

What We Mean When We Say “Design”: A Field Scan of Coursework Offerings on Design Topics in Master’s Level Library Education

Rachel Ivy Clarke, *School of Information Studies,
Syracuse University School of Information Studies*
rclark01@syr.edu

Future MLIS graduates need to be collaborative, creative, socially innovative, flexible, and adaptable problem solvers—characteristics demonstrated by people with backgrounds in design. Yet design, especially as an epistemological framework, seems underrepresented in master’s level library education. This work explores the current landscape of coursework offerings on design topics in master’s-level library education, including the availability of design coursework, the array of design courses offered, and coverage of various methods for, approaches to, and perspectives on design. A field scan of existing coursework in master’s-level library degree programs and subsequent categorical, linguistic, and grammatical analysis revealed patterns of topical content and linguistic frequency. These findings show that design is conceptualized in alignment with applied fields, especially technology/computing and instruction, and rarely addressed as an overarching epistemological approach. The use of the term *design* is especially problematic due to myriad meanings and applied uses: it may refer to a disciplinary field, an artifactual product, or a process of creation, or it may be used to modify another concept. Such use emphasizes difference among contexts over the similarity of epistemology, thus perpetuating a divisive perspective that contradicts the current scholarship of design and may have negative implications for LIS education and the field of librarianship at large.

Keywords: course descriptions, design, graduate-level library education, MLIS programs

Over the past 150 years, librarianship in the United States has evolved into a profession, with accordant requirements for education and training. The turn of the twentieth century saw a shift from vocational training to education in the scholarly academy, in order to foster a professional workforce. Professional stature became the norm in American librarianship, codified by graduate-level library education, for example the MLIS and equivalent degrees (Bobinski, 2007; Quinn, 2014). But standards and content for this education vary and also evolve with time. As twenty-first-century libraries evolve, so too must the librarians that staff them. Numerous studies have shown that in addition to field-specific content-based knowledge, MLIS graduates also need to excel at more abstract skills, such as communication, flexibility, adaptability, and interpersonal interaction (Partridge, Lee, & Munro 2010; Partridge, Menzies, Lee, & Munro 2010; Saunders, 2012, 2015, 2019). Yet, as Saunders (2015, p. 443) asks, “how does one teach a

person to be flexible and adaptable or to deal skillfully with change?”

A recent report on the future of MLIS education highlights the increasing need to foster graduates that are collaborative, creative, socially innovative, flexible, and adaptable problem solvers—and explicitly notes that such characteristics are demonstrated by people with backgrounds in design (Bertot, Sarin, & Purcell, 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—a multi-stage, iterative, problem-solving process originating in design fields—as an integral part of this paradigm shift (Garmer, 2016). With a growing emphasis on science, technology, engineering, and math (STEM) in K–12 education and the advent of creative tools like makerspaces in libraries, librarians not only need to be competent designers themselves; they also need the ability to teach design to patrons in school, public, and academic libraries.

Design offers a skill set and pedagogical approach with the potential to scaffold the desired characteristics of future librarians. But are MLIS programs supporting this approach? This research explores coursework offerings on design topics in master’s-level library education, specifically, what types of design coursework opportunities exist for master’s students in graduate library degree programs (e.g., MLIS programs). In addition to understanding the availability of design coursework, this study seeks to understand the array of design courses offered, including coverage of various methods for, approaches to, and perspectives on design.

Literature review

What is design?

Ask 10 people for a definition of “design” and you are likely to receive 11 different answers. By dictionary definition, “design” means “to create, fashion, execute, or construct according to plan; to conceive and plan out

KEY POINTS:

- The word “design” occurs most frequently in titles and descriptions of courses on computing and information technology topics, followed by instruction and education topics, and a focus on use and users.
- Although the topic of design is clearly woven throughout MLIS curricula, it still appears to be siloed and relegated into specific contexts and domains, potentially preventing students from seeing holistic and universal connections across these different contexts.
- Linguistic analysis confirms vague, multifaceted, and fluid uses of the term “design” in course descriptions, which perpetuates a divisive perspective that contradicts the current scholarship of design.

in the mind; to have as a purpose; to devise for a specific function or end” (“Design” [def. 1], n.d.). People typically think of this creation in terms of specific industries or applications, such as graphic design, fashion design, architecture, technology (like software design or website design), just to name a few. While many people think of design in these specific applied contexts, scholars have identified commonalities and consistent factors and aspects of design processes across these various applied disciplines (e.g., Archer, 1965; Cross, 1999, 2011; Lawson, 1990, 1994; Rowe, 1987; Schön, 1983; Simon, 1969; Thomas & Carroll, 1979). This well-established record of research shows that design is a creative, problem-solving approach that differs from traditional science. It is an overarching creative discipline with its own ways of working and knowing. Just as fields like biology and genomics rely on higher-level scientific perspectives, applied fields like architecture and graphic design draw on broader shared design perspectives. The fundamental difference between traditional science and design worldviews stems from the idea that science is about *what is*, while design is about what *could be* (or arguably what *should be*) (Liedka, 2004). While science focuses on observing and describing the existing world with the goal of replicability and prediction, knowledge in design stems from creating artifacts and addressing problems (Binder et al., 2011; Konsorski-Lang & Hampe, 2010). Therefore, the different goals and focus of design require a different approach: what Cross (2011) calls a “designerly way of knowing.”

Design in librarianship

These “designerly ways” of thinking and knowing have been harnessed by other fields to great advantage. For instance, one prominent design approach, called “design thinking,” has generated tremendous traction in industry, where it has been applied to more than just the looks and usability of physical products. Brown and Katz (2009) and Martin (2009) argue for the application of design thinking in corporate environments, especially in management and leadership. 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, p. 42). Design thinking helps these leaders in other fields achieve characteristics such as creativity, flexibility and adaptability, user-centeredness, and the ability to dynamically respond to change—all highly desirable in twenty-first-century librarians (Bertot et al., 2015; Partridge, Lee, & Munro, 2010; Partridge, Menzies, et al., 2010; Saunders, 2012, 2015).

Although libraries are not businesses, professional library managers and leaders 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 indeed, some libraries are increasingly drawing on design thinking and methods to help inform their practice. Many of these examples are relegated to architecture and space planning, such as *Library Journal's* annual Design Showcase, which highlights architectural and interior-design prowess (Morehart, 2015). Bradburn (2013) describes the stages typically found in the design thinking process in the context of redesigning school library facilities. Bradigan and Rodman's (2008) new design of consolidated reference/information service in a single “ASL desk” also emerged in the context of remodeling/architecture. In addition to this emphasis on architecture, discussions and discourse of design in library and information science literature often reflect technology, such as “web design,” and printed material formats, such as the design of book jackets (Clarke, 2015).

But design in librarianship is much more than physical spaces and web pages. Recent research reveals that all aspects of librarianship are fundamentally aligned with design. In the early 2000s, when the popularity of the design thinking process model increased in business and industry, some librarians 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). Public libraries are also increasingly harnessing design techniques and processes. The Chicago Public Library is well known for actively embracing a design thinking perspective, from programming ideas to staff hires (Schwartz, 2013). Other public libraries have designed alternative classification systems to help their users browse and find materials, such as Maricopa County, Arizona, Public Library's “ShelfLogic,” an adaption of the BISAC subject headings (Charles, 2012; Lynch & Mulero, 2007; Shore, 2007) or Markham, Ontario, Public Library's Customer Centered Classification (Hosseini-Ara, 2012; Markham Public Library, n.d.; Sharma, Walker, Dolmer, & Cecchetto, 2009). Additional examples of library services improved with design thinking include signage and wayfinding at the University of Technology Sydney (Luca & Narayan, 2016), data management at Oklahoma State University (Ippoliti, 2016), and transfer student relations at the University of Washington (Whang et al., 2017). These examples were chosen to illustrate the breadth and diversity of library design projects and because many of them are likely to be familiar or recognizable, but for each project listed here there are hundreds if not thousands of others. Arguably every tool and service created in librarianship is a design artifact, meaning librarianship may even be considered a design profession, thus benefiting from design education (Clarke, 2016, 2018b, 2019).

Design in graduate-level library education

Given the relevance of design methods and perspectives to librarianship, education and training addressing these topics seems necessary for the future of the profession. Design firms like IDEO, the company that helped publicize design thinking, and design schools like Stanford's famous d.school offer introductory toolkits and online mini-courses in basic design thinking approaches and methods. A few are even specifically tailored for libraries, such as the "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, one of the original contributors to the "Design Thinking for Libraries" toolkit. Grant-funded workshops from the Council on Library and Information Resources (CLIR) focused on the method and technique of participatory design, a form of design process that supports cooperation and collaboration between users and designers (Council on Library and Information Resources, 2012). However, these workshops focused mainly on applied techniques and methods rather than on the underlying epistemological perspectives that constitute design. 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 such tools are certainly useful, they are limited in the amount of depth they can provide. And although some of the resources were created in conjunction with and with input from librarians, most toolkits and online courses like those offered by IDEO and Stanford are still created by non-library organizations. Although they may offer a useful introduction to design thinking, they are limited in terms of the historical context and knowledge of libraries.

This underrepresentation of design is especially noticeable in master's-level library education, which is intended to offer a standardized base of knowledge across the field. For instance, design research methods are conspicuously absent from textbooks on research methods for librarians, even recent publications (Clarke, 2018a). A pilot study reviewing core (required) coursework at the top 20 ALA-accredited master's-level library education programs revealed that none required coursework in design (Clarke, Lee, & Mayer, 2017). In recent years, an increasing interest in user experience (UX), especially as it applies to libraries, has motivated coursework on this topic. Maceli (2015) found that user experience-related topics were the most commonly offered across all ALA-accredited

programs. However, while there is certainly overlap between UX and design, they are not synonymous. UX encompasses a range of activities and may even exclude the actual creation of design products. MacDonald (2015) found this to be the case in interviews with UX librarians, most of whom conceptualized their role as a research position (identifying needs and problems) rather than a design one, as they de-emphasized design-related work tasks and relegated the creation of design products to other staff and departments. To help address this, MacDonald (2017) calls for the inclusion of “design-inclusive UX research”—that is, UX research that includes design activities as an integral component (from Vermeeren, Roto, & Väänänen, 2016)—as part of LIS education. This presumes two ideas: first, not all UX research includes design activities; and second, such design activities are not present in LIS education, at least not at a level of noticeable impact. Thus, while UX coursework may be common in MLIS programs, this does not mean that students are necessarily exposed to design thinking, methods, or techniques in such coursework.

Although not yet part of required curricula, a few selected master’s-level programs in librarianship have begun to show interest in incorporating design thinking and methods into their program offerings. In 2016, Simmons College (now Simmons University) offered an experimental summer course called “Library Test Kitchen,” which offered students the opportunity to “gain experience with human-centered design skills, ethnographic observation and interviews, rapid ideation, applied problem-solving, developing and pitching ideas, identifying assumptions, and design fictions” (Abels, Howarth, & Smith, 2018, pp. 85–86). The University of Washington Information School currently offers a full-term course in design methods for libraries and librarianship (Mills et al., 2017). The University of Maryland has begun to offer a master’s-level concentration in “youth experience (YX)” which draws on design methods and principles from the participatory design and user experience communities (Subramaniam, Waugh, & Clegg, 2018). While these emergent ventures offer promises that design will increasingly be incorporated in master’s-level library education, each of these projects is currently moving forward in its own silo. As the skills necessary for the future of librarianship progressively hinge on reimagining the profession in a design mindset, education for this perspective needs to be systematically included in formal education. Clarke and Bell (2018) even argue that the current MLIS degree should be reinvented as an “MLD”: a master’s of library design.

Clearly there is a great deal of burgeoning interest in educating librarians in design thinking, methods, and perspectives, as well as a perceived need to examine the potential for systematic inclusion of such content in master’s-level library education. This work seeks to address that gap by exploring the current landscape of coursework offerings on design topics in master’s-level library education, including the availability of design

coursework, the array of design courses offered, and coverage of various methods for, approaches to, and perspectives on design.

Methods

To investigate these questions, the author, with assistance from a research assistant, conducted a field scan of existing coursework in master's-level library degree programs (i.e., MLIS and equivalent programs). Between July and December 2017, we compiled publicly accessible curricular information from ALA-accredited MLIS and equivalent programs in the United States, Canada, and Puerto Rico. We collected available title and course description information that included the word “design” from all 60 ALA-accredited graduate-level library education programs. When necessary and possible, we contacted instructors or other educational personnel to clarify content or further understand the role of design in a particular course.

When data collection was complete, we used an inductive card-sorting process to identify similar courses and topics in the course descriptions. Two researchers participated in a collaborative sorting process. In the event of disagreements, discussion occurred until consensus was reached. We also performed basic linguistic analysis on the collected text of the course descriptions, calculating word frequencies and compiling concordances with “design” at the center. We also performed a basic grammatical analysis on the titles and course descriptions to surface the multiple ways in which the term *design* aligned with various parts of speech when used to describe a course and its content.

Findings

Our field scan identified 466 courses that included the word “design” in the course title and/or description. Of the 60 ALA-accredited degree programs, two programs had no courses listed that included the word “design” in the title or description. Course information from three additional schools was not publicly accessible online and could not be added to our field scan. The remaining 55 programs varied widely, with the program offering the most courses including the word “design” topping out at 35, and five programs offering the fewest, with one course each. On average, eight courses per program included the word “design” in the title and/or description. Of the 466 courses, 12 included the term “design” in the title only. Some 107 courses included the term in both the title and the description, and the remaining 359 featured the term in the body text of the description.

Although we attempted to gather information regarding additional factors, such as whether a course was required (core) curriculum compared to an elective, and frequency of course offering, this information was not systematically included across all programs and could not be reliably collected.

Table 1: Number of courses with the word “design” in the title and/or course description in each topical subject area

Category	Total number of courses
Computing and information technology	212
Instruction and education	43
Users	38
Specific settings (e.g., public libraries, art libraries, etc.)	34
Research methods	28
Information organization	21
Media	20
Information retrieval	11
Management	11
Special topics	11
Visual aspects	11
Overview courses	8
Issues and values	5
Design thinking	4
Miscellaneous (uncategorizable)	9

Patterns in course topics

To investigate topical patterns among these design courses, we used an inductive card-sorting procedure to group courses according to subject-based themes that emerged from the courses themselves. At the completion of our card sorting, we had 79 specific categories (including a category for miscellaneous courses). However, many of these categories reflected a high level of specificity that did not necessarily lend itself to an overarching analysis. Many of the categories showed clear relationships to other categories, either thematically or hierarchically. For example, the categories of metadata, indexing and abstracting, and vocabulary/thesaurus design were all considered to be related, as they were all specific aspects or applications of information organization. We reviewed and reorganized the 79 categories into a hierarchically structured outline. After this process, 14 major topical areas emerged. Nine additional courses could not be categorized into the major topical areas and so were grouped together in a miscellaneous category. Table 1 shows the number of courses in each major topical area.

Basic linguistic analysis

We imported the raw text of the course descriptions (not including school names, course titles, or course numbers) into TextSTAT,¹ a basic corpus

Table 2: Words occurring more than 100 times and their counts

Rank	Word	Count
1	design	696
2	information	573
3	course	340
4	system	320
5	student	277
6	use	221
7	library/ies	185
8	technology/ies	177
9	research	152
10	management	150
11	web	148
12	theory/ies	144
13	user	142
14	data	138
15	learning	133
15	introduction	130
16	analysis	126
17	evaluation	118
18	development	117
18	interaction	117
20	application	116
20	digital	115
21	implement	103
22	service	102
23	practice	101

linguistics program. We calculated word frequencies as well as concordances with “design” at the center. Note that this analysis does not include common stopwords and prepositions.² Table 2 shows a list of the words occurring more than 100 times, along with their counts. We performed basic stemming and lemmatization to identify root words and concepts.

Obviously the word “design” has the highest count, appearing 696 times, or an average of almost 1.5 times per course description. The word “information” is unsurprisingly the second most frequently occurring word, appearing 573 times (an average of approximately 1.2 times per

description). Then there is a significant difference in frequency between “information” and the next most frequently appearing word, “course,” which appeared only 340 times. The distribution of terms emulates a typical Zipfian distribution as the frequency counts decline.

We also ran left and right concordances of the word “design” in TextSTAT (Tables 3 and 4). A concordance is a list of each occurrence of a word, presented with the words surrounding it. This allows some general insight into the context of word usage. We found that concordances to the left emphasize specific topical applications of design—design of specific

Table 3: Left concordances of the word “design”

Left concordances	Number of occurrences
database design	39
interface design	27 (11 out of 27 are “user interface design”)
web design	26
user-centered design	17
instructional design	14
interaction design	14
research design	12
website design	10
system(s) design	18
program design	5
experience design	4 (3 out of 4 are “user experience”)
conceptual design	4
organizational design	4
web site design	4
file design	3
graphic design	3
information design	3
project design	3
curriculum design	2
prototype design	2
responsive design	2
students design	2
systematic design	2
who design	2
use design	2

Table 4: Right concordances of the word “design”

Right concordances	Number of occurrences
design principles	16
design process(es)	13
design thinking	9
design methods	7
design project	6
design information	4
design tools	4
design approach(es)	3
design fundamentals	3
design including	3
design skills	3
design solutions	3
design strategy/ies	3
design techniques	3
design alternatives	2
design concepts	2
design course	2
design cycle(s)	2
design decision(s)	2
design exercise(s)	2
design issues	2
design patterns	2
design problem	2
design research	2
design theory	2

types of artifacts (e.g., database design, interface design, web design). These also encapsulate specific domains of design (e.g., graphic design, instructional design). A smaller subset of concordant terms reflects types of philosophical or conceptual approaches to design (e.g., user-centered design, conceptual design, systematic design) that may be applied across various topics or domains. The remaining few refer to people (e.g., students design; who design) or people-based activities (e.g., use design).

Concordances to the right are more likely to reflect the use of the word “design” as a modifier. For instance, principles, process(es), and

thinking are all concepts that may be modified by various terms: principles could just as easily be library science principles, or ethical principles, or any number of other modifiers. But the word “design” is often used to describe these concepts. This is in contrast with the left concordances, where specific domains and types or artifacts are used to modify “design” itself. In the former, “design” functions as an adjective, while in the latter it functions as a noun. This demonstrates two very distinct views of design: one based in applied contexts, the other as an overarching approach to work.

In addition to these uses, we found a number of instances where the term “design” did not refer to the topical or student learning content of the course, but rather to the course itself. The most common occurrence is what we call self-reflexive, or the idea that the design being discussed in these descriptions refers to the design of the course itself. While such uses certainly reveal a framing of instruction as design work and a course as a design product, this phrasing and framing does not in and of itself reflect instruction about design within a course. Similarly, the term “design” was often used to describe a target audience for a course. While again reflecting the course itself as a design product, the use of the term in this case also describes the course itself rather than describing the topical instructional content. Another, slightly different application of the term was its use in providing contextual information about the course topic. Course descriptions demonstrating this type of use usually included sentences in the prose text description that provide a larger context or motivation for students to better understand the purpose and focus of a particular course. We also found the use of the word “designer” to indicate a specific role rather than specific educational content within a course. Examples of each of these uses can be found in [Table 5](#). Although these instances do not necessarily reflect topical design content within a course, they were all still included in the card-sorting analysis, as many overlap with and/or provide further insight into descriptions of topical content.

Discussion

Specific topical courses

Design seems to be woven throughout MLIS education, although the use of the term represents many different applications and conceptual perspectives. Topic-wise, there is a heavy emphasis on computing and technology-related topics. The word “design” occurs most frequently in titles and descriptions of courses on computing and information technology topics. This large category of courses included many sub-categories such as databases, human-computer interaction, web and internet, and information systems, all of which tend to use the word “design” to describe subject content. It is notable that the most frequent occurrence of the word “design” in this category was “database design.” This phrase, and other similar uses of the word in the context of technology, may seem at first glance to be

Table 5: Uses of the word “design” beyond topical course learning content

Type of contextual use	Number of occurrences	Example from course descriptions
Self-reflexive	13	<p>This course is designed to introduce students to the fundamental concepts, terminology, techniques and applications of digital imaging as they relate to the development of digital image collections depicting works found in museum collections, archives and special collections in libraries. (Kent LIS 60651)</p> <p>This course is designed to prepare students to lead organizations in the management of records in all formats produced and received during the course of the organization’s operations and functions. (UBC LIBR 516)</p>
Target audience description	4	<p>This course is designed as a first database course for students without any previous experience. (Kentucky LIS 688)</p> <p>This course is designed for students interested in becoming skilled searchers of Internet resources. (Catholic LSC 610)</p>
Contextual or motivational information framing the course description	27	<p>Information services and systems must be designed on the basis of information behavior: what is known about how people think about, access, evaluate and use information. (Buffalo LIS 506)</p> <p>Many software tools for such visualizations come from statistical packages; others come from GIS or spatial mapping, while others are more diagrammatic in design. (UCLA IS 275)</p> <p>Art and design research has been revitalized by the revisionist impulse of visual culture analysis, which seeks to embed creativity within sociological and historical contexts. (Toronto INF 2312H)</p>
Role	2	<p>This course introduces students to the social and technical issues that designers of personal informatics technologies face in helping users understand and improve their lives through the use of data. (Mich SI 606)</p> <p>The value of collaboration and cooperation with learners, other teachers/designers, and management in the development of learner-centered instruction will be emphasized. (SJSU INFO 250)</p>

incongruent with contemporary notions of “design thinking.” However, while the phrase “design thinking” has seen recent popularity due to its use by David Kelley, one of IDEO’s founders (Brown & Katz, 2009), the term actually originated with L. Bruce Archer (1965). Although understanding of design thinking has evolved since the 1960s, the term has

always been used to describe how designers create artifacts, and databases and other technological products are no exception.

The large focus on technology may be due to the increasing focus on technology as schools of librarianship morphed into information schools. Self-described as studying the intersection of information, people, and technology, information schools drew on research and scholarship from computer science to support this interdisciplinary approach (Olson & Grudin, 2009). This may also reflect Seadle and Greifeneder’s (2007) perspective that iSchools offer a curriculum more focused on human-computer interaction (HCI). When comparing design courses from iSchools and non-iSchools, iSchools offer approximately 2.5 times more technology courses with the word “design” in the title or description (Clarke & Potter, 2019). In addition to computer science and HCI, iSchools also drew on fields like psychology, sociology, anthropology, and management to support the “people” aspect of their interdisciplinary triangle. In our field scan, courses categorized as social issues and values (such as social justice, privacy, race, and gender) were observed only in iSchools, with no examples from non-iSchools. It should be noted that this does not mean that non-member schools do not offer courses on these topics, only that they do not use the word “design” to describe them. The only topic with more occurrences of the word “design” in non-iSchool courses was management. This raises interesting questions about how the “people” leg of the “information-technology-people” triangle is conceptualized in various information-based degree programs.

Instruction and education topics were the next most frequent occurrence, possibly due to references to instructional design. Librarianship has a long history of connections to the education field. For instance, there is a clearly established connection between academic librarianship and instructional design. Academic librarians in the United States have been involved in instructional activities since the early nineteenth century (Salony, 1995). Over the last half-century, this instruction has evolved beyond simple bibliographic instruction to a focus on information literacy instruction (Behrens, 1994). In parallel, the diversity and specialized nature of teaching-oriented positions in the field have risen dramatically (Sproles & Detmering, 2015). The goals of contemporary academic librarianship explicitly include patron education (Gregory 2005; Roberts & Levy, 2005). Bell and Shank (2007) explicitly discuss applying design approaches to librarianship in the context of instructional design, or the broad process of determining the state and needs of the learner, defining the end goal of instruction, and creating an intervention to assist in the transition. While much of the literature on instructional design portrays it as a kind of science (e.g., Merrill, Drake, Lacy, & Pratt, 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. In addition to instruction,

other topics represented in this field scan, such as research methods and visual and media topics, parallel previous findings about the concept of design in the LIS field based on controlled vocabularies used to describe the literature (Clarke, 2015).

Standalone design courses

Only four courses were identified as standalone design courses, that is, courses about design itself, rather than design as applied to a specific topic or function. Of these four courses, two were “special topics” courses, meaning they are not permanent additions to the course catalog and have no guaranteed rotation. Three of the four courses focused specifically on design thinking, while the fourth was self-described as “students develop[ing] theoretical and practical skills for design” and “an introduction to design methodologies and theory.”

This is not to say that other courses do not include design thinking. However, other courses that mention or refer to design thinking in their descriptions do so in the context of a specific topic, such as the following examples:

- University of Michigan SI 582: Introduction to Interaction Design, which mentions a “focus on design methods and design thinking” as part of an introduction to interaction design;
- Pratt Institute LIS 682: Projects in Information Experience Design, which includes design thinking as one topic among many covered in the course;
- San Jose State University LBR 232: Issues in Public Libraries, which includes the “[recognition of] how design thinking is being applied” as a course learning outcome;
- University of British Columbia LIBR 507: Methods of Research and Evaluation in Information Organization, which includes “design thinking and the applied research design process” in its course content.

There appear to be very few courses that teach design itself. Although design is clearly woven throughout MLIS curricula, it still appears to be siloed and relegated into specific topics, contexts, and domains. By keeping design positioned in specific domains, students may not be able to see the holistic and universal connections that it offers across these different contexts. Additionally, given that the established idea of design as a unique epistemology stems from the similar ways of working and knowing that bridge across applied design domains (Archer, 1965; Cross, 1999, 2011; Lawson, 1990; Rowe, 1987; Schön, 1983; Thomas & Carroll, 1979), keeping design positioned in specific domains within librarianship disregards established epistemological research and positioning and implicitly prevents students from being exposed to this broader epistemological understanding. Continuing to overlook this perspective and the framing of librarianship

writ large as a design field has many potential future ramifications, especially regarding the development of future librarians who can be flexible, adaptable, and creative outside of traditional library silos.

Influence of language

The basic linguistic analyses performed parallel and support the ideas uncovered in the categorization and content analysis. The emphasis on technology is reified through high counts of frequently occurring words like “technology,” “web,” and “digital.” Design also appears to be tightly focused on users, based on the frequent occurrence of “use” and “user” in course description text. This likely stems from the user-centered design movement, a school of thought within the design field that bases design decisions on the needs of the user (Norman, 1988; Norman & Draper, 1986). This design approach is one of many within the field, but it has become popular and nearly ubiquitous in many views of design. Other frequently occurring words such as “development,” “evaluation,” and “implement[ation]” also reflect user-centered design perspectives in that they describe phases of the user-centered design process. However, other key concepts in user-centered design (and the epistemological foundations of design writ large), such as iteration, are practically absent, with only seven occurrences of the word appearing across the course description text. The high frequency of the word “service” is interesting, as it emphasizes the idea that design artifacts need not be physical products, which is highly relevant to intangible library services like programming, event planning, and instructional delivery. It also reflects the unique epistemological element of design’s service orientation (Nelson & Stolterman, 2012).

Our linguistic analysis also confirms vague, multifaceted, and fluid uses of the term “design.” This is not surprising, as issues have been previously noted with the various levels of meaning inherent in the word. Heskett (2002, p. 3) illustrates this with the sentence “Design is to design a design to produce a design,” which seems nonsensical at first glance, yet every use of the term is correct. The term “design” can be used as a noun representing a general concept of the field as a whole; a verb indicating an action or process; a noun meaning a concept or proposal; or a noun indicating a finished product of some kind (Heskett, 2002, pp. 3–4). We observed all these uses in course descriptions, as well as additional use of the term as a modifier, e.g. “design principles,” “design tools,” “design strategies,” and so on. Uses of other terms to modify design, such as “database design,” imply that the specific instantiation is unique and somehow different from other applications of design, for example, instructional design. Such use emphasizes difference among contexts over the similarity of epistemology, thus perpetuating a divisive perspective that contradicts the current scholarship of design. This may in turn potentially do a disservice to the library field by leaving unharnessed the larger, broader, problem-solving approach to issues spanning multiple contexts that design

Table 6: Examples of text from course descriptions reflecting Frayling (1994) and Cooper et al. (2010)

	Frayling (1994)	Cooper et al. (2010)	Examples from course descriptions
of/into	Research into art and design (such as the history of a design field)	Thinking of design (to imagine, visualize and dream up new understandings)	Examines the design and operation of digital libraries and related electronic publishing practices from a socio-technical perspective. Students develop understanding of major issues, concepts, and trends, enabling them to understand the socio-technical character of digital libraries that can and will be effectively supported and used by various groups. (Indiana Z652)
about/for	Research for art and design (research intended to inform design, such as user studies)	Thinking about design (considering perceptions, expectations and capabilities associated with design)	Study of interactions between humans and information systems, leading to more effective system design and evaluation; human cognition, user modeling, system design approaches, evaluation methods. (Louisiana LIS 7409)
through	Research through art and design (generating research knowledge through creation and making)	Thinking through design (the ability to use design methods and principles to address uncertainty and complexity)	Designing and creating textual and/or directory databases from the viewpoint of information specialists and content providers. Needs analysis, file design, record content and structuring, software choices. Students implement a prototype database. (Hawaii LIS 674)

provides—a skill specifically desired in contemporary librarianship. On the other hand, the use of the term as a modifier implies that there are tools, strategies, techniques, and so forth that are somehow made different and distinguishable when modified by the term “design”—that there are specific principles, tools, and techniques that are applicable to design and distinguished from principles, tools, and techniques in other fields. This multiplicity of term use reflects the variety of ways in which design is conceptualized in different fields and domains.

These various linguistic uses may parallel some other conceptualizations of design, notably Frayling’s (1994) three types of design research and Cooper, Junginger, and Lockwood’s (2009) three major qualities of thinking and design, all of which were observed in course descriptions (see Table 6).

Design is also implicitly used to refer to a pedagogical artifact in the instances where course descriptions are self-reflective. This is perhaps unsurprising to people versed in instructional design, where courses themselves may be viewed as design artifacts. However, the question becomes whether such conceptualizations are intentional and explicit, or unintentional and implicit. That is, how aware of this usage of design are the instructors or authors of course descriptions? Are instructors aware of and/or self-reflective regarding the implications of the discourse of design in their course descriptions and other course materials? Using a term in such myriad ways sends mixed messages that ultimately lead to confusion. If “design” is used to describe artifacts, the processes that result in said artifacts, and modifications/characteristics of artifacts, how is anyone to have a discussion about design that results in shared understanding? When the word is used to mean everything, it ends up meaning nothing. To further harness the potential offered to LIS education by design epistemology, we need better understandings of such epistemology, which may require new vocabularies for these concepts.

Conclusion

This work explored the current landscape of coursework offerings on design topics in master’s-level library education. A preliminary field scan showed that course titles and descriptions use the word design primarily to describe computing and technology-related topics, although other specific areas such as instruction, research, and media are considered design as well. Very few courses offer a holistic, non-topical, non-domain approach to design. Such siloing runs the risk of reinforcing perceptions that design is limited to specific domains, which may be counterproductive to developing skills sought in twenty-first-century library program graduates, such as adaptability, flexibility, and creative problem solving. It also directly contradicts the well-established idea of design as an overarching perspective or approach, much less one that fundamentally underscores the field of librarianship.

Additionally, the myriad uses of the term “design” in course descriptions may refer to artifacts, processes, pedagogy, and even people. Using the same term to represent so many different concepts sends mixed messages that lead to confusion and ultimately contributes to and reifies the siloing identified previously. Although this issue is not unique to the use of the term in library education, a profession with strengths in knowledge representation and description through tools like controlled vocabularies may be well positioned to address this issue, both for librarianship and for the field of design at large. Based on the findings of this study, most uses of the word “design” refer to the creation of specific kinds of artifacts (e.g., databases, websites, instructional materials, etc.). However, not all artifact creation uses the same design approaches. In addition to the design thinking model, other design approaches (such as system-centered design,

value-sensitive design, universal design, critical design, etc.) exist and may be applied across contexts of creation. One major recommendation to address the nebulous use of vocabulary is to use the words “artifact” or “product” in place of “design” when referring to creations, and to include more specific text regarding which design approaches are being applied when referring to design processes. Turning the focus toward design approaches rather than products may also help prevent the siloing of creation into specific artifacts, a practice that precludes new and innovative solutions and reifies existing ones. Or, as one UX librarian notes, we may be bringing students in to decide on the color of the couches without questioning whether couches are what they really need (MacDonald, 2017). Pre-assigning design to artifact-based categories presumes to already know what design solutions are necessary and limits space and freedom to develop new artifactual solutions.

It should be noted that although all courses were listed as current curricular offerings at the time of data collection, no information about frequency or regular availability could be gleaned. We also have no current enrollment data or information about required versus elective courses with which to determine student exposure to these courses and topics. The amount of information included in each course description varied by program: while some courses offered robust and thorough descriptions, others were sparse. This may be due to a variety of factors, from institutional standards regarding length and content to individual authorship of the descriptive text. We did attempt to clarify content, but it was not always possible. Additionally, this field scan captured only official course descriptions. The delivered content of any given courses may be very different than a brief catalog description, based on factors such as individual instructors and terms. A review of syllabi from these courses would be an appropriate next step to help determine what design concepts, if any, are included in instruction. These could be analyzed using term or document clustering to characterize courses more holistically. However, as the most publicly accessible content representing a program’s curriculum, course descriptions offer a good first step, since syllabi are often available only to people affiliated with the program, such as those possessing a login or other credentials. Programs need to realize the communicative power of these public-facing course descriptions and ensure that they represent current course content and are aligned with current syllabi. Prospective students often make decisions based on such information. As future librarians who will need to be collaborative, creative, socially innovative, flexible, and adaptable problem solvers, they have the right to know the ways in which their coursework will help them build those skills.

[Rachel Ivy Clarke](#) is an assistant professor at the Syracuse University School of Information Studies, where she researches the application of design methodologies and epistemologies to facilitate the systematic, purposeful design of library services and education.

Acknowledgments

This project was made possible in part by the Institute of Museum and Library Services [RE-98-17-0032-17]. The author wishes to thank Nicole Potter for her assistance with data collection and analysis.

Notes

1. See <http://neon.niederlandistik.fu-berlin.de/en/textstat/>
2. Such words include the following: and, of, the, to, in, a, for, will, on, with, as, this, an, is, be, that, are, their, including, include, or, from, such, by, through, other.

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