Diffusion of KM Education in LIS Schools

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This paper aims to identify the current state of knowledge management (KM) diffusion in LIS schools. In terms of content, we have identified two principal approaches to the perception of KM in the LIS community: an active approach, seeing KM as an opportunity for the LIS community to change; and a passive approach, seeing KM merely as a topic of information management with a new label. Our research analyzed study programs at 145 LIS schools and in 188 LIS study programs in the United States, Canada, Europe (in particular, Russia), Australia, India, South Africa, China, Japan, Singapore, and Brazil and observed the inclusion or non-inclusion of KM courses in those programs. We employ a narrower approach to defining a KM course as being one having the term "knowledge management" in its name. The findings indicate that KM courses are integrated in one-third of the LIS study programs analyzed, and in schools with an information science focus this figure can rise to around 45%. Given the importance of this area and various views regarding KM diffusion in LIS schools, we recommend that those who have already implemented a KM course in their LIS programs create an informal community of practice (CoP) on KM implementation in LIS schools and build an open database of lessons learned from such integration, thereby capturing and sharing this crucial knowledge in a single place.

Keywords: knowledge management, knowledge society, LIS community, LIS curriculum, new trends

Introduction to knowledge management

There is very limited consensus concerning a definition of knowledge management (KM), partly because of its multidisciplinary origins, ranging from organizational science and cognitive science to library and information science (LIS) (Dalkir, 2009). KM is based on the theories, metaphors, and approaches of a number of disciplines. Its intellectual origins are profound and relatively extensive, influenced by philosophy, economics, psychology, sociology, education, communication theory, and also LIS (Wallace, 2007), making it difficult to achieve one generally used definition. More widely accepted definitions include the following, for example: "knowledge management is the process of capturing, distributing, and effectively using knowledge" (Davenport & Prusak, 2000, p. 107) and "KM is the ability of

KEY POINTS

- Quantitative research data from WoS Core Collection show that there is higher research literature production on KM than on IM, with the LIS community being the third most active discipline in KM research literature production.
- Two kinds of attitudes of the LIS community toward KM can be identified: passive (KM is seen as the same or almost the same as IM), and active (KM is definitely not the same as IM, as stated by IFLA, and we have to expand the competencies of information professionals to include KM).
- At least 33% of LIS programs analyzed have implemented KM courses in their curricula, as well as at least 45% of iSchools, representing 65% of ALA-accredited schools.

an organization to manage, store, value, and distribute knowledge" (Liebowitz & Wilcox, 1997, preface).

Two basic KM frameworks can be distinguished, one focused on knowledge codification and building knowledge repositories, and another on personalization, specializing in tacit knowledge and knowledge workers (Hansen, Nohria, & Tierney, 1999). Based on the four main KM processes (discovery, capture, sharing, and application of knowledge), we can identify four knowledge management systems, powered by specific mechanisms and technologies. For example, knowledge sharing systems are supported by mechanisms including employee rotation across departments, brainstorming, conferences, and so on, and technologies such as videoconferencing, team collaboration tools, best practice databases, and expertise locator systems (Becerra-Fernandez & Sabherwal, 2015). The core KM concepts include tacit knowledge, being valuable yet barely expressible, documented explicit knowledge, organizational learning conveyed as best practices and lessons learned, and preservation of the content in an organizational memory system (Dalkir, 2009).

KM is also being developed in the academic environment. As early as 2005, Stankosky pointed out that KM was gradually becoming an academic discipline or field of study. Later, Dalkir (2009) pointed to the evolution of KM from a management fad to a scholarly discipline of study and research, and two years later, Grant (2011), with the help of bibliometric and content analysis, provided evidence that KM is not like any other management fads because it is still "alive."

The broad and genuine interest in KM is also evidenced by the publication by the United Nations of *The KM in the United Nations System* (Dumitriu, 2016), which emphasized that KM can handle the global issues raised by Agenda 2030 and the principles of KM implementation within the UN's structures: "Knowledge management remains a challenge for United Nations system organizations in their attempt to systematically and efficiently develop, organize, share and integrate knowledge to achieve

their cross-cutting goals" (p. iii). There are also other international organizations interested in KM, such as the Organisation for Economic Cooperation and Development (OECD/Statistics Canada, 2004) and the World Intellectual Property Organization (WIPO, 2015). At the same time, finalization of the draft ISO/DIS 30401 Knowledge Management Systems standard is underway.

In today's society, the practical applications of KM principles are broad, necessitating further advancement in research and education in such an interdisciplinary area. The aim of the present study is to explore the existing situation of KM courses offered in LIS study programs, as a prerequisite of expanding the competencies of LIS professionals by the field of KM, and to identify the trends in KM research literature production.

The interest of LIS in KM: A qualitative view

In LIS, there has been a very deliberate approach to expanding the focus area. In the past, the LIS focus area broadened to include information management (IM), having shifted from document management to actual information, including business information. The convergence of library science and information science has not been an easy process, and the perception of these two disciplines varied and was often problematic, as is the case today between LIS and KM. At present, LIS professionals admit that they have widened their interest in KM since IM has been a part of the LIS focus for a long time (Roknuzzaman & Umemoto, 2017). As Wallace (2007) notes, from the viewpoint of librarians, the history of KM is rooted in LIS, through the management of codified knowledge (knowledge organization). Given the fact that LIS has already moved from organizing documents and knowledge and toward the business environment by means of IM, it is logical to assume that it will move further and, with some interdisciplinary collaboration, help manage tacit knowledge and expand its scope to include the organization of people and communities as the bearers of knowledge.

In the LIS community, there is no consensus concerning the relationship between IM and KM (Koloniari & Fassoulis, 2017), and there is often no distinction made between the two terms. However, Wallace (2007) states that KM is very different from IM, and especially from information technology management. Some authors agree that KM builds on IM, applying the methods and tools of a knowledge-based organization, and covers all the expert knowledge of information science (Al-Hawamdeh, 2003; Hazeri, 2008). KM differs from IM in that KM is focused also on managing human expertise, whereas LIS and IM are focused on managing information resources (Broadbent, 1998). KM emphasizes unstructured and informal information and knowledge, while IM focuses on structured and formal information. At the same time, knowledge, unlike information, is more intensely linked to people, whereas KM also addresses the need to change a company's corporate culture for knowledge to work properly, something that has never been tackled by IM (Singh, 2005).

As illustrated by Figure 1, from the viewpoint of KM, the relationship between KM and IM is unambiguous, because the KM community makes a strict distinction between information and knowledge, and among various types of knowledge, representing the core of the KM concept. Some authors consider information to be a synonym for explicit knowledge, while others, like Milton (2017), distinguish these two concepts, as shown in Figure 1.

In LIS, the view of KM is often intentionally simplified. Some authors see no difference between IM and KM, referring to the latter as "just a new name for information resource management, which in turn was just a new name for documentation, which in turn was just a new name for librarianship" (Khairah & Singh, 2008; Rowley, 1999). Some authors believe that KM is what librarians or information professionals have been doing for years (Ajiferuke, 2003), while some see the KM concept as a utopian idea (Wilson, 2002) in its entirety. As Wallace (2007) has pointed out, this attitude is natural because LIS professionals are often skeptical about any new things. LIS professionals were skeptical, for instance, when documentation movements in the 1950s were labeled "librarianship practiced by amateurs," the information science movement of the 1970s was labeled "librarianship practiced by men," and KM movements of the 1990s were labeled "library and information science practiced by businessmen." On the other hand, some authors consider LIS a dynamic field adapting itself to social changes.

Simply put, it is possible to differentiate between the two lines of attitudes toward KM in the LIS community:

- *Active*: KM is not IM, so the LIS community should start to focus on and expand competencies to become active participants in KM.

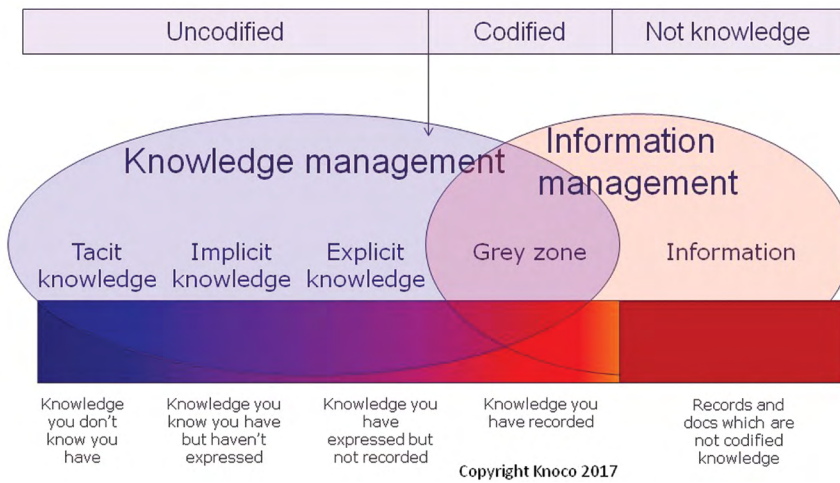

Figure 1: The current view of the relationship between KM and IM as seen by the KM community. Courtesy of N. Milton (Milton, 2017).

- *Passive/skeptical*: the KM issue needs not be addressed, because it is actually IM with a new name.

With respect to the active line, many authors demand a change in focus and an expansion of information professionals' competencies, insisting that they should start viewing themselves as part of the core business rather than as a service to businessmen and urging them to understand how business information is created and utilized and to be able to map the underlying knowledge processes (Abell & Oxbrow, 2001). As Butler (2000) notes, the Special Library Association requires librarians to make a changeover from being collection keepers to becoming the managers of organizational memory. Roknuzzaman and Umemoto (2017) recommend that knowledge be borrowed mutually between LIS and KM, and that LIS begin a curricular renovation, redefine the role of its profession, and modify the existing names (from "information science" to "knowledge science").

By contrast, taking the passive line, some authors suppose that today's LIS professionals possess all the necessary competencies to be employed in the field of KM. Traditional skills and knowledge in information and content management predispose information professionals ideally for organizational knowledge initiatives (Hazeri, 2008). KM roles and teams are good opportunities for information professionals whose experiences cover a majority of the most important KM skills (Abell & Oxbrow, 2001), so they have both the theoretical and the practical skills to support the major KM elements. Some authors and associations state that the emerging roles for information professionals include, for example, chief knowledge officer, chief information officer, knowledge manager, information manager, and data professional (Dalkir, 2009). At the 1998 IFLA conference, Reardon (1998) pointed out that LIS professionals possess a lot of experiences and skills required for KM, but that their skills would not create KM. They need to develop and modify their skills to be able to meet the needs of KM. Therefore, we also believe it is relevant to find out how many LIS schools have decided to include KM in their curricula.

The interest of LIS in KM: A quantitative view

The results of the Delphi study of 54 leading scholars on the field of (L)IS who create the Knowledge Map of Information Science on an ongoing basis and select the key concepts of information science (Capurro & Zins, 2017) point to the growing importance of KM in the (L)IS community. KM was selected by 23 panelists, ranking as the second most important key concept of information science, while IM was chosen by 22 panelists.

Similarly, another bibliometric research study (Ardanuy & Urbano, 2015) focused on the order of priority of LIS research topics in a survey conducted in 28 European Union countries in Scopus databases in the LIS category, which indicates an increase in interest in KM within the EU's LIS community. Based on the number of articles in databases, KM ranked higher than IM, in the following order: (1) information systems,

(2) research, (3) bibliometrics, (4) information retrieval, (5) libraries, (6) knowledge management, (7) the Internet, (8) open access, (9) information management, and (10) citation analysis.

In order to obtain the information needed for this study, we performed pre-research in the literature review phase using the Web of Science's (WoS) analytical tools (Core Collection).

We observed the dynamics of the research literature production in the field of KM (topic: "knowledge management"), and we also looked at the field of IM (topic: "information management"), which has been seen for a long time as a part of the LIS focus. It is important to analyze the results of the "new" LIS topic of KM, along with the more "traditional" LIS topic of IM in the LIS context, as it enables one to better understand the development and the existing position of KM in science and research. The scope of the pre-research included bibliographic records of publications from the WoS Core Collection, time span: 1990–2017. We used WoS analytical tools, which combine mathematical and statistical methods, citation bibliometric methods, and visualization methods. We created two queries, TOPIC: ("knowledge management"), and TOPIC: ("information management"). Both queries were Refined by Timespan: 1990–2017, and used Indexes: SCI-EXPANDED, SSCI, A & HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC. The results are shown in Figure 2. It can be stated on the basis of the data in Figure 2 that in the early 1990s there was an exponential growth in publishing activity on the topic of KM, achieving its global peak in 2009, whereas for IM a global peak was reached only in 2015. It is relevant to mention that since 2000 the research literature production on KM has been higher than that on IM, and this trend still persists.

Subsequently, we refined the two queries in WoS Core Collection (for TOPIC: "knowledge management" and TOPIC: "information

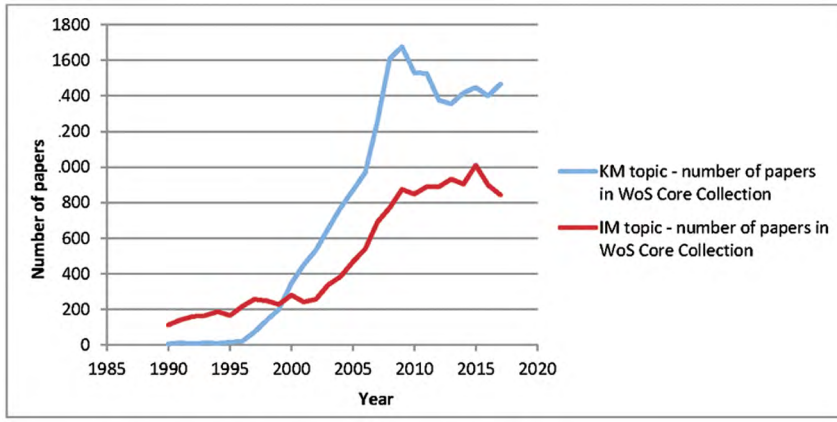

Figure 2: KM research literature trends.

management") by WEB OF SCIENCE CATEGORIES: (INFORMATION SCIENCE LIBRARY SCIENCE) to retrieve a subset of research literature on KM and IM in the LIS community, as illustrated in Figure 3. The publishing activity by the LIS community on the topic of KM has been continuous and growing since 1990 (except for 1994) until 2008, when it reached its global peak. Similar to the set of all research papers on the topic of KM in the WoS Core Collection, the subset of Information Science Library Science has had higher research literature production on the topic of KM than on the topic of IM since 2000. For the 2008–2012 period we can observe a decline in the production of research papers on KM; however, since 2013 there has been a slight upward trend.

We also analyzed a major set of highly cited papers (33) in the WoS Core Collection using the query TOPIC: ("knowledge management") refined by: ESI Top Papers: (Highly Cited in Field) AND WEB OF SCIENCE CATEGORIES: (INFORMATION SCIENCE LIBRARY SCIENCE), Timespan: 1990–2017, Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC. The fact that most of the papers in this set were published in 2017 (21%), followed by papers published in 2015 (15%), suggests that the papers on KM produced recently are a particular source of interest, especially when looking at the citation numbers. This may also indicate that the interest in KM will persist in the foreseeable future.

With respect to observing interdisciplinary activity, it is important that LIS was interested in KM from its earliest days. Data from the WoS Core Collection indicates that LIS was the most active discipline in 1990 (by WoS categories), producing three research papers indexed as "knowledge management." Other disciplines in the same year indexed as "knowledge management" included computer science software engineering, biochemistry,

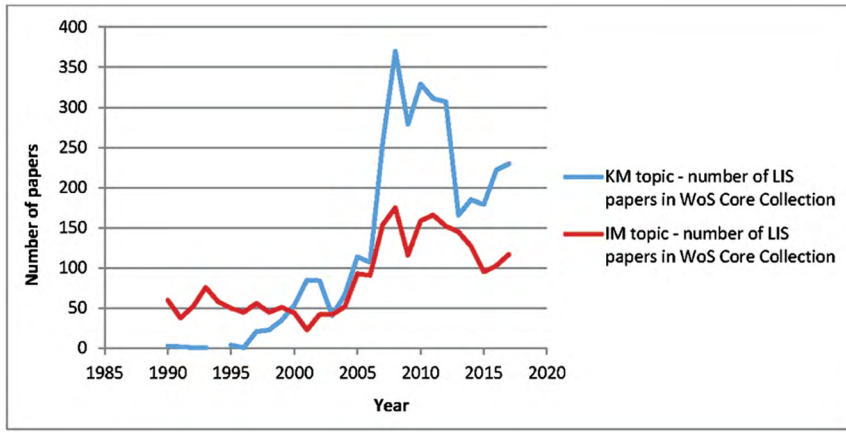

Figure 3: KM research literature trends in the LIS community.

molecular biology, environmental sciences, genetics, pathology, and applied mathematics. From 1997, this set was expanded to include the management and business WoS categories. We discovered that LIS ranked third in overall interdisciplinary activity on the topic of "knowledge management" in the WoS Core Collection, Timespan: 1990–2017; see Figure 4.

In this context, we also analyzed a set of highly cited papers (33) in the WoS Core Collection. The query used was: TOPIC: "knowledge management," refined by: ESI Top Papers: (Highly Cited in Field), Timespan: 1990–2017, Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC. This step is justified by the fact that interdisciplinary research activity in this set may not be identical to that in the total set of research papers on the topic of "knowledge management." We have also found that in this important set of research papers, LIS remains the third most important WoS category in highly cited papers. Moreover, research papers on the interdisciplinary topic of "knowledge management" in the WoS are included in more than 100 WoS categories.

We assume that the LIS community's considerable scientific interest in KM should gradually be reflected in the training of future LIS professionals. At the same time, we are aware of various attitudes toward the need to extend the competencies of LIS professionals to cover KM skills. Therefore, our goal is to identify the existing state of implementing KM courses in LIS schools.

The development of KM diffusion in LIS education

Changes throughout society and the fact that ICT is incorporated in all LIS-related programs, as well as changing labor market demands and job opportunities in business, industry, or public administration, have naturally

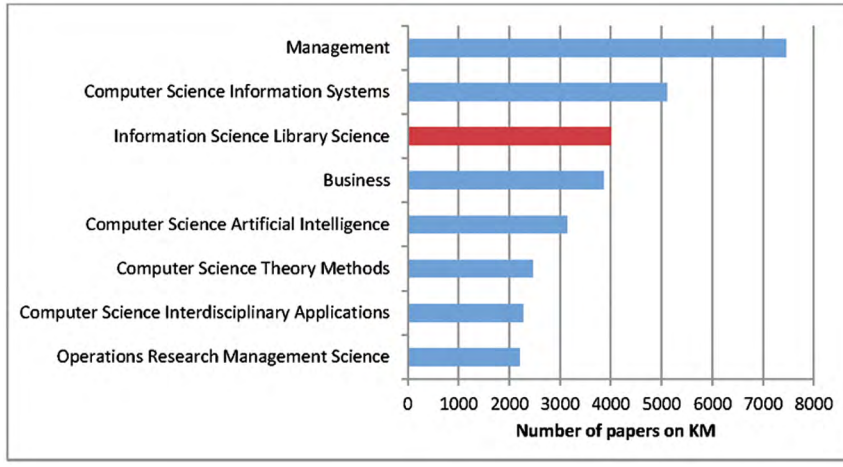

Figure 4: KM interdisciplinary research activity.

led to a transformation of librarianship into new nomenclatural disciplines (Mutula, 2013). LIS schools opt for the repackaging and rebranding of course outlines, content, and nomenclature. Since the end of 1980s, there was nearly a total shift from purely "library" schools to "library and information" schools. In 1996, only one-third of ALA-accredited schools were called "library schools." In 2004, there was another shift when one-third of ALA-accredited schools deleted "library" from their names and "I-schools" came into existence (Durrance, 2004). In 2017, we identified almost two-thirds (65%) of ALA-accredited schools having erased "library" from their names. The further possible development was predicted by Roknuzzaman and Umemoto (2017), suggesting that since there had been a shift from information paradigm to knowledge paradigm, we should consider changing the name to Library and Knowledge Science and restructuring LIS academic programs toward KM. For example, in 2006, the University of Tsukuba in Japan established the College of Knowledge and Library Science.

Both LIS and KM are characterized by huge diversity and complexity. Two intrinsic features of LIS are its multi- and interdisciplinary nature and the vagueness of its borders with other areas. The multidimensional nature of KM and differing interpretations of its scope and application explain why there is a problem arriving at a clear consensus about the content of curricula (Wallace, 2007). The recognition of the holistic nature of KM led to the gradual inclusion of KM into an educational framework of a number of academic units, for example, computer science, business, public policy, medicine, and, of course, LIS (Hazeri, 2008). According to Lamont (2016), KM spans a number of disciplines, so it does not come as a surprise that graduate-level programs in KM have their roots in a variety of areas. As Lamont notes, some of the areas have evolved from LIS and are focusing on information management, including record management. Others originate from the IT perspective and offer enterprise information systems or database management programs, while others focus on the analytical aspects of KM and educate students in traditional analytics, big data, and data science.

In the last decade, many LIS schools have recognized the importance of educating their students in the area of KM. As Chaudhry (2007) also points out, expanding LIS curricula offers an opportunity for LIS programs to expand their market beyond traditional student groups. LIS professionals attempt to re-engineer education so as to be able to cope with the changes that have arrived with KM initiatives, among others (Sutton, 2007). If we could tap into the full potential of KM, then the curricula of LIS programs should be amended to change the traditional information management skills into KM competencies (Rehman & Chaudhry, 2005). As we have already mentioned, in European LIS or information science programs, KM education was incorporated as an integral part of information management programs (Kajberg & Lørring, 2005). The question is

whether these programs also cover tacit knowledge management or merely deepen the skills in managing different types of explicit knowledge.

The prior state of KM integration in LIS education

So far, a number of surveys have been conducted with a similar focus. Kajberg & Lørring (2005) analyzed 10 selected topics in LIS curricula in Europe (excluding Belarus, Russia, Ukraine, and Turkey) based on answers from 47 LIS schools that returned the e-questionnaires, which had been sent out to a total of 200 LIS institutions. The authors researched the emphasis (weight) placed on 10 selected topics, or the perception of their being the core LIS topics. Information seeking was allocated the highest weight (100%), followed by library management (81%), knowledge organisation (66%), and KM (49%). Another interesting survey was conducted among the respondents from English-speaking countries subscribed to two international LIS mailing lists (Sarrafzadeh, 2008). They found that all of the respondents from all countries agreed with the statement that the mainstream LIS curricula do not provide for the competencies required for KM. Some 82% agreed that education for LIS must change to accommodate KM developments. A majority of the respondents agreed that KM could be a new area for information professionals and did not consider KM a threat to the future of LIS professionals. Roknuzzaman and Umemoto (2013) conducted a survey of 600 websites of schools providing LIS education, in addition to using a questionnaire sent by e-mail to 106 universities. The authors observed what aspects of KM had been integrated into LIS curricula, discovering that most often (50%) the schools had implemented the so-called technological perspective of KM (knowledge database, knowledge warehouses, knowledge networks, designing KM systems, knowledge discovery, taxonomies, collaborative tools, etc.), followed by the information perspective (information/content and its management) (40%); they also discovered that the LIS schools teaching KM focus least on business (business intelligence, information economics) and the human perspective (psychology, cognition) of KM (10%). This also shows that the major conjunction between LIS and KM is in the field of information/knowledge technology and the focus on content.

We have examined some research aimed at determining the degree of KM diffusion in LIS education based on content analysis. According to the approach to defining the concept of "KM education," we can distinguish two approaches. The first is a broader, semantic approach classifying KM courses as those containing the term "knowledge management" in their names, as well as courses that do not contain the term but belong thematically to the area of interest of KM. A limitation of this approach is the need to use the subjective approach of an evaluator who decides whether a given course without the term KM in its name belongs to a set of KM courses. The second approach is narrower, seeking a match only at the level of the term "knowledge management." The set thus created is

actually a subset of the set obtained using the broader approach, but the results achieved using this method are considered more objective, allowing further comparison over time. For example, Roknuzzaman and Umemoto (2009, 2010) analyzed 300 LIS schools in 2009, 12.3% of which offered KM programs/courses. A year later, the authors analyzed 600 LIS schools, of which 17.7% offered KM training. In these cases, the broader, semantic approach to classification of KM education was used. Our research is based on the narrower approach to defining KM courses and searching for a minimum set of LIS schools offering KM courses.

Research into KM in LIS schools

Our preliminary observations suggest that from the viewpoint of research literature production, the interest in KM still persists both in the overall interdisciplinary context and in the LIS community.

We identified two lines of looking at KM in the LIS community—passive (skeptical) and active—and found that some authors refer to an advent of knowledge science (Roknuzzaman, 2012; Roknuzzaman & Umemoto, 2017; Zins, 2006). The aim of this study is to identify the extent to which our theoretical findings and the interest by a relatively large LIS group in the extension of the LIS competencies of professionals and the skills of KM begin to materialize through the implementation of KM courses in LIS study programs. The objective is to explore the current number of LIS programs that have integrated KM courses into their curricula.

Methodology

In the initial phase of the research we analyzed schools from lists of universities that offer LIS study programs: the Times Higher Education World University Rankings 2016–2017 list (Times Higher Education, 2016) and the QS World University Rankings list (Quacquarelli Symonds Limited, 2017) in order to identify LIS schools, defined in this study as a faculty, a school, a department, or a division offering an LIS study program.

We identified a set of 145 LIS schools offering 188 study programs. The necessary data were collected from the websites of the LIS schools identified, using the following structure: LIS school name and type, study programs offered, and course names. Subsequently, each program was assigned a binary variable expressing the presence (1) or absence (0) of a KM course in the given study program. For the ALA-accredited LIS schools, we used the ALA database options (ALA, 2017), which allowed us to directly observe the number of LIS schools and study programs that offer KM courses as part of their curricula.

We employed the narrower approach to define a KM course, which means that a course qualified as a KM course only if it contained the term "knowledge management" in its name, For example, "Knowledge Management" and "Information and Knowledge Management" were considered

KM courses, unlike courses such as "Intellectual Capital Management" or "Knowledge Society." As noted above, the main limitation of the broader approach is the subjective classification of the courses offered in terms of their pertinence to KM, which is often not possible using the information provided on websites. We assume that if an LIS school offers a course integrating the term "knowledge management," then it declares an interest to teach at least one aspect of KM. The set of LIS schools and study programs created in such a manner can be seen as a minimum set of LIS schools offering KM courses, being more objective and appropriate for further testing and comparison over time.

A special note on our inclusion of Russia is in order. Russia is a large country with a long LIS tradition; however, it has been absent from similar analyses to date. Therefore, we decided to perform an analysis of the current situation of KM diffusion in LIS education in that country.

Findings

We analyzed 145 LIS schools and identified 188 LIS study programs in those schools. This included 60 ALA-accredited schools in the United States and Canada, 24 schools in Russia, 20 in the rest of Europe, 17 in Australia, seven in India, six in South Africa, five in China, four in Japan, one in Singapore, and one in Brazil.

In the database of the ALA-accredited programs/schools we identified 60 schools, of which 21 offer KM courses, meaning that 35% of these LIS programs had implemented KM into their LIS curricula. The following (more traditional) focus areas are the most frequent in the ALA-accredited schools: school librarianship (80%), public librarianship (75%), academic librarianship (73%), young adult services (72%), children's services (68%), and archival studies (67%) (ALA, 2017). In Europe, we analyzed the websites of 20 LIS schools and 44 study programs (in the Czech Republic, Croatia, England, Estonia, Finland, Germany, Hungary, Ireland, Malta, Norway, Poland, and Sweden). In European universities we identified 20 LIS study programs that have broadened their curricula with KM courses, meaning that KM was implemented in 45% of the study programs in the group of LIS schools analyzed. For Australia, we analyzed the websites of 17 LIS schools and 21 study programs and identified KM courses in five study programs only. For Asia, we analyzed Japan (four major Japanese universities) and identified six LIS study programs; however, we did not find a KM course in any of the curricula. According to some librarians, in general, Japanese librarianship is not oriented sufficiently toward research in LIS trends. There are fewer than 10 universities in Japan with an LIS program at the bachelor's, master's, or doctoral level (Nemoto, 2009). We also analyzed five LIS schools and five LIS study programs in China, where we identified KM courses in four of them; and in India, we analyzed seven LIS schools and seven LIS study programs and identified KM courses in six of them.

We analyzed 24 major LIS schools and 34 study programs in the Russian Federation, including three universities educating specialists in the highest LIS qualification (the State University of Culture and Arts in Moscow, St. Petersburg, and Krasnodar). Despite the number of LIS study programs analyzed, none was found to include a KM course. Based on these findings, we decided to explore the situation in the theoretical field of KM in Russia, and specifically in the Russian LIS community. From a practical perspective, in higher education, it is necessary to emphasize that while KM is addressed in scientific and technical literature (Kel'chevskaja & Stukova, 2015; Nestik, 2014), it is quite rare in LIS literature (Dresher, 2015; Krymskaja, 2009; Olejnik, 2012). KM is richly present in universities with a technical and economic focus. There are also some specialized centers, institutes, and departments that focus on KM: for example, the Knowledge Management Centre at the Graduate School of Management at St. Petersburg State University; the Department of Knowledge Management at the Moscow State University of Management; and the Scientific and Research Institute of KM at the Moscow State University of Economics, Statistics and Informatics, to name just a few. We concluded that the subject of KM in Russia was taught mainly in faculties associated with information technology, and in faculties of management and economics. So far, KM has been almost ignored in the field of LIS education.

We also analyzed one LIS school offering one program in Brazil, which did not have a KM course in its curriculum, and six LIS schools offering six LIS programs in South Africa, where we identified KM courses in five study programs.

Making any geographic generalizations or conclusions would not be appropriate, because the sample we selected was not based on a geographical point of view, which means that it does not take into account the number of schools required given the size of the country. Our selection was based on the rankings of top universities and the lists of LIS schools, and we were interested in the situation in the major LIS schools; see Table 1.

We found KM courses implemented in almost 33% of the 188 LIS programs analyzed. There is a higher proportion (45%) of KM in LIS schools focusing on information science, with more than one-third of these schools having abandoned the use of the word "library" and with their names including a focus on information science in conjunction with digital media, communication, data science, data analytics, and information and knowledge management.

Conclusion

KM can provide a solution to many global problems in today's knowledge society, as pointed out by many UNESCO initiatives and publications, and, particularly, by the UN (Dumitriu, 2016), the OECD (2004), or WIPO (2015). In terms of research literature production, KM still remains a topic of high interdisciplinary interest. The persisting interest in KM is also confirmed by

Table 1: KM courses in LIS study programs

Region	Country	Number of LIS Schools	Number of LIS study programs	Number of LIS study programs with KM courses
Americas	USA (ALA)	54	54	17
	Canada (ALA)	6	6	4
	Brazil	1	1	0
Asia	India	7	7	6
	China	5	5	4
	Japan	4	6	0
	Singapore	1	4	0
Europe	Russia	24	34	0
	England	3	12	4
	Germany	3	6	6
	Hungary	2	2	0
	Malta	2	3	3
	Finland	1	1	1
	Sweden	2	4	1
	Norway	1	4	3
	Poland	1	3	0
	Spain	1	2	0
	Croatia	1	2	0
	Czech republic	1	2	1
	Estonia	1	2	1
	Ireland	1	1	0
Australia	Australia	17	21	5
Africa	South Africa	6	6	5
Total		**145**	**188**	**61**

the fact that, in the set of 33 highly cited papers on the topic of "knowledge management" in the WoS Core Collection, there is the highest share of papers published in 2017 and in 2015. From the LIS perspective, it is interesting that since 2000, the number of KM research papers has been higher than the number of IM papers in that data set. Likewise, the production of LIS research papers on KM in KM interdisciplinary activity ranks third, following management and computer science information systems.

In terms of content, many LIS authors view KM as a challenge for expanding the competencies of LIS professionals and also to increase

the interest in studying at LIS schools. We have identified two main approaches to accepting KM in the LIS community: the passive approach, where KM is seen as a new name for LIS, or no more or little more than IM, and where, therefore, there is no need to change anything in LIS; and the active approach, where KM is different from both LIS and IM and represents an opportunity to expand the scope of the LIS profession.

On the basis of an analysis of the curricula published on the websites of 145 LIS schools and 188 LIS programs offered there, we can see that KM shifts slowly from theory to practice on the part of LIS professionals, as almost 33% of the study programs analyzed have already implemented KM courses in their curricula. We can also observe a gradual renaming of schools and study programs from LIS to information science, and an extension of curricula by subjects such as data mining, storytelling, collaboration, innovation, organizational learning, knowledge systems, and so on. The share of KM courses in LIS schools focused on information science is higher, amounting almost to 45%. As the number of such schools grows steadily, we expect that the share of schools including KM courses will increase, too.

We were also interested in the situation in Russia, which has been left out of similar research so far. We found no LIS study programs offering KM courses in Russia, despite having analyzed the 24 most important LIS schools, with 34 study programs. In contrast, in India we analyzed seven LIS schools (with seven study programs) and discovered that six of them had implemented KM courses in their curricula.

Our findings that nearly a half of the iSchools have already implemented KM into their curricula may influence other teachers who have so far been indecisive about such initiatives, which may be seen as a kind of a social proof. Having studied KM for several years, we assume that in order to be fully prepared for KM activities, it is inevitable that the scope of LIS curricula will be broadened. With such extension, LIS professionals could be employed to work with various KM systems, for example, knowledge discovery systems (e.g., through the literature-based discovery method introduced by Swanson (2008), or through a text-mining application), knowledge capture systems (e.g., facilitating the building of databases of best practices and lessons learned), knowledge sharing systems (e.g., via Web 2.0 tools or by means of building expertise locator systems), or knowledge application systems (e.g., when developing case-based reasoning systems), besides using knowledge organization tools such as metadata, taxonomy, ontology, knowledge maps, and so on. The more LIS schools implement KM, the more experience and expertise we can gain as a community. This process can be more effective if we apply KM knowledge to this process: for example, we will create communities of practice for the implementation of KM in LIS school practice, share experiences and knowledge, and build databases of lessons learned and best practices with the help of those who have already started implementing KM. We find it important that librarians stay involved in all of these KM-related processes.

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