Core and More: Examining Foundational and Specialized Content in Library and Information Science

Laura Saunders, *Simmons College*
laura.saunders@simmons.edu

A master's degree from an ALA-accredited institution can prepare graduates for a wide range of job functions and career paths, but the variety of jobs raises some questions about how LIS programs are meeting the wide range and evolving needs of employers in order to best prepare students for professional positions. What knowledge, skills, and aptitudes (KSAs) are necessary for practitioners? What are common competencies and foundational areas of knowledge that apply across information settings and job functions, and which skills and competencies are specialized enough to be relevant only to certain positions? This study reports on the results of a nationwide survey of over 2,000 practicing information professionals and LIS faculty who were asked to rate 53 skills and competencies as core or specialized. The findings identified 11 core KSAs but also suggest that areas of emphasis vary by type of information setting. The findings have implications for LIS programs and faculty.

Keywords: competencies, curriculum, information settings, LIS education, skills

A master's degree from an ALA-accredited institution can prepare graduates for a wide range of job functions and career paths. While the majority of graduates from ALA-accredited master's programs (63%) go on to work in traditional settings such as public and academic libraries, opportunities outside of these more traditional paths are increasing rapidly (Allard, 2017). According to *Library Journal*'s annual salary survey, placements in private industry increased 37% last year, while placements in non-profits grew by 11% (Allard, 2017). Even within traditional institutions, information professionals are taking on new and emerging roles, including in areas such as digital curation and collections, data management, geographic information systems (GIS), and usability and user experience roles (Allard, 2017; Institute of Museum and Library Services, 2018). Each job and setting entails specialized knowledge and skills related to its specific functions and focus.

The range of career paths for library and information science (LIS) graduates speaks to the relevance of the skills and competencies associated with the degree and suggests that LIS programs are responding to rapid

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KEY POINTS

- Master's programs must keep pace with the knowledge, skills, and abilities necessary for emerging professionals to succeed in the ever-changing world of information jobs.
- Results from a nationwide survey suggest that eleven knowledge areas and abilities including selecting and evaluating sources, searching, interpersonal skills, and writing are core for all MSLIS students to learn, regardless of their ultimate career path.
- MSLIS program faculty must determine how to embed instruction of these skills and knowledge areas into their curricula

technological, policy, and societal changes within their curricula. However, the variety of jobs also raises some questions about how these programs can respond to rapid changes and meet the wide range and evolving needs of employers in order to best prepare students for professional positions. What knowledge, skills, and aptitudes (KSAs) are necessary for practitioners? What are common competencies and foundational areas of knowledge that apply across information settings and job functions, and which skills and competencies are specialized enough to be relevant only to certain positions? Which skills and competencies do current practitioners and LIS faculty believe are core to the field? This article attempts to answer these questions through a nationwide survey of information professionals across different settings and job functions and LIS faculty in a variety of iSchools. In an era of increased accountability, when students and other stakeholders such as employers and accreditation organizations are looking for institutions of higher education to demonstrate their value through student outcomes, including employment upon graduation, it is crucial for these institutions to ensure that they are adequately preparing students for work and meeting the demands of the profession. The results of this study will be of interest to LIS faculty and administrators in charge of developing courses and curricula, as well as practitioners interested in current trends in the field.

Literature review

Similar to many other professional associations, the American Library Association (ALA) publishes the *Core Competences of Librarianship* (ALA, 2009). This fairly extensive list groups knowledge and skills into eight areas: foundations of the profession, information resources, organization of recorded knowledge and information, technological knowledge and skills, reference and user services, research continuing education and lifelong learning, and administration and management. Within these categories, ALA identifies specific KSAs, including knowledge of professional ethics, effective communication techniques, knowledge of organizational and classification systems and principles, information literacy, and the

fundamentals of qualitative and quantitative research methods. As one of the main professional organizations in the field, ALA also accredits LIS master's programs, and its *Standards for Accreditation* (ALA, 2015) provide additional guidance on student learning outcomes and core competencies. In Standard II: Curriculum, ALA indicates that the LIS "curriculum is concerned with information resources and the services and technologies to facilitate their management and use" and "encompasses information and knowledge creation, communication, identification, selection, acquisition, organization and description, storage and retrieval, preservation and curation, analysis, interpretation, evaluation, synthesis, dissemination, use and users, and management of human and information resources" (ALA, 2015, p. 5).

While ALA's *Competences* and *Standards* are meant to apply broadly across the information professions, other professional associations and various ALA divisions and branches publish competency statements that elaborate on the skills and qualities specific to specialized areas of the information professions, or to specific information settings. For example, the Society of American Archivists (SAA, 2016) publishes guidelines for archival education, which set out core and complementary areas of knowledge for practicing archivists. The American Association of School Librarians (AASL, 2010) emphasizes standards related to teaching and learning, while the Special Libraries Association (SLA, 2016) includes attention to data retrieval and analysis and the Medical Library Association (MLA, 2007) states the need for medical librarians to understand health sciences and health-care environment policies, issues, and trends. Similarly, the Reference and User Services Association publishes a set of *Professional Competencies for Reference and User Services Librarians* (RUSA, 2017), as well as a set of *Guidelines for Behavioral Performance of Reference and Information Service Providers* (RUSA, 2013), which offer an overview of both knowledge areas and personal attributes and behaviors expected of practitioners in reference positions. The Young Adult Library Services Association provides competencies for teen services librarians (YALSA, 2017), and the Association of College & Research Libraries publishes standards for assessment librarians (ACRL, 2017a) and teaching librarians (ACRL, 2017b). The proliferation of standards suggests that while there might be core competencies and foundational knowledge that cut across the information professions, there are also specialized skills and knowledge specific to different information settings and different job functions.

In addition to the various lists of professional competencies, there is substantial attention to skills and competencies in the LIS literature, as well as discussions of how well LIS curricula are preparing students to meet the current demands of the field. Researchers use a variety of methods to gather data on these topics, ranging from surveys and focus groups to content analysis of job ads and LIS courses and curricula. As with the lists of competencies from the professional associations, there

are studies that look at competencies broadly across the profession, and others that focus on specific job titles or functions. For example, Kloppenberg and Lodge (2010) used a survey and Koh and Abbas (2015) interviewed practitioners to build a profile of skills and qualifications for librarians staffing learning commons and makerspaces. Both studies emphasize the importance of understanding issues related to diversity and inclusion and being able to work with diverse communities, and both highlighted the importance of technology literacy skills, including skills related to Web 2.0 applications, and the ability to work collaboratively. Other important areas included communication skills, dealing with difficult customers, service-desk training, and the ability to lead and manage change (Kloppenberg & Lodge), as well as program development, grant writing, and the ability to engage in instruction (Koh & Abbas). In a US nationwide survey of public and academic reference librarians, Saunders and Jordan (2013) found that customer service, search skills, verbal communication, comfort with teaching, comfort with the reference interview, and technology troubleshooting were among the most highly valued skills.

Bishop, Cadle, and Grubesic (2015) surveyed professionals and identified a list of core competencies for GIS librarians, which included cartography, collection development, and reference and instruction. Similarly, Hartnett (2014) developed a list of core qualifications and areas of responsibility for electronic resources librarians based on a review of job ads, finding that electronic resources management, reference and instruction, collection development, and communication were among the top mentioned skills and qualifications. Several studies have noted an increase in instruction responsibilities across information settings, with a concurrent need for competencies related to teaching, pedagogy, and instructional design, as well as assessment of learning (Botts & Emmons, 2002; Detmering & Sproles, 2012; Hall, 2013; Turner, 2016; Wang, Tang, & Knight, 2010).

Other studies have focused on a specific knowledge or skill area. Applegate (2016), Passoneau and Erickson (2014), and Dole (2013) stress the need for information professionals to be able to engage in assessment and evaluation. Passoneau and Erickson found that, in addition to knowledge of assessment techniques, job ads specified familiarity with specific assessment and analysis software such as SPSS, STAT, and Excel. Other important KSAs include copyright literacy (Charbonneau & Priehs, 2014; Kawooya, Veverka, & Lipinski, 2015; Schmidt & English, 2015); technology skills ranging from office productivity tools to databases and integrated systems, Web 2.0 applications, web design, digital curation, and programming skills (Coghill & Russell, 2017; Henry, 2017; Maceli & Burke, 2016; Raju, 2017; Riley-Huff & Rholes, 2011; Thomson, 2008); management and leadership abilities (Goulding, Walton, & Stephens, 2012; Harris-Keith, 2016; Hicks & Given, 2013); and cultural competencies, including the ability to work with diverse communities (Adkins, Verdin, & Yier, 2015; Jaeger, Bertot, & Subramaniam, 2013; Jaeger, Cooke, Feltis, Hamiel, Jardine, & Shilton, 2015).

Finally, some studies have tried to establish a common or core set of competencies by looking across positions and settings and beyond a single knowledge area or skill set. While these studies identify a range of relevant KSAs, it is notable that behavioral and interpersonal traits are consistently listed as among the most important. Gerolimos, Malliardi, and Iakovidis (2015) noted that interpersonal and computer skills are the most frequently listed in job ads, with an emphasis on interpersonal skills including emotional intelligence. Several studies reported on focus groups with practicing information professionals (Partridge, Lee, and Munro, 2010; Partridge, Menzies, Lee, and Munro, 2010; Saunders, 2015). Participants in these studies identified hard skills and content knowledge such as technology, project management, outreach and community engagement, lifelong learning, and the ability to engage in research and evidence-based practice. In each study, however, personal attributes, or what might be called "soft skills," stood out as most important, with participants emphasizing communication skills, interpersonal skills, flexibility and adaptability, and customer-service skills. In fact, these soft skills were so prevalent that Partridge, Menzies et al. concluded that "personality traits, not just qualifications, were critical to be a successful librarian or contemporary information worker" (p. 271).

However, it is also worth noting that some of these studies identified differences across positions and settings. Gerolimos et al. (2015) clustered skills by position and found some differences across these positions. For instance, public-services positions listed flexibility and public relations most often as qualifications, and instruction and presentations as among the most common duties. Technical services positions tended to emphasize independence and problem solving and listed duties related to databases and ICT technologies. Saunders (2015) found differences in technology expectations among public, academic, and corporate librarians and found that public and academic librarians put a heavier emphasis on professional ethics related to patron privacy and confidentiality. In addition, while all participants agreed that communication and interpersonal skills were important, public librarians were particularly interested in people's ability to work with difficult patrons.

A number of the studies that examined skills and competencies considered implications for LIS education. Gerolimos (2009) examined LIS curricula to determine what skills are being taught and suggested that LIS programs should emphasize technology, interpersonal skills, and global and cooperative education. Applegate (2016) sees a need for more attention to research and assessment abilities, while Turner (2016) contends that virtually all information professionals are engaged in instruction and therefore need to learn how to identify user needs, design and develop educational materials, and assess learning. Each of these studies acknowledges that the competencies and skills needed in the field and expected by employers must be addressed either in core or specialized LIS courses.

Taken as a whole, these studies suggest a wide, almost overwhelming number of skills, qualities, and knowledge areas necessary to the information

professions. However, it is not clear which KSAs are common across positions and settings and which are relevant only to specialized positions and settings. As the field of library and information science continues to grow and evolve, it is necessary for LIS programs to determine which skills and areas of knowledge should be taught in core courses and across the curriculum so that all graduating students have attained them, and which areas can be focused on in courses within tracks or areas of specialization. This study attempts to fill a gap in the literature by identifying these core and specialized skills.

Procedure

This study was undertaken in part to support a curriculum review at an ALA-accredited Master's of Library and Information Science program. Faculty and administrators in this program were reviewing and redesigning the core curriculum, as well as operationalizing and defining the various tracks and concentrations through which students could gain depth in an area of specialization. The faculty were especially keen to be sure that the curriculum was reflecting the current trends in the field and was preparing students to meet the needs of their future employers. The ALA (2015) *Standards for Accreditation* acknowledges employers as key stakeholders in areas like curriculum development and encourages programs to gather feedback and input from them to inform decisions. In keeping with the ALA *Standards*, the faculty decided to conduct a survey to gather feedback from current practitioners who are actual and potential employers of program graduates, as well as LIS faculty, on which knowledge, skills, and aptitudes are core across the field and which are specialized. Specifically, this study aimed to answer the following questions:

- Which knowledge, skills, and aptitudes are core to the field of LIS? Which KSAs should all graduates of ALA-accredited programs have firm grounding in, regardless of their anticipated career path or area of specialization?
- Which KSAs are relevant only to practitioners in specialized settings or positions?
- Do practitioners identify different skills as core or specialized depending on their current job function or information setting?

Because the purpose of the study was to identify common KSAs across various information settings and job functions, it was necessary to have a large sample. A survey was the most appropriate data-collection method for this study because it had the potential to be distributed widely and gather a greater number and variety of responses than other methods like focus groups or interviews. The larger sample made possible by a survey allowed for greater representation from the field and thus gave a better baseline of where consensus on KSAs lies and enabled generalization to the wider field. A smaller sample might have reflected only the concerns and priorities of the particular settings or position types represented.

The survey consisted of a list of 53 skills, aptitudes, and knowledge areas broken down into five categories: general, communication, user services, management, and technology (see Appendix A for the full survey). The list of skills was compiled from LIS literature, professional competency statements, and job postings. The purpose of the survey was to discover not just which skills and knowledge areas are considered important but also which are core to the field, meaning that every graduate of an ALA-accredited program should have some grounding in the area. Respondents were therefore asked to rate each of the KSAs on the following scale: **Core** (all MSLIS graduates should have a strong foundation regardless of area of concentration/career path); **Very Important** (most professionals will need to know/be able to do this); **Important** (many professionals will need to be familiar with this skill/content); **Specialized** (only professionals in specialized positions are likely to need this skill/knowledge); and **Not Important**. The survey concluded with demographic questions and an open-ended question asking respondents if there were any skills omitted from the original list that should have been included.

The survey was developed by the researcher and refined by the program's assessment committee. The survey was piloted with the program faculty, and after final revisions were made, the survey was officially distributed in March 2017. The initial distribution of the survey by Simmons University was sent to the total available list of the program's alumni, which numbered over 4,000 people, as well as all internship and practicum supervisors, and all adjunct faculty. A link to the survey was also sent to several area listservs, including local chapters of ASIS&T, SAA, and SLA, the state library network, and a listserv of state public library directors. When the researcher and the dean of the school shared the executive summary from this study with colleagues, several other iSchools expressed interest in replicating the survey. Between April and November 2017, three additional schools administered the survey to their respective populations. Each school chose their own distribution method and population for the study. Some directly emailed alumni and faculty, some provided a link in an alumni newsletter, and others sent the link through listservs. This study presents the total results of all four distributions of the survey.

Limitations

It is important to note that despite the large number of survey respondents, this study has a number of limitations. To begin with, surveys always run the risk of responder bias. It is possible that people who chose to respond to the survey share characteristics that differ from those who chose not to answer the survey, and that those differences might affect the survey outcomes. In particular, although Simmons University did reach out to area employers, including internship and fieldwork supervisors who might not be alums of the program, the majority of respondents to this survey are primarily alumni and faculty of four iSchools in the United

States. As such, these respondents' answers might reflect some of the more traditional approaches to LIS and might not be reflective of the wider field. Furthermore, the survey does not include the growing population of non-MLS degree holders now working in the field. Therefore, care must be taken in generalizing the results of this survey too broadly.

Findings

In total, there were 2,412 responses to the survey. Each participating school distributed the survey in its own way. Some sent a direct link to alumni, while some posted to newsletters or listservs. Some schools reached out to internship supervisors and others did not. Thus, it is not possible to calculate a response rate to the survey, or to claim a random sample. However, given the size of the respondent pool and the fact that respondents came from a wide range of professional backgrounds, including different information settings and different positions, it is reasonable to suggest that the survey sample is broadly representative of the field.

General overview

The vast majority of the respondents (91%) held an MSLIS degree. There was a relatively even spread in types of positions, with 27% identifying as a staff librarian; 19% as department managers; 18% as a dean, director, or head of the institution; and 4% as archivists. Three percent of respondents identified as LIS faculty, and 2% as adjuncts. An additional 24% of respondents selected "other," and those positions ranged from faculty and teacher librarians to retirees, to people working outside of the field. In terms of information setting, the majority of the respondents were from academic libraries (34%), followed by public libraries (28%) and school libraries (9%). Additional settings included special libraries (5%), corporate libraries (3%), academic archives (1%), government archives (1%), museums (1%), and technology provider or vendor (1%), as well as an "other" category. Broadly speaking, this breakdown by information setting seems to reflect overall employment levels in the field. Successive *Library Journal* salary surveys (Allard, 2016, 2017) show about half or more of LIS school graduates each year are employed by academic and public libraries, while archives jobs represent between 3 and 5% of placements. On the other hand, school library jobs represent around 15% of placements while they have only a 9% response rate here. As a result, it must be considered that settings and areas of the field might be under- or over-represented.

The bulk of the survey asked respondents to rank 53 skills in five categories as core, very important, important, specialized, or not important. In the general skills and content category, four areas were ranked as core by at least 50% of respondents: knowledge of professional ethics (81%), evaluating and selecting information sources (77%), cultural competence (ability to work effectively in cross-cultural situations/with people of various cultural backgrounds) (65%), and reflective practice grounded

in diversity and inclusion (52%). An additional four skills were ranked as core by at least one-third of respondents: describing information sources (45%), knowledge of user information behaviors (43%), legal issues (copyright, etc.) (41%), and information literacy standards (39%).

Six skills were ranked as core by at least one-quarter of respondents: evaluation research (collecting and analyzing data for purposes of improvement) (31%), grounding in history of library and information practices and professions (31%), reporting basic descriptive statistics (31%), basic data-collection methods (surveys, focus groups, etc.) (30%), grounding in social justice (30%), and knowledge management (25%). Only two areas were identified as specialized by at least half of respondents: management of archival records and manuscripts (67%) and preservation of non-digital resources (53%). Preservation of digital sources was identified as specialized by 44%. Several other skills were not ranked as core but were identified as either important or very important, meaning that most people in the field would still need to know something about these areas. Examples included metadata creation and metadata management, which were ranked as core by only 10% of respondents but were ranked as important or very important by over 50% each. No skill was ranked as not important by more than 10% of respondents. Figure 1 shows the ranking for all skills in the general content and skills section.

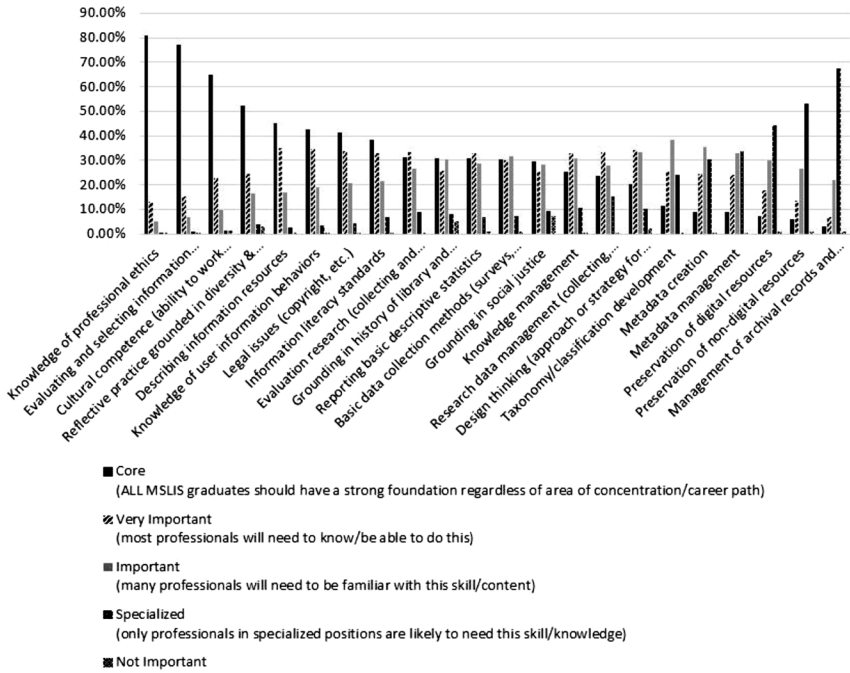

Figure 1: Ranking of general content and skills.

Three of the seven communication skills were considered core by more than half of the respondents: interpersonal communication (87%), writing (79%), and customer-service skills (72%). These were followed by advocacy (representing organizational interests to stakeholders) (43%), making effective visual presentations (33%), public speaking (32%), and marketing and outreach (29%). None of the communication skills were ranked as either specialized or not important by more than a few respondents, meaning that while some of these skills might not be considered core, or necessary for all students, they are considered relevant and necessary to a majority of practitioners in the field. Figure 2 shows the ranking for communication skills.

Three user-services skills were ranked as core by at least half of respondents. These included search skills (ability to search databases, internet resources, and catalogs efficiently and effectively) (79%), interacting with diverse communities (62%), and the reference interview/question negotiation (50%). Community or user needs assessment and instruction/teaching (face to face and online) were ranked as core by only 36% and 30% of respondents, respectively. However, while not ranked as core, these skills were not considered either specialized or not important. Instead, most people ranked them as important or very important, suggesting that the majority of practitioners should be familiar with or have some grounding in these areas. Conversely, reader's advisory was ranked as specialized by 25% of respondents, and as core by only 17%. Figure 3 shows the ranking for user services skills.

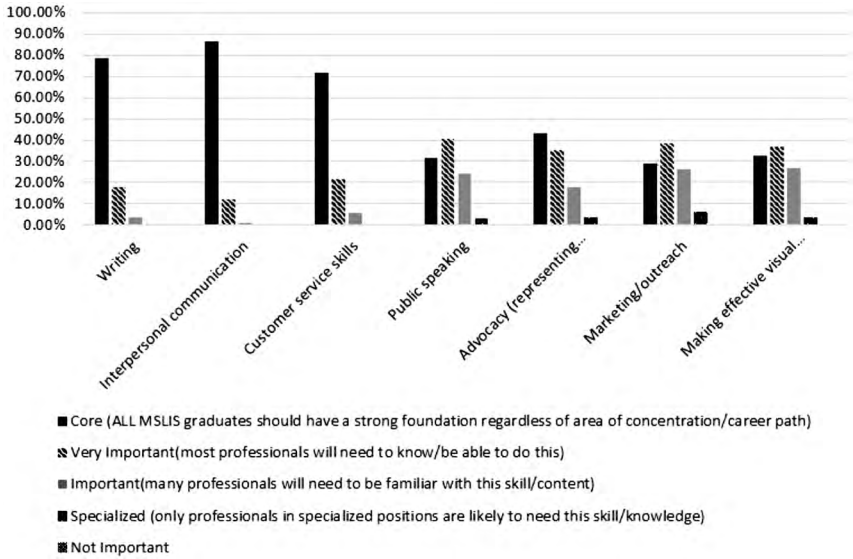

Figure 2: Ranking of communication skills.

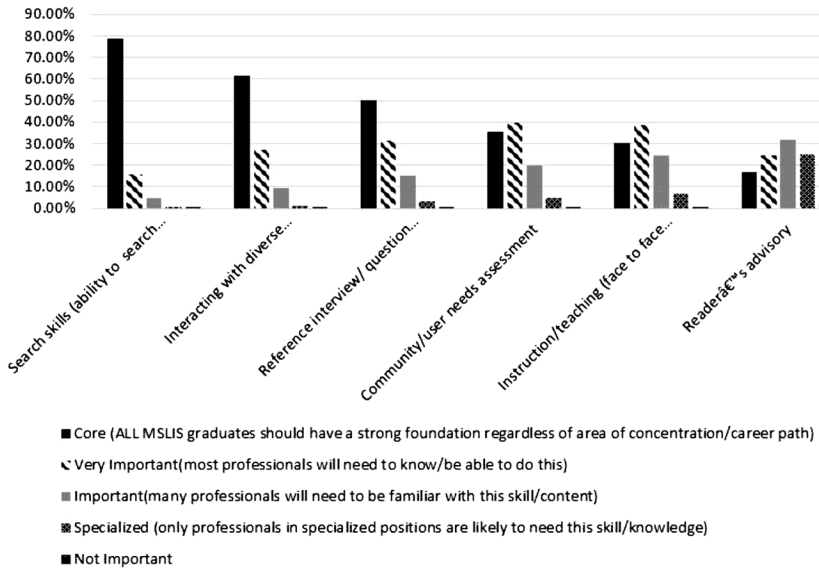

Figure 3: Ranking of user services skills.

The next matrix of questions was related to management skills. At 76%, teamwork was the only management-related skill to be rated as core by a majority of respondents. Four additional skills were ranked as core by at least one-third of respondents: project management (43%), fundamentals of management (42%), leadership (39%), and change management (36%). Data-driven decision making and budgeting were ranked as core by only 32% and 26% of respondents, respectively, but most respondents ranked them as important or very important. However, several other skills were considered specialized by a substantial number of people: grant writing (20%), HR/personnel management (25%), and facilities management (33%). Figure 4 shows the ranking of all management skills.

The last matrix of questions was related to technology skills. Interestingly, none of the technology skills was ranked as core by a majority of respondents, and only two skills were ranked as core by at least one-quarter of respondents: knowledge of online security issues (36%) and troubleshooting software (26%). Troubleshooting hardware, social networking application in information settings, usability testing for improvement, and web site design were all ranked as important or very important by a majority of respondents. Managing network systems was the only technology skill to be ranked as specialized by a majority of respondents (58%). However, substantial numbers also ranked coding/programming (39%), web site design (25%), and usability testing for improvement (24%) as specialized. Figure 5 shows the ranking of technology skills.

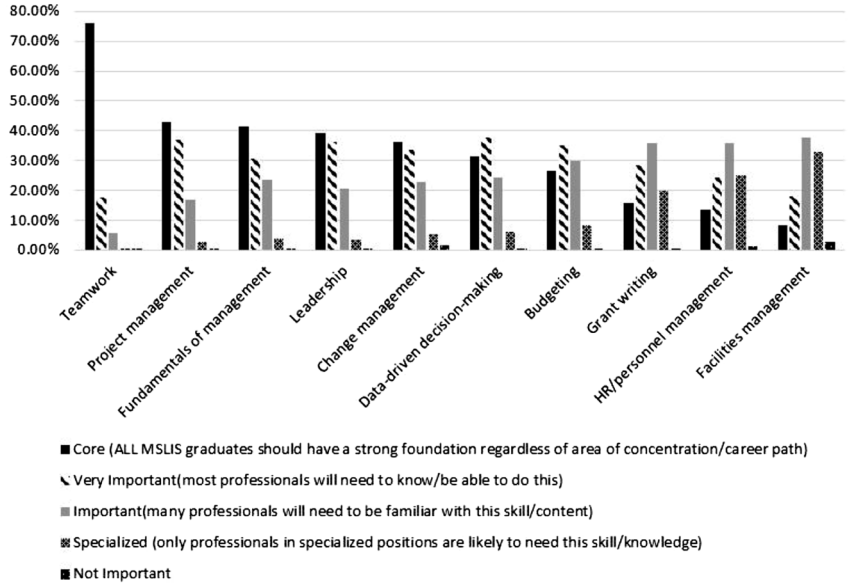

Figure 4: Ranking of management skills.

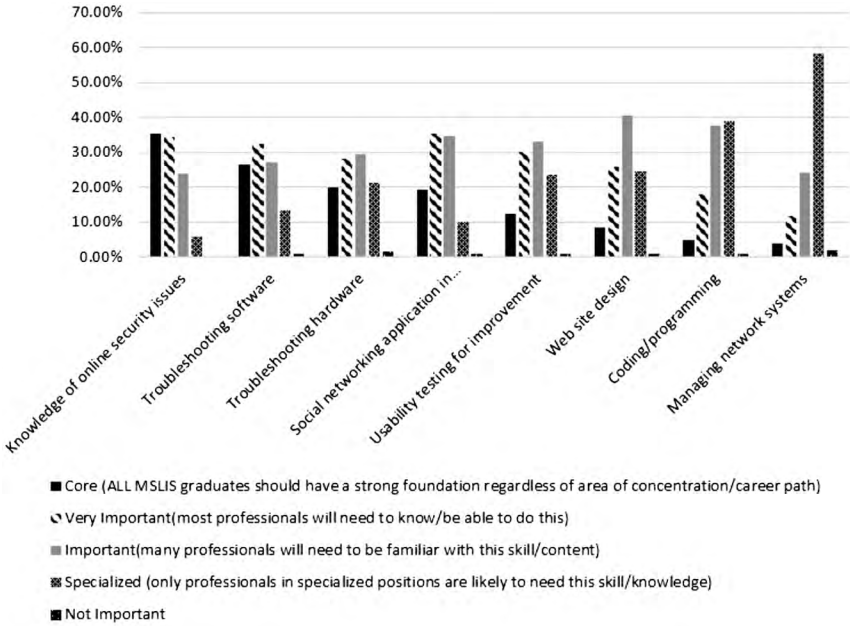

Figure 5: Ranking of technology skills.

Comparisons and cross-tabs

Looking across the entire data set and the competency categories, 11 of the 53 knowledge areas, skills, and attributes were ranked as core by at least 50% of respondents. A twelfth area, advocacy, was ranked core only by School D. In descending order, these 11 are as follows: interpersonal communication (86%), knowledge of professional ethics (81%), writing (79%), search skills (79%), evaluating and selecting information resources (77%), teamwork (76%), customer service skills (72%), cultural competence (65%), interacting with diverse communities (62%), reflective practice grounded in diversity and inclusion (52%), and reference interview/question negotiation (50%). However, as noted above, the survey was distributed by four different iSchools, which raises the question of whether there might be some difference in responses based on the participants' affiliation. After all, each program sets its own program learning outcomes based on its particular mission, values, and focus, and core curricula can vary from program to program. A cross-tab of all skills rated as core by 50% or more respondents by schools shows that there is actually little variance. When viewed by school, rather than as an average, two additional skills were ranked at 50% or above for one school. Also, the reference interview, which on average was ranked as core by 52% of respondents, fell below 50% for one school. Other than that, the top 11 skills remain the same, and vary only slightly in terms of the total percentage of respondents ranking the skills as core. Table 1 shows all skills ranked as core by 50% or more respondents by school.

Results were also cross-tabbed to look for differences in ranking by information setting (public library, academic library, corporate library, school library, special library, academic archive, community archive, museum, government archive, technology provider or vendor, other). According to chi-square tests, there were statistically significant differences in how skills were ranked by setting for 42 of the 53 skills. The only KSAs that did not show a statistically significant difference by setting were evaluation research (collecting and analyzing data for the purpose of improvement, $p = 0.08$); knowledge of user information behaviors ($p = 0.20$); reporting basic descriptive statistics ($p = 0.07$); writing ($p = 0.87$); interpersonal communication ($p = 0.44$); making effective visual presentations ($p = 0.28$); search skills (ability to search databases, internet resources, and catalogs efficiently and effectively, $p = 0.40$); data-driven decision-making ($p = 0.58$); teamwork ($p = 0.40$); coding/programming ($p = 0.39$); and web site design ($p = 0.34$). Of the top 11 KSAs, writing, interpersonal communication, search skills, and teamwork were all ranked as core by a vast majority of respondents. The fact that there was no statistically significant difference across settings suggests that these four skills, at least, could be considered core regardless of where information professionals find themselves working. Similarly, the lack of statistical significance for the remaining seven KSAs suggests that

Table 1: Core ranked skills by survey distribution

Top Skills/ Knowledge Areas	Simmons University % (*n* = 1117)	School B % (*n* = 873)	School C % (*n* = 394)	School D % (*n* = 24)	Average % (*N* = 2384)
Interpersonal communication	86%	86%	89%	92%	**86%**
Knowledge of professional ethics	79%	84%	81%	75%	**81%**
Writing	80%	77%	79%	79%	**79%**
Evaluating and selecting information resources	78%	78%	74%	83%	**77%**
Teamwork	75%	78%	76%	79%	**76%**
Search skills	80%	79%	74%	92%	**79%**
Customer service skills	73%	71%	71%	83%	**72%**
Cultural competence	62%	68%	66%	63%	**65%**
Interacting with diverse communities	57%	65%	67%	71%	**62%**
Reflective practice grounded in diversity & inclusion	49%	57%	51%	50%	**52%**
Reference interview/ question negotiation	50%	52%	47%	54%	**50%**
Advocacy	43%	44%	41%	58%	**43%**

they might not be core, regardless of setting. For the other 42 KSAs, the data suggest that whether they are considered core or not might depend on the type of information setting in which a professional works. It is important to note, however, that some of the setting categories, such as government archives, had very few respondents, which might affect statistical significance. Appendix B shows the *p* values for all 53 KSAs.

Discussion

This study identified 11 knowledge areas, skills, and aptitudes that are considered core to the LIS field by at least 50% or more of survey respondents. These 11 KSAs were consistent across four distributions of

the survey, which seems to support their rank as core. Granted, one distribution of the survey did highlight three additional skills as core, but that distribution had an extremely small sample size, which might have affected the validity of the responses. Of the 11 core KSAs, four skills (writing, interpersonal communication, search skills, and teamwork) showed no statistically significant difference, regardless of the participant's work setting, suggesting that those four KSAs in particular can be considered core across the field.

Examining the rankings of the KSAs in more detail highlights some interesting points and raises some questions. Many of the skills that have been highlighted in the literature as important, including knowledge of legal issues such as copyright, ability to engage in research and use data for decision making, data-management skills, and the ability to engage in instruction did not make the 50% cut-off. Nor are the skills that fell below 50% core considered to be unimportant; on the contrary, as noted above, most were ranked as important or very important by the majority of respondents. The findings suggest that many, or even most, information professionals will come across these topics and should have some knowledge of them, but most current professionals do not believe that these areas need to be formulated as student learning outcomes for every graduate of the program or addressed in depth in core courses. The implication seems to be that while many professionals will need to be familiar with these skills, actual job responsibilities related to these KSAs will be limited to certain positions. For example, while data-driven decision making has become increasingly important in an era of accountability, perhaps it is mostly people in management positions who will be implementing decisions and reporting to stakeholders and therefore need the relevant knowledge and skills to do that. It is also possible that some of the KSAs, such as data management, are related to emerging areas of the field, and while they are not considered core now, this perception might shift if job growth in those areas continues.

The findings related to technology KSAs are particularly interesting. Despite a strong emphasis on the importance of technology skills both in the LIS literature and its prevalence in job postings, not a single technology skill was rated as core by half or more of the respondents. Indeed, the only skill that even came close was knowledge of online security issues, which was ranked as core by 36%. Even relatively broad and generic skills, such as troubleshooting hardware and software, were rated as core by less than one-quarter of respondents. While this finding was surprising, there are several explanations. The most straightforward possibility is that the survey simply asked the wrong questions. Perhaps the skills listed in this survey do not accurately reflect the types of technology skills expected of all information professionals, or the skills most relevant across the field.

Another possibility is that while technology broadly is important across the field, the specific skills sets and hardware and software knowledge

varies enough by position and/or setting that it is hard to identify a single set of core skills. This explanation actually aligns with Saunders's (2015) and Partridge, Menzies et al.'s (2010) findings. Focus groups in both studies emphasized the importance of technology abilities but did not appear to come to a consensus on specific skills. Saunders (2015) found substantial variety in technology expectations across information settings, and Partridge, Menzies et al. suggested that "library 2.0 should not be tied to specific technological tools (e.g., blogs or wiki), as this may impede scope for libraries and their services to continue to evolve. The focus needs to be on change and how to meet the changing needs of users" (p. 271). It might be that what is common across the field is a certain level of comfort with technology and an ability to keep learning and keep pace with changes in technology, rather than a specific set of skills or software packages. With that said, Goodsett and Koziura (2016) found that recent graduates felt their LIS programs lacked attention to emerging technology skills.

This study also supports the findings of several other studies (Gerolimos, 2009; Partridge, Menzies et al., 2010; Reeves & Hahn, 2010; Saunders, 2015) that "soft skills" or personal qualities are among the most important KSAs. Of those 11 skills ranked as core, only four could be considered specific to the field of LIS: knowledge of professional ethics, evaluating and selecting information sources, search skills, and the reference interview. The remaining seven are not only more generic but could also be categorized as "soft skills" or personal attributes: interpersonal communication, writing, teamwork, customer service skills, cultural competence, interacting with diverse communities, and reflective practice grounded in diversity and inclusion. Indeed, even the reference interview, which can be considered a domain-specific KSA, relies heavily on soft skills such as interpersonal and communication skills in its implementation. Tables 2 and 3 show the breakdown of the 11 core skills separated as domain specific and soft skills.

This emphasis on interpersonal and communication skills seems to align with the idea of the information professions as user-centered and customer-service oriented. Partridge, Menzies et al. asserted from their findings that "personality traits, not just qualifications, were critical to be a successful librarian or contemporary information worker" (2010, p. 271), and Saunders (2015) found that some focus-group participants said they would prioritize soft skills over hard skills or content knowledge when hiring. Nevertheless, it seems curious that so few domain-specific skills emerged as core. For example, describing information sources—essentially, cataloging and classification—fell below the core cut-off, at 45%. While it might be true that only people in specific positions would need in-depth knowledge of metadata and classification standards, one might argue that everyone in the information professions needs some grounding in this area. After all, even LIS professionals who are not

Table 2: Soft skills ranked by survey distribution

Soft Skills	Simmons University % (*n* = 1117)	School B % (*n* = 873)	School C % (*n* = 394)	School D % (*n* = 24)	Average % (*N* = 2384)
Interpersonal communication	86%	86%	89%	92%	**86%**
Writing	80%	77%	79%	79%	**79%**
Teamwork	75%	78%	76%	79%	**76%**
Customer service skills	73%	71%	71%	83%	**72%**
Cultural competence	62%	68%	66%	63%	**65%**
Interacting with diverse communities	57%	65%	67%	71%	**62%**
Reflective practice grounded in diversity & inclusion	57%	65%	67%	50%	**52%**

Table 3: Hard skills ranked by survey distribution

Hard Skills/ Domain Knowledge	Simmons University % (*n* = 1117)	School B % (*n* = 873)	School C % (*n* = 394)	School D% (*n* = 24)	Average % (*N* = 2384)
Knowledge of professional ethics	79%	84%	81%	75%	**81%**
Evaluating and selecting information resources	78%	78%	74%	83%	**77%**
Search skills	80%	79%	74%	92%	**79%**
Reference interview/ question negotiation	50%	52%	47%	54%	**50%**

engaged in applying the standards will be navigating them to search for materials and teaching patrons how to search for them. Similarly, knowledge of user information behaviors was ranked as core by only 43% of respondents, yet nearly everyone in the field could benefit from this knowledge. Reference professionals and other front-line service staff could use knowledge of information behaviors to understand their patrons and better support them in their research, while technical services, technology,

and discovery services staff could use that knowledge to organize collections and design systems with user behaviors in mind.

The emphasis on soft skills also raises questions about how those skills should be taught in LIS programs and, indeed, whether they can be taught at all. In a review of LIS curricula, Gerolimos (2009) noted a lack of courses that focus on communications skills. However, the author also noted that such skills would be unlikely to be taught in separate courses but could be "developed through similar courses such as public service, user education and understanding user needs" (p. 536). Given the importance of these skills, Gerolimos asserts that "it is necessary to give a higher priority to the development of communication and interpersonal skills with the incorporation of related and autonomous courses" (p. 536). However, Saunders (2012) notes that there is little evidence to suggest that interpersonal and communication skills are being directly taught or assessed in reference courses. She points out that discussing interpersonal behaviors and communication skills in courses like reference is not the same as giving students opportunities to put those skills into practice and, without specific feedback on how well they are engaging those skills, it is unlikely that students will be able to improve those skills. In her focus group study, Saunders (2015) found that information professionals indicated they would prioritize interpersonal and communication skills over content knowledge and technology skills, because the latter skills can be learned on the job but it is hard for employers to teach soft skills. Saunders goes on to suggest that it can be equally difficult for faculty in LIS programs to try to teach soft skills. She notes that oral presentations might give students experience with public speaking, but faculty would need to provide feedback on the mechanics of the presentation as well as its content for students to learn and improve, and she goes on to wonder, "how does one teach a person to be flexible and adaptable or to deal skillfully with change?" (2015, p. 443). Nevertheless, as studies repeatedly confirm the primary importance of these skills, LIS programs will need to find ways to address and measure them.

Conclusion

This study shows that virtually all of the 53 KSAs included in the survey are considered important to the field of LIS. Only four skills were identified as specialized by a majority of respondents, meaning that they are only relevant to professionals in very specific positions or information settings, and none of the KSAs were identified as not important by more than a handful of respondents. That said, only 11 skills were identified as core by a majority of respondents, meaning that all information professionals should have some grounding in that skill or knowledge area regardless of their ultimate career path. Only four of those 11 skills showed no statistical significance by respondents' employment setting, suggesting that the other seven, despite being ranked as core by more than 50% of respondents, could actually

vary by setting. Further, of those 11 KSAs, seven are soft skills or personal attributes that are not specific to LIS or related to domain knowledge.

These findings have a number of implications for LIS education. Given that many of the skills identified as core in this study, especially interpersonal and communication skills, have also been confirmed in various other studies, it is incumbent upon LIS programs to consider where and how they address these skills within their curricula. As Gerolimos (2009) notes, some of the domain-specific knowledge such as evaluating and selecting information sources and the reference interview might be addressed within the core curriculum, but soft skills such as interpersonal communication, writing, and reflective practice will more likely be woven through the curriculum, addressed in various classes through assignments, case studies, readings and hands-on practice. For example, in teaching how to interact with patrons and conduct a reference interview, a reference course would likely address interpersonal communication and customer services skills and perhaps also areas such as interacting with diverse populations and cultural competence. These skills might be addressed through reading RUSA's (2013) *Guidelines for Behavioral Performance* and practiced through role-playing assignments and critiques of actual or virtual reference transactions. These same skills would probably also be reinforced in courses on instruction, community engagement, and outreach and services to diverse populations.

However, as Saunders (2012, 2015) notes, hands-on practice in these skills is more important than readings and discussions and unless instructors teach and assess the skills, students might not learn from the experiences. In other words, in order for LIS programs to directly address soft skills, instructors cannot simply assign oral presentations and assume that students will learn public-speaking skills as part of that assignment. Rather, the courses and assignments must include learning outcomes specific to those skills, and instructors need to offer feedback related to these skills. In this example, instructors would need to discuss with students the elements of good oral presentations and public speaking, such as organization, word choice, pace, volume, and so on, and then provide students with feedback on their performance in those areas as well as feedback on the content of the presentation.

Another important finding of this study is that there were statistically significant differences in the rankings of the majority of the KSAs by setting. In other words, there were significant differences in how academic librarians ranked skills compared to public librarians, archivists, corporate librarians, and so on. This finding has two important implications. First, it suggests that only the four skills that were ranked as core and did not show a statistically significant difference are similarly important across settings. Other skills might be more or less important depending on which information setting or job function a professional finds themselves working in. In terms of LIS education, this finding suggests that

LIS programs might actually have fewer core courses and might need to consider concentrating more on developing tracks or areas of specialization within their curriculum where students can gain the KSAs specific to their area of interest. In other words, LIS programs might offer students tracks in areas like academic libraries, public libraries, archives, corporate libraries, and so on, which would constitute a series of courses that would build on the common core skill, but would allow the student to specialize by focusing on the KSAs considered most important in those areas. In fact, this recommendation aligns with Goodsett and Koziura (2016), who found that recent graduates wished that their programs had offered subject-specific tracks and more subject or discipline-based courses.

Laura Saunders is an associate professor at Simmons University School of Library and Information Science, teaching and conducting research in the areas of reference and instruction, information literacy, and academic libraries. She also has a strong interest in the connections between information literacy and the spread of misinformation or "fake news," and social justice issues related to libraries.

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Appendix A: Skills & topics survey

Q1 The purpose of this survey is to identify foundational skills and knowledge areas for LIS professionals. Please rate the importance of the skills and content areas along the following scale

General Skills and Content Areas

	Core (ALL MSLIS graduates should have a strong foundation regardless of area of concentration/career path) (1)	Very Important (most professionals will need to know/be able to do this) (2)	Important (many professionals will need to be familiar with this skill/content) (3)	Specialized (only professionals in specialized positions are likely to need this skill/knowledge) (4)	Not Important (5)
Evaluating and selecting information resources (1)	○	○	○	○	○
Describing information resources (2)	○	○	○	○	○
Taxonomy/classification development (3)	○	○	○	○	○
Knowledge management (4)	○	○	○	○	○
Research data management (collecting, organizing, and making data accessible) (5)	○	○	○	○	○
Evaluation research (collecting and analyzing data for purposes of improvement) (6)	○	○	○	○	○

continued

	Core (ALL MSLIS graduates should have a strong foundation regardless of area of concentration/career path) (1)	Very Important (most professionals will need to know/be able to do this) (2)	Important (many professionals will need to be familiar with this skill/content) (3)	Specialized (only professionals in specialized positions are likely to need this skill/knowledge) (4)	Not Important (5)
Management of archival records and manuscripts (7)	○	○	○	○	○
Basic data collection methods (surveys, focus groups, etc) (8)	○	○	○	○	○
Reflective practice grounded in diversity & inclusion (9)	○	○	○	○	○
Knowledge of professional ethics (10)	○	○	○	○	○
Metadata creation (11)	○	○	○	○	○
Metadata management (12)	○	○	○	○	○
Knowledge of user information behaviors (13)	○	○	○	○	○
Legal issues (copyright, etc.) (14)	○	○	○	○	○
Information literacy standards (15)	○	○	○	○	○

	Core (ALL MSLIS graduates should have a strong foundation regardless of area of concentration/career path) (1)	Very Important (most professionals will need to know/be able to do this) (2)	Important (many professionals will need to be familiar with this skill/content) (3)	Specialized (only professionals in specialized positions are likely to need this skill/knowledge) (4)	Not Important (5)
Design thinking (approach or strategy for innovation) (16)	○	○	○	○	○
Cultural competence (ability to work effectively in cross-cultural situations/ with people of various cultural backgrounds) (17)	○	○	○	○	○
Reporting basic descriptive statistics (18)	○	○	○	○	○
Preservation of non-digital resources (19)	○	○	○	○	○
Preservation of digital resources (20)	○	○	○	○	○
Grounding in social justice (21)	○	○	○	○	○
Grounding in history of library and information practices and professions (22)	○	○	○	○	○

Q2 Communication

	Core (ALL MSLIS graduates should have a strong foundation regardless of area of concentration/career path) (1)	Very Important (most professionals will need to know/be able to do this) (2)	Important (many professionals will need to be familiar with this skill/content) (3)	Specialized (only professionals in specialized positions are likely to need this skill/knowledge) (4)	Not Important (5)
Writing (1)	○	○	○	○	○
Interpersonal communication (2)	○	○	○	○	○
Customer service skills (3)	○	○	○	○	○
Public speaking (4)	○	○	○	○	○
Advocacy (representing organizational interests to stakeholders) (5)	○	○	○	○	○
Marketing/ outreach (6)	○	○	○	○	○
Making effective visual presentations (7)	○	○	○	○	○

Q4 User Services

	Core (ALL MSLIS graduates should have a strong foundation regardless of area of concentration/career path) (1)	Very Important (most professionals will need to know/be able to do this) (2)	Important (many professionals will need to be familiar with this skill/content) (3)	Specialized (only professionals in specialized positions are likely to need this skill/knowledge) (4)	Not Important (5)
Instruction/teaching (face to face and online) (1)	○	○	○	○	○
Reference interview/ question negotiation (2)	○	○	○	○	○
Interacting with diverse communities (3)	○	○	○	○	○
Reader's advisory (4)	○	○	○	○	○
Search skills (ability to search databases, internet resources, and catalogs efficiently and effectively) (5)	○	○	○	○	○
Community/ user needs assessment (6)	○	○	○	○	○

Q5 Management

	Core (ALL MSLIS graduates should have a strong foundation regardless of area of concentration/career path) (1)	Very Important (most professionals will need to know/be able to do this) (2)	Important (many professionals will need to be familiar with this skill/content) (3)	Specialized (only professionals in specialized positions are likely to need this skill/knowledge) (4)	Not Important (5)
Fundamentals of management (1)	○	○	○	○	○
Project management (2)	○	○	○	○	○
Budgeting (3)	○	○	○	○	○
Grant writing (4)	○	○	○	○	○
HR/personnel management (5)	○	○	○	○	○
Facilities management (6)	○	○	○	○	○
Data-driven decision-making (7)	○	○	○	○	○
Leadership (8)	○	○	○	○	○
Change management (9)	○	○	○	○	○
Teamwork (10)	○	○	○	○	○

Q6 Technology

	Core (ALL MSLIS graduates should have a strong foundation regardless of area of concentration/career path) (1)	Very Important (most professionals will need to know/be able to do this) (2)	Important (many professionals will need to be familiar with this skill/content) (3)	Specialized (only professionals in specialized positions are likely to need this skill/knowledge) (4)	Not Important (5)
Coding/ programming (1)	○	○	○	○	○
Troubleshooting software (2)	○	○	○	○	○
Troubleshooting hardware (3)	○	○	○	○	○
Knowledge of online security issues (4)	○	○	○	○	○
Web site design (5)	○	○	○	○	○
Social networking application in information settings (6)	○	○	○	○	○
Usability testing for improvement (7)	○	○	○	○	○
Managing network systems (8)	○	○	○	○	○

Q7 Are there any additional skills or content areas that you believe should be covered in the MSLIS curriculum?

Q8 Do you have an MSLIS degree?

- ○ Yes (1)
- ○ No (2)

Q9 Which of the following best describes your current position?

- ☐ Director/Dean/Head (1)
- ☐ Department Manager (2)
- ☐ Staff Librarian (3)
- ☐ Staff Archivist (4)
- ☐ Library/Archival Assistant (5)
- ☐ LIS Faculty (6)
- ☐ Adjunct Faculty (7)
- ☐ Other (8) _____

Q10 Which of the following best describes your place of employment?

- ○ Public Library (1)
- ○ Academic Library (2)
- ○ Corporate Library (3)
- ○ School Library (4)
- ○ Special Library (5)
- ○ Academic Archive (6)
- ○ Community Archive (7)
- ○ Museum (8)
- ○ Government Archive (9)
- ○ Technology Provider or Vendor (10)
- ○ Other (11) _____

Q11 Please tell us which organization invited you to take this survey?

- ○ A
- ○ B
- ○ C
- ○ D

Appendix B: *p* Values

General	*p* value
Evaluating and selecting information resources	0.00
Describing information resources	0.00
Taxonomy/classification development	0.00
Knowledge management	0.00
Research data management (collecting, organizing, and making data accessible)	0.00
Evaluation research (collecting and analyzing data for purposes of improvement)	0.08
Management of archival records and manuscripts	0.00
Basic data collection methods (surveys, focus groups, etc)	0.02
Reflective practice grounded in diversity & inclusion	0.00
Knowledge of professional ethics	0.05
Metadata creation	0.00
Metadata management	0.00
Knowledge of user information behaviors	0.20
Legal issues (copyright, etc.)	0.00
Information literacy standards	0.00
Design thinking (approach or strategy for innovation)	0.00
Cultural competence (ability to work effectively in cross-cultural situations/with people of various cultural backgrounds)	0.00
Reporting basic descriptive statistics	0.07
Preservation of non-digital resources	0.00
Preservation of digital resources	0.00
Grounding in social justice	0.00
Grounding in history of library and information practices and professions	0.00
Communication	
Writing	0.87
Interpersonal communication	0.44
Customer service skills	0.00
Public speaking	0.00
Advocacy (representing organizational interests to stakeholders)	0.00
Marketing/outreach	0.00
Making effective visual presentations	0.28

continued

General	*p* value
User Services	
Instruction/teaching (face to face and online)	0.00
Reference interview/question negotiation	0.00
Interacting with diverse communities	0.00
Reader's advisory	0.00
Search skills (ability to search databases, internet resources, and catalogs efficiently and effectively)	0.40
Community/user needs assessment	0.00
Management	
Fundamentals of management	0.00
Project management	0.03
Budgeting	0.00
Grant writing	0.00
HR/personnel management	0.00
Facilities management	0.00
Data-driven decision-making	0.58
Leadership	0.00
Change management	0.01
Teamwork	0.40
Technology	
Coding/programming	0.39
Troubleshooting software	0.00
Troubleshooting hardware	0.00
Knowledge of online security issues	0.05
Web site design	0.34
Social networking application in information settings	0.00
Usability testing for improvement	0.03