Information, School of Information</p>

What challenges does the iSchool establishment create for LIS education? The iSchools consortium sets a high standard of sponsored research for all LIS schools, which is the most pronounced criterion that distinguishes iSchools from non-iSchools, according to a study that [Chu \(2012\)](#) conducted with five iSchools and five non-iSchools. This criterion indisputably presents a serious challenge to those LIS schools that have a small faculty size and reside in a teaching university. The faculty at those LIS schools are under enormous pressure to obtain research grants in order to become a member of the iSchools consortium, while at the same time those LIS schools traditionally could not be major producers of funded research for the reasons (e.g., infrastructure, visibility, and institutional support) that multiple authors ([Chawner, 2015](#); [Lopatovska & Ransom, 2014](#); [Nkanu et al., 2013](#); [Rukwaro & Bii, 2016](#)) have aptly summarized in their study reports. Nevertheless, the introduction of the four-tier iSchool membership structure in 2016 alleviated this issue to some extent. On the other hand, iSchools originated in the United States, so it is not surprising at all to see that only 4 (5%) of the 73 LIS schools in China ([China Higher Education Information and Career Center, 2016](#)) were members of the iSchools consortium in 2017. In contrast, 27 (52%) of the 52 institutions with an ALA-accredited MLIS program in the United States hold iSchool membership. The iSchool movement might therefore pose a challenge particularly to non-iSchools in China.

Another look at [Table 1](#) reveals the name variations among the members that currently belong to the iSchools consortium. A total of seven different names (i.e., information, informatics, information & library science, information management, information science, information studies, and library & information science) are used by the 31 iSchool members from both China and the United States. How then should the LIS field identify itself in society when it has so many different names and when its name changes so often? Or are we currently content with the popular School of Information in the United States and the School of Information Management in China? Perhaps we have to get an answer to this question. If we cannot reach consensus regarding our own identity or stick to one name as other disciplines do (e.g., chemistry, mathematics, psychology, sociology), how can we expect society to view us with a uniform lens?

A perennial challenge in LIS education in the United States is accreditation. An MLIS program in an LIS school, once accredited, has to be reaccredited at least every seven years and possibly more often (e.g., after five years) if not all the standards set by the ALA/COA are met. That is, some MLIS programs may receive conditional reaccreditation when they meet only some of the ALA standards. The debate about ALA accreditation centers mainly on three elements of the certification practice: what, who, and how. All constituencies pertaining to accreditation cannot seem to reach any consensus on this issue. On the other hand, they all agree that the ALA accreditation process needs to be revisited and improved

(e.g., [Chu, 2010](#); [Mulvaney & O'Connor, 2014](#)). In 2007 and 2008, the Association of Information Science & Technology (ASIS&T, formerly the American Society for Information Science & Technology), in its capacity as a major association for information science, explored whether it should launch a similar effort in the field ([ASIS&T, 2007](#)). However, perhaps due to the complexity of the issue, ASIS&T did not make a formal decision on accreditation after exploring the issue.

[Cronin \(2000, p. 54\)](#) listed the following five options, with his tongue in his cheek, when pondering the controversial ALA accreditation process:

1. stick with the status quo and progressively dumb-down the profession;
2. transfer responsibility for accreditation from the COA to some other body;
3. lay LIS accreditation firmly to rest;
4. reengineer the overall process; and
5. move away from accrediting academic programs to accrediting libraries.

Of the five suggestions, which one appears more likely to become the reality? Cronin gave his answer to the question in the order of the suggestions: unacceptable, feasible, wishful thinking, commonsensical, and with an enigmatic closing ellipsis for the last option. Almost two decades later, none of the five options has become a reality. Instead, since 2000 the COA has adopted two new editions of the ALA Standards (i.e., 2008 & 2015) and has revised some procedures for accreditation. Revisiting the accreditation standards and procedures always seems timely, even though the most recent ALA Standards were approved in 2015 ([American Library Association, Committee on Accreditation, 2015](#)).

China's assessment of institutions that offer the master's program in LIS is done differently. Similar to what the *U.S. News & World Report* does with its ranking of institutions of higher education, this assessment is designed for ranking purposes rather than for accrediting degree programs in China. The Center for Degree Granting and Graduate Education in the Ministry of Education is in charge of periodically evaluating not only MLIS degree-granting institutions but also all other degree programs throughout China. The first evaluation of degree programs (including the MLIS program) was done in 2002–2004, followed by two more in 2006–2008 and 2012 respectively. The fourth evaluation effort is currently under way ([China Degree & Graduate Education Information Network, 2017](#)). Even though the purpose of China's assessment of degree programs is not for accreditation, there are still concerns about this endeavor, which can be summarized as follows: 1) Connect this ranking with government resource allocation. Institutions with degree programs ranked higher would receive more resources from the government. 2) Evaluation criteria are slanted toward research (e.g., publication & citation counts) while few

cover teaching and learning which should be another essential function of higher education. 3) The evaluation process lacks transparency (Chen et al., 2016; Yuan & Li, 2016). This kind of assessment, though not akin to the ALA/COA accreditation, still poses a challenge to LIS schools in China. Higher-ranked LIS schools would like to stay at the same rank, while those rated lower strive to achieve a higher status by all means, legitimate or otherwise. It is therefore time for those in charge of ranking LIS schools in China to review the assessment guidelines in order to deal with this issue.

The status of the LIS field is gradually improving, thanks to the adaptations and changes made in LIS education in recent decades. However, the challenge in this domain remains if we intend to obtain the same identity and recognition that many other disciplines enjoy.

Challenges in survival and thriving

The survival and thriving of LIS education depends by and large on a healthy student mass. Table 2A displays the student enrollment numbers of the 10 US LIS schools for fall 2014 and fall 2015 respectively, taken from Table II-1-a-4 of the *ALISE Statistical Report 2015* (Albertson et al., 2015) and Table II-1-a-4 of the *ALISE Statistical Report 2016* (Albertson et al., 2016).

Five of the 10 LIS schools included in Table 2A had a total of 411 fewer students enrolled in fall 2015 than in fall 2014, while the remaining five went in the positive direction by gaining a total of 401 students. It though should be pointed out that Michigan, the school with the largest increase (i.e., 224) in student enrollment among the group, did not submit any of its data to the *ALISE Statistical Report 2015* because it was not an ALISE institution member in 2014 (Albertson, personal communication, 2016). The

Table 2A: Student enrollment totals in 10 US LIS schools

School	Fall 2014	Fall 2015	Difference (#/%)
Catholic	70	57	-13/-18.6
Drexel	211	168	-43/-20.4
Kent State	487	337	-150/-38.8
Long Island	310	126	-184/-59.4
Maryland	167	146	-21/-12.6
Michigan	367 ³	591	+224/61
North Texas	251	358	+107/42.6
San Jose	1029	1041	+12/1.2
South Carolina	53	106	+53/100
Washington	276	281	+5/1.8

number listed in [Table 2A](#) is in fact for fall 2011, taken from the *ALISE Statistical Report 2012* (Wallace, 2012). In other words, the significant increase in student enrollment from fall 2011 to fall 2015 for Michigan could be due to the emergence of online education during that time. Students typically would choose a reputable school like Michigan when geographical location was no longer a restriction in online LIS education. Similarly, San Jose State University in California distinguished itself in its huge student enrollment in contrast to the other nine schools included in this study. Geoffrey Liu, a faculty member at San Jose, attributes the large student enrollment number to the following: “The SJSU online degree program attracts more students because of its outstanding quality. As you are aware, the SJSU iSchool has been a leader in pioneering and re-innovating online LIS education, and we have been really creative in finding ways to make students’ educational experience involving and rewarding, including instructional platform, online instruction strategies, community building, advising, technological support, and more” (personal communication, 2016).

Lower student enrollment numbers have become a challenge to many LIS schools in the United States. Effective marketing, coupled with curriculum updates and enhancement, might help increase student enrollment, and offering financial assistance could attract more students to LIS schools; however, not all of them have such resources.

Student enrollment data for LIS schools in China are not as readily available as they are in the United States. However, specific efforts were made to gather fall 2016 enrollment data of master’s students in the 10 selected LIS schools in China (see [Table 2B](#)). Compared with LIS schools in the United States, those in China usually have smaller student sizes partly because the LIS education systems in the two countries are different. In China, for example, almost all master’s students are full-time. Their length of study in the program is 2½ years or 3 years with a thesis requirement. Furthermore, LIS schools in China admit students only once a year, unlike their American counterparts, which admit students every semester, including the summer. As shown in [Table 2B](#), the professional master’s programs in China in general recruit 165 more students than the research ones, since more LIS professionals are needed than those who intend to do teaching and research in LIS after graduation. One additional difference regarding the enrollment data presented in [Table 2B](#) is that LIS schools in China usually have a larger number of undergraduates as well as Ph.D. students. [Table 2B](#) also does not include master’s students who enroll in the archives and publishing specializations housed within the LIS schools. Unlike the case in the United States, those two specialties in China are separate departments in the LIS school if the school has either or both. In general, student enrollment does not pose such a big challenge to LIS schools in China due to that country’s different education and admissions system.

As far as student enrollment numbers are concerned, size does matter in merger and closure decisions, regardless of how prestigious an

Table 2B: Master's student enrollment totals in 10 LIS schools in China, fall 2016

School	Research master's (#/%)	Professional master's (#/%)	Total
Anhui	35/34.3	67/65.7	102
China Agricultural	16/100	N/A	16
Fuzhou	22/100	N/A	22
NJU	85/46	100/54	185
NJUST	41/47.6	45/52.4	86
Nankai	25/22	89/78	114
Shanghai	45/31	100/69	145
Shanxi	32/42.7	43/57.3	75
Sun Yat-Sen	45/32.6	93/67.4	138
Zhengzhou	78/60	52/40	130
Total	424	589	1013

LIS school might be. Even the top-ranked LIS school at the University of Illinois at Urbana Champaign was considered for merger with three other units (i.e., one college and two schools) on campus in 2010 (Unsworth, 2010), although the “reorganization” ultimately did not take place because of strong protests from the LIS school and other units in the university. Less well-known LIS schools would not be able to defend themselves from a similar merger decision made by the upper administration. Consequently, there were fewer stand-alone LIS schools (e.g., Washington) in 2016 than there were schools that had merged with other sibling units on campus to form a new college (e.g., Drexel) in the United States. Fortunately, many more LIS schools in China can remain autonomous at the school or college level within a university when compared with their counterparts in the United States. Table 1 reconfirms this fact in that only 10 of the 27 member iSchools in that country (i.e., Dominican, Illinois, Maryland, North Carolina at Chapel Hill, Pratt, Syracuse, Texas-Austin, Washington, Wisconsin-Madison, and Wisconsin-Milwaukee) continue to be a separate unit at the college level while all the rest have become a sibling unit in a college. Jank et al. (2013) explored the merger issue of LIS schools in detail, and unfortunately the trend has not changed since then.

The trend of closing LIS schools, on the other hand, seems to have come to an end in recent years in the United States. Nevertheless, no one can be certain if another round of LIS school closures will happen in the future. The number of LIS schools in China steadily increased from two (i.e., Peking University and Wuhan University) in 1977 to 73 in 2016. However, in the same year, five of the 73 LIS schools (i.e., Beijing Institute of Technology,

Tianjin University of Technology, Zhejiang University, Huazhong University of Science and Technology, and Central South University) were ordered to close their master's programs in LIS ([Committee on Degree Granting, Ministry of Education, China, 2016](#)). Termination of degree programs (including the MLIS program) in China is determined at the national level, as opposed to the institutional level in the United States. Such decisions are made based on a variety of reasons that are beyond the scope of this study.

The survival and thriving of LIS education also depend on how well the field can meet the needs of a changing student body and higher expectations of users ([Rosa, 2016](#)). Compared with the not-so-distant past, today's students in LIS schools in the United States are younger, and there are noticeably more men than before. The gender ratio of LIS students in China is somewhat different from that in the United States in that male students have had a real presence among their peers, although there appear to be more female students in the master's program in the past decade. LIS graduates have recently been taking non-traditional jobs such as information analysts and data-science librarians. Likewise, users of library and other information services are no longer satisfied with only checking out books ([Nkanu et al., 2013](#)), obtaining pathfinders or services of similar type. They instead expect more services from LIS professionals, ranging from gaming as a learning platform to 24/7, location-independent services via digital means (e.g., apps and social media). Many users nowadays would never set foot in a physical library to use its services.

What should be done, then, in LIS education in order not only to meet such challenges but also to prepare LIS students for further developments, when the only constant in today's society is change? Specifically, the LIS curriculum needs to be updated to reflect the changes taking place in multiple areas so that LIS graduates are ready to cope with changes while serving users with higher expectations. The next section is therefore devoted to curriculum update and enhancement.

Challenges in curriculum update and enhancement

The curricular issue always stands in the center of any discussion on LIS education. Previous research often reports that the LIS curriculum is not in tandem with the job market (e.g., [Rukwaro & Bii, 2016](#); [Xiao, 2016](#)), and LIS professionals often readily repeat this complaint when they are surveyed about LIS education. For example, 71.2% of MLIS graduates in a 2014 survey believed that the connection is fairly low between what is taught in the classroom and what is needed at work ([Duan, Yin, & Wu, 2015](#)).

A comparative analysis of the courses offered by the 10 US LIS schools chosen for this study is presented below, with an emphasis on the changes that occurred between 2009 and 2016. This time range was chosen because one of the current authors (Chu) gathered course data from the 10 LIS schools in 2009 for another study. It is therefore interesting to observe any changes in their curricula in the past seven years (see [Table 3A](#)).

Table 3A: Course offering changes in 10 US LIS schools, 2009–2016

School	Course offering changes		
	2009	Required 2016	New electives 2016
Catholic	<ul style="list-style-type: none"> (1) Organization of info (2) Info resources & services (3) Info systems in library & info centers (4) Libraries & info in society 	<ul style="list-style-type: none"> (1)–(3) Same (4) The info professionals in society 	<ul style="list-style-type: none"> • Actionable intelligence • Digital content creation and management • Digital curation • Digital humanities • Institute on digital collections in libraries, archives & museums • User interface design & evaluation
Drexel	<ul style="list-style-type: none"> (1) Action research & statistics (2) Social context of info professions (3) Info users and services (4) Info access & resources (5) Foundations of info systems (6) Managing info organizations 	<ul style="list-style-type: none"> (1) Intro to research in info organization (2)–(6) Same 	<ul style="list-style-type: none"> • Information policy • Introduction to digital curation • Managing digital collections & repositories • Museum informatics • Social media resource design for info professionals • Cyber-security <ul style="list-style-type: none"> • Cyber-computer crime law • Cyber-security, law & policy • Introduction to national security enterprise • Principles of cybersecurity • Health informatics <ul style="list-style-type: none"> • Healthcare informatics: Planning & evaluation • Public health informatics

Course offering changes		
School	Required	
	2009	2016
Kent State	<ol style="list-style-type: none"> (1) Access to info (2) Organization of info (3) Info tech for library & info professionals (4) Foundation of LIS (5) Management of library & info centers (6) Cumulating experience 	<ol style="list-style-type: none"> (1) The info landscape (2) Info organization (3) People in the info ecology (4) Info institutions & professions (5) Research & assessment in LIS
		<p style="text-align: center;">New electives 2016</p> <ul style="list-style-type: none"> • Copyright: Understanding user rights & responsibilities • Digital technologies I: Data fundamentals • Digital technologies II: Internet fundamentals • Digital technologies III: Info systems fundamentals • Knowledge organization structures, systems & services • Licensing of info products & services • Website development, design & management • Museum studies <ul style="list-style-type: none"> • Foundations of museum studies • Museum collections • Museum communications • Museum users • Museum systems • Art librarianship • Contemporary artists' books • Copyright law & info policy • Facilitating online learning • Film & media collections • Info seeking behavior • Map collections • Principles & practices of rare book cataloging & descriptive bibliography • Readers' advisory • Data science <ul style="list-style-type: none"> • Big data in practice • Data mining for info professionals • Info discovery in data science • Introduction to database management systems
Long Island	<ol style="list-style-type: none"> (1) Intro to LIS (2) Knowledge organization (3) Info sources & services (4) Intro to research in LIS (5) Internship 	<ol style="list-style-type: none"> (1)–(5) Same (6) Management course

continued

School	Course offering changes		
	Required		
	2009	2016	New electives 2016
Maryland	<ol style="list-style-type: none"> (1) Users and info context (2) Info access services (3) Organization of info (4) Info technology (5) Field study 	<ol style="list-style-type: none"> (1) Users & use context (2) Management of info programs & services (3) Info environments (4) Info tech & organizational context (5) Same 	<ul style="list-style-type: none"> • Achieving organizational excellence • Archival arrangement and description • Creating info infrastructures • Digital preservation • Diverse populations, inclusion, & info • Info & universal usability • Serving info needs
Michigan	<ol style="list-style-type: none"> (1) Info in social systems (2) Contextual inquiry & project management (3) Networked computing (4) Research course (5) Management course (6) Cognate course 	<ol style="list-style-type: none"> (1) Practice engagement (2)–(6) Same 	<ul style="list-style-type: none"> • Content management systems configuration & site building • Content management systems & web frameworks • Data mining: Methods & applications • Fundamentals of human behavior • Introduction to interactive design • Makerspace, maker culture & maker tools • Network (analysis) • Pervasive interaction design • Semantics-based knowledge descriptions & organization • Technology & accessibility • Health informatics • Consumer health informatics • Designing consumer-health technologies • Health informatics program seminar I • Health informatics program seminar II • Managing health informatics • Personal informatics design • Population health informatics

School	Course offering changes		
	Required		
	2009	2016	New electives 2016
North Texas	<ol style="list-style-type: none"> (1) Intro to info professions (2) Intro to info organization (3) Intro to info access and retrieval 	<ol style="list-style-type: none"> (1) Info & knowledge professions (2) Same (3) Info access & knowledge inquiry 	<ul style="list-style-type: none"> • Graphic novels & comics for youth & adults • Info & cyber security • Info architecture • Usability & user experience assessment • Web content development & maintenance
San Jose	<ol style="list-style-type: none"> (1) Online social networking (2) Info & society (3) Info retrieval (4) Info organization & management (5) Research methods in LIS (6) Advanced topics or thesis 	<ol style="list-style-type: none"> (1) Online learning (2) Info communities (3) Info retrieval system design (4) Info professions (5) Same (6) Same 	N/A
South Carolina	<ol style="list-style-type: none"> (1) Intro to LIS (2) Intro to research in LIS (3) Info organization and retrieval 	<ol style="list-style-type: none"> (1) Same (2) Intro to info literacy & technology (3) Using info resources 	<ul style="list-style-type: none"> • Competitive intelligence • Digital info architecture • Info issues in cultural heritage institutions • User-centered info architecture
Washington	<ol style="list-style-type: none"> (1) The life cycle of info (2) Info behavior (3) Info resources, services & collections (4) Organization of info & resources (5) Info in social context (6) Instructional & training strategies for info professionals (7) Research methods (8) Management of info organization 	<ol style="list-style-type: none"> (1) The question of info (2)–(4) Same (5) Info & society (6)–(8) Same (9) Technology course Capstone 	<ul style="list-style-type: none"> • Community engagement strategies in info science • Youth development & info behavior in a digital age

Overall, as [Table 3A](#) shows, there is not much change in the required course offerings of the 10 US LIS schools. Some schools (e.g., Kent State) retitled their core courses to be more in step with the iSchool movement, while Washington alone increased its number of required courses from 8 to 10, which seems large, but some of the courses are worth fewer than three credits each. Moreover, Washington had different requirements for students entering its MLIS program in 2015, 2016, and 2017. With the exception of Washington, though, the tendency has been for there to be fewer required courses.

More changes can be observed in electives, with all the selected LIS schools except San Jose having added no new courses to their curricula. It is possible that San Jose groups all new courses under “Seminars in contemporary issues.” Some schools even introduced a cluster of courses, perhaps for the specializations they have created. For instance, Drexel has a group of courses on cybersecurity, Kent State on museum studies, Long Island on data science, and Michigan on health informatics. All such course clusters are listed after individual new courses in [Table 3A](#) for easy identification.

Because no course information on China’s LIS schools in 2009 is available, [Table 3B](#) presents the courses that have been created in recent years.

[Table 3B](#) shows two distinctive points: (1) the average number of new courses offered by LIS schools in China is 3.3, about half the figure for their US counterparts (7.7); (2) the new courses mostly center around topics such as data mining, e-commerce, informetrics/webmetrics, and readers’ advisory, which is different from the new courses offered in the US LIS schools (e.g., content management, cybersecurity, data science, and health informatics).

It becomes apparent from the above presentation that most LIS schools attempt to create new courses in order to equip and prepare their students with what they need when assuming the role of information professionals. Yet not all of the LIS schools are “on the same page” in the updating of their curricula. The challenge to LIS education in this regard is therefore to encourage and motivate every school to proactively review and enhance its curriculum periodically.

Challenges in course delivery format and content

More and more LIS schools in the United States have been adopting the online mode of education in the past decade, and especially in the most recent few years. Some LIS schools (e.g., San Jose) have even become fully online, without any onsite instruction, with 31 (47.7%) of the 65 ALA-accredited MLIS programs offered 100% online ([Price, 2017](#)). The blended format of LIS education (i.e., part online, part onsite) is also increasingly chosen by many students in order to take advantage of both the online and onsite course-delivery formats. Onsite courses are consequently offered less and less in LIS schools. In addition to the pros and cons of online and blended education explored in previous research ([Aharony, 2011](#); [Buchanan et al., 2001](#); [Smith et al., 2001](#); [Yukawa, 2010](#)),

Table 3B: New course offerings in 10 LIS schools in China

School	New courses
Anhui	<ul style="list-style-type: none"> • Readers' advisory
China Agricultural	<ul style="list-style-type: none"> • Informetrics
Fuzhou	<ul style="list-style-type: none"> • Interactive info technologies and services • Organizational behavior
NJU	<ul style="list-style-type: none"> • Cloud computing applications • Data mining • Information security • Informetrics • Internet business models • Natural language processing and text mining • New media • Webometrics
NJUST	<ul style="list-style-type: none"> • Database and data mining • E-commerce systems • Text information processing
Nankai	<ul style="list-style-type: none"> • Human computer interaction • Information behaviors • Information ethics • Institutional repositories • Readers' advisory • Social informatics • Web mining
Shanghai	<ul style="list-style-type: none"> • N/A
Shanxi	<ul style="list-style-type: none"> • Informetrics • Information ecology • Web mining
Sun Yat-Sen	<ul style="list-style-type: none"> • Data mining and applications • Ethics of information professional • Information management in e-commerce and e-government • Network security technologies • Readers' advisory
Zhengzhou	<ul style="list-style-type: none"> • Data mining • Research progress in informetrics • Social information resource optimization

the emerging form of course delivery also poses the following challenges to LIS education in general.

First, education with no or little onsite interaction is not the most efficient means for either the student or the instructor. Learning management systems such as Blackboard are often the platform for online or blended education, with text-based communication via email, discussion boards, and similar built-in tools completely replacing the synchronous teaching and learning in a physical classroom. Some instructors may choose to use audio or video to deliver lectures, but they are very likely in the asynchronous mode. Furthermore, it does take longer time to go over an audio or video

lecture than reading a text-based lecture. Some students may choose to skip the audio/video lecture completely in online classes, according to the viewing statistics that the learning management system keeps.

Second, course preparation time typically at least doubles for the instructor in online LIS education. Even so, instructors cannot be certain if students are able to understand what is taught via online lectures. Students likewise cannot ask questions in real time if they have any, as they would do in the onsite learning environment. The end result is that both teaching and learning are negatively affected in online education. Moreover, Chawner (2015) reports that online students have no opportunity to socialize with peers or to attend colloquia or similar functions on campus, which makes students' learning experience less fulfilling and satisfactory.

Third, larger and more reputable LIS schools are able to attract more students who can enroll in any LIS program of their choice because geographical proximity is no longer an issue in online education. In comparison, smaller institutions would have a harder time recruiting students who would otherwise be in their target pool.

By contrast, the only form of online LIS education in China is MOOC (Massive Open Online Courses), pioneered by a few institutions with the aim to educate the general public rather than students already in LIS schools. LIS education in China remains 100% onsite.

As for course content, the challenge to LIS education in China and the United States has been how to strike a reasonable balance between theory and practice (e.g., Pradhan, 2014; Rukwaro & Bii, 2016; Xiao, 2016). The MLIS degree in the United States focuses more on LIS practices than on theories, although knowing the theory or principle behind a given practice enables students to better learn what is taught. The professional master's program in China, on the other hand, is established specifically to fill the void left in LIS education by the research master's program, which has a theoretical orientation to a large extent.

Meeting the challenges in course delivery format and content naturally cannot be done in a short period of time. LIS educators instead should work together to seek feasible and pertinent measures. For instance, blended education proves to work better than the pure online format, according to research (e.g., Yukawa, 2010) and the present authors' own experiences. Hiring LIS professionals as adjuncts to teach certain practice-based courses (e.g., collection development) would help keep a reasonable balance between theory and practice in course contents.

Suggested measures for addressing the challenges in LIS education

Throughout the discussion on challenges in LIS education, we suggest, where possible, measures for addressing them. Table 4 summarizes such suggestions, with the understanding that some issues (e.g., merging or closing LIS schools) are often beyond the purview of LIS schools

Table 4: Summary of measures suggested for meeting the challenges

Challenge	Measure(s)	Note
Identity	Stop frequent name changing	
Accreditation	Revisit the accreditation standards and procedures in the United States, and review the assessment guidelines in China	It is actually beyond the authors' purview to suggest measures in this regard.
Student enrollment	Effective marketing and financial support Curriculum update	
Merger with other units on campus		Little can be done, as the university administration typically makes the merger decision while the LIS school is at the receiving end.
Curriculum update & enhancement	Update the curriculum to reflect changes occurring in society Create new course clusters for emerging topics such as cybersecurity and data science Encourage and motivate LIS schools to proactively review and enhance their curricula periodically	
Online vs. onsite education	Blended education	
Theory vs. practice in course contents	Invite LIS professionals to teach some courses in the curriculum	

themselves. Even so, we still should point out such challenges and air our concerns in the hope of calling related decision makers' attention to them.

As shown in [Table 4](#), seven individual challenges are derived from the four types of challenges identified and discussed in this report, with corresponding measures for coping with each challenge outlined as well. In addition, the suggested measures for addressing the challenges in LIS education should be regarded as a starting point for all the concerned parties to search for more feasible ways of achieving the same purpose, as well as to be proactively in charge of the development and improvement of education in library and information science.

Conclusions

Four kinds of challenges in LIS education are identified and discussed in this study by quantitatively and qualitatively analyzing the data collected from both China and the United States: 1) identity and accreditation, 2) survival and thriving, 3) curriculum update and enhancement, and

4) course delivery format and content. These identified challenges should serve as catalysts for LIS educators and professionals in both countries to seek or develop measures for addressing the challenges in order to advance education in the field of library and information science.

The present study makes some suggestions, where applicable, regarding how to meet the challenges that have been explored in this and other research over the years. In addition to seeking further understanding and support from the university administration, all constituencies (i.e., educators, practitioners, and students) in LIS education should work more, and more collaboratively, to cope with the challenges, already identified or yet to be identified, in both China and the United States.

Chunxiang Xue is an associate professor in the School of Economics & Management at Nanjing University of Science & Technology, China. Her teaching and research interests include knowledge organization with focuses on knowledge organization systems, text classification, and social media mining. She now leads a project funded by the National Natural Science Foundation of China on short text processing and mining.

Xiuzhi Wu is a graduate student of library and information science at Nanjing University of Science & Technology. Her current research focuses on user information behavior and online learning.

Lei Zhu is a graduate student of library and information science at Nanjing University of Science & Technology, China. Her current research interests are user interactive behavior and text mining on social media.

Heting Chu is a professor in the Palmer School of Library & Information Science at Long Island University, New York state. Her teaching and research interests include the use of information technology in library and information science, especially in the areas of information representation and retrieval, LIS education, research methods, and scientific communication.

Acknowledgments

This research is funded by the National Natural Science Foundation of China (Grant No. 71503126) and the Social Science Foundation of Jiangsu Province (Grant No. 14TQB10). The authors wish to thank the following colleagues for their timely responses to our inquiries during our data collection: Dr. Dan Albertson from the University of Alabama, Dr. Geoffrey Liu from San Jose State University, Dr. Lei Pei from Nanjing University, and Dr. Yin Zhang from Kent State University. We are also grateful to our colleagues in the 10 selected LIS schools in China for providing their master's student enrollment data.

References

- Aharony, N. (2011). Library and information science students' feedback in an on-line course. *Journal of Education for Library and Information Science*, 52(4), 305–319.
- Albertson, D., Culbert, C., Snow, K., Spetka, K., & Hollenkamp, J. (Comps.). (2015). *ALISE Statistical Report 2015*. Seattle, WA: Association for Library and Information Science Education.
- Albertson, D., Spetka, K., & Hill, S. (Comps.). (2016). *ALISE Statistical Report 2016*. Seattle, WA: Association for Library and Information Science Education.

- American Library Association, Committee on Accreditation. (2015). *Standards for Accreditation of Master's Programs in Library and Information Studies*. Retrieved from http://www.ala.org/educationcareers/sites/ala.org.educationcareers/files/content/standards/Standards_2015_adopted_02-02-15.pdf
- ASIS&T. (2007). Accreditation of programs for the education of information professionals. Silver Spring, MD: American Society for Information Science and Technology. Retrieved from http://www.asis.org/white_paper.html
- Buchanan, E., Xie, H., Brown, M., & Wolfram, D. (2001). A systematic study of web-based and traditional instruction in an MLIS program: Success factors and implications for curriculum design. *Journal of Education for Library and Information Science*, 42(4), 274–288. <https://doi.org/10.2307/40323996>
- Chawner, B. (2015). Library and information studies education in New Zealand and Australia: Background, issues, and challenges. *Journal of Education for Library and Information Science*, 56, Supplement 1, S17–S26.
- Chen, C., Chen, Y., Si, L., Zan, C., & Feng, C. (2017). Forty years of development and innovation: Postgraduate education of library and information science in China. *Journal of Library in China*, 43(227), 17–28. <https://doi.org/10.13530/j.cnki.jlis.170002>
- Chen, X., Ye, Z., Wang, Y., Xiong, Q., Gong, F., Hu, J., et al. (2016). Chinese style evaluation of disciplines: Problems and possible measures. *Exploration and Contention*, 9, 59–74.
- China Degree and Graduate Education Information Network. (2017). About discipline evaluation. Retrieved from <http://www.cdgdc.edu.cn/xwyjsjyxx/xxsbdxz/276985.shtml>
- China Higher Education Information and Career Center. (2016). Catalog for institutions offering the professional MLIS degree. Retrieved from <http://yz.chsi.com.cn/zsml/queryAction.do>
- Chu, H. (2010). Library and information science education in the digital age. In A. Wordsworth (Ed.), *Advances in Librarianship* (vol. 32, pp. 77–111). Bingley, England: Emerald Group.
- Chu, H. (2012). iSchools vs. non-iSchools in the USA: An examination of their master's programs. *Education for Information*, 29(1), 1–17. <https://doi.org/10.3233/efi-2010-0908>
- Committee on Degree Granting, Ministry of Education, China. (2016). Announcement on the closing of degree programs. Retrieved from http://www.moe.gov.cn/s78/A22/xwb_left_zcywlm_xwgl/moe_818/201610/t20161019_285495.html
- Cronin, B. (2000). Accreditation: Retool it or kill it. *Library Journal*, 125(11), 54.
- Deng, S., & Ling, F. (2014). LIS education reform in the Big Data era based on information analytics. *Journal of Information Resource Management*, 3, 88–94. <https://doi.org/10.13365/j.jirm.2014.03.088>
- Duan, Y., & Wang, C. (2016). Survey report on the development of the MLIS program in China 2015. *Document, Information, Knowledge*, 3, 116–128. <https://doi.org/10.13366/j.dik.2016.03.116>
- Duan, Y., Yin, G., & Wu, C. (2015). Survey report on MLIS graduates' satisfaction with their education. *Document, Information, Knowledge*, 1, 24–32. <https://doi.org/10.13366/j.dik.2015.01.024>
- Ge, J., & Sun, Z. (2014). Innovative practices in establishing master's programs in university libraries: Review and reflections on the 10th anniversary of the creation of the master's program in information at the Shandong University of Science & Technology. *Library & Information Services*, 58(13), 45–50. <https://doi.org/10.13266/j.issn.0252-3116.2014.13.007>
- Hartley, R. J., & Virkus, S. (2003). Approaches to quality assurance and accreditation of LIS programmes: Experiences from Estonia and United Kingdom. *Education for Information*, 21, 31–48.
- iSchools Consortium. (2017). Directory. Retrieved from <http://ischools.org/members/directory/>
- Jank, J., Chu, H., & Koenig, M. (2013). Mergers, collaborations, alliances, and partnerships in LIS Education. In A. Wordsworth & W. D. Penniman (Eds.), *Advances in Librarianship* (vol. 36, pp. 185–222). Bingley, England: Emerald Group.

- Jiang, Y., & Zheng, X. (2013). Exploration of the coordination mechanism between research degree and professional degree in library and information science. *Library Development*, 12, 1–4. <https://doi.org/10.3969/j.issn.1004-325X.2013.12.001>
- Kaur, T. (2015). Challenges and concerns for library and information science (LIS) education in India and South Asia. *Journal of Education for Library and Information Science, Supplement 1*, 56, 6–16.
- Li, Y., Yan, H., & Ke, P. (2011). Shaping MLIS as MBA: Reflections on MLIS education in China. *Library & Information Service*, 55(13), 24–27, 120.
- Lopatovska, I., & Ransom, E. (2016). The state of L-Schools: Intellectual diversity and faculty composition. *Journal of Librarianship and Information Science*, 48(1), 18–35. <https://doi.org/10.1177/0961000614533718>
- Mulvaney, P., & O'Connor, D. (2014). Rethinking how we rate and rank MLIS programs. *Library Journal*, 139(11), 37–38, 40.
- Nkanu, W. O., Iyishu, V. A., & Ogar, F. O. (2013). Education and training for library and information science professionals in Nigeria: Their role, opportunities and challenges in the information age. *Knowledge Review*, 28(2), 1–10.
- Partridge, H. L., Hanisch, J., Hughes, H. E., Henninger, M., Carroll, M., Combes, B., . . . & Yates, C. (2011). *Re-conceptualising and re-positioning Australian library and information science education for the 21st century: Final report 2011*. Sydney, Australia: Australian Learning & Teaching Council.
- Pei, L. (2016). *Comparison of LIS education in multiple countries based on an analysis of their curricula* (Unpublished manuscript in Chinese).
- Pradhan, S. (2014). Library and information science education in India: Perspectives and challenges. *International Research: Journal of Library & Information Science*, 4(1), 151–169.
- Price, K. (Ed.). (2017). ALA accreditation at a glance. *PRISM: The Office for Accreditation Newsletter*, 25(1). Retrieved from http://www.ala.org/offices/accreditation/prp/prism/prism_current
- Rosa, K. S. (Ed.). (2016). The state of the America's libraries: A report from the American Library Association. *American Libraries*, Special Issue, 1–31. Retrieved from <http://www.ala.org/news/state-americas-libraries-report-2016>
- Rukwaro, M. W., & Bii, H. (2016). Library and information science (LIS) education and training in Kenya: Emergence, evolution, challenges and opportunities. *International Journal of Library and Information Science*, 8(2), 11–18.
- Smith, L., Lastra, S., & Robins, J. (2001). Teaching online: Changing models of teaching and learning in LEEP. *Journal of Education for Library and Information Science*, 42(2), 348–363.
- Sun, H., & Zuo, W. (2013). Comparison of the research and course offerings of information science programs in university libraries and colleges/departments. *Journal of Library and Information Science in Agriculture*, 25(10), 118–122. <https://doi.org/10.13998/j.cnki.issn1002-1248.2013.10.004>
- Unsworth, J. (2010). Draft responses to questions from the letter to the project team of academic unit reviews by Dean of Graduate School of Library & Information Science, University of Illinois at Urbana-Champaign. Retrieved from <http://webdocs.lis.illinois.edu/comm/gslis.se.response.pdf>
- U.S. News & World Report. (2018). Best library and information science programs. Retrieved from <https://www.usnews.com/best-graduate-schools/top-library-information-science-programs/library-information-science-rankings?int=a31a09>
- Wallace, D. P. (Ed.). (2012). *ALISE Statistical Report 2012*. Chicago, IL: Association for Library and Information Science Education.
- Wozniczka-Paruzel, B. (2003). Experiences of library and information science (LIS) studies accreditation in the context of quality assurance systems in Poland. *Education for Information*, 21(1), 49–57. <https://doi.org/10.3233/efi-2003-21106>
- Xiao, X. (2016). Thoughts on some issues in MLIS education. *Documentation, Information & Knowledge*, 1, 30–34. <https://doi.org/10.13366/j.dik.2016.01.030>
- Yang, J. (2004). Reflections on the expansion and development of graduate education. *China Higher Education Research*, 5, 40–43. <https://doi.org/10.3969/j.issn.1004-3667.2004.05.014>

- Yu, X., & Qu, S. (2015). Analysis of the master's education of information science in China. *Information Research*, 215, 68–74. <https://doi.org/10.3969/j.issn.1005-8095.2015.09.017>
- Yuan, B., & Li, F. (2016). An investigation and analysis of discipline evaluation in China. *Journal of Higher Education*, 37(3), 28–33.
- Yukawa, J. (2010). Communities of practice for blended learning: Toward an integrated model for LIS education. *Journal of Education for Library and Information Science*, 51(2), 54–75.

Endnotes

1. For the sake of brevity, LIS departments and schools are all referred to as LIS schools.
2. This site is available daily from 7 pm to 5 am EST but is down at other times for maintenance.
3. This enrollment number is obtained from the *ALISE Statistical Report 2012* (Wallace, 2012). According to Albertson (2016), the *ALISE Statistical Report 2015* does not contain any entry for Michigan because it was not an institutional member of ALISE in that year.