

Attitudes and Perceptions Towards Design Thinking in Graduate Level Library Education

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Abstract

This study aims to understand educators'--specifically those in positions of authority in graduate level library education programs--perceptions of and attitudes towards design thinking and methods in graduate level library curricula by investigating the following research questions: What is the current landscape for the integration of design into the LIS curriculum from the program director's perspective? What do these directors think about the competencies required for future librarians, and where does design fit into those competencies? What are the possibilities for a future degree focused on reconceptualizing the field from a design perspective rather than the traditional library science? We interviewed thirteen MLIS program directors and people in equivalent positions at ALA-accredited programs in the U.S. and Canada to investigate these queries. Our conversations suggest there is a growing openness to design education that may contribute to the diversification of the curriculum so that graduates' competencies more closely reflect recommendations in the literature and address the needs of employers. It also reveals dichotomies in how LIS program directors define and integrate design education into LIS curricula, such as barriers of bureaucratic concerns versus interest in experimenting with design courses available elsewhere in their universities or even the potential for a dual library science/library design degree option. We conclude with recommendations for next steps in advancing design in library education so as to prepare graduates for the growing number of user experience, public programming or even more traditional teaching librarian positions where a design thinking approach leads to effective practice.

Keywords: design thinking; design; curriculum; LIS education

In the 21st century, future librarians increasingly require new skill sets beyond what has been traditionally taught in master's level library education (e.g., MLIS and equivalent) programs. Numerous studies have shown that in addition to knowledge of field-specific content, skills such as communication, innovation, flexibility, adaptability, creativity, collaboration, interpersonal interaction, and problem-solving are necessary for success (Bertot, Sarin and Purcell 2015,

Partridge, Lee and Munro 2010, Partridge, Menzies, Lee and Munro 2010, Saunders 2012, Saunders 2015, Saunders 2019). A growing body of work posits that educational opportunities informed by design can support library professionals' mastery of these skills to improve their ability to address community needs (e.g. Clarke, Amonkar & Rosenblad 2019; Clarke 2020a). Concurrently, the increasing incorporation of design content into MLIS programs points to a growth in interest among LIS educators in design as curricular subject matter.

As part of a larger research agenda about integrating design education into master's level library education, this study aims to understand educators'—specifically those in positions of authority in graduate level library education programs—perceptions of and attitudes towards design thinking and methods in graduate level library curricula by investigating the following research questions: What is the current landscape for the integration of design into the LIS curriculum from the program director's perspective? What do these directors think about the competencies required for future librarians and where does design fit into those competencies? What are the possibilities for a future degree focused on reconceptualizing the field from a design perspective rather than the traditional library science? We interviewed MLIS program directors and people in equivalent positions at ALA-accredited programs in the U.S. and Canada to investigate these queries and identify themes, trends, potential opportunities and possible challenges.

The intended outcome of this research project is to provide LIS program directors, along with deans and other key decision makers, a better sense of the growth potential for integrating design into the curriculum. Based on the perceptions, attitudes and observations of the interview participants, we hope leaders in this space will be better positioned to grasp the landscape of design thinking and where it might fit into the LIS curriculum.

Literature Review

What is design thinking?

Despite the surge of recent interest implying that design is the new hip thing, design thinking is not a new concept. In the 1960s, Herbert Simon first proposed that design constituted a unique way of thinking (Simon 1969). L. Bruce Archer (1965) is generally recognized as the first person to use the phrase “design thinking” to describe this alternative mindset. Archer and other researchers and theorists since then have studied designers across various settings—architecture, fashion design, graphic design, engineering, software development, and more—to understand both the thought processes and actions that underlie design work (e.g. Cross 1982, 2011; Lawson 1980; Rowe 1987; Schön 1983). This scholarship culminates in a unique

epistemological worldview and an accordant process of activities and methods that reflect and support that worldview (Clarke 2018).

Recent years have seen an explosion of interest in this worldview and process. While such popularity means that many people have heard of and are familiar with the terms, it may also cause confusion as various understandings and definitions are bandied about. There are almost as many ways as describing the design thinking process as there are design fields that incorporate the principles into practice. In the most basic sense, the process consists of defining a problem and then implementing a solution. While there are many models and processes in the world that can be used to solve problems, what separates the design thinking process from these other approaches is the movement through multiple phases that are grounded in the main tenets of the design way of thinking. These phases have been outlined by various major design firms and sources of design thinking instruction. While the phases in each of these sources can be given various names or grouped and organized differently, it's easy to see clear commonalities (see table 1).

Table 1. Organization and names of phases in the design thinking process from various sources. From Clarke (2020b).

IDEO U design thinking course	gather inspiration		generate ideas	make ideas tangible		share the story
Design Thinking for Educators (IDEO)	discovery	interpretation	ideation	experimentation	evolution	
Design Thinking for Libraries Toolkit	inspiration		ideation			implementation
Stanford d.school	empathize	define	ideate	prototype	test	
Henry Ford Learning Institute	empathy	define	ideate	prototype	feedback & reflect	
Design Council Double Diamond	discovery	define		develop		deliver
Nielsen Norman Group	understand		explore		materialize	
	empathize	define	ideate	prototype	test	implement

While different explanations of design thinking may contain more or less steps in the process, a clear pattern emerges:

- 1) Some kind of empathetic discovery
- 2) Some kind of problem definition
- 3) Some kind of idea generation
- 4) Some kind of creation
- 5) Some kind of evaluation (Clarke 2020b).

These stages form a cyclical, iterative process that allows for reflection on previous work and continual, ongoing improvement (see Figure 1 for one of many visual examples of this process). Designers are not beholden to follow this process in a linear fashion, but rather jump back and forth among these phases throughout their work (Darke 1979) making this iterative mindset core to the design thinking process and resulting in arguably better solutions to problems. This robust body of scholarship about design and designers has enabled designers to become more intentional about their design processes, and to purposefully apply elements of design thinking to their work. One famous example is the design firm IDEO, which is known for exposing a whole new non-design audience to the principles and processes of design thinking. David Kelley, one of IDEO's founders, found it challenging to explain this new design approach to people, so he drew on the phrase "design thinking" to explain it, bringing the phrase into the popular zeitgeist (Brown and Katz 2009).



Figure 1. A visual representation of the design thinking process. Created by Sarah Gibbons, Nielsen Norman Group, <https://www.nngroup.com/articles/design-thinking/>

Design thinking has gone on to be used in a variety of settings outside of traditional design work. By 2001, IDEO was increasingly engaging in projects that were outside the scope of traditional tangible products, such as restructuring the organization of a healthcare foundation, helping a 100-year-old manufacturing company better understand its clients, and creating alternative school learning environments beyond traditional classrooms (Brown and Wyatt 2010). Other organizations, such as Proctor and Gamble, Kaiser Permanente and Costco, have recognized this shift from looks and usability of physical products to intangible experiences, and now apply design thinking to strategic planning, business models, and organizational structures and processes (Leavy 2010; 2012). These organizations that have embraced design thinking and methods have been shown to do better financially than their less design-conscious competitors (Guterman 2009). In addition to corporations, design thinking is increasingly applied to work toward the greater social good in settings like healthcare, charitable foundations, social innovation start-ups, national governments, and elementary schools.

Design and librarianship

While various design approaches have been utilized in information science and specifically librarianship, these approaches have not always reflected the contemporary view of design thinking described above. Numerous projects in the areas of information retrieval and digital libraries surely may be considered design projects as they create new products. Knowledge organization, especially the development of controlled vocabularies, is well known for aligning with design concepts and principles in the creation of thesauri, indexes, and other similar products (e.g. Svenonius 1986, 1989; Weedman 2004a; 2004b; 2010). However, these approaches reflect the epistemological view of *design science*; that is, a historical view of design in which researchers attempted to understand the creative design process from a rational scientific point of view (Cross 2001). Such scientific understandings of design pervade information science and specifically librarianship (Clarke 2016). However, such understandings have not kept pace with scholarship from the design field itself, which rests on a body of work refuting the scientific understanding of design (e.g. Cross 2011). Design differs from science in that science concerns itself with observing and describing the existing natural world with the goal of replicability and prediction, while design centers on the artificial world: objects created by humans to institute change and solve problems (Clarke 2016; 2018).

This contemporary understanding of design is slowly making its way into librarianship. Libraries are seeing an increase in the intentional, explicit application of design thinking and methods. A common example is architecture and interior design, in which design thinking is used to construct or reconceive library spaces, such as the remodeling project at the John A. Prior Health Sciences Library at Ohio State University (Bradigan and Rodman 2008). After observing library usage patterns and collecting direct feedback via informal surveys and oral and written suggestions, the team brainstormed a variety of proposed solutions before implementing a single service point—the ASK desk, which served as a one-stop shop for information, circulation, and computing services. Other examples include the University of Technology Sydney, where a team used the design thinking process to improve signage and wayfinding (Luca and Narayan 2016) and Chicago Public Library’s Bezazian Branch, where a team of library staff and design professionals used the design thinking process to create a new co-working space (Schwartz and Miller 2014).

In addition to architecture and space planning, design thinking is increasingly seen as relevant to other areas of librarianship. Bell and Shank (2007) were some of the first to explicitly discuss applying design approaches to the context of instructional design in academic librarianship. While much of the literature on instructional design portrays it as a kind of science (e.g. Merrill et al. 1996; Wagner 2011), Bell and Shank discuss the ADDIE model of instructional design and how its five phases—analysis, design, development, implementation, and evaluation—reflect a design approach. Booth (2011) also explicitly outlines the use of design thinking for

instructional design in librarianship, emphasizing the reflective elements of design. In fact, Bell emphasizes that design thinking should be used to improve not just physical space and instructional design, but all library practices and services. At Temple University, Bell draws on design thinking to improve all manner of library experiences, everything from reducing the amount of time students wait for printing to branding and marketing the library across campus (Bell 2011). Projects like the eXtensible Catalog at the University of Rochester used design methods to understand what patrons really wanted from their libraries. Knowledge gleaned from design sessions revealed that students work with a variety of materials and sources, which led to the creation of a new metadata schema that allowed records for materials of various formats to be united together into one collection and seamless user interface, enabling students to search one location rather than multiple silos (Foster 2011). Other examples of library user experiences improved with design thinking include data management at Oklahoma State University (Ippoliti 2016), and transfer student relations at the University of Washington (Whang et al. 2017). Such approaches are not limited to academic libraries. The Chicago Public Library is well-known for using design thinking techniques for more than just architectural projects, everything from programming ideas to staff hires (Schwartz 2013). A recent survey of practicing librarians and library workers found that many consider design thinking to be highly relevant to their work, especially those working in traditionally user-facing services (Clarke, Amonkar & Rosenblad 2019).

For each of these examples of explicit application of design in librarianship, there are many more implicit applications, where libraries and librarians use aspects of design methods and thinking without formal training or knowledge. For example, Clarke (2020a) shows how projects like the Tough Topics materials—posters and bookmarks listing sensitive subjects, such as abuse, depression, and sex, with their corresponding Dewey Decimal Classification numbers—harnessed key elements of the design thinking mindset and fundamental design methods and phases of the design thinking process, even though the project never explicitly referred to design thinking. Examples of the implicit use of design thinking occur throughout the history of librarianship in America, including projects like Poole's Index to Periodical Literature (Clarke 2019) and America's first library bookmobile (Clarke 2016; Clarke 2020a).

The need for design in LIS education

Given the increasing use of design thinking and methods in librarianship, there is a corresponding increasing need for education in those topics. Specific education in design thinking for librarianship has emerged in practical professional development settings, such as the well-known "Design Thinking For Libraries" toolkit (<http://designthinkingforlibraries.com>) created by the design firm IDEO in conjunction with the Chicago Public Library in the U.S. and Aarhus Public Libraries in Denmark. The freely available online toolkit offers librarians a step-

by-step guide to adopting design thinking as a staff-driven process for change. Other examples include Library Journal's Design Program, which in 2016 began to offer a design thinking workshop in conjunction with the Chicago Public Library, and grant-funded workshops about participatory design from the Council on Library and Information Resources (Council on Library and Information Resources 2012). Conference workshops such as "Pedagogical (Re)-vision: from Concept to Course" at the 2019 Association for Library and Information Science Education (ALISE) conference and "Design Thinking: Craft Powerful Stories About Your Library" at the 2019 OCLC Library Futures Conference are another form of professional education in this space. Additional offerings from major library networks like OCLC (https://www.youtube.com/watch?v=q_Np7hL68z8), Lyris (<https://www.lyris.org/content/Pages/Event-Details.aspx?Eid=B5DAE21E-A204-E911-80F1-00155DF5E41E>) and Amigos (<https://www.amigos.org/civcrm/event/info?reset=1&id=1287>) indicate a growing professional interest in design thinking topics and education. 37.5% of respondents to a recent survey said they had received some sort of education in design thinking, frequently mentioning professional development and conference workshops as the source (Clarke, Amonkar & Rosenblad 2019). The same survey reported that most people in a position to influence hiring to some capacity think that education in design thinking and methods should be required for library work.

An increasing interest in design thinking and methods can also be seen in formal education programs for librarianship (e.g. graduate level library degree programs such as the MLIS and equivalent). 95.17% of respondents to a recent survey were in favor of including design thinking and methods education in MLIS and equivalent programs (Clarke, Amonkar & Rosenblad 2019). A field scan of recent MLIS coursework identified only 4 stand-alone design thinking courses, that is, courses about design itself, rather than design as applied to a specific topic or function (Clarke 2020b). Of these four courses, two are considered "special topics" courses, meaning they are not permanent additions to the course catalog and have no guaranteed rotation. Three of the four courses specifically focused on design thinking, while the fourth is self-described as "students develop[ing] theoretical and practical skills for design" and "an introduction to design methodologies and theory" (Clarke 2020b, 16). Other courses that included design thinking only did so in the context of a specific topic, such as interaction design or user experience design. Although design is clearly woven throughout MLIS curricula, it still appears to be siloed and relegated into specific topics, contexts and domains. In an effort to discourage siloing and increase design education in librarianship, Clarke and Bell (2018) proposed a revolutionary re-envisioning of graduate level library education, arguing that the current MLIS degree should be reinvented as an "MLD": a masters of library design.

It is evident that design education is of increasing interest and relevance to library education, especially graduate level library education. There is interest from the professional community, interest on the part of instructors, even innovative curricular proposals. Yet a number of

barriers seem to exist to incorporating design into formal library education, including but not limited to conflicting definitions of design; lack of instructional expertise; administrative and organization limitations (including concerns about ALA accreditation); and lack of resources (Clarke, Mills & Potter 2019). To dig deeper into some of these concerns, we need to understand educators'--specifically those in positions of authority in graduate level library education programs--perceptions of and attitudes towards design thinking and methods in graduate level library curricula by investigating the following research questions: What is the current landscape for the integration of design into the LIS curriculum from the program director's perspective? What do these directors think about the competencies required for future librarians and where does design fit into those competencies? What are the possibilities for a future degree focused on reconceptualizing the field from a design perspective rather than the traditional library science?

Methodology

To investigate the proposed research questions, we sought to interview people currently employed as a dean, program director, or other head of an ALA-accredited graduate level library education program (e.g. MLIS or equivalent program). Although we use the term "director" throughout this paper to refer to the person in this role, we note that roles and titles varied across institutions. We collected name and contact information from people in this role from the staff directories of all (at the time) 60 ALA-accredited graduate level library education programs. We then reached out to all 60 potential participants directly via a personal email in the spring of 2018, inviting them to participate. All email contact information was accessed using publicly available resources.

We received 14 responses to our emails resulting in 13 interviews. Although we aimed to include diverse representation across programs (such as size of program, type of institution, etc.), representation was shaped by the people who self-selected to participate. 12 participants from the United States were from institutions in 8 different states; one participant was from Canada. Of the 12 US institutions, 4 were private schools and 8 were state public schools. 8 of the 13 institutions were members of the iSchools (iSchools.org). In addition to the 13 successful interviews, we received one additional response stating "design thinking is a scam" and asking us to refrain from further contact, a request we respected.

Each semi-structured interview included questions asking about participants' experience with design thinking and methods in their program's curricula and their thoughts regarding incorporating design thinking and methods into graduate level library education programs (the full list of questions is included in Appendix A). Interviews were conducted between May and August 2018. Each interview lasted approximately 45 minutes to an hour and each participant received a \$20 Amazon gift card for their time.

All interviews were conducted by phone and audio-recorded by the authors. The recordings were then transcribed for thematic analysis. Since this was not a theoretical study, but rather applied research to better understand the landscape of current practice, we did not engage a formal coding process. For the purposes of this investigation, we engaged in a basic inductive thematic analysis in which both authors reviewed all the transcripts independently and extracted themes and concepts that emerged from the interviews. The authors then compared their themes and identified themes held in common, those that were merged into new themes and then additional themes were identified from a joint review of the interview transcripts. These findings from interviews were iteratively sorted into groups uniting similar themes and concepts. Themes were then fleshed out through discussion among the authors before being summarized and presented in the following sections.

Conversations and Themes

When the authors began the interview process they did so with no preconceived notions as to how directors would respond to the formal interview questions or what differences could be expected among the different LIS programs represented in the respondent population. Even as interviews were conducted it became evident that certain themes emerged clearly from the conversations. For example, there was a clear distinction between interviews with directors from larger iSchool programs and those from smaller, less well-resourced programs. While the iSchool respondents expressed greater capability to conduct curricular experimentation the smaller programs expressed the need to exercise considerable caution in determining ways in which the curriculum might expand into new territory. Other themes were less evident from initial conversations. They were revealed only through the in depth analysis of the transcripts. For example, concerns about disrupting the status quo within the school curriculum or to the broader academic standards of library education were cited as a rationale for proceeding cautiously with design. That was somewhat unexpected. What follows are the significant themes, both anticipated and surprising, emerging from the conversations.

Those directors who agreed to participate in the interviews represented the variation in LIS programs, covering the spectrum from online programs to face-to-face ones, as well as a mix of the cutting edge and the traditional. While the directors come from different types of programs, there were multiple consistencies in their views of integrating design thinking into the curriculum. In general, while nearly all the program directors were agreeable in their enthusiasm about design thinking, both as a concept and for having potential as curricular content, they also expressed two consistent responses to the suggestion that design should be integrated into their course offerings. First, many of the interviewees pointed to some existing content in their curriculums that they believed covered design thinking. Second, they were consistent in their negative reaction to an alternate library science degree based primarily on design principles rather than the traditional social science framing of library education.

In our interviews we found that several additional themes emerged as the program directors shared their insights into, perspectives on and beliefs about how design might potentially fit into the future of library education. We discuss each of these themes in the following sections.

Skills Needed by Future Students

To better understand what our interviewees thought about general skills needed by their students, looking ahead to the short and long-term future, we asked the directors to describe the skills their programs emphasized in the curriculum. There was a fair amount of commonality among the responses with program directors sharing a mix of skills specific to the information disciplines, and soft skills, such as communication, management and organizational diversity. Several referred to strategic documentation or competency lists on their websites identifying specific skill-related outcomes for their graduates.

One group of skills addressed information organizations and systems. Every program director identified some set of core skills related to information organizations and their structure and services, organizing and managing information, information technology trends, information policy, research methods, the information industry and other skills needed by those planning for careers in information occupations. Directors indicated that their core, required courses are designed to impart many of these information-related skills. The other group of skills was much broader and related to competencies that library employers are seeking in new staff members. This skill group set of competencies included topics such as leadership, ethics, critical thinking, continuing professional development and diversity. There were also mentions of familiar practitioner skills such as reference and research support, library education and project management. While some of the competencies identified are related to design thinking, similar to those listed by Bertot et al. (2015) (e.g. flexibility, adaptability, problem-solving), none of the program directors specifically spoke of design or design thinking as one of the competencies for their students. As one director's comment suggests, the focus is on more direct information-related skills:

Our graduates tend to be information technology focused so they're interested in everything from basic understanding of what information is in the modern world to how it's produced and managed.

However, even though none of the interviewees indicated design thinking as a current core competency, at least one mentioned it as a possible future inclusion, noting that it should be core program content because based on trial curricula, it results in "phenomenal" projects that "helped prime [students] for the job market and their first position." Another director also noted that including design topics in database and web courses gives students "the skills they need to be competitive in the field." Although that interviewee noted that neither of those two courses is a required course nor a course every student should take, they mentioned seeing the value of design in narrow areas like databases and web, and "if it works in those areas then I think it may also have application in many different areas." Additional interviewees also perceived value in the inclusion of design thinking into the curriculum due to its broad

usefulness and applicability across settings, including various library communities as well as both physical and digital settings.

Knowledge of Design Thinking

Uncertain to what extent we would hear design thinking identified as a prominent or planned competency for the program's student learning outcomes, the interviewees were asked directly what familiarity they had with design thinking. We asked if directors themselves knew about design thinking, how they had learned about it, and to what extent they felt design thinking differed from other elements of the library science curriculum. Their responses revealed what may be a significant barrier to the adoption of design thinking in library science programs. Put simply, there is either confusion about what design thinking is, or a perception persists that any type of design already situated in the program, no matter how different from design thinking it actually is, constitutes design thinking in the curriculum.

Passing or basic familiarity with design thinking is what best describes the primary response from the program directors. Most directors claimed "a pretty basic" or "superficial" understanding and said things like "I think I'm fairly familiar with it personally but I don't know if I can voice it appropriately." Many indicated having heard about design thinking at a conference or in the library literature, but frequently expressed having done little beyond that to learn more about design thinking. Several credited the 2016 "Educate to Innovate" workshop at the ALISE annual conference, which included an introduction to the concept and process of design thinking.

Even when interviewees themselves claimed a level of knowledge beyond basic familiarity, when the interviews turned to specifics about design thinking, the responses failed to support the claim of more in-depth knowledge. For example, one program director expressed knowledge of the phases of design thinking but was unable to clearly articulate them. Another said "I'm fairly familiar with [design thinking]" but "I don't think I have a textbook definition." Another director defined design thinking through the lens of their own expertise, computer science:

When I hear the term design, or design thinking, I link it toward my background. So I'm coming from a computer science background, and I teach database design...So that's one aspect of design, in terms of a database. The other aspect of design that directly relates to my interests are web design.

This director went on to describe design thinking as "a combination of creativity [and] innovation, but also employing well-defined methodologies," but admitted a lack of familiarity with literature on design thinking.

Other program directors gave similar responses, describing design thinking in terms of their own professional expertise, with some knowledge of design but not specifically design thinking. Few program directors had good familiarity with design thinking, but those who did reflected on how they were experiencing it in their programs. In one case, design was a significant

curricular area for the university which naturally influenced a design emphasis within the LIS curriculum. Another director discussed the development of an innovation and makerspace center for their students in which they would be exposed to the design thinking process:

We actually created things and we did have a workshop live in class on solving a problem. I presented a problem to my students and then they had to go through that whole process of...empathizing, coming up with a solution, ideating, testing, prototyping, all that all the whole sequence.

Based on the responses from interviewees, it seems that there is still a great deal of confusion about what design thinking is.

Presence of Design Coursework

Familiarity with design thinking is a good indicator that a program director is giving attention to the growing interest in it in librarianship. But does that exposure to design thinking translate to an increase in the development of design thinking or design-oriented courses in LIS programs? We asked the program directors if their curriculum currently included a design thinking course or if there were any plans to introduce such a course anytime soon.

Several of the program directors shared that their programs did not yet have a design thinking course. Of those interviewees who did indicate the presence of design thinking courses in their programs, responses to this line of questioning revealed three major trends:

- 1) identification of courses that were specifically about design thinking and methods yet were usually not specific to the LIS degree program;
- 2) identification of courses by program directors as being design thinking courses but are not specifically about design thinking; and
- 3) identification of no specific design thinking course but inclusion of design thinking concepts throughout other courses in the program/curriculum.

Several interviewees who mentioned courses specific to design thinking noted that these courses were actually happening in a larger context, such as other degree programs within a department or school. One director mentioned that their course offerings in design thinking were happening on the undergraduate level. Another mentioned a number of design-specific courses across multiple degrees offered within the school of information in which the LIS program was situated.

Others pointed to design-related courses as examples even if they were not labeled as a design thinking course. For example, web design or human-computer interaction courses were provided as examples of design thinking courses. Other courses mentioned by interviewees as design thinking courses included courses about makerspaces, instructional design, systems analysis, information system usability, computer supported cooperative work, games for learning, entrepreneurship, information visualization, information users, databases, web design

and development, and capstone/project courses. When asked for details about these courses identified as “design thinking”, it was typically the case that the courses did not cover basic design thinking practices, share examples of libraries where design thinking is applied to problem solving, or require students to apply the design thinking process for course assignments. The notable exception were descriptions of capstone or similar culminating project courses, such as this description from one director:

[Students] did a capstone project that was based around design thinking, a whole two hour course with structure around design thinking and their project. As part of their graduation requirement, they selected a wicked problem that they found relevant to a library near them or another information agency. There were a pretty wide variety of problems. They used design thinking to cycle through a variety of solutions which they then went back and presented to their constituents.

This director notes that the full design thinking process was not included, as students could not actually implement their proposed solutions due to time constraints, although students were required to develop a plan for implementation. The director notes that the program is considering expanding the course to three credit hours and making it a graduation requirement.

In addition to courses incorrectly put forth as examples of design thinking courses, interviewees also indicated that design thinking concepts were covered throughout the curriculum. For example, one director said the following:

I think it's introduced in two of our MLIS core courses. We try to emphasize that research can take many forms and one of them is kind of an iterative, creative approach. And we map out the design thinking approach there, so we introduce it in that course. One of our other core courses is called human information interaction and it also has a design component where we have a thing about design but I don't know if it exclusively talks about design thinking. Then we have a course called information design which is closest to a web design course. The whole course is structured around the design life cycle [and it goes] into design thinking in more detail.

Another director said the following:

I don't think we've talked about having a separate course, I think we're more committed, I would say, to having the notion of design embedded in many of our different courses.

Some program directors pointed to the lack of a course specifically labeled “design thinking” as a semantics issue. Even though the curriculum had no course by that name, they pointed to its existence elsewhere in learning modules within courses or program requirements. For example:

I'm not even sure it's delivered as design thinking. The idea is the fundamental principles are incorporated in some aspect of the curriculum. And I'll give you an example of that. The core course called “information users” takes basic theory, taking the research that's been done with various new client groups and turning that into different thinking about how that applies to

consistent design and service delivery. Okay. There's an example of one way in which [design thinking] would come in.

Another, when asked about the inclusion of design thinking coursework in their program, said, "I think the answer to that is yes very much so, [but] we don't specifically label it design thinking."

While there are undoubtedly places within the curriculum where elements of design philosophy and design thinking are occurring within most LIS programs, the absence of a designated design thinking course may speak volumes about an unawareness of how much it would be differentiated from all these other courses identified as having "design-thinking like" components. At least one program that is still primarily face-to-face appears to have lab segments that offer more of a design challenge approach to learning. We did hear encouraging developments that suggest the directors are gaining interest in a course that is singularly focused on design thinking and integrating it into library practice.

Program Size and Type

One factor that impacted how directors perceive the need for design thinking in their curriculum was the size and type of program they were leading. Among the directors from programs characterized by a more traditional library focus, smaller enrollments, and/or a less well-resourced base, there was a fairly consistent observation that their programs currently lacked the capacity to experiment with the curriculum, introduce a course on design thinking, or create a mandate for faculty to integrate design philosophy into their courses. Several directors from these programs indicated that introducing a course in a new or experimental area required a more significant degree of their resources and therefore had to be carefully considered before investing resources in a new, untested area:

We're a relatively small department and we can't. We can't do it all.

People are busy. They're working on other projects. They've got to focus on [ALA] accreditation, so there isn't always time to say, "let's explore this totally new area".

This was the case regardless of interest level. At least one director had interest in incorporating design thinking into the curriculum, but faced a lack of qualified personnel:

I am very interested in moving this forward. And I don't think there'd be anybody against it, It's only a question of, you know, [no one specializes in this area].

These program directors acknowledged that they expected the larger LIS programs, such as those housed in iSchools, as the programs more likely to take risks in introducing courses in new, emerging areas of librarianship. They based this on past experience observing iSchools' exploration of cutting edge topics in their curricula, and their perceptions that the more well-resourced iSchools had the flexibility to do so.

I think it's really important to distinguish, because [the iSchools] are a separate movement at this point and think differently and [they are] leading that charge within the consortium...if the iSchools want to go in that direction, more power to them, as part of their spinoff.

While the program directors from iSchools did not explicitly state that their programs were more open to curricular experimentation or expending resources to develop new, more cutting edge courses, we did not hear concerns similar to those of the non-iSchool directors when it came to their responses to questions about adding a new course in design thinking or integrating more design into their programs. And even within iSchools, there were questions about programmatic directions, such as from this interviewee:

Right now I think that design thinking that's happening in the iSchools is oriented towards computing issues, not library science issues. We're not library design and not even library system design...so the question comes back to how related are we as LIS schools and iSchools to the practicing library environments.

Additionally, several directors of non-iSchool programs mentioned that they had recently revised their curricula and/or had their ALA-accreditation renewed, such as the following interviewee:

We just implemented our revised curriculum this year and we're in the process of evaluating it. We're not really looking to do any sort of major revisions, and the elective courses we expect to add are not in the design thinking area.

Given the amount of effort involved in these endeavors, organizationally there was less impetus to take on the work of developing new courses or doing curriculum experimentation so soon after a significant revision or overhaul. This speaks to factors that may hinder the adoption of a new course, such as design thinking, when the issue is more than just perception but actual lack of organization resources.

Uncertainty, Bureaucracy and Challenging the Status Quo

While all of the respondents were open, to varying degrees, to the idea of integrating design thinking into the LIS curriculum, there were more than a few questions, concerns and uncertainties about how it would be accomplished in the current library and information science environment. In particular, three issues surfaced:

- Is design thinking more than a fad;
- Is the bureaucratic effort to accomplish this worth the return;
- Is the LIS establishment ready for a design-focused library degree

All three emerged as indicators that program directors wanted to be careful and cautious about investing institutional resources into a concept that was, to their way of thinking, still in an

experimental phase in education-at-large and within library schools. Except the one program director who was outwardly hostile to the possibility with their “design thinking is a scam” response to our invitation to participate, the limited response to the call for participants may be an additional indicator that there is an observable level of uncertainty based on a lack of familiarity about design thinking among program directors.

Given the degree of effort and investment required to initiate a new course, it was not totally unexpected to hear concerns about making a commitment in an atmosphere of uncertainty. For some directors, the jury was still out with no clear verdict on whether design thinking was simply the latest bandwagon idea upon which to jump or a solid skill worthy of curriculum integration. This concern is reflected in the statement of the director who questioned design thinking’s staying power:

“I’m always concerned about ideas like this, which sort of become super hot and people jump on bandwagons and you know, everybody throws the course in the curriculum and within a very short period of time, a few years, it’s no longer hot. So I’m a bit worried about it being that. Um, I don’t know whether you saw the recent article that was actually, it actually appeared across a number of platforms in the last week or so about design thinking and, and it was very critical was, um, you know, I don’t necessarily agree with it, but, uh, um, you know, I just, I just think it’s not sort of a magic bullet for anything.”

While not quite the same as a fear of fads or bandwagon jumping, another director expressed a lack of comfort with the idea of integrating design into the curriculum based simply on a lack of information:

“I feel I don’t have enough information to move forward on it yet.”

If lack of information required to make an informed decision is a challenge, in time, early-adopter programs may be able to demonstrate the value and staying power of their design-influenced curriculum decisions. That, in turn, may enable more program directors to gain confidence that adding design thinking and related design ideas into their curriculum is indeed in the best interest of their students.

While lack of information reflects a degree of ambiguity about the future trajectory of design in LIS education, there was another quite concrete factor that interviewees identified as a potential barrier. That was their lack of desire or willingness to confront the bureaucracy required to introduce new courses, as well as their questioning of how a curriculum-wide integration of design would be supported by current ALA accreditation standards. Given the requirements to create new courses, shepherd them through a curriculum review process and then launch them, the program directors we interviewed expressed considerable caution about engaging in the development of specialized design courses.

We can’t really do keep developing a lot of new courses when we’ve already got some on the books that, covered that, because then we wouldn’t have enough students to take it.

It would come from the curriculum committee. Sure. If there was an interested faculty member, they'd, they'd take it there and if they were to take the time to develop such a course that would come in as a special topics [course].

Navigating the program administration or curriculum committee policies was somewhat of a concern for some of the directors. Obtaining approval for a new course or an even broader change in curriculum directions can have political overtones that requires assurances that allies will support recommended changes. Given the nature of a change to integrate more design thinking and philosophy as a standalone course or more broadly across the curriculum is a fairly substantial or risky proposal that gave our interviewees second thoughts:

If there's only one advocate and that advocate doesn't stay, then these things disappear. So I would like to be able to see a critical mass.

The faculty are kind of focused in their separate research areas. I don't think there'd be anybody against it;, it's only a question of, you know, we have a youth services person, academic, public person, and they, they're all from more traditional I guess PhDs for the LIS discipline, and I'm the unusual person in our group who has a PhD in applied mathematics.

It's extraordinarily hard to teach people that[design thinking] because it's just a plain difficult thing. I think it's more difficult than it may sound. It sounds easy, but it's not.

Looking beyond their own programs, the directors thought out loud about bigger issues such as accreditation or whether design will be mainstream enough for eventual widespread adoption. Multiple interviewees raised concerns about accreditation and how design would be perceived by accrediting bodies, especially the American Library Association, which was mentioned by several participants as having a large and significant influence over program decisions.

Finally, our interviews turned up a host of concerns small and large, all hallmarks of the thoughtful questions program directors must ask when considering change to their program, be it minor or major. Potential showstoppers for a change to integrate design into the curriculum could be as basic as a recognized lack of interest from students. Yet if there was a significant demand how well could an LIS program scale up the delivery of one or more design courses to 50 students or more. Given the studio nature of design and interaction with people in lab-like settings, how well could any LIS program replicate that type of pedagogy, particularly to a primarily online degree program. One director astutely considered the dilemma of what to do about design thinking from a completely different but entirely possible perspective. What if design thinking had to be addressed by LIS programs--would those programs be capable of rising to the challenge?

Discussion

What are the prospects for today's LIS programs to integrate design thinking into their curriculums, either by virtue of establishing a separate course on the topic or a more general incorporation of design philosophy and principles across the curriculum – or both? While the

interviews reflect a spectrum of perspectives and perceptions, from negative to positive and all points in between, what we heard from the program directors is that despite current internal and external barriers to expanding into new curricular areas, they see some potential value in adding design, either as a high-level skill across the curriculum, as a multi-course certificate option or a specific course on design thinking, to their academic offerings. While the limited number of participants and concerns expressed by those program directors who did participate might lead LIS educators to conclude there is too little interest in design education to warrant the authors' optimistic outlook, we argue that all radical change begins as a struggle against cynicism and doubt.

While LIS program directors are hardly solely responsible for the content of their programs, they can play a significant role as gatekeepers in determining what new ideas may be introduced into the curriculum. Based on our conversations with them, the attitudes and perceptions towards design thinking are certainly changing in ways that suggest more openness to it as a valued skill for graduates of their programs. Less likely, in the foreseeable future, is the development of some separate track within LIS education, that would put design thinking at the core of the curriculum, or even a distinct new degree program such as a Masters in Library Design. While such a degree would emphasize design along with other critical librarianship skills, given the prevailing nature of their LIS programs, their university administration and ALA accreditation, there is understandable uncertainty surrounding the introduction of a new degree track, even though it might attract new, design-minded aspiring librarians to the profession.

Put simply, some general confusion or uncertainty about what design thinking is persists, to varying degrees, among program directors. This is not surprising given prior research showing confused understandings of design in LIS education (e.g. Clarke 2020b; Clarke, Mills & Potter 2019). Some directors could benefit from being more well informed about what design thinking is and how it can complement other curricular areas in achieving the competencies that many of the programs expect their students to acquire. For other directors, a perception persists that any type of design already situated in the program, no matter how different from design thinking it actually is, constitutes design thinking in the curriculum. These are two different issues, but similar in that each presents a potential barrier to a deeper inclusion of design thinking into LIS education.

In addition to these implicit barriers that we observed, we also note the types of barriers to progress that we directly heard most frequently from the program directors as follows:

- Lack of awareness among LIS faculty that could drive more interest and spur program directors to explore ways to introduce design into the curriculum.
- Despite mild interest there is a feeling among some directors that it is not the right time for their program to go in this direction for a variety of reasons;
- Doing nothing about the integration of design is hardly perceived as a problem that must be addressed by program directors;

- Concerns about finding qualified faculty to teach design thinking or design-oriented courses;
- Simply too many other priorities to get this on the radar screen of those who make these decisions
- Administrative or other logistical concerns, such as larger university resources and priorities and accrediting bodies

In addition to these practical barriers, broader intellectual and theoretical ramifications are at play. If LIS programs fail to acknowledge what design thinking is or identify course content as design thinking when it is different, is it truly being taught? Such lack of understanding, intentional or otherwise, is not only a large barrier to incorporating design into LIS. Failing to identify design content essentially erases it from the curriculum, leading to a form of epistemicide (e.g. de Sousa Santos 2014; Patin et. al. 2020) in which design knowledge and methods are either rendered non-existent through invisibility or colonized into existing knowledge structures. For a field that values inclusivity, critical pedagogy, and diverse perspectives, the lack of understanding and acknowledgement of design ways of thinking and accordant methods is disappointing.

Given this disappointment, we could certainly have suppressed any skeptical or questioning comments when reporting our findings. However, as faithful researchers, we believe it necessary to present both the skepticism and enthusiasm in order to provide a realistic picture of what we heard in our interviews. Just because we focus on the challenges as ripe for discussion does not mean there is only lukewarm interest in design thinking. Multiple program directors expressed optimism that their programs might one day incorporate design thinking into their curriculum:

I would say that the place we are at now is launching a space that is going to be a great launching pad for doing more with design thinking.

I don't think you're going to design a program. I think you're going to see a library science that includes a lot more design. I mean I just don't see the design taking over from the science.

We certainly do need to bring people and new perspectives into the field, and that seems like it might be a good way. An interim step might be something, and I've been arguing for trying really hard is to combine Masters degrees in LIS with other domain areas; a combined degree in LIS and media design, would really excite our students.

If the directors we interviewed are representative of most LIS program directors, then we anticipate this mix of uncertainty and optimism is likely to make for any transition to a more designed influenced curriculum slow in coming. We believe there are some actions program directors could take to engage more deeply with design thought and perhaps accelerate, in collaboration with their deans, faculty colleagues, students, accreditors and practitioners, the

integration of design thinking and philosophy into their programs. Several of these ideas are taken directly from suggestions made by interviewees.

- Start with small change that can grow into a larger acceptance of design in the curriculum. Micro-learning modules or micro-credentials in design thinking could be a less risk intensive approach to testing student interest or library employer demand for this skill set;
- Similar to the suggestion above, offer a set of credentials or short-term design-oriented courses that are stackable for earning a certificate in library design;
- Allow students to take design courses in other subject degree programs, such as education or art; multiple or blended degrees have potential as an avenue to more integration of design or an eventual Masters of Library Design. As one director said “If programs that offer multiple degrees wanted to do something creative and could get it approved through their board of regents or whoever approves new degrees.”
- In addition to collaboration with other subject degrees, consider collaboration with other LIS programs, such as via the WISE consortium or other vehicles of multi-program collaboration. With such models, every school need not offer similar redundant coursework, but rather allow students to pursue more in-depth knowledge by offering a broader range of design topics by harnessing expertise across the field without straining local demands.
- Work within the LIS education profession to create more clarity around design thinking and how design could be integrated into the curriculum. A pre-conference program at ALISE on design thinking broke this ground a few years ago, and a similar set of programs could update on the introduction of design thinking courses at several iSchools.
- Encourage more design research at the doctoral level or otherwise introduce PhD candidates to design thinking. If the goal is to infuse library education with design thinking then the next generations of library educators and researchers must be positioned to oversee the curricular integration.
- Establish virtual learning circles or similar types of online communities to share ideas and strategies among faculty and program directors for integrating design into the curriculum.
- Explicitly identify and recognize design content in the curriculum when and where it occurs, thus preventing unintentional erasure of design knowledge.

Conclusion

While LIS education is no closer to taking a separate, standalone Masters in Library Degree seriously as an option, our conversations with LIS program directors suggests there is a growing openness to or recognition that design education may help to contribute to the diversification

of the curriculum so that graduates' competencies more closely reflect recommendations in the literature and address the needs of employers. It also calls into question how LIS program directors define design education in the context of the LIS curriculum and how they perceive what it means to integrate design philosophy and thought into the curriculum. For some, the perception is that it already is integrated in certain courses while for others there is a much more concrete understanding of what constitutes the integration of design thinking. If there is a growing consensus among program directors that there are potential benefits to adding more design into their program's curriculum, a starting point must be a thorough understanding of what design thinking is and is not. We share several recommendations for what could be next steps in advancing library education towards accepting the value of design

What we learned suggests that there is a path forward for increasing the presence of design into the curriculum. A few iSchools have already laid the foundation by adding a specific design thinking course to their offerings. Others are exploring making design practice more prominent in their core courses. Despite the bureaucratic concerns of our respondents, this appears to be outweighed by the interest in experimenting with design courses available elsewhere in their universities or even the potential for a dual library science/library design degree option. Even exploring the addition of a design for librarianship certificate could provide graduates with an edge for the growing number of user experience, public programming or even more traditional teaching librarian positions where a design thinking approach leads to effective practice. The authors hope their research finds its way into discussions among program directors, LIS educators and students who want to re-imagine library education and practice as a design-oriented profession. Whether or not it leads to a Masters of Library Design is less important in our minds than starting now to allow current, aspiring and future library students to be their own masters of design in libraries.

References

- Archer, L. B. (1965). "Systematic Method for Designers." In Nigel Cross (ed.), *Developments in Design Methodology* (pp.57-82), Chichester, UK: John Wiley and Sons, 1984.
- Bell, S. (2011). Design Thinking for Better Libraries. *Information Outlook*, 15(6), 10–11.
- Bell, S. J. and Shank, J. D. (2007). *Academic Librarianship by Design: A Blended Librarian's Guide to the Tools and Techniques*. Chicago: American Library Association.
- Bertot, J.C., Sarin, L.C., & Percell, J. (2015). *Re-envisioning the MLIS: Findings, issues, and considerations*. College Park, MD: College of Information Studies.
- Booth, C. (2011). *Reflective Teaching, Effective Learning: Instructional Literacy for Library Educators*. Chicago: American Library Association.

- Bradigan, P. S., & Rodman, R. L. (2008). Single Service Point: It's All in the Design. *Medical Reference Services Quarterly*, 27(4), 367–378.
<https://doi.org/10.1080/02763860802367755>
- Brown, T., & Katz, B. (2009). *Change by design : how design thinking transforms organizations and inspires innovation*. New York: Harper Business.
- Brown, T., & Wyatt, J. (2010). Design Thinking for Social Innovation (SSIR). *Stanford Social Innovation Review*. https://ssir.org/articles/entry/design_thinking_for_social_innovation
- Clarke, R. I. (2016). "It's Not Rocket Library Science: Design Epistemology & American Librarianship." Doctoral Dissertation, University of Washington.
<https://digital.lib.washington.edu/researchworks/handle/1773/37159>
- Clarke, R. I. (2018). "Toward a design epistemology for librarianship." *The Library Quarterly: Information, Community, Policy* 88 (1): 41-59. DOI: <https://doi.org/10.1086/694872>
- Clarke, R. I. (2019). "The Role of Design in *Poole's Index to Periodical Literature*: Implications for American Librarianship." *Libraries: Culture, History, Society* 3(2): 129-154. DOI: <https://doi.org/10.5325/libraries.3.2.0129>
- Clarke, R. I. (2020a). *Design Thinking (Library Futures Series, Book 4)*. Chicago: American Library Association/Neal-Schuman.
- Clarke, R. I. (2020b). "What We Mean When We Say 'Design': A Field Scan of Coursework Offerings on Design Topics in Master's Level Library Education." *Journal of Education for Library and Information Science* 61(1):2-24. DOI: <https://doi.org/10.3138/jelis.61.1.2019-0037>
- Clarke, R. I., Amonkar, S., & Rosenblad, A. (2019). Design thinking and methods in library practice and graduate library education. *Journal of Librarianship and Information Science*.
doi:10.1177/0961000619871989
- Clarke, R. I. and Bell, S. (2018). Transitioning From the MLS to the MLD: Integrating Design Thinking and Philosophy into Library and Information Science Education. In L.C. Sarin, J. Percell, P.T. Jaeger and J.C. Bertot (Eds.), *Re-Envisioning the MLS: Perspectives on the Future of Library and Information Science Education* (pp. 195-214). Bingley, UK: Emerald.
- Clarke, R. I., Mills, J.E., and Potter, N. (2019). "Designing Future Library Leaders: Takeaways from the 2018 National Forum." White paper. <https://dfll.ischool.syr.edu/wp-content/uploads/2019/09/DFLL2018whitepaper.pdf>
- Council on Library and Information Resources. (2012). *Participatory Design in Academic Libraries: Methods, Findings, and Implementations*. Washington, D.C.: Council on Library

- and Information Resources. <http://www.clir.org/pubs/reports/pub155/pub155.pdf> (accessed October 29, 2015).
- Cross, N. (1982). "Designerly Ways of Knowing." *Design Studies* 3 (4): 221-27
- Cross, N. (2001). Designerly Ways of Knowing: Design Discipline versus Design Science. *Design Issues*, 17(3), 49-55. Retrieved June 26, 2020, from www.jstor.org/stable/1511801
- Cross, N. (2011). *Design Thinking: Understanding How Designers Think and Work*. Oxford UK and New York: Berg.
- Darke, J. (1979). "The Primary Generator and the Design Process." *Design Studies* 1: 36-44.
- Boaventura De Sousa Santos. (2014;2015;). *Epistemologies of the south: Justice against epistemicide*. Herndon: Routledge Ltd
- Guterman, J. (2009). How to Become a Better Manager . . . By Thinking Like a Designer. *MIT Sloan Management Review* 50(4), 39–42.
- Foster, N. F. (2011). *Scholarly practice, participatory design and the extensible catalog*. Chicago: Association of College and Research Libraries.
- Ippoliti, C. (2016). "Research as Design, Design as Research: Applying Design Thinking to Data Management Needs Assessment." Proceedings of the 2016 Library Assessment Conference. <http://old.libraryassessment.org/bm~doc/4-ippoliti-2016.pdf>
- Lawson, B. (1980). *How Designers Think: The Design Process Demystified*. London: Architectural.
- Leavy, B. (2010). Design thinking - a new mental model of value innovation. *Strategy & Leadership* 38(3), 5–14.
- Leavy, B. (2012). "Collaborative innovation as the new imperative – design thinking, value co-creation and the power of 'pull.'" *Strategy & Leadership* 40(2), 25–34.
- Luca, E. and Narayan, B. (2016). "Signage by Design: A Design-Thinking Approach to Library User Experience." *Weave: Journal of Library User Experience* 1(5): <http://dx.doi.org/10.3998/weave.12535642.0001.501>
- Merrill, M.D., Drake, L., Lacy, M.J., and Pratt, J. (1996). "Reclaiming Instructional Design," *Educational Technology* 36 (5): 5-7.

- Miller, R. T., & Schwartz, M. (2014). *What Wallets Have To Do with Libraries | Design4Impact*. Library Journal. <https://www.libraryjournal.com?detailStory=what-wallets-have-to-do-with-libraries-design4impact>
- Partridge, H., Lee, J., & Munro, C. (2010). Becoming 'librarian 2.0': The skills, knowledge, and attributes required by library and information science professionals in a web 2.0 world (and beyond). *Library Trends*, 59(1/2), 315–335. Retrieved from <https://www.ideals.illinois.edu/bitstream/handle/2142/18735/59.1-2.partridge.pdf>
- Partridge, H., Menzies, V., Lee, J., & Munro, C. (2010). The contemporary librarian: Skills, knowledge and attributes required in a world of emerging technologies. *Library and Information Science Research*, 32(4), 265–271. <https://doi.org/10.1016/j.lisr.2010.07.001>
- Patin, B., Sebastian M., Yeon, J. & Bertolini, D. (2020). "Toward Epistemic Justice: An approach for conceptualizing epistemicide in the information professions." To appear in *Proceedings of the 2020 ASIST annual meeting*. Silver Spring, MD: American Society for Information Science and Technology.
- Rowe, G. P. (1987). *Design Thinking*. Cambridge: MIT Press.
- Saunders, L. (2012). Identifying core reference competencies from an employers' perspective: Implications for instruction. *College & Research Libraries*, 73(4), 390–404. <https://doi.org/10.5860/crl-281>
- Saunders, L. (2015). Professional perspectives on library and information science education. *Library Quarterly*, 85(4), 427–453. <https://doi.org/10.1086/682735>
- Saunders, L. (2019). Core and more: Examining foundational and specialized content in library and information science. *Journal of Education for Library and Information Science*, 60(1), 3-34. doi:10.3138/jelis.60.1.2018-0034
- Schön, D. A. (1983). *The Reflective Practitioner: How Professionals Think in Action*. New York, NY: Basic Books.
- Schwartz, M. (2013). First Year in the Second City: Brian Bannon's First Year at the Helm of the Chicago Public Library. *Library Journal* 138 (11): 42.
- Simon, H. (1969). *The Sciences of the Artificial*. Cambridge, MA: M.I.T. Press.
- Svenonius, E. (1986). Unanswered questions in the design of controlled vocabularies. *Journal of the American Society for Information Science*, 37(5), 331-340.

- Svenonius, E. (1989). Design of controlled vocabularies. *Encyclopedia of library and information science*, 45(suppl 10), 82-109.
- Wagner, E. (2011). "In Search of the Secret Handshakes of ID," *Journal of Applied Instructional Design* 1 (1), 33-37.
- Weedman, J. (2004a). The Practice of Design: Creating Local Vocabularies for Images.
<https://repository.arizona.edu/handle/10150/105394>
- Weedman, J. (2004b). The professional practice of design: Local vocabularies. In M. Breitenstein (Ed.), *Proceedings of the 15th Workshop of the American Society for Information Science and Technology Special Interest Group in Classification Research*. Providence, RI: ASIS&T.
- Weedman, Judith (2010). Design science in the information sciences. In Marcia J. Bates & Mary Niles Maack (Eds.), *Encyclopedia of library and information sciences*, 3rd ed. (pp. 1493-1506). Oxfordshire, UK: Taylor & Francis.
- Whang, L., Tawatao, C., Danneker, J., Belanger, J., Weber, S.E., Garcia, L., and Klaus, A. (2017). "Understanding the transfer student experience using design thinking." *Reference Services Review* 45 (2): 298-313. <https://doi.org/10.1108/RSR-10-2016-0073>

Appendix A

Interview Questions

- What do you think are some of the critical skills graduates of your LIS program will need to be successful in the workplace?
 - Then maybe follow this up with something like 'what kinds of courses do you offer to support these skills?'
- How familiar are you with the idea of design thinking? [interviewer may need to offer follow up information about design thinking here]
- Does your program offer any coursework in design thinking? [If needed: clarify that this could be a single course devoted to design thinking, or it could be module or portion of another course.]
 - If yes:
 - Please tell us more. [Interviewer will ask for detail/specifics on how design thinking was introduced into the curriculum]

- Why did you decide to introduce design thinking into the curriculum?
What factors influenced the decision to do so?
 - How did you identify faculty qualified to integrate design thinking into the curriculum and/or teach the design thinking course?
 - What has the experience been so far?
 - What is the initial reaction from students?
 - Do you have a longer-term plan for integrating design thinking into your curriculum?
 - If no:
 - Has there been any discussion among you and your colleagues/faculty about design thinking and the possibility of exploring it?
 - Have you been following developments at other LIS programs around design thinking? What about attending any conference sessions, workshops, etc?
 - Can you discuss your thoughts on why there hasn't been more movement within your program on design thinking?
 - Can you share your perspective on design thinking and its potential for integration into the LIS curriculum?
 - What factors would most likely lead you to explore the integration of design thinking into your program's curriculum?
- What is your personal perspective on integrating design thinking into the curriculum, not only in your program but for LIS education in general?
- Do you think we will ever see something like a Masters of Library Design as an alternative to the Masters of Library Science?
 - If so, what do you think that curriculum or learning experience would look like?
- Are there any other comments you would like to make related to the integration of DT into the LIS curriculum?

Note: Interviewers may ask follow-up questions or probe for more information as needed.