Shaping LIS Education for Blended Professionals in a Pluralist Information Environment: Global Reflections[1]

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Technological innovations have led to an increase in demand for information technology (IT) skills in contemporary library and information agencies. This in turn has created an increased need for pedagogical skills on the part of library and information science (LIS) professionals for them to empower users with knowledge and skills to navigate a complex digital information terrain. Hence LIS professionals with both technology and pedagogical skills have become increasingly critical in a digitized information environment. In the context of this confluence of knowledge and skills requirements for the LIS professional, this article draws early findings from a global phenomenological probe into curriculum design and development directed at the blended or hybrid LIS professional located in a pluralist information environment and requiring cross-disciplinary competencies spanning LIS, IT, teaching and learning, and perhaps even other cognate areas. It explores, in this context, challenges, ideas, and thinking in LIS education from preliminary empirical findings from parts of Africa, Asia, and South America (representing the Global South) and from parts of Europe and North America (representing the Global North), with a view to stimulating debate and discourse on the repositioning of the LIS discipline toward staking an intellectual claim on the broadening of its disciplinary space resulting from a natural evolution of the LIS discipline in response to a technology-driven information environment. Shank and Bell's concepts of "disruptive innovations" and the blending of traditional librarian skills with information technology and pedagogical skills, together with Corrall's "content, conduit, and context" approach to educating for a pluralist digital information environment, are used to frame this reflection.

Keywords: digital information environment, LIS competencies, LIS curriculum design and development, LIS education, LIS knowledge and skills

KEY POINTS:

- A pluralist information environment requires a blend of traditional LIS knowledge and skills, IT, and pedagogical competencies in responding to "disruptive innovations" of digital information technologies.
- Irrespective of global location and local challenges, traditional LIS knowledge and skills are being reconceptualized with the use of new technologies.
- Despite evidence of the confluence of knowledge and skills requirements for the LIS professional involving traditional LIS competencies, IT, and teaching and learning knowledge and skills, the latter continues to remain "unstuck" in LIS education globally.

The subject of exploring learning in a global information context cannot ignore the controversial area of disciplinary identity and its implications for Library and Information Science (LIS) education, specifically LIS curriculum development. In my paper on transforming LIS education for professionals in a global information world (Raju, 2020), I used Andrew Abbott's (2001) chaos of disciplines theory to describe the LIS discipline in the following way. First, LIS is "a discipline that has a natural interstitial nature" (Raju, 2020, p. 344)—that is, like sociology, gender studies, and other interdisciplinary social sciences, LIS occupies spaces between (hence "interstitial") other disciplines and therefore is in regular conflict with disciplines such as

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information technology, information systems, computer science, and other cognate fields. Further, according to the chaos of disciplines theory (Abbott, 2001, pp. 5–6), such a discipline is in constant conflict with itself. It is therefore not surprising that LIS has a somewhat beleaguered history, which is captured in the literature of, and continues to be subjected to, debates around its disciplinary identity. Nomenclature issues have been rampant. Is it "library science" or "librarianship" or "library studies" or "information science" or "information studies," or both "library and information science" (LIS)? Are the "L" and the "I" two sides of the same coin, or is one a sub-discipline of the other? Then there is also the question of the iField or iSchool concept and whether it represents a genuine paradigm shift from the discipline of LIS or is merely a symbolic move (Bonnici, Subramaniam, & Burnett, 2009; Chu, 2010; Golub, Hansson, & Selden, 2017; King, 2006; Mezick & Koenig, 2008). These questions or uncertainties, *inter alia*, reflect Abbott's chaos of disciplines theory playing itself out in the form of "the interstitial character of a discipline," which Abbott (2001, pp. 5–6) ascribes to a discipline that is "not very good at excluding things from itself" and has an inherent tendency to "acquire" topics and no "intellectually effective way" of denying them.

A second characteristic of the LIS discipline which I make reference to in Raju (2020), using Abbott's (2001, p. 15) chaos of disciplines theory, is that of "fractal distinctions in time." That is, a new context such as a digital information environment presents an "old idea" (for example, traditional cataloguing and classification/information organization) in new language and reconceptualized form, for example, metadata management, research data management, digital curation, data science, open scholarship, and so on—a reflection of new information trends in a highly digitized, evolving, technology-driven global information environment. Traditional LIS knowledge and skills are being reconceptualized with the use of new technologies.

Both the "interstitial character" of the LIS discipline as well as its tendency for "fractal distinctions in time" (Abbott, 2001, pp. 5, 10), which have been briefly described with reference to LIS disciplinary identity, have implications for LIS education globally. These disciplinary characteristics, in combination, have resulted in what Corrall (2010, n.p.), in another context, aptly describes as a "blurring of boundaries between professions and the growth in hybrid and blended information-based roles" in "complex pluralist information environments awaiting our graduates." This resonates with Shank and Bell's (2011) conceptualization of the librarian blending the traditional skills of librarianship with the information technologist's hardware and software skills, and the educational designer's capacity to apply technology to teaching and learning. In a context of this confluence of knowledge and skills requirements for the LIS professional, this article draws early findings from a global phenomenological probe into curriculum development directed at the blended or hybrid LIS professional, located in a pluralist information environment and requiring cross-disciplinary competencies spanning library and information science, information technology, teaching and learning, and various other cognate areas.

Conceptual framing

Shank and Bell (2011, p. 105), from a professional practice perspective, suggested a blended librarian conceptualization in a context of ubiquitous application of technologically enabled innovations for information access and dissemination, resulting from what they termed

"disruptive innovations" such as "new computing technologies." For them, the concept of blended librarianship is guided by the "principle that librarians can and should be integral, educational partners as well as a catalyst for students' knowledge enrichment and intellectual enquiry" (p. 106). Hence they define a blended librarian as a "librarian who combines the traditional skill set of librarianship with the information technologist's hardware/software skills, and the instructional or educational designer's ability to apply technology appropriately in the teaching-learning process" (Bell & Shank, 2004, p. 373; Shank & Bell, 2011, p. 107).

Resonating with the Shank and Bell (2011) concept, Corrall (2010), but from the perspective of education for librarians as blended professionals, adopts a "content, conduit, and context" approach. For LIS education, she suggests hybridization of the competencies of an information professional, such as the academic librarian (a content professional) with that of an IT (infrastructure/conduit) professional and the teaching and learning/pedagogical professional working in different disciplinary domains (context) (Corrall, 2010, n.p.).

This article uses:

1. Shank and Bell's (2011, pp. 105–106) critical concepts of "disruptive innovations" in the form of technological innovations, and the blending of traditional librarian skills with information technology and pedagogical skills, together with
2. Corrall's (2010) "content, conduit, and context" approach to educating for a pluralist/interdisciplinary/interstitial digital information environment that requires a hybridization of competencies in the professional preparation of the LIS graduate,

to frame its reflection on global perspectives, based on early findings from a probe into curriculum development directed at the blended or hybrid LIS professional located in a pluralist information environment that requires cross-disciplinary competencies spanning multiple disciplines; and the implications of this for the shape of future LIS education.

The literature

The aggregated demand for LIS, IT, and teaching and learning knowledge and skills on the part of LIS professionals (or what Corral, 2010, refers to as a hybridization of competencies) is richly captured in the literature.

"Disruptive innovations" (Shank & Bell, 2011, p. 105) have led to an increase in demand for IT skills in contemporary library and information environments. Studies globally (for example, Baro & Godfrey, 2015; Henry, 2015; Maceli & Burke, 2016; Mathews & Par due, 2009; Musangi, 2015; Raju, 2017a; Riley-Huff & Rholes, 2011; Saunders, 2015, 2019; Shongwe, 2015) make reference to the influence of IT knowledge and skills on library and information services (LIS services), many of which are traditional library services now being delivered with the use of evolving digital technologies. Shongwe (2015, p. 202), in a South African study of newspaper LIS job advertisements, found that complex IT systems are being used to process information, and hence libraries "are actively recruiting personnel who are skilled in IT." Skills being sought, according to Shongwe, include web development, computer networking, institutional repository development, and database design and development. Mathews and Pardue (2009, p. 250) found a need for web development, systems

development, and systems application in librarian positions in a content analysis study of a sample of 100 job advertisements in the United States. They observed that "librarians are incorporating a significant subset of IT professionals' skill sets" and reported a "significant intersection between the skill sets of librarians and the skill sets of IT professionals" with 72% of the 100 librarian job advertisements analysed requiring at least one IT skill (pp. 255–256). This trend is confirmed in my 2017 study of almost 100 academic library professional positions in South Africa, in which I also found that 70% to 75% of these job advertisements "stipulate requirements for advanced IT skills" (Raju, 2017a, p. 753). Saunders (2015, p. 427) explains in her study that technology-driven transformation in the LIS field has resulted in the restructuring of traditional LIS jobs and in the development of new roles and responsibilities that require "a host of different skills and competencies." The latter is further emphasized in Maceli and Burke's (2016, p. 35) study on technology skills in the LIS workplace, in a context in which "information technology serves as an essential tool for today's information professional"; interestingly, in this study coding and programming "topped the list of most-desired technology skill to learn."

"Disruptive innovations" in the form of rapidly evolving IT impacting LIS services have, in turn, created a need for pedagogical skills. Shank (2006, p. 516), in a job advertisement study, observed that the "increase in the number of library position announcements requiring IT skills over the past several decades is mirrored by an increase in job ads that seek instruction skills." He found that these instructional positions included some of the more traditional roles of academic librarians, such as reference work, user instruction, and collection development, but also included new "roles of both instructional designer and instructional [or educational] technologist" (p. 515). Shank's study concluded that librarians with both technology and pedagogical skills are critical to a digitized library environment, thus highlighting "blended" or "hybrid" professional roles in a "pluralist" information environment (referred to by Corrall, 2010)—one requiring knowledge and skill sets from multiple disciplinary domains (LIS, IT, and teaching and learning). Shortly after Shank's study, Miller (2007, pp. 202, 207) researched "blending . . . educational technology" into twenty-first-century librarianship and found that LIS professional preparation needs to develop pedagogical knowledge and skills in teaching the use of technology in order to empower the end user of information to navigate the complex digital information terrain. Walter's (2008) study emphasized that sound pedagogical foundations in teaching and learning in the professional preparation of especially academic librarians are required. This is confirmed in a 2017 study in which I identify key pedagogical knowledge and skills required for the academic librarian to fulfil a teaching role (Raju, 2017b). These include assessment of student learning, classroom management, designing learning material, educational technology, instructional design, lesson planning, online instruction, pedagogical and learning theory and styles, and reflective practice/critical reflection on teaching.

The literature, however, also reflects a disconnect over the years between the increasing importance of pedagogical knowledge and skills in LIS services and the response from LIS schools globally to this knowledge and skills demand. Saunders (2015, p. 427) usefully points out that "as libraries evolve and innovate to keep pace with transformations in the field, it is incumbent on library schools to ensure that they are developing curricula

that effectively prepare graduates for the workplace." However, Davies-Hoffman, Alvarez, Costello, and Emerson (2013, p. 9) point out that despite criticisms in the literature "for over thirty years," there has been a "lack of pedagogical training for new librarians." This lack persisted despite the growing importance of information literacy (Davies-Hoffman et al., 2013, p. 9) and a complex digital environment, which, according to Westbrock and Fabian (2010, p. 569), requires, for example, academic librarians to teach students the skills necessary "to navigate, understand and assess this vast world of information." As far back as 2007, Miller (2007, p. 207) criticized LIS schools for their over-emphasis on IT skills but their neglect of instructional design and teaching and learning theories, arguing that "understanding of new 'pedagogical technology' is critical." The literature also shows evidence of attention to IT coverage by LIS schools. For example, a literature review study by Wyman and Imamverdiyev (2018, p. 221) covering LIS programs from both developed and the developing world countries reports that, "globally, LIS programs . . . have made extraordinary changes due . . . to the phenomenon of the internet and the use of various mobile devices." Yet LIS professionals have largely had to resort to continuing professional development (CPD) to prepare themselves for teaching roles increasingly thrust upon them, especially in a technology-driven higher-education information environment (Hall, 2013; Hensley, 2015; Walter, 2008; Westbrock & Fabian, 2010). Davies-Hoffman et al. (2013), provide evidence from global studies of how infrequently pedagogical training is offered in LIS schools as a required core course; it is often embedded as a minor inclusion in a broader reference services course, and in instances where there has been growth in instruction courses, these have largely been electives. Most librarians provide some degree of teaching, be it to students, in training fellow librarians, or in the "development of online learning modules for remote library users" (Turner, 2016, p. 477). Despite this pedagogical need, the literature continues to lament the lack of pedagogical education in the professional preparation of LIS graduates (Goodsett & Koziura, 2016, p. 702; Turner, 2016, p. 477).

The literature makes clear the need for a blend of traditional LIS knowledge and skills, IT, and pedagogical competencies in response to the "disruptive innovations" of digital information technologies, as conceptualized by Shank and Bell (2011, p. 105), in a pluralist information environment referred to by Corrall (2010). Hence it would be useful to glimpse early findings from a global phenomenological probe into curriculum development directed at the blended or hybrid LIS professional located in a pluralist information environment, and into who requires cross-disciplinary competencies involving LIS, IT, and teaching and learning.

A global phenomenological probe

These early findings emanate from a three-year (2018–2020) South African National Research Foundation (NRF)–funded project aimed at producing a curriculum statement that is relevant for the professional preparation by LIS schools of the academic librarian in South Africa practising in a pluralist information environment (as outlined earlier). An earlier baseline study on academic librarian competencies in the digital age (Raju, 2017b) made the methodological recommendation that a fuller picture of the professional preparation of the modern academic librarian by LIS schools in South Africa requires a detailed study of course descriptions of LIS professional programs and interviews with LIS schools. That

is, personal narratives, or what Creswell and Creswell (2018, p. 13) refer to as the "essence of the experiences" of LIS professional practitioners and LIS educators experiencing the "phenomenon" under study, would be useful. Hence this research adopted a qualitative approach, a phenomenological research design, and interviews and document reviews as research methods within a conceptual framework formed by Bell and Shank's (Bell & Shank, 2004; Shank & Bell, 2011) conceptualization of the blended librarian and adapting Corrall's (2010) Sheffield model of blended or hybrid information professionals involving "content, conduit and context."

In a phenomenological research design, "the researcher describes the lived experiences of individuals about a phenomenon as described by the participants . . . and typically involves conducting interviews" (Creswell & Cresswell, 2018, p.13). For the purposes of these interviews, the study purposively sampled (based on the "judgement of a researcher" regarding particular characteristics that are of interest to the researcher [Bless, Higson-Smith, & Sithole 2013, p. 172]) five of the eight active LIS schools in South Africa as research sites for interviews and document review. Rather than including all eight schools (which might result in replication of data), the study, for the purposes of international benchmarking, supplemented the purposive selection of these five South African LIS schools with at least two LIS schools from the Global North (United States and/or Europe), two from Asia, and two from elsewhere in Africa (north of South Africa). In each of the purposively selected LIS schools, the intention was to interview a senior academic involved in curriculum design and development as well as at least two academic librarians from the institution in which the LIS school is located. This, together with content analysis of course descriptions of LIS professional programs in these LIS schools, were considered appropriate to provide the study with rich data to address its primary objective of producing a curriculum statement that is relevant for the professional preparation by LIS schools of the academic librarian in South Africa practising in a pluralist information environment. At the time of the preparation of this article (September 2019), the NRF-funded project was at its mid-term point, with a further 18 months still to go and further data collection still to take place.

In preparation for the ALISE 2019 keynote address (on which this article is based), and cognizant of ALISE's aspiration for "global" reach reflected in the theme of its conference ("Exploring learning in a global information context"), I deviated somewhat from the planned research sample and attempted a small measure of data collection from across the globe. In the time available in the run-up to the conference, as well as being sensitive to the time constraints of the respondents approached, I elicited responses (15 LIS educators and 23 academic librarians) from the following parts of the world, with an obvious emphasis on South Africa and elsewhere in Africa, as this is the location of the research (see Figure 1).

All three data-collection instruments (a semi-structured interview schedule for selected LIS educators from identified LIS schools, a semi-structured interview schedule for selected academic librarians from identified universities, and a document-review protocol for identified LIS schools) were triangulated during the design of the instruments for the purposes of confirming the data collected in order to enhance the "trustworthiness" of analysis and findings (Miles, Huberman, & Saldaña, 2014, p. 299). The document-review aspect

Figure 1: Map showing data-collection sources (by country)

of the study, at the time of preparation of this article, had not yet begun and is therefore not included. In most instances, the geographic distribution of the respondents across the globe precluded the ideal option of a one-on-one interview, so email communication of the set of questions was resorted to. Framed by Bell and Shank's (Bell & Shank, 2004; Shank & Bell, 2011) conceptualization of the blended librarian and Corrall's (2010) hybrid/blended competency requirements in a pluralist information environment, the interview schedules probed issues relating to traditional librarianship knowledge and skills, IT knowledge and skills, and teaching and learning knowledge and skills from the perspectives of both LIS educators and practising LIS professionals. In the design of the instruments, there was a particular emphasis on how these categories of knowledge and skills interfaced with each other in an age of "disruptive innovations" emanating from technology advances.

What follows are some reflections on global perspectives based on selected early findings from this study.

Global reflections

Thematic content analysis (Neuendorf, 2017, p. 45) allowed the researcher to extract the "essence" of curricular "experiences" (Creswell & Creswell, 2018, p. 13) from the responses of LIS educators (n = 15) and practising academic librarians (n = 23) and to capture them by question on Excel spreadsheets for the purposes of comparison and ascertaining trends and patterns. The narratives revealed interesting findings that spoke to issues of confluence of knowledge and skills requirements for the LIS professional who requires cross-disciplinary competencies spanning LIS, IT, and teaching and learning. Findings that relate to the theme of this paper are highlighted.

Traditional librarianship knowledge and skills

In light of clear indications from the literature of the need in the LIS discipline for a blend of traditional LIS knowledge and skills, IT, and pedagogical competencies, it was important to ask both LIS educators and LIS professional practitioners (in the case of this research, academic librarians) to identify traditional librarianship knowledge and skills in their professional preparation program offerings and education, respectively. Responses from both sets of globally spread respondents are reflected in the word cloud captured in Figure 2, with "cataloguing" and "classification" not surprisingly dominating the word cloud, as these represent very much the basis of the LIS services profession (Lazarinis, 2015). The extent of the presence of traditional librarianship competencies acknowledged by both LIS educators and practitioners is also notable; in the current digital age, these are being presented in reconceptualized forms (Abbott, 2001) and in new roles and responsibilities requiring new skills and other competencies (Saunders, 2015).

When asked to what extent these traditional librarianship knowledge and skills are being (in the case of LIS educators) or were (in the case of LIS professional practitioners) taught with the adoption of the latest technology, responses included "To a great extent"; "We attempt to blend IT in all teaching"; "Many activities where traditional skills are integrated with technology"; "We try and keep up-to-date"; "Technology is deeply embedded in all classes, traditional or otherwise"; "Yes, our curriculum taught traditional librarianship knowledge and skills and mixed it with IT and catalogues standard"; and "The course

Figure 2: Traditional librarianship knowledge and skills

was up-to-date looking at the latest technology." These responses came from both Global North and Global South contexts. Many enthusiastically provided examples of the latest technology adopted in the teaching or practice of these knowledge and skills, for example, e-books, virtual reference, RDA toolkit, Web Dewey/classification or even "dial-up for Dialog," reflecting the technology of the time. The following were also acknowledged about the integration of technology with traditional librarianship knowledge and skills: "To a lesser extent; we rely heavily on print resources for classification and cataloguing, however, we are slowly shifting our focus to new metadata standards"; "Curriculum is being reviewed to incorporate emerging technologies"; "There was no technology [at the time] applied to the teaching of traditional librarianship knowledge and skills. Perhaps the library school did not have access to these resources"; "Minimum extent—only Library of Congress, cataloguing and indexing were taught with the adoption of technology"; and "Very little. The required technology course was very basic and did not include the adoption of recent technology". While many of these responses are a reflection of resource challenges in some parts of the developing world, surprisingly, the last mentioned emanated from the so-called developed world. Notwithstanding these challenges and for whatever reasons, reflected in each of these statements is intent at some stage for the integration of technology into traditional librarianship knowledge and skills, a trend reported in the literature (Baro & Godfrey, 2015; Henry, 2015; Maceli & Burke, 2016; Musangi, 2015; Raju, 2017a; Saunders, 2015; Shongwe, 2015), including that from the developing world. This also speaks to Abbott's (2001, p. 15) chaos of disciplines concept of "fractal distinctions in time," where a new context presents an old idea in new language and reconceptualized form—that is, traditional LIS knowledge and skills are being reconceptualized with the use of new technologies.

IT knowledge and skills

Both LIS educators and LIS professional practitioners/academic librarians were also asked to identify IT knowledge and skills in their professional preparation program offerings and education, respectively. Again, responses from both sets of globally spread respondents are reflected in a word cloud captured in Figure 3. As reflected in the literature reviewed by Wyman and Imamverdiyev (2018), IT has been enthusiastically embraced, including programming and coding, which are traditionally associated with computer science and related disciplines. This speaks to what Abbott (2001, pp. 5–6) referred to as "the interstitial character of a discipline" such as LIS, one that occupies spaces between other disciplines and is in regular conflict with cognate fields.

LIS educators were also asked who teaches IT knowledge and skills in their programs/departments/schools. In other words, is it a member of the LIS academic staff or is this teaching being serviced by a department from outside the LIS school? In view of implications for future LIS education (discussed below), the responses from Global North and Global South contexts were encouraging: "LIS members of staff (all hold PhDs) teach IT"; "It is important for us that LIS academics teach IT aspects as this needs to be contextualized in LIS. Hence LIS academics are encouraged to become as proficient as possible in the IT aspects of the LIS discipline . . . [we have] academic staff with work experience in IT and Masters in Information Systems"; "We hired an IT lecturer with a PhD specifically for such

Figure 3: IT knowledge and skills

a course unit . . . he has a PhD in Business Information Systems and has worked closely with library-related courses and fraternity"; "[IT is taught by] all [LIS] academic staff as appropriate within their subject specialities . . . several staff have specific IT qualifications in addition to their LIS qualifications"; "[IT is taught by] two members of academic staff from LIS . . . one is a graduate from Computer Engineering with a Masters in Information Science, the other is a graduate from our Information Science program with a Masters in Innovation Technology"; "[By] staff from the School with a background in IT . . . we have computer scientists, we also have someone with industry background (OCLC, Google, Facebook)." Of the 14 LIS educator responses (one was spoiled because the respondent did not respond to the correct instrument), only two indicated IT being taught by academics from the "Department of ICT" and "School of IT"; the rest indicated that it is being taught by staff from within the LIS program/department/school.

In view of the confluence of knowledge and skills requirements for the LIS professional who requires cross-disciplinary competencies for a pluralist information environment, academic librarians were asked if there were any IT knowledge and skills that their professional preparation degrees did not cover but which they would like to have seen covered for their subsequent roles as academic librarians. Figure 4 captures this is a word cloud, showing the dominance of computer programming and again demonstrating the "interstitial character" (Abbott, 2001, p. 5) of the LIS discipline. As mentioned already, Maceli and Burke's (2016, p. 35) study also showed that computer programming "topped the list of most-desired technology skill to learn" in the LIS workplace.

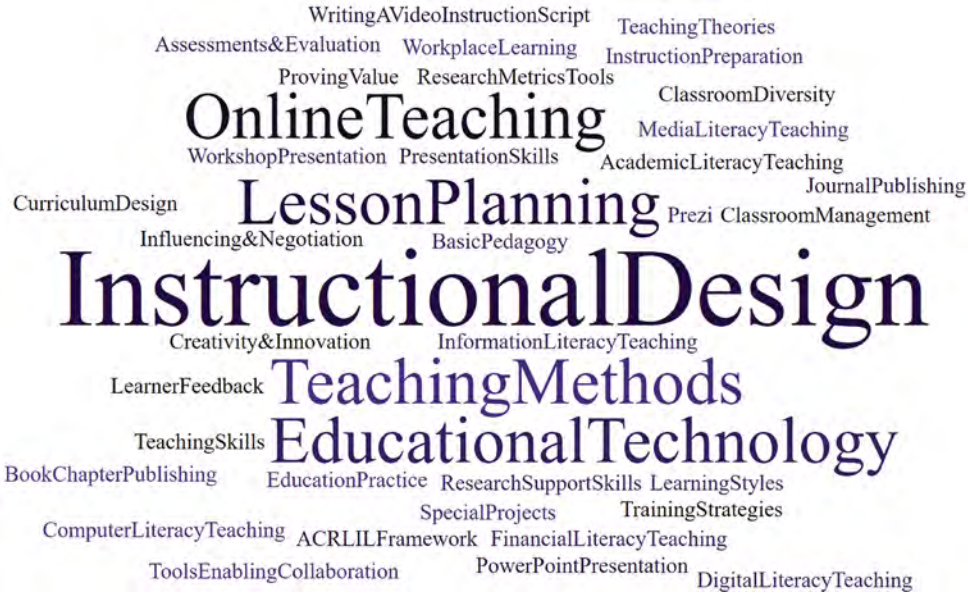

Figure 4: IT knowledge and skills preferred by academic librarians but not covered by LIS professional preparation degrees

Teaching and learning knowledge and skills

The literature indicates that "disruptive innovations" in the form of rapidly evolving IT impacting LIS services have created a need for pedagogical skills on the part of LIS professionals (Miller, 2007; Raju, 2017b; Shank, 2006; Turner, 2016; Walter, 2008; Westbrock & Fabian, 2010). The literature also captures a disconnect between the increasing importance of pedagogical knowledge and skills in LIS services and the response from LIS schools globally to this knowledge and skills demand (Davies-Hoffman et al., 2013; Goodsell & Koziura, 2016; Hensley, 2015; Miller, 2007; Walter, 2008; Wyman & Imamverdiyev, 2018). Hence LIS educators were asked what teaching and learning knowledge and skills their professional preparation programs cover. In keeping with what is reflected in the literature, responses from the 14 LIS educators across the globe revealed what Miller (2007, p. 207) described as an "over-emphasis," on the part of LIS schools, on IT skills but a neglect of instructional design and teaching and learning theories. In this study, this question was either not responded to or furnished with a vague response around information literacy and instruction without detailing precise teaching and learning knowledge and skills. In one instance there was a categorical "none" to teaching and learning knowledge and skills. Only in two (one a Global North school and the other a Global South school) out of 14 LIS educator responses were teaching and learning competencies itemized, albeit not at a professional preparation level but at the Master's specialization level. In the case of the one

LIS school, this included "Critical thinking skills; curriculum design; delivery and evaluation; pedagogical theory and its application to LIS education and training; teaching and learning methods pertinent to information and other literacies; structuring, planning and delivering a lesson in both face-to-face and online teaching environments; assessment and evaluation." In response to the question about who teaches this knowledge and skills set in the respondent's school and what the person's qualifications are, the response was "Taught by a LIS academic (with a PhD) who is growing T&L as an area of expertise. [It is] important to build this knowledge and skills expertise within the department and not have it serviced by Education. T&L in LIS is very context based." In the case of the second LIS school with teaching and learning at the Master's specialization level, the content response was "Learning theories; learning styles; learning evaluation and constructivist and connectivist methods." With respect to teaching, the response was that "all LIS teachers [are] involved in the module—none external."

The practising professionals were asked what teaching and learning knowledge and skills their professional training degrees covered. The responses confirmed the general lack of attention to this area, reflected in the literature mentioned earlier as well as in the responses of LIS educators in this study. Multiple responses indicated "None." Others remarked "Nothing/Very basic background" or "Very little." Some did not respond, and this is possibly an indication of there being nothing to report. Yet others provided generic responses such as these: "Training skills to assist students to develop search strategies"; "Teaching users to adequately identify, locate, evaluate and use information resources"; "Information literacy training"; "Communication and interpersonal communication for reference librarians"; "Reference interview skills"; "Research skills"; "PowerPoint presentation skills." Only one academic librarian of the 23 made reference to having being exposed to "Theories about learning and different learning styles" during professional preparation. Another mentioned encountering a Master's (specialization) module "on teaching and learning theories; information literacy; practical suggestions for learning activities." Two interesting responses from the developing world were the following:

> "I think the reference interview might be the only part which was covered which relates to teaching. Otherwise, I believe the professional degree did not adequately prepare me for the teaching roles in my job."
>
> "My undergraduate degree introduced me to psychology, philosophy and sociology of education; through these I learnt learning and teaching styles, andragogical and pedagogical skills, communication and analytical skills as well as testing and measurement."

The following response came from a Global North context:

> "Very little in my course covered teaching and learning knowledge; this was mainly covered with on-the-job training and from matching learning objectives to the lesson plan, preparing activities and creating an engaged classroom."

On the whole, it would seem that, globally, LIS schools are not embracing teaching and learning knowledge and skills in their professional preparation of LIS graduates to the same

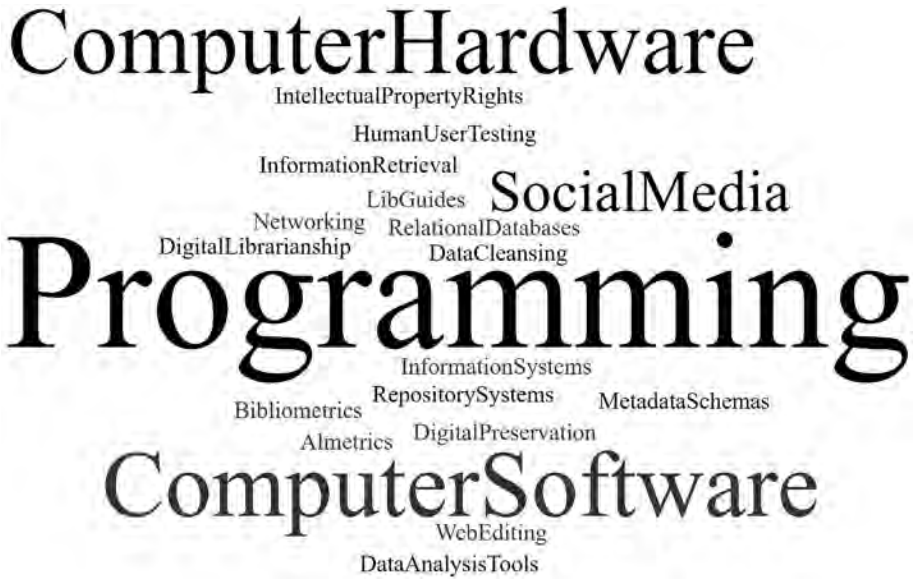

Figure 5: Teaching & learning knowledge and skills which academic librarians would like to see covered in their professional preparation degrees

extent as they are with IT knowledge and skills, despite the connection between the two knowledge and skills sets in LIS professional practice (Shank, 2006, p. 516)

Academic librarians were asked if there were any teaching and learning knowledge skills that their professional preparation degree did not cover but that they would like to have seen covered to better prepare them for their subsequent roles as academic librarians. Figure 5, which captures their responses, indicates the need for pedagogical skills in the academic library workplace.

Implications for the shape of future LIS education

The study being reported in this article is a continuing one. At the time of preparation of the article, more data collection was still to take place, course descriptions linked to URLs provided by respondents were still to be studied, and more phenomenological observations from early findings were still to be made. However, what has been highlighted in these early findings has implications for the shape of future LIS education.

There are clear indications from the literature of the need for a blend of traditional LIS knowledge and skills, IT, and pedagogical competencies in response to the "disruptive innovations" of digital information technologies, as conceptualized by Shank and Bell (2011, p. 105), in a pluralist information environment referred to by Corrall (2010). This is supported by early findings from a global probe based on a research project aimed at producing a curriculum statement that is relevant for the professional preparation by LIS schools of professionals practising in a pluralistic information environment. Irrespective of

global location and local challenges, and albeit done to different extents for various reasons, the findings reported provide evidence of integration of technology into traditional LIS knowledge and skills and thereby lend credence to Abbott's (2001, p. 15) concept of "fractal distinctions in time," where traditional LIS knowledge and skills are being reconceptualized with the use of new technologies.

Not coincidentally, then, the word clouds presented in Figures 3 and 4 show signs of the LIS discipline's encroachment into other disciplinary spaces (information technology, computer science, information systems) which, according to Abbott's (2001, pp. 5–6) chaos of disciplines concept, is a natural tendency for a discipline such as LIS, which has an "interstitial character." This presents LIS education with an opportunity to stake an intellectual claim on this technology-driven extension of the LIS disciplinary domain, a point I have previously made (Raju, 2017a, 2020). Once again, I caution that if the LIS discipline does not reposition itself epistemologically to stake this intellectual claim, "then other 'interstitially'-oriented and better established disciplines [because of their clearer disciplinary identities] are likely to move into the LIS domain to fulfil this function" (Raju, 2020, p. 15). Perhaps unknowingly, this repositioning is already happening to some extent, with signs emerging in the way in which all but two LIS schools in these early findings report that the teaching of IT knowledge and skills is being done from within the LIS schools rather than being outsourced to IT departments. This means that required IT is being contextualized into LIS disciplinary specialities and is not being taught separately as a serviced "add on." These early findings also show signs, in both Global North and Global South contexts, of LIS academics making efforts to "become as proficient as possible in the IT aspects of the LIS discipline," with LIS academics adding IT-related qualifications to their LIS qualifications. Some LIS schools have been hiring academics with IT and related qualifications but with working associations with LIS-related courses and fraternity. LIS schools have also targeted individuals with IT industry background to strengthen IT proficiency within the school and decrease dependence on "outside" sources for teaching IT knowledge and skills. These attempts at embedding the teaching of IT knowledge and skills within LIS programs are encouraging efforts toward staking an intellectual claim on the technology-driven extension of the LIS disciplinary domain.

The same, however, cannot be said of teaching and learning skills. Despite evidence in the literature of the confluence of knowledge and skills requirements for the LIS professional involving traditional LIS competencies, IT, and teaching and learning knowledge and skills, the latter, as evidenced in these early findings, continues to remain "unstuck," globally. Yet, as pointed out by Turner (2016), most LIS professionals are involved in some form of teaching, for example, instruction to students, training of fellow LIS professionals, or developing online learning instruction for remote users. Where serious instructional design and teaching and learning theories have occurred, this has been at the specialization level, as revealed both in the literature (Davies-Hoffman et al., 2013) and in the findings cited earlier, and not at the professional preparation level. As long as this continues, the triangulation of traditional LIS knowledge and skills, IT, and pedagogical competencies in response to the 'disruptive innovations' of digital information technologies in a pluralist

information environment will remain incomplete and affect how adequately LIS education responds to multiple competency requirements from pluralist information sites of professional practice.

Conclusion

I opened this article on the controversial note of disciplinary identity and made reference to the LIS discipline's beleaguered history, as captured in the literature on the matter of questions and uncertainties around its own identity and nomenclature choices. I have contextualized this vulnerability in terms of a natural "interstitial character" (Abbott, 2001, p. 15) of disciplines such as LIS. The LIS discipline is in a position to grasp the opportunity presented by this inherent characteristic in order to reposition itself epistemologically by staking an intellectual claim on the broadening of its disciplinary space triggered by "disruptive innovations" (Shank & Bell, 2011, p. 105) in an evolving technology-driven information environment and thus effecting a natural evolution of the LIS discipline—one where traditional knowledge and skills have been reconceptualized for the digital era (as evident in the empirical aspect of this study). As scholars, educators, students and professional practitioners, we have a role to play in this epistemological repositioning and the way in which it shapes future LIS education directed at blended professionals in a pluralist information environment.

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Note

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