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Design Thinking and Methods in Library Practice and Graduate Library Education

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Description/Abstract

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Keywords

Design thinking, librarianship, graduate library education, questionnaire surveys, United States

Disciplines

Curriculum and Instruction | Educational Methods | Higher Education | Library and Information Science

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Introduction

In the 21st century, future librarians increasingly require new skill sets beyond what has been traditionally taught in master's level library education programs. We posit that educational opportunities informed by design can support library professionals' mastery of new skills to improve their ability to address community needs. A recent report on the future of MLIS education notes an increasing need to foster graduates that are collaborative, creative, socially innovative, flexible, and adaptable problem solvers—characteristics which are demonstrated by people with backgrounds in design (Bertot et al., 2015). The Aspen Institute's recent report on the future of public libraries emphasizes the need for libraries to foster new organizational cultures that emphasize innovation, calling out design thinking as an integral part of this paradigm shift (Garmer, 2016). Design thinking--a multi-stage cyclical problem-solving process originating in design fields--helps leaders in other fields achieve these characteristics through a unique, problem-centered, iterative approach. Businesses such as Proctor and Gamble, Kaiser Permanente and Costco have applied 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: 42).

Although libraries are not businesses, library workers also support strategic planning, organizational processes, and the creation of tools and services for library users and patrons. Design thinking is a natural approach to these tasks, and it seems that some libraries are drawing on design thinking and methods to help inform their practice: but to what extent? This research explores the current landscape of design thinking and methods in American library practice. Using a survey instrument, we investigate in what ways, if any, design methods and approaches are being used in library practice, sources of education for these approaches, and library workers' opinions on the application of education for these approaches.

Literature Review

What is design thinking?

The phrase "design thinking" is used to describe two different but overlapping concepts:
1. a unique way of looking at the world
2. a process of activities and methods that reflect and support that worldview (Clarke, 2019)

The major fundamental difference between design ways of thinking and other mindsets is a focus on creating artifacts to solve problems (see for example Simon, 1969; Lawson, Cross, etc.). This creation occurs through a process model that reflects components of the overall design-based worldview. 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 iterative movement through multiple phases that are grounded in the main tenets of the design way of thinking. For example, Stanford's d.school proposes a model of the design thinking process that includes five phases: empathize, define, ideate, prototype, and test (see Figure 1).
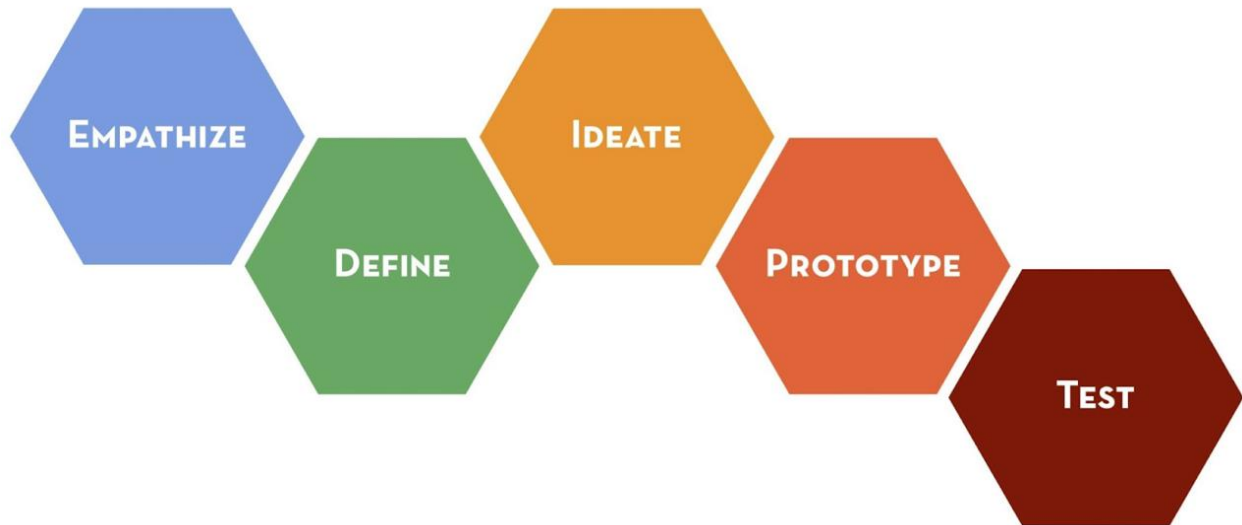
Figure 1. The Stanford d.school model of design thinking (CC BY-NC-SA 3.0).

Similar phases have been outlined by various major design firms and sources of design thinking instruction.[1] While the phases in each of these sources are given different names and grouped and organized differently, clear commonalities emerge, resulting in the following five phases:

1. an investigative discovery phase, wherein a problem is defined and understood;
2. a problem definition phase, in which specific issues and problems are articulated;
3. a generative phase, where ideas are brainstormed;
4. a development phase, where products or artifacts are actually created;
5. an evaluative phase, intended to assess the product.

It is important to note that these phases are not separate and linear, but form an overlapping iterative cycle, allowing constant reflection and improvement. One famous example is from the design firm IDEO, which demonstrated the process and mindset of design thinking in a 1999 episode of Nightline (Koppel et al. 2004). In the episode, an interdisciplinary IDEO design team demonstrates the application and iteration of each of the above phases and how the method led to the design of a new and improved grocery shopping cart.

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 product design. Instead of designing more ergonomic chairs or more efficient

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[1] See for example IDEO U. "Design Thinking." https://www.ideou.com/pages/design-thinking; Design Thinking for Educators (version 2). https://designthinkingforeducators.com/design-thinking/; *Design Thinking for Libraries: A Toolkit for Patron-Centered Design*. From http://designthinkingforlibraries.com/; Stanford d.school. "A Virtual Crash Course in Design Thinking." https://dschool.stanford.edu/resources-collections/a-virtual-crash-course-in-design-thinking; Henry Ford Learning Institute's design thinking workshops: https://hfli.org/design-thinking-workshops-press-release/; Design Council. "The Design Process: What is the Double Diamond?" https://www.designcouncil.org.uk/news-opinion/design-process-what-double-diamond; Neilson Norman Group. "Design Thinking 101." https://www.nngroup.com/articles/design-thinking/

shopping carts, IDEO found itself tackling less tangible outcomes, including 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. This type of work took IDEO from designing consumer products to "designing consumer experiences" and demonstrated that design products extend beyond tangible, physical things (Brown and Wyatt 2010).

Design thinking's relevance to librarianship

Design thinking has generated tremendous traction in industry, where it has been applied to more than just the looks and usability of physical products. Prominent books have argued for the application of design thinking in corporate environments, especially in management and leadership (see for example Brown and Katz, 2009; Martin, 2009). Businesses such as Proctor and Gamble, Kaiser Permanente and Costco have applied 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: 42).

Although libraries are not businesses, recent research shows that librarianship is fundamentally aligned with design, since librarians create tools and services to help solve information problems (Clarke, 2016, 2018b). However, this same research shows that the use of design thinking and methods has been implicit throughout the history of American librarianship. In the early 2000s, when the popularity of the design thinking process model increased in business and industry, Bell (2007) began explicitly noting the similarities between design thinking and library work and calling for the application of the design thinking process in libraries. Bell and Shank (2007) explicitly articulate the parallels between design thinking and instructional design work in academic libraries. Bell also drew on design thinking to improve library user experiences at Temple University Libraries, from services to branding (Bell, 2008, 2011). Design thinking is often 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). At Chicago Public Library's Bezazian Branch, a team of library staff and design professionals used the design thinking process to create a new co-working space. First, in the investigative phase, the team visited diverse examples of existing co-working spaces—many of them outside of library contexts. They interviewed users of those spaces to understand their needs and desires. They also interviewed library patrons for similar information. After synthesizing what they found out about people's co-working needs, they brainstormed ideas for co-working spaces in the library. Next, they created a prototype space in the library and observed how people used it. Aspects of the space that were not working were either modified or eliminated entirely and replaced with other approaches, thus beginning the cycle anew. New perspectives surfaced, such as the need to support job seekers. Additional co-working spaces as well as services to assist with employment will be developed based on what they learned from the original prototype (Miller and Schwartz 2014).

However, physical spaces are not the only things libraries and librarians create. For example, some public libraries have also designed alternative classification systems to help their users browse and find materials, such as Maricopa County (AZ) PL's "ShelfLogic," an adaption of the BISAC subject headings (Lynch and Mulero, 2007; Shore, 2007; Charles, 2012) or Markham PL's Customer Centered Classification (Hosseini-Ara, 2012; Sharma et al., 2009; Markham Public Library, n.d.).The Chicago Public Library is well-known for actively embracing a design thinking perspective, from programming ideas to staff hires (Schwartz, 2013). For example, a team working in the Literature and Language department wanted to better assist patrons interested in learning English. To understand what navigating the library might be like for a non-English-literate patron, the team took a trip to a local Korean grocery store. They brought a list of items to find, written in Korean—a language that none of the team members were able to speak or read. They declined to ask any of the market's staff for assistance, to experience what it might be like to search for items in an unfamiliar language without help. Based on what they learned from this immersive empathetic experience, they reorganized their entire English Language Learners section and created signage in both English as well as the languages of their patrons. Other examples of library services improved with design thinking include signage and wayfinding at the University of Technology Sydney (Luca and Narayan, 2016), data management at Oklahoma State University (Ippoliti, 2016), and transfer student relations at the University of Washington (Whang et. al., 2017).

Education for design thinking in librarianship

Where do librarians learn about design thinking and methods? In these examples, the influence of IDEO, a seminal design firm that helped publicize design thinking, is evident. So is the influence of design schools like Stanford's famous d.school. These organizations offer introductory toolkits and online mini-courses in basic design thinking approaches and methods. A few are even specifically tailored for libraries, such as IDEO's "Design Thinking for Libraries" toolkit (http://designthinkingforlibraries.com), which offers librarians a step-by-step guide to adopting design thinking as a staff-driven process for change. The toolkit's popularity continues to contribute to greater awareness about design thinking among library workers. In 2016, the Library Journal Design Program, which initially focused on architectural design challenges that united librarians and architects to explore the use of design to improve library services, began to offer a design thinking workshop in conjunction with the Chicago Public Library, which itself contributed to the rise of design thinking. Other online tools, like the blogs at the Blended Librarians Online Learning Community (http://blendedlibrarian.org) and Designing Better Libraries (http://dbl.lishost.org) offer practicing librarians opportunities to participate in discussions and information exchange.

While these tools are certainly useful, they must be independently sought out and found by librarians through means like published articles or word-of-mouth. There is no systematic exposure to this design material across the field of librarianship as a whole. Formal design education is traditionally absent from education of librarianship (Clarke et al., 2017). A historical review of librarians' educational and disciplinary backgrounds reveals that less than 9% of librarians have undergraduate education or additional degrees in visual and performing arts, the

broader disciplinary category that includes design (Clarke and Kim, 2018). A recent curriculum review of ALA-accredited MLIS and equivalent programs reveals that the word "design" is used to describe over 400 courses, including topics like software design, instructional design, research design, and graphic design; however, only 4 courses specifically focused on design thinking and methods were identified (Clarke and Potter 2019). And despite articulation of design as a legitimate research method for librarianship, it is conspicuously absent from LIS research textbooks and studies (Clarke 2018a).

There is clearly a great deal of interest in the application of design thinking and methods in librarianship. However, there seems to be a disconnect between this application and education to potentially support it. As part of a larger IMLS-supported National Forum about integrating design education into master's level library education, this study aims to understand interest in and use of design thinking and methods in library practice, and the use of and need for design skills and abilities in library education by investigating the following research questions:

- What, if any, design methods and approaches are being used in library practice?
- What are practicing librarians' opinions on the need for design thinking and methods in library work?
- Where do practicing librarians who utilize design thinking and methods learn these techniques?
- How and in what context do practicing librarians think design thinking and methods could or should be taught?

Methods

To answer these exploratory questions, we created a questionnaire intended to solicit feedback regarding the interest in and use of design thinking and methods in library practice, and the use of and need for design skills and abilities in library practice from active librarians and library workers. The questionnaire included questions about topics such as practitioners' familiarity with design thinking and methods; source(s) of education for any exposure to design thinking and methods, and their thoughts regarding incorporating design thinking and methods into MLIS programs. The questionnaire was implemented using Qualtrics and was open for responses for approximately 10 weeks from January through March 2018. The full questionnaire is included in the Appendix.

Participants were people 18 years or older who self-identified as a practicing librarian or library worker in the United States and were able to complete a questionnaire in the English language. Survey invitations were distributed through various online venues, such as state and regional library associations and library-related listservs. Many users on social media also chose to share or forward invitation messages to friends and relevant communities. The respondents for this study were recruited relying on convenience sampling. While we made our best efforts to widely distribute the survey invitations through multiple channels, and collect a substantial number of responses to alleviate issues with convenience sampling, the limitation regarding the generalizability of the findings must be noted.

We received 284 responses to the questionnaire; however, 12 respondents answered that they did not currently work in a US library and so their responses were excluded. Out of the remaining respondents, 145 people (53.3%) completed the questionnaire in its entirety. On average, these participants took 18 minutes and 16 seconds to complete the survey. Quantitative data from the responses were cross-tabulated, visualized and analyzed using R and Tableau. Open-ended responses were indexed thematically to establish representative ranges of cited concepts and perceptions.

Findings

Of the 272 total responses, 81% of respondents identified as female and 81% as white, which generally parallels the demographics of U.S. librarianship. The average age reported by respondents was 47 years, with an average of 18 years of experience working in libraries. Most (82%) of respondents held an ALA-accredited MLS or equivalent degree. 96% of respondents reported working for more than 20 hours/week, with almost 70% reporting working 40 hours/week or more. Public libraries were the most represented work setting, with 66% of respondents stating those as their places of work, followed by academic, school, and special libraries (see Figure 2). Approximately 50% of respondents described their work as being in the category of administration/management (see Figure 3). We received the highest number of responses (66) from participants in California, followed by Idaho (33), Connecticut (31), Florida (23), Hawaii (13), and Illinois (12). We also received responses from participants residing in Washington, Nevada, Missouri, Louisiana, Georgia, Kentucky, Virginia, Maryland, Vermont.

Distribution of Work Settings

Q13
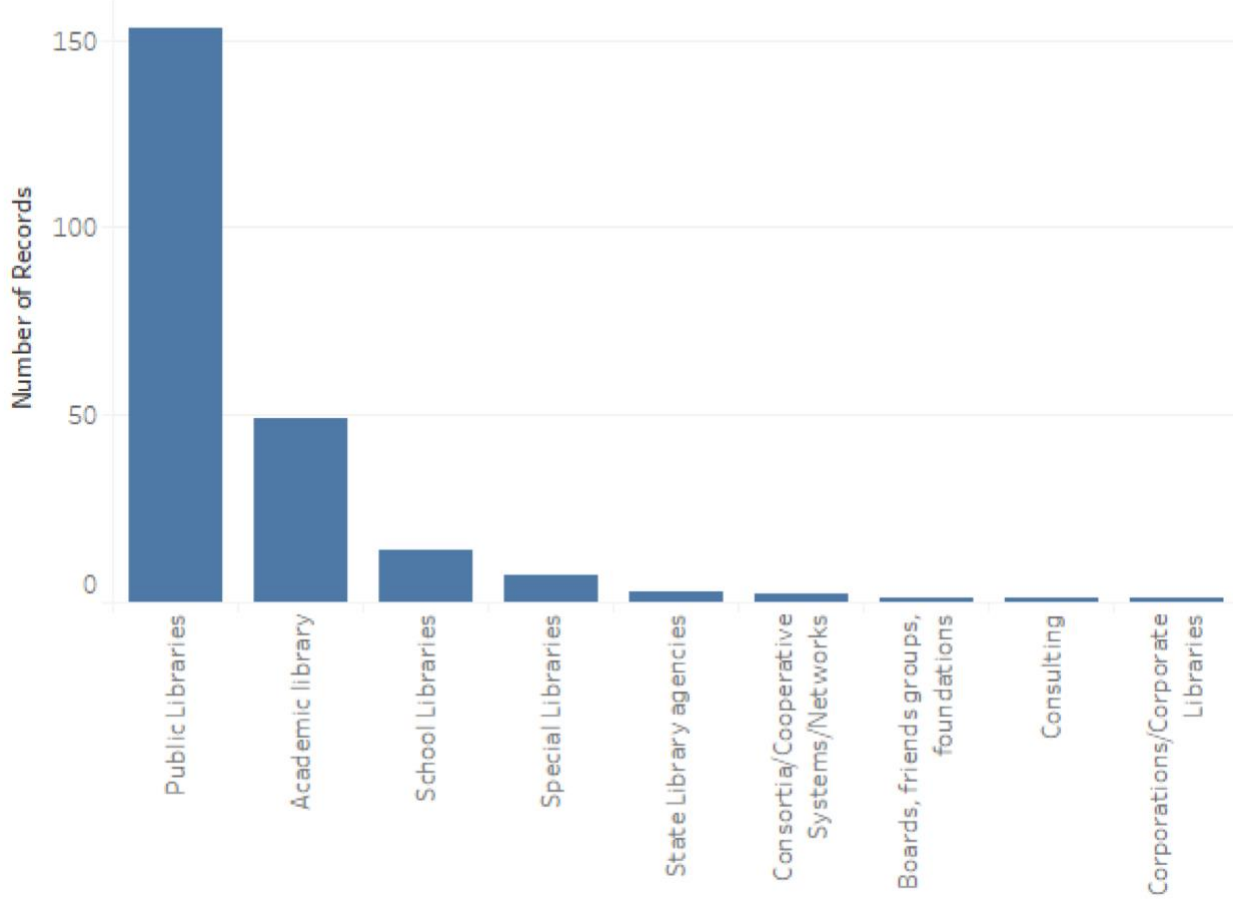
Figure 2. Distribution of responses to the question "What type of library is most representative of the library in which you currently work?" Answer choices taken from ALA's membership application, April 2017.

Distribution of Work Types
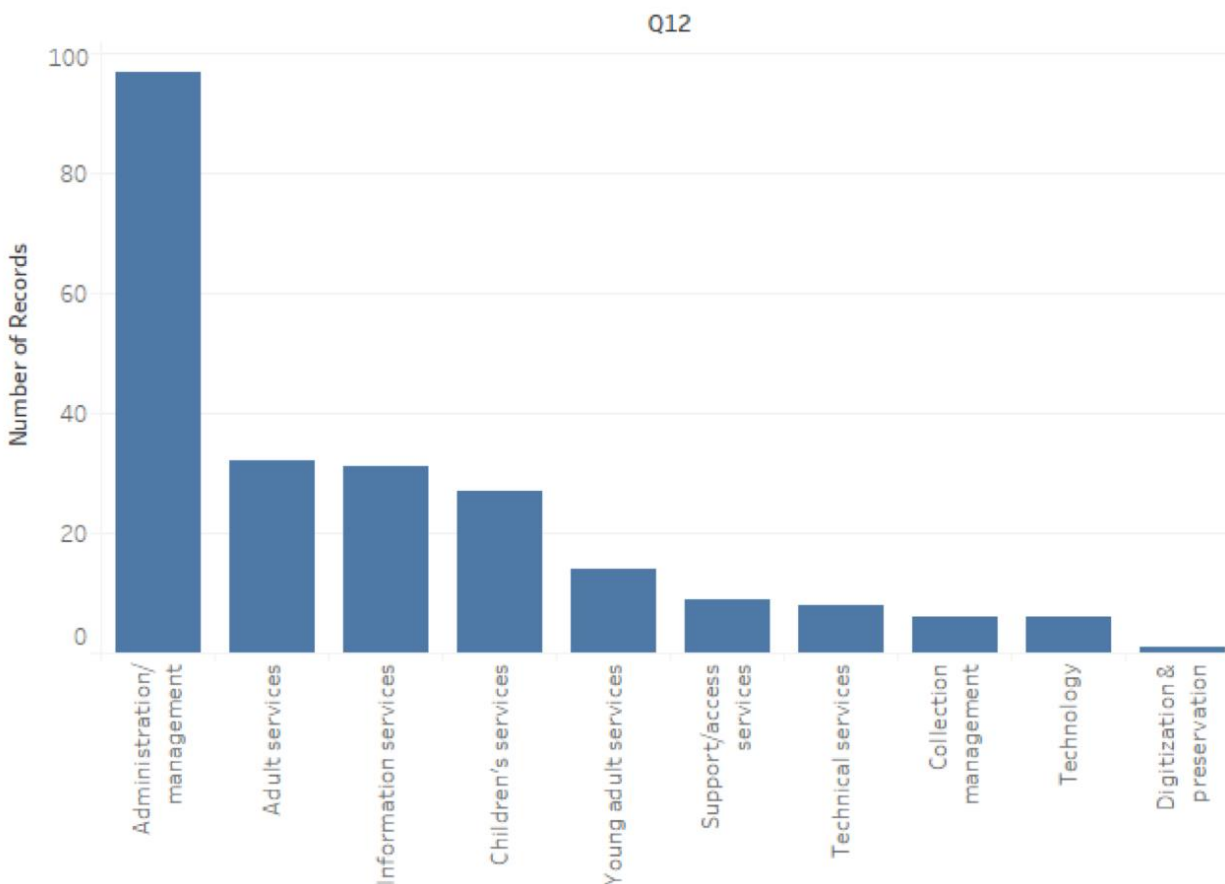
Figure 3. Distribution of responses to the question "Which of the following would you say best reflects most of your day-to-day work?" Answer choices taken from ALA's membership application, April 2017.

Familiarity with design thinking

Overall, 60.9% of the respondents from public libraries reported being either somewhat familiar or very familiar with design thinking. Even though the overall number of respondents from academic libraries was lower, 75.5% (37/49) of academic library workers who responded said they were somewhat or very familiar with design thinking. See Figure 4 for the distribution of responses from other library types.
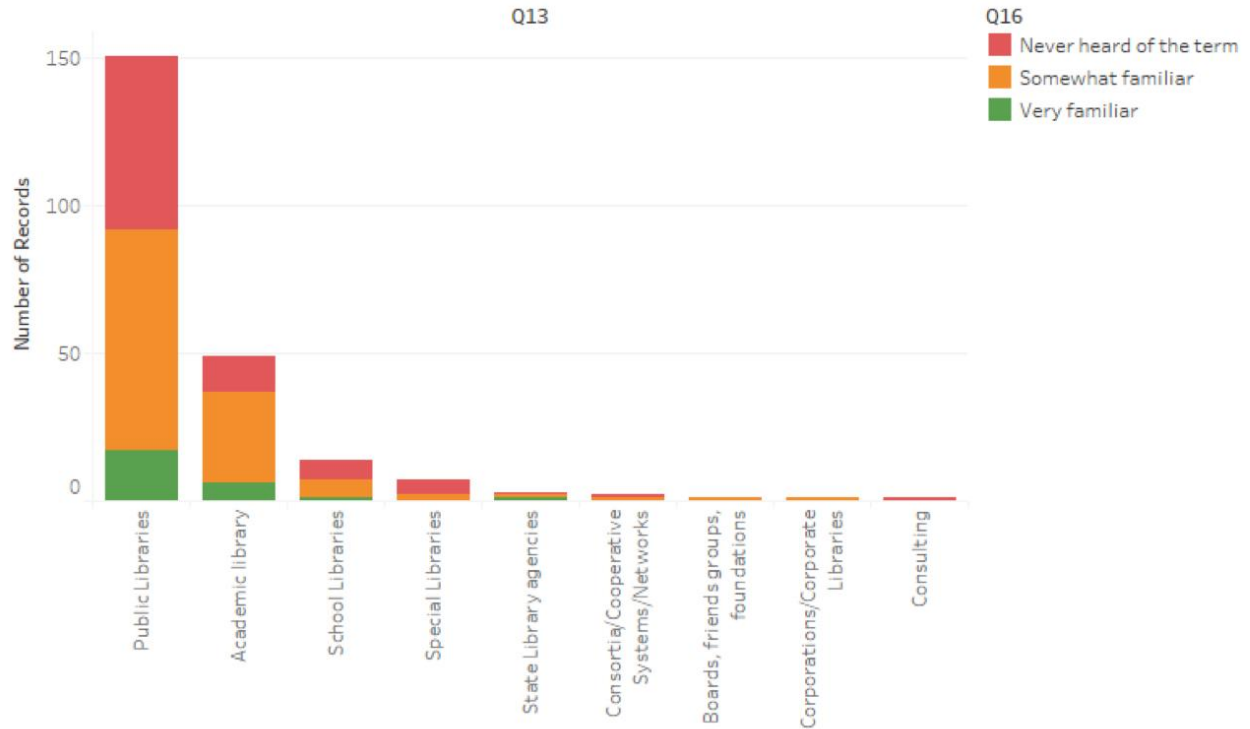
Figure 4. Distribution of responses to the question "How familiar would you say you are with the concept of 'design thinking'?" by library type.

Self-reported familiarity with design thinking and methods also varied by day-to-day work role (see Figure 5). Notably, a majority of respondents from information services, support/access services, technical services, and young adult services replied that they had never heard of design thinking. Young adult services was unique in that no respondents indicated a high level of familiarity with design thinking and methods.
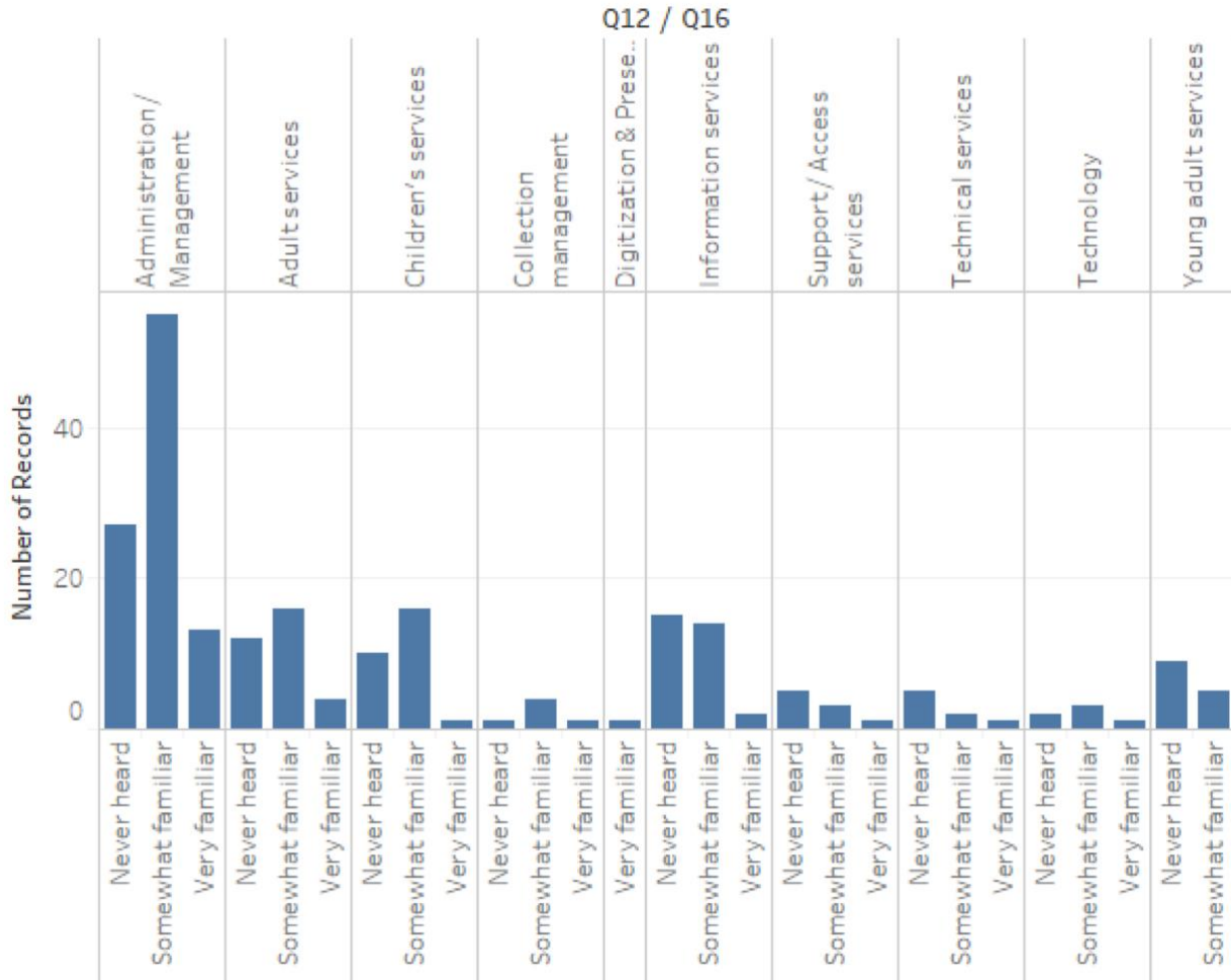
Figure 5. Distribution of responses to the question "How familiar would you say you are with the concept of "design thinking"?" by day-to-day work role.

In an attempt to understand the potential influence of respondents' opinions, we asked about role and responsibility in hiring decisions. While most people in a position to influence hiring to some capacity self-identified as being somewhat familiar with design thinking, more than 20% of people with some hiring input had not heard of design thinking (see Figure 6).

Q15	Q16		
	Never heard of the term	Somewhat familiar	Very familiar
Final say in hiring decisions	10.48%	18.34%	3.93%
Serve on search committees or other roles that directly influence hiring	9.17%	15.28%	3.49%
Make recommendations or Provide opinions that indirectly inform hiring decisions	3.93%	7.86%	1.75%
Play no role in hiring decisions	13.97%	10.04%	1.75%

Figure 6. Familiarity with design thinking and methods and level of influence in the hiring process.

To better ascertain respondents' familiarity with design thinking and methods, we asked them to define design thinking in their own words. Respondents tended to define design thinking as an approach to problem solving (often additionally described as user-centered, empathetic, creative, and/or experimental); decision making (similarly described as user-centered by several respondents); or development and evaluation (of products, programs, services, and/or physical spaces). Other recurring concepts respondents highlighted include rapidity, collaboration, and iteration. Many respondents identified design thinking as a process—some of these participants described this process using terminology similar to that used in Stanford's d.school's five stages of design thinking, as seen in Figure 7. Several principles that did not directly correlate to the d.school's stages were cited as well, including a focus on physical space layout and aesthetics, creativity, innovation, a positive attitude toward failure, and ambition.
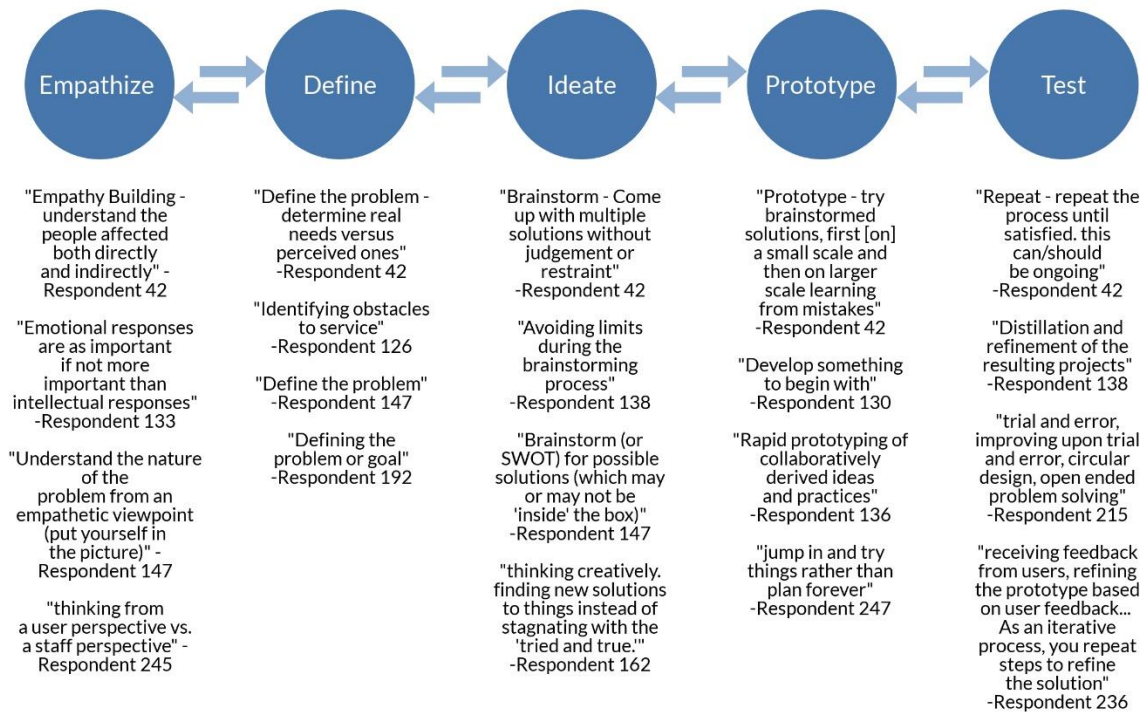
Empathize

"Empathy Building - understand the people affected both directly and indirectly" - Respondent 42

"Emotional responses are as important if not more important than intellectual responses" -Respondent 133

"Understand the nature of the problem from an empathetic viewpoint (put yourself in the picture)" - Respondent 147

"thinking from a user perspective vs. a staff perspective" - Respondent 245

Define

"Define the problem - determine real needs versus perceived ones" -Respondent 42

"Identifying obstacles to service" -Respondent 126

"Define the problem" -Respondent 147

"Defining the problem or goal" -Respondent 192

Ideate

"Brainstorm - Come up with multiple solutions without judgement or restraint" -Respondent 42

"Avoiding limits during the brainstorming process" -Respondent 138

"Brainstorm (or SWOT) for possible solutions (which may or may not be 'inside' the box)" -Respondent 147

"thinking creatively. finding new solutions to things instead of stagnating with the 'tried and true.'" -Respondent 162

Prototype

"Prototype - try brainstormed solutions, first [on] a small scale and then on larger scale learning from mistakes" -Respondent 42

"Develop something to begin with" -Respondent 130

"Rapid prototyping of collaboratively derived ideas and practices" -Respondent 136

"jump in and try things rather than plan forever" -Respondent 247

Test

"Repeat - repeat the process until satisfied. this can/should be ongoing" -Respondent 42

"Distillation and refinement of the resulting projects" -Respondent 138

"trial and error, improving upon trial and error, circular design, open ended problem solving" -Respondent 215

"receiving feedback from users, refining the prototype based on user feedback... As an iterative process, you repeat steps to refine the solution" -Respondent 236

Figure 7. Respondents' key principles of design thinking and the d.school's five stages of design thinking.

Current uses of design thinking in libraries

When asked if they had ever actively used design thinking and methods in their library work, 50 (27% of respondents to that question) answered yes; 70 (38%) answered not sure; and 64 (34%) said no. For the respondents who answered in the affirmative, we asked open-ended follow-up questions about the types of projects in which design thinking had been used. Respondents cited a broad range of projects to which design thinking was applied, including programming, planning, technical services, research and grant writing, administrative work, user experience (UX), outreach, and updates or renovations to physical library spaces. A few respondents named specific projects within these general categories, such as the "Fabslam 3D design and fabrication program" (Respondent 215), an ethnographic study titled "Library Next" (R130), and "makeX, the City of Palo Alto's teen-designed makerspace" (R219). Design thinking was frequently implemented through empathy and understanding, brainstorming, and iteration. Many respondents did not provide specific information as to how these aspects of design thinking were applied to projects in their libraries. The majority of participants who mentioned that they performed group brainstorming sessions did not discuss the actual brainstorming process in detail. Generally, participants provided the most information about the role empathy

and understanding played. One respondent described "literally exploring" the library's community "on foot, door to door" to get a better understanding of the community's wants and needs (R224). Several participants discussed interviewing and/or surveying various stakeholder groups, including students, patrons, community members, and library staff. Still other participants described observing patrons while in the library as part of their work on pathfinding projects.

Responses reflecting the benefits of using design thinking in the previously discussed projects fall into three main groups: staff benefits (improved problem-solving skills, increased flexibility and ability to rebound from failures, and increased confidence); user benefits (increased opportunities to provide input, collaborate with staff, learn, and feel understood); and overall library benefits (increased awareness and use, streamlined operations, and increased reputation in the user community). One participant summarized in the response: "We have a vital library instead of a warehouse for books" (R147). While some respondents reported that they did not find any downsides to design thinking, the most commonly cited drawback was having to work within limitations. Difficulties with time and budget constraints were especially prevalent. Responses also reflected interpersonal challenges, such as resistance to change and group work, and difficulties with buy-in among staff, stakeholders, and the field at large.

Opinions about the relevance of design thinking to library practice

Interestingly, respondents seemed to find design thinking most relevant to the area of young adult services, with 78.62% of the respondents answering that design thinking and methods are highly relevant to that specific area. This is surprising, given that none of the participants who reported working in young adult services indicated a high level of familiarity with design thinking. Other traditionally user-facing services, like children's services, adult services, and information services were also considered to be highly relevant. At the other end of the spectrum, respondents most frequently identified digitization & preservation work as an area where design thinking and methods have limited relevance (41.37%; 60/145) or is not relevant (8%; 12/145). See Figure 8 for the full distribution.
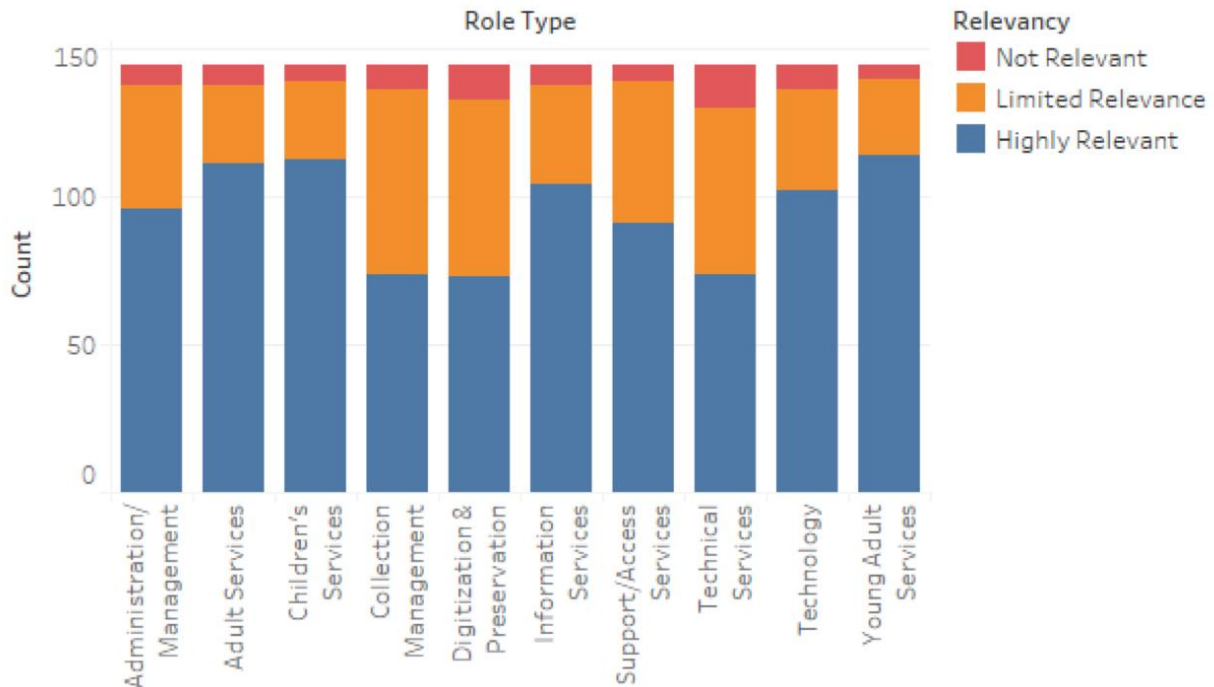
Figure 8. Distribution of responses to the question "How relevant do you think design thinking and methods are to each of the following aspects of library work?"

When asked if there were any other specific aspects of library work in which design thinking might be especially useful, the majority of respondents indicated that there were no other specific areas of library work that would not benefit from design thinking. Of those who did offer additional aspects, common themes of physical space design and program development emerged as additional aspects of librarianship in which design thinking is especially relevant. Several respondents reported that design thinking was relevant to every or any aspect of library work. One respondent described design thinking as important for "Survival skills- a viable tool as we reinvent ourselves to stay relevant in today's world" (R147).

A few participants reiterated the opinion that design thinking has limited relevance in the previously discussed areas of administration/management, collection management, and technology. Budgeting was mentioned in a few responses as a specific aspect of librarianship in which design thinking is less beneficial.

Education for design thinking

We asked respondents about their own experiences with education covering design thinking as well as their opinions about the inclusion of design thinking and methods specifically in formal library education such as MLIS degree programs. First, we asked whether or not participants had ever received education in design thinking and methods, and if so, what was the source or venue for that education. 39 (out of 104) participants replied that they had experienced some kind of design education. See Figures 9 and 10 for distribution of responses by work role and library type. Participants reported a variety of venues as the source of education, including university courses, professional development workshops within libraries or at their workplaces,

and association conferences. There were also several mentions of informal or self-education through media such as reading books, articles or blogs, or through conversations with colleagues.
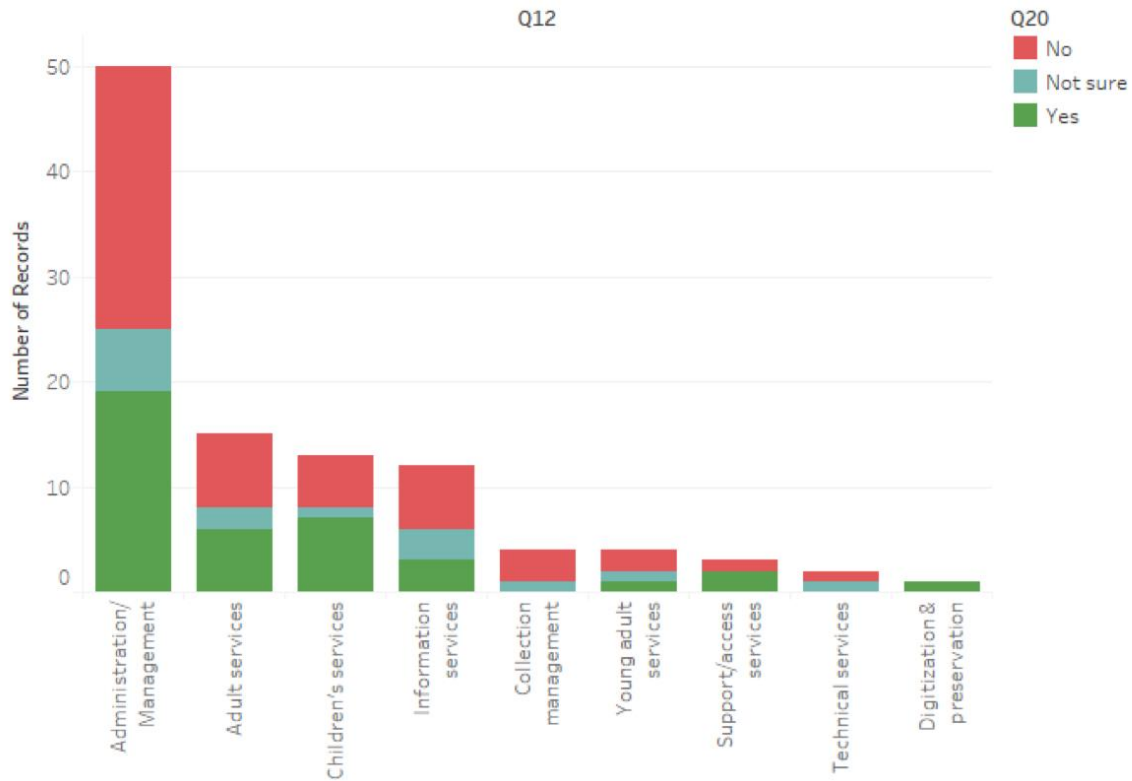

Figure 9. Distribution of responses to the question "Have you ever received any education or training in design thinking and methods?" by work role.
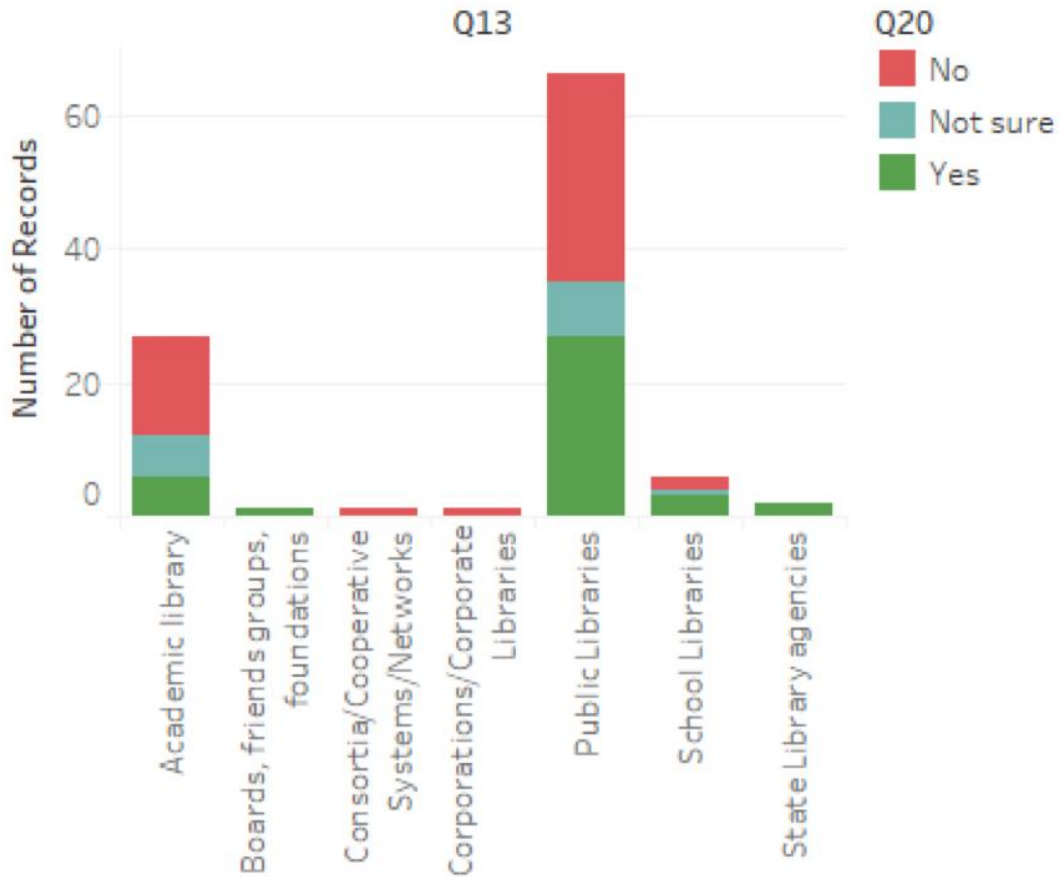
Figure 10. Distribution of responses to the question "Have you ever received any education or training in design thinking and methods?" by library type.

We also asked respondents whether they thought design thinking education should be required for their specific area of library work. Responses were similar to the assessment by library workers overall. Design thinking was perceived as relevant to technology services, with 100% of respondents working in a technology role stating relevance, and not relevant to digitization and preservation work, with 100% of respondents working in that area stating design thinking was not relevant to that area of work. However, the actual number of respondents that identified themselves as working in technology or digitization and preservation were low, with only one person reporting working in technology and only one respondent who identified working in digitization. Thoughts about design thinking's relevance to other roles by those working in those roles were more varied (see Figure 11).
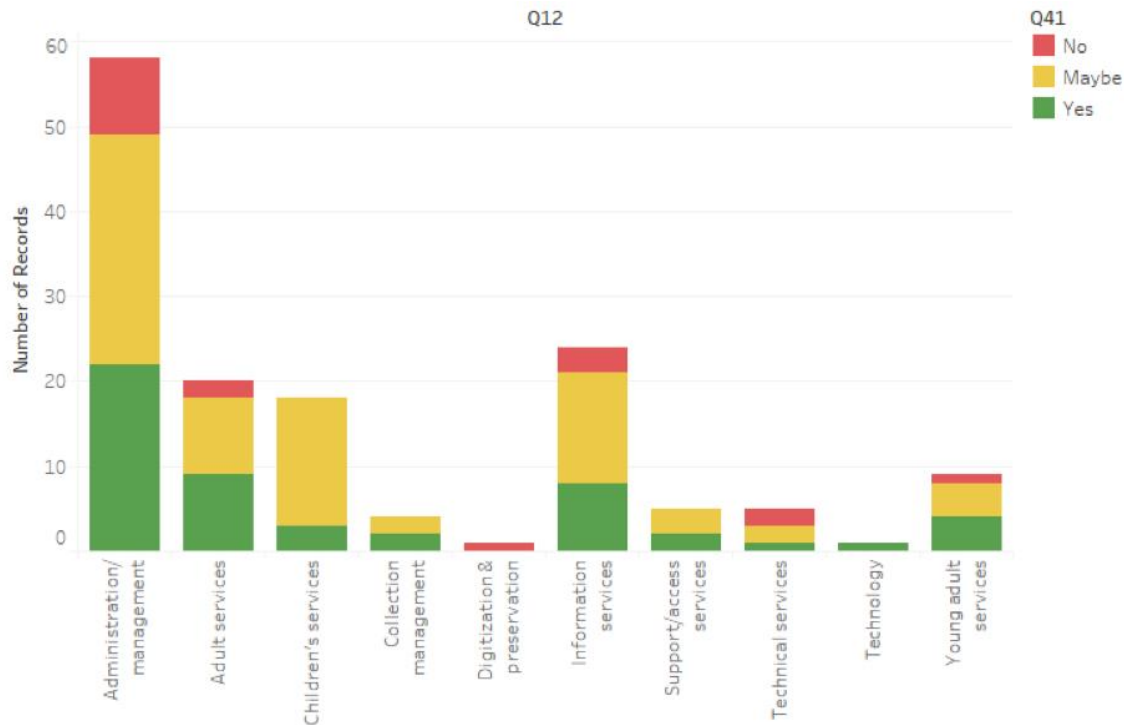
Figure 11. Distribution of responses regarding educational requirement for design thinking and methods across roles.

In addition, we asked participants if they would personally be interested in education or training in design thinking and methods that was specifically tailored for libraries and library workers. 55.17% (80) of respondents said yes, they were interested in this kind of education. The small number of people who responded that they would not be interested (8.97%; 13), came from administration/management, children's services, digitization & preservation, information services, technical services, and young adult services. Respondents from adult services, collection management, support/access services and technology all replied either "yes" or "maybe" regarding interest in library-specific design education. See Figure 12 for the full breakdown by role.
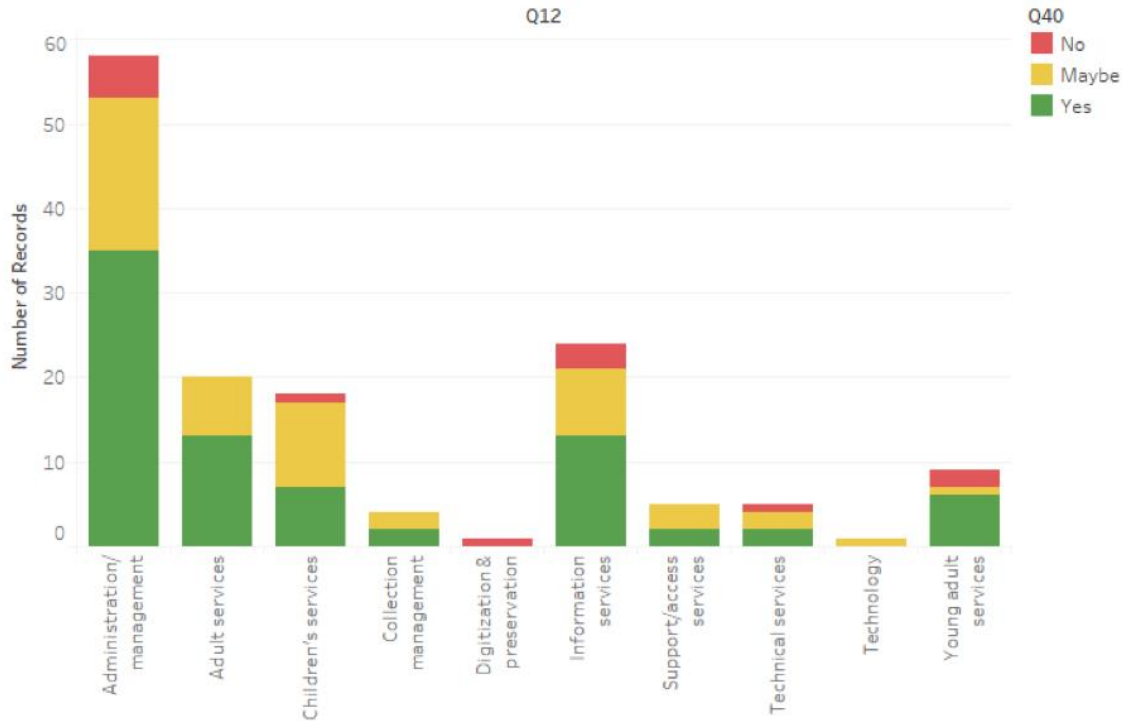
Figure 12. Distribution of responses regarding interest in participating in education or training in design thinking or methods specifically for library workers by role

55.4% (51 of 92) of respondents from public libraries, 52.94% (18 of 34) from academic libraries and 88.8% (8 of 9) from school libraries showed definite or possible interest in design education specifically for library workers. Respondents from all other organizational settings, such as special and state libraries, indicated potential interest; however, the overall number of respondents from these settings was low (4) compared to the more traditional library types, especially public and academic libraries.

Interestingly, respondents who were already somewhat or very familiar with design thinking indicated interest in participating in education or training in design thinking or methods specifically for library workers (see figure 13).

Interest Categorization

Q16	Q40			Total Records	
	No	Maybe	Yes	1.38%	35.86%
Never heard of the term	4.83%	15.17%	11.72%		
Somewhat familiar	2.76%	17.24%	35.86%		
Very familiar	1.38%	3.45%	7.59%		

Figure 13. Distribution of responses regarding interest in participating in education or training in

design thinking or methods specifically for library workers by familiarity with the term "design thinking."

Regarding the inclusion of education for design thinking and methods in MLIS programs, most (95.17%) people were in favor, with 26.9% (39 of 145) answering that it should be required and 68.27% (99) that it should be offered but optional, like an elective course. Respondents from all roles felt that it should be offered at least optionally, with the exception of administration/management and information services, in which a small number of respondents said no, it should not be offered (5 and 2, respectfully) (see Figure 14).
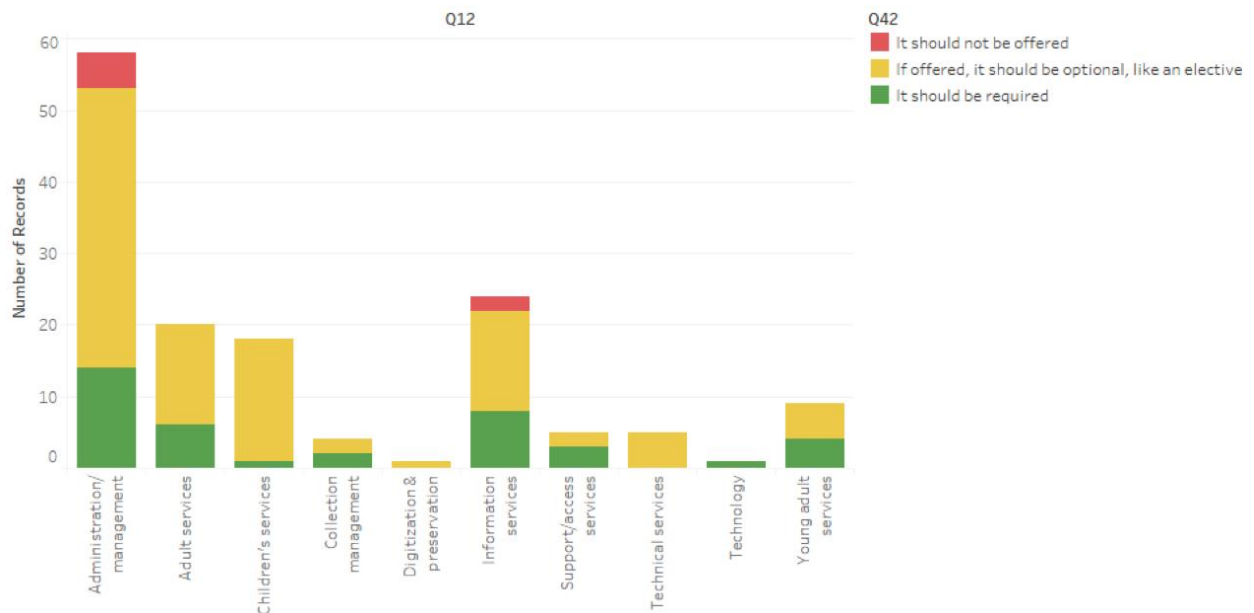

Figure 14. Distribution of responses regarding the inclusion of design thinking in MLIS and equivalent degree programs by role.

When considering role and responsibility in hiring decisions, we found that most people in a position to influence hiring to some capacity think that education in design thinking and methods should be required for the type of work they do (see Figure 15).

Q15	Q41		
	No	Maybe	Yes
Final say in hiring decisions	6.90%	12.41%	13.10%
Serve on search committees or other roles that directly influence hiring	4.14%	17.24%	6.90%
Make recommendations or Provide opinions that indirectly inform hiring decisions		5.52%	7.59%
Play no role in hiring decisions	1.38%	16.55%	8.28%

Total Records
1.38% — 17.24%

Figure 15. Perceptions regarding requirement of education in design thinking and methods for respondents' work types and level of influence in the hiring process.

Discussion

Even though a number of participants did not complete the full survey, there is still clear interest in the application of design thinking and methods in library work as well as education to support such endeavors. Most of the people who did not complete the full questionnaire dropped out after the more specific questions about design thinking, especially those who responded that they were unfamiliar with design thinking and/or had not actively used design thinking in their library work. 46.5% of the people who responded that they had never heard the concept of design thinking did not complete the entire questionnaire. This makes sense as those participants might not have been able or willing to answer the remainder of the design thinking-specific questions. Additionally, the nature of the questionnaire distribution means that respondents likely chose to respond because of previous or existing interest in the topic. While we certainly cannot claim that the findings from this work are representative of U.S. library work as a whole, they still work to illustrate the ways in which design methods and approaches are being used in library practice.

Design thinking and library practice

The most common applications of design thinking projects in libraries include space planning and program design. But it appears that the application of design thinking in libraries is less about the actual spaces and programs that emerge from the process, but rather what the process has to offer in terms of community understanding. As libraries are increasingly called upon to be community catalysts, connecting with patrons in new and deeper ways (Norton and Dowdall, 2016), a thorough understanding of these communities is imperative. There was considerable emphasis placed on empathy throughout many of the responses—some addressed empathy exclusively. One participant noted that "The emphases on empathy and

open-ended/iterative experimentation is the valuable takeaway" (R155), thus shifting the value of design thinking away from outcomes (i.e. specific products and services) and instead in the direction of what can be learned about the library's user community in the process of working toward those outcomes.

The focus on empathy often led to lesser consideration of other aspects of design thinking. Using the example of Stanford d.school process model of design thinking, empathy is but one of five aspects inherent in design thinking. Compared to empathy, respondents commented noticeably less on other phases, such as defining problems, ideating and prototyping solutions, and testing and evaluation, or other aspects inherent to design, such as iteration and reflection. Two respondents briefly touched on "adjustments" (R147) or revision (R242). None overtly addressed prototyping, though some mentioned "experimenting with ideas" (R182) or "implementing" a "devised game plan" (R147). Prototyping was often either skipped over entirely or treated as a part of/the same as brainstorming. Several respondents described going directly from brainstorming to fully implementing a specific solution with no discussion of prototyping. Revision was often skipped over as well.

Design of physical products vs. intangible services

The reduced focus on these aspects may be due to the perception that physical making is less relevant to a lot of library work: "[design thinking] tends to be confusing because you can't physically construct a model and test it out for staffing distribution and population use of materials over a 24 branch system serving a million people. Not the same thing as creating a space model to figure out workflows or making a test model of something that will be built and exist in a physical framework" (R181). Respondent 217 noted that "there's a lot of good that can come from design techniques," but also that "a lot of design methodology doesn't fit neatly into libraryland… Design offers some great tools, but I'm not convinced it is of central importance to the daily function of most library employees. The signal to noise ratio is pretty staticky in my experience."

Because so many library products and services are intangible, it may be difficult for people to make the leap from prototyping physical products to these less tangible outputs. However, even though common perceptions of design may focus on physical products, the design field does not limit itself to this narrow focus. Design thinking and methods are well-established as equally applicable to intangible products like services and experiences. For instance, the design firm IDEO evolved from designing consumer products to "designing consumer experiences"(Brown and Wyatt 2010), demonstrating that design products extend beyond tangible, physical things. Other organizations have recognized this shift in design from a focus on looks and usability of physical artifacts to intangible products, applying design thinking to strategic planning, business models, and organizational structures and processes (Leavy 2010; 2012). Design principles and processes are fundamental to service design, which is rooted in intangible constructs like communication, environment, behaviors and experiences (Zomerdijk and Voss 2010; Stickdorn and Schneider 2011; Polaine et al. 2013). Libraries are no exception-- Marquez and Downey have written extensively about library service design (e.g. Marquez 2015; Marquez and Downey

2015; Marquez and Downey 2016). Yet the disconnect in how to apply design thinking and methods to intangible services persists. It seems evident that more education and experience regarding how to apply design thinking to intangible intellectual products may be necessary and highly relevant to library work. This might occur through formal coursework in graduate library education programs or via professional development workshops, conference presentations, or other similar venues. We also suggest that more examples of intangible design products in libraries be included in discussions, presentations, and repositories of exemplars so that intangible products become more commonly acknowledged as design artifacts.

Fear of commercialism

Although design thinking does not directly stem from commercial business enterprises, many business organizations have adopted design thinking to help with strategic planning and other managerial or leadership activities (Brown and Katz, 2009; Martin, 2009; Leavy, 2010, 2012). Such applications may lead library workers to be skeptical of design thinking's relevance to librarianship. For example, Respondent 155 noted that "Public libraries are not commercial enterprises" and expressed concern over the fact that design thinking appears to "inherently identify patrons as customers to 'sell' something to." Although libraries are not businesses, library workers also support strategic planning, organizational processes, and the creation of tools and services for library users and patrons.

Design thinking or design theory?

The focus on one phase of the design process points at deeper issues. Even though the phrase "design thinking" is used to describe a process model and a theoretical worldview (Clarke 2019), its use in library practice seems to emphasize the former. The emphasis on the application of the process distills a large worldview into a set of seemingly simple steps. But design is much more than a set of steps: design is actually its own overarching discipline, one based in creating artifacts to solve problems (Simon, 1969; 1996). Because of this distinction, design offers fundamentally different ways of knowing--theories, philosophies, and principles that lay the foundations for the design thinking mindset (Cross 2011). Although library workers may be engaging in the applied practices of empathizing with users, defining problems, ideating solutions and evaluating implementations, they may not be explicitly engaging with the theoretical and epistemological perspectives that underlie those practices. Given this, it then makes sense that library workers cannot transfer their applied knowledge from the design of physical products to intangible services if they do not have the theoretical knowledge of design that applies across those contexts. Reducing design thinking to a process model may offer easy access to important concepts in design for beginners, but at the risk of losing much of the theoretical and philosophical depth that powers strong design outcomes.

Even when the theoretical worldview of design is drawn upon, it is often implicit or unacknowledged. For instance, some respondents described design thinking as "basic common sense relabeled" (R 248) or an approach "we all have been using… before it was labeled as Design Thinking" (R 148). This reflects the idea that librarians are doing design work, using

methods and techniques of design, but not acknowledging or recognizing them as such. Presumably, this negation is out of ignorance regarding the discipline of design, but it has potentially negative implications regarding both the ability to further harness design theories and methods to improve library products and services as well as the establishment and recognition of design as a legitimate discipline. Interestingly, many respondents noted resistance to change and group work, and difficulties with buy-in among staff, stakeholders, and the field at large as some of the challenges and drawbacks to design thinking in libraries. Yet how much is really change if design thinking is just common sense and regular library work relabeled?

Design thinking and education

While respondents were generally in favor of design education specifically for librarianship, a majority of the responses (68.27%) indicate that if design coursework is offered in MLIS programs, it should be an optional course like an elective in the curriculum. This is a pragmatic solution, especially given the distribution of perceived relevance across various types of library work. MLIS students who want to pursue a career in areas perceived as highly relevant to design thinking, such as youth services or technology, can opt to take design coursework, while those interested in areas like digitization and preservation can choose other courses specific to that topic. While there are obvious benefits to such flexibility, a lack of requirement may also be problematic given the high perceived relevance in specific areas, such as youth services. Even though more than three-quarters of respondents indicated that design thinking and methods were highly relevant to young adult services, no respondents who identified as working in that role indicated a high level of familiarity with these concepts. This disparity may reflect librarians' limited understanding of how design thinking and methods are actually used in day-to-day library work. Programs like the University of Maryland's master's level concentration in "youth experience (YX)" which draws on design methods and principles from the participatory design and user experience communities, can begin to address this gap (Subramaniam, Waugh and Clegg 2018). However, focusing only on youth services leaves other areas of librarianship not currently addressed.

Respondents who were not in favor of design education for librarianship seemed to hold the view based on negative personal experiences with design thinking in their institutions. For example, Respondent 181 described management in their institution overusing design thinking, writing that its use has been "excessive," that it is done "very innapropriately [sic]," and that it "just serves to increase the purchase of jumbo post-its and markers." Although this perspective was not reflected in most of the other descriptive responses, Respondent 269 cited "Inadequate accomplishment of underlying purpose" as a drawback to implementing design thinking. Based on this perceived lack of relevance, it is easy to see a corresponding lack of interest in further education. However, it is entirely possible that these kinds of excessive and inappropriate applications of design thinking stem from a lack of education, especially given some of the other perceptions and misunderstandings of design thinking that emerged in the responses.

Additionally, the findings here in conjunction with the demonstration of increased relevance of design to librarianship (e.g. Clarke 2016, 2018a, 2018b) may call for more mandatory inclusion

of design course work in MLIS programs. In addition to ensuring that all graduates emerge with flexibility, creativity, and problem-solving skills (all of which are called for by various sources, e.g. Bertot, Sarin and Purcell 2015; Garmer 2016), required coursework in design also makes an epistemological statement about the field of librarianship. The development of classes and the production of course materials play a key role in establishing norms and identity of a field (e.g. Carter, 1999). Therefore, not requiring design coursework may leave the library profession lacking a definitive standpoint as regards the relevance of design to the field.

MLIS programs are obviously not the only educational mechanism for library education. Respondents who identified as having previous design education noted a number of other sources beyond formal educational institutions and degree programs, such as professional development courses and workshops and self-education through books, websites, and other media. Given the interest in education for this topic, professional development offerings make sense, as most respondents already held MLIS or equivalent degrees and had an average of approximately 14 years of library experience. However, as previously noted, many contemporary professional development offerings on the topic of design thinking are not library-specific. Often those that are, such as the Design Thinking for Libraries Toolkit, offer more of a self-training exercise, rather than expert training. Respondent 136 noted that without expert guidance and/or a very strong understanding of the concepts, it is difficult to use design thinking effectively. Such lack of expert guidance may also continue to contribute to the oversimplification of design thinking discussed in the previous section. To be educated adequately in design thinking and methods, either via graduate education or professional development, librarians need instructors and mentors who are experts in both design and library topics. As not many people currently exist with expertise at this intersection, there should be opportunities for people expert in design to study and work in libraries, as well as for librarians to study design, be it in library settings or other venues, such as Stanford University's d.school, which offers formal degree programs as well as immersive fellowships and short courses. Additionally, reliance on professional development rather than integration into degree programs means there is no systematic exposure to design concepts across the field of librarianship as a whole. An integrated combination of formal education and ongoing professional development is necessary to overcome the barriers created by the oversimplification of design in librarianship.

Conclusion

There is clearly a great deal of interest in the application of design thinking and methods in librarianship. As part of a larger IMLS-supported National Forum about integrating design education into master's level library education, this study sought to understand interest in and use of design thinking and methods in library practice, and the use of and need for design skills and abilities in library education. We found that while many design methods and approaches are currently being used in library practice, there is an emphasis on the empathy and user/community understanding aspect of design thinking, perhaps to the detriment and neglect of other aspects. We were surprised to find that many respondents wrote very little about prototyping and refinement, or neglected to address them at all, when discussing projects in which design thinking and methods were applied. We see this as an issue which may benefit

from more a more focused study in the future. Design thinking and methods are also used mostly for projects like space planning and program development, both of which seem like easily applicable targets for design thinking and methods due to more straightforwardly observable connections and applications. Library workers seem to struggle with applying design thinking and methods to more intangible services and experiences, even though design thinking has been applied to that type work in other domains. To address this issue, we suggest that more education and experience regarding how to apply design thinking to intangible intellectual products may be necessary and highly relevant to library work. This might occur through formal coursework in graduate library education programs or via professional development workshops, conference presentations, or other similar venues. We also suggest that more examples of intangible design products in libraries be included in discussions, presentations, and repositories of exemplars so that intangible products become more commonly acknowledged as design artifacts.

Given these applications, practicing librarians think that design thinking and methods have relevance to library work, but opinions vary based on library type and nature of the work. Respondents from public and academic libraries were most familiar with design thinking and methods. Design thinking was perceived as highly relevant to areas of library work such as technology and youth services, and least relevant to work in digitization and preservation. Perhaps professional organizations aligned with relevant focus areas, such as the American Library Association's divisions for information technology (LITA) or youth services (YALSA) could play host to design education and programming specifically targeted at these services. However, we also note that the respondent pool did not equally or equitably represent the variety of library and role types, which affects these conclusions.

Nearly 40% of respondents reported some education in design thinking and methods. This education stemmed from a variety of sources, including professional development courses and workshops and self-education through books, websites, and other media. Some also reported learning about design in formal coursework in MLIS and equivalent programs. More than half of respondents said they would be interested in education or training in design thinking and methods that was specifically tailored for libraries and library workers. Most were in favor of including design thinking and methods in MLIS programs, either as a required course or an optional elective. Therefore, we recommend increased inclusion of design education in MLIS programs. This can help to overcome some of the simplified and superficial applications of design thinking reported in this work by offering expert guidance and including education in the theoretical, philosophical, and epistemological underpinnings from which design thinking and methods emerge. Additionally, as not all MLIS programs may current have the instructional expertise necessary to support the inclusion of design topics, we recommend that programs as well as individual libraries partner with existing expert sources of design education, such as d.schools and other design degree programs to include the expertise necessary to move beyond superficial treatment. Until such topics are addressed, librarianship will not be able to harness the true value that design can bring to library practice.

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References

Bell S (2007) Design thinking for better libraries. *Information Outlook* 15(6): 10-11.

Bell SJ (2008) Design thinking. *American Libraries* 39 (1/2): 44-49.

Bell SJ and Shank JD (2007) *Academic Librarianship by Design: A Blended Librarian's Guide to the Tools and Techniques.* Chicago: American Library Association.

Bertot JC, Sarin LC and Percell J (2015) *Re-envisioning the MLS: Findings, issues and considerations.* Report, College of Information Studies, University of Maryland College Park. Available at: http://mls.umd.edu/wp-content/uploads/2015/08/ReEnvisioningFinalReport.pdf.

Bradigan PS and Rodman RL (2008) Single service point: It's all in the design. *Medical Reference Services Quarterly* 27(4): 367-378. doi: 10.1080/02763860802367755.

Brown T and Katz B (2009) *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation.* New York: Harper Business.

Brown T and Wyatt J (2010) Design thinking for social innovation. *Stanford Social Innovation Review.* Available at: https://ssir.org/articles/entry/design_thinking_for_social_innovation

Carter WB (1999) Introduction: What makes a 'field' a field. *Virginia Journal of Sports & the Law* 235: GWU Legal Studies Research Paper No. 2013-128; GWU Law School Public Law Research Paper No. 2013-128. Available at: https://ssrn.com/abstract=2351495

Charles C (2012) Is Dewey dead? *Public Libraries Online.* Available at: http://publiclibrariesonline.org/2012/12/is-dewey-dead/ (accessed April 17, 2019).

Clarke RI (2016) *It's not rocket library science: Design epistemology and American librarianship.* Doctoral dissertation, University of Washington Information School, Seattle.

Clarke RI (2018a) How we done it good: Research through design as a legitimate methodology for librarianship. *Library and Information Science Research* 40(4): 255-261. doi: 10.1016/j.lisr.2018.09.007.

Clarke RI (2018b) Toward a design epistemology for librarianship. *The Library Quarterly: Information, Community, Policy* 88(1): 401-405. DOI: 10.1086/694872.

Clarke RI (2019) *Design Thinking* (Library Futures Series, Book 4). Chicago: American Library Association/Neal-Schuman.

Clarke RI and Kim Y (2018) The more things change the more they stay the same: Educational and disciplinary backgrounds of American librarians, 1950-2015. *Journal of Education for Library and Information Science* 59(4): 179-205. doi: 10.3138/jelis.59.4.2018-0001.

Clarke RI, Lee JH and Mayer K (2017) Design topics in graduate library education: A preliminary investigation. In: *The Association for Library and Information Science Education Conference*, Atlanta, Georgia, January 17-20.

Cross N (2011) *Design Thinking*. Oxford: Berg.

Garmer AK (2016) Libraries in the exponential age: Moving from the edge of innovation to the center of community. Report for the Aspen Institute, Washington D.C. Available at: http://csreports.aspeninstitute.org/documents/Libraries_Exponential_Age.pdf.

Guterman J (2009) How to become a better manager… By thinking like a designer. *MIT Sloan Management Review* 50(4): 39-42.

Hosseini-Ara M (2012) C3: Customer-centered classification. In: *27th Annual Computers in Libraries conference*, Washington, D.C., March 22, 2012. Available at: http://www.infotoday.com/cil2012/session.asp?ID=B201.

Ippoliti C (2016) Research as design, design as research: Applying design thinking to data management needs assessment. In: *2016 Library Assessment Conference*, Washington, D.C., October 31-November 2, 2016 (ed S Baughman, S Hiller, K Monroe and A Pappalardo). Available at: http://old.libraryassessment.org/bm~doc/4-ippoliti-2016.pdf.

Koppel T, Smith J, Films for the Humanities and ABC News (2004) The deep dive: One company's secret weapon for innovation. [Video/DVD] Princeton, NJ: Films for the Humanities & Sciences.

Lawson B (1990) *How Designers Think*, 2nd ed. London: Butterworth Architecture.

Lawson B (1994) *Design in Mind*. Oxford: Butterworth-Heinemann.

Leavy B (2010) Design thinking - a new mental model of value innovation. *Strategy & Leadership* 38(3): 5-14. DOI: 10.1108/10878571011042050.

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. DOI: 10.1108/10878571211209323.

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). doi: 10.3998/weave.12535642.0001.501.

Lynch SN and Mulero E (2007) Dewey? At this library with a very different outlook, they don't. *The New York Times*, July 14, 2007. Available at: https://www.nytimes.com/2007/07/14/us/14dewey.html.

Markham Public Library (n.d.) C3 customer-centered classification at Markham Public Library. Available at: http://c3mpl.blogspot.com/ (accessed January 10, 2019).

Marquez J and Downey A (2015a) Service design: An introduction to a holistic assessment methodology of library services. *Weave: Journal of Library User Experience* 1(2). DOI: 10.3998/weave.12535642.0001.201.

Marquez J and Downey A (2015b) Service design: Toward a holistic assessment of the library. *PNLA Quarterly* 80(1). Available at: https://arc.lib.montana.edu/ojs/index.php/pnla/article/view/293.

Marquez J and Downey A (2016) *Library Service Design: A LITA Guide to Holistic Assessment, Insight, and Improvement.* Lanham, Maryland: Rowman & Littlefield.

Martin RL (2009) *The Design of Business: Why Design Thinking is the Next Competitive Advantage.* Boston: Harvard Business Press.

Miller RT and Schwartz M (2014) What Wallets Have to Do With Libraries. *Library Journal.* Available at http://lj.libraryjournal.com/2014/01/opinion/design4impact/what-wallets-have-to-do-with-libraries-design4impact/#_.

Norton MH and Dowdall E (2016) *Strengthening networks, sparking change: Museums and libraries as community catalysts.* Report for the Institute of Museum and Library Services. Available at: https://www.imls.gov/sites/default/files/publications/documents/community-catalyst-report-january-2017.pdf

Polaine A and Lؘvlie L (2013) *Service Design: From Insight to Implementation.* Brooklyn: Rosenfeld Media.

Sharma S, Walker D, Dolmer A and Cecchetto A (2009) C3: Replacing Dewey for better merchandising and customer service. In: *Ontario Library Association Conference 2009*, Ontario, Canada, January 29, 2009. Available at: http://accessola2.com/superconference2009/thu/316/mpl.pdf.

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.

Shore M (2007) Arizona library shuns Dewey system (interview by J Ydstie). *National Public Radio*. June 16, 2007. Available at: https://www.npr.org/templates/story/story.php?storyId=11131877.

Simon H (1969) *The Sciences of the Artificial*. Cambridge: M.I.T. Press.

Simon H (1996) *The Sciences of the Artificial*, 3rd ed. Cambridge, MA; London: M.I.T. Press.

Stickdorn M and Schneider J (2011) *This is Service Design Thinking: Basics, Tools, Cases*. Hoboken, NJ: Wiley.

Subramaniam M, Waugh A and Clegg T (2018) Co-designing the next generation of education for children and youth librarians: A research-practice partnership. In: *Proceedings of the 2018 ALISE Annual Conference* (ed P Wang, A Green and S Assefa), Denver, CO, February 6-9 2018, pp. 25-30. Available at: https://www.ideals.illinois.edu/handle/2142/99018

Whang L, Tawatao C, Danneker J, Belanger J, Weber SE, Garcia L and Klaus A (2017) Understanding the transfer student experience using design thinking. *Reference Services Review*, 45(2): 298-313. doi: 10.1108/RSR-10-2016-0073.

Zomerdijk LG and Voss CA (2010) Service design for experience-centric services. *Journal of Service Research* 13(1): 68-82. DOI: 10.1177/1094670509351960.

Appendix

Understanding Design Thinking and Methods in Library Practice Questionnaire Protocol (for electronic distribution)

Section 1 – About You
In this section, we will ask you some questions about yourself.
1. Are you currently working in a library in the United States?
    a. Yes
    b. No (if no, exit survey)

2. What is your current gender identity?
    a. Man
    b. Woman
    c. Other: _____
    d. Prefer not to say

3. In what year were you born?
    a. [drop-down menu]

4. What is your ethnicity?
    a. White
    b. Hispanic or Latino
    c. Black or African American
    d. Native American
    e. Asian/Pacific Islander
    f. Mixed
    g. Other:_____

5. Approximately how many years have you been working in libraries?
    a. [whole number]

6. What is the highest degree or level of school you have completed? (If you are currently enrolled in school, please indicate the highest degree you have *received.*)
    a. Less than a high school diploma
    b. High school degree or equivalent (e.g. GED)
    c. Some college, no degree
    d. Associate degree (e.g. AA, AS)
    e. Bachelor's degree (e.g. BA, BS)
    f. Master's degree (e.g. MA, MS, MEd)
    g. Professional degree (e.g. MD, DDS, DVM)
    h. Doctorate (e.g. PhD, EdD)

7. Do you have an ALA-accredited MLS (or equivalent) degree?
    a. Yes
    b. No
    c. Degree in progress
    d. If so, what year did you earn your degree, or in what year do you expect to receive your degree?
        i. [drop-down list of years 1900 to present/future]

Section 2 – About Your Library Employer(s)
This next section will ask about the library organization where you work. If you work for more than one library, please answer based on the library you work for the most.
    1. In what U.S. state is the library in which you work?
        a. [drop down]

    2. What is the name of the library in which you work?
        a. [blank]

    3. What is your job title?
        a. [blank]

4. How many hours a week do you work for this organization?
   a. 40 hours or more per week
   b. 20-39.5 hours per week
   c. 10-19.5 hours per week
   d. Less than 10 hours per week

5. Which of the following would you say best reflects most of your day-to-day work? [2]
   a. Administration/management
   b. Adult services
   c. Children's services
   d. Collection management
   e. Digitization & preservation
   f. Information Services
   g. Support/Access Services
   h. Technical Services
   i. Technology
   j. Young Adult Services

6. What type of library is most representative of the library in which you currently work? [3]
   a. Academic library
   b. Boards. Friends groups, foundations
   c. Consortia/Cooperative Systems/Networks
   d. Consulting
   e. Corporations/Corporate libraries
   f. Federal or Military Libraries
   g. Public Libraries
   h. School Libraries
   i. Special libraries
   j. State Library agencies

7. What is the approximate size of the population your library serves?
   a. [whole number]

8. Which of the following most closely reflects your role or responsibility in hiring decisions at your library?
   a. I have the final say in hiring decisions
   b. I serve on search committees or have other roles that directly influence hiring
   c. I make recommendations or provide opinions that indirectly inform hiring decisions
   d. I play no role in in hiring decisions

Section 3 – Design Thinking and Methods:
This next section will ask your opinions about design thinking and methods.

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[2] Answer choices taken from ALA's membership application, April 2017
[3] Answer choices taken from ALA's membership application, April 2017

1. How familiar would you say you are with the concept of "design thinking"?
   a. Never heard of the term
   b. Somewhat familiar
   c. Very familiar

If (a), respondents will be presented with a page defining "design thinking," then proceed to Question 8; if (b) or (c), continue to Question 2.

2. Please briefly define "design thinking" as you understand it:
   a. [blank]

3. What do you see as the key principles of "design thinking"?
   a. [blank]

4. Where have you heard about design thinking before?
   a. [blank]

5. Have you ever received any education or training in design thinking and methods?
   a. Yes
      i. Please tell us where: [fill in the blank]
   b. No
   c. Not sure

6. Have you ever actively used design thinking and methods in your library work?
   a. Yes
   b. No
   c. Not sure

If (a), proceed to Question 7; if (b) or (c), proceed to Question 8.

7. Thinking about a recent library project in which you used design thinking, please tell us…
   a. What was the project(s)?
   b. When did the project start?
   c. When did the project end?
   d. How did you use design thinking or other design methods?
   e. What were the benefits of using design thinking or other design methods in this project?
   f. What were the downsides or drawbacks of using design thinking or other design methods?

8. How relevant do you think design thinking and methods are to each of the following aspects of library work? (For each aspect, respondents will select one of the following options: Design thinking is not relevant to this aspect of library work; Design thinking is of limited relevance to this aspect of library work; Design thinking is highly relevant to this aspect of library work)
   a. Administration/management
   b. Adult services
   c. Children's services

- d. Collection management
- e. Digitization & preservation
- f. Information Services
- g. Support/Access Services
- h. Technical Services
- i. Technology
- j. Young Adult Services

9. Are there any other specific aspects of library work where you think design thinking would be especially useful? Please describe.
   - a. [fill in the blank]

10. Are there any other specific aspects of library work that you think would not benefit from design thinking? Please describe.
    - a. [fill in the blank]

11. Would you be interested in participating in education or training in design thinking or methods specifically for library workers?
    - a. Yes
    - b. No
    - c. Maybe/not sure

12. Do you think education in design thinking and methods should be required for the type of library work you do?
    - a. Yes
    - b. No
    - c. Maybe/not sure

13. Do you think a course in design thinking and other design methods should be offered in graduate library education programs, such as MLIS and other equivalent degree programs?
    - a. It should not be offered
    - b. If offered, it should be optional, such as an elective course
    - c. It should be required
    - d. Other:_____

Section 4 – Closing:

14. Do you have any additional comments or feedback?
    - a. [fill in the blank]

15. OPTIONAL: If you would be willing to be contacted for a follow-up interview or further participation in this research, please leave your name and email address.
    - a. Name [fill in the blank]
    - b. Email address [fill in the blank]