Training Information Professionals in the Digital Humanities: An Analysis of DH Courses in LIS Education

Chris Alen Sula and Claudia Berger

The digital humanities (DH) remain a growing area of interest among researchers and a locus of new positions within libraries, especially academic libraries, as well as archives, museums, and cultural heritage organizations. In response to this demand, many programs that train information professionals have developed specific curricula around DH. This paper analyzes courses offered within two overlapping contexts: American Library Association (ALA) accredited programs and iSchools. In addition to documenting the scope and extent of DH courses in these settings, we also analyze their contents, relating our findings to previous research, including analysis of job ads and interviews with professionals.

Introduction

The digital humanities (DH) are a cluster of scholarly activities that explore the intersections of humanities and technology. While the boundaries of the field are disputed,[1] there is wide agreement that DH is interdisciplinary,[2] collaborative,[3] and often critical in its approach to tools and technology.[4] Many have also recognized overlaps between DH and libraries, archives, museums, and other cultural heritage institutions,[5] as well as the library and information science (LIS) education that prepares knowledge workers for careers in these settings.[6]

In 2014, the Research Planning and Review Committee of the Association of College & Research Libraries (ACRL) named digital humanities as one of the top trends in academic libraries, identified as "logical partners for digital humanities collaborations because they have already developed the skill sets necessary to sustain and preserve a digital archive."[7] Since 2010, ACRL's biennial trends reports have mentioned DH or DH-adjacent areas, such as digital collections and preservation, data curation and analysis, digital scholarship, new publishing models, project management, and programming.[8] As recently as 2021, an analysis of LIS job listings found frequent mention of DH in academic library positions, especially in reference to faculty and student research, and in positions within archives, museums, and cultural heritage institutions, given their extensive work with digitizing and digitized materials.[9] Among the sample job duties and skills for these positions were "partner[ing] with faculty, students, and

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other researchers to create effective, innovative, and sustainable digital scholarship projects" and having "hands-on experience in an academic/research setting in one or more of following areas in digital scholarship: data science; text mining, analysis; data mining, visualization; natural language processing, human computer interaction, GIS applications and tools."

Given the current and projected prevalence of DH and related expertise in LIS settings, it is worth considering what educational opportunities exist for professionals in the field. Training in DH takes place across many contexts, from university courses and programs to informal settings such as workshops, (un)conferences, institutes, and more. Formal educational offerings provide unique opportunities for studying a field, particularly because they carry accreditation standards, organize labor and capital, and present public-facing views of the field to prospective students, employers, funders, and the public. Studies of formal education can also guide others who wish to add curricular offerings at their own institutions, helping to build capacity within the field.

Because DH is a relatively recent development,[10] it has taken time for LIS programs to add offerings in the area. In 2017, a series of interviews with librarians working in or adjacent to DH found that 90 percent learned relevant skills on the job, while only 29 percent learned such skills during their time in library school.[11] Moreover, 30 percent of respondents said that the concept of DH did not exist when they were in library school. More recent surveys of DH instructors also suggest they are largely autodidacts, but when they do have formal encounters learning DH, those are more often found in graduate programs,[12] consistent with the level at which many information professionals are trained.

Here, we focus on DH courses offered within the context of LIS programs, as defined by two overlapping contexts: American Library Association (ALA) accredited programs and iSchools, an international group of institutions focusing on the information field. Both of these settings train professionals for work at institutions that have been identified as key sites of DH work and as partners for collaboration. In surveying these courses, this study addresses several questions, including:

- What skills and competencies do LIS programs provide students and employers?
- Where do LIS and DH overlap conceptually and methodologically?
- How does LIS-inflected DH align with and diverge from the broader field?

In pursuing these questions, we pay particular attention to disciplinarity, employment, and technology, as well as how our results align with or diverge from previous research and discussions about DH. The findings of this study should help readers keep pace with recent developments, contribute to studies of educational infrastructure, and suggest possible paths for the field.

This research was conducted through the iSchools Digital Humanities Curriculum Committee (iDHCC), convened in 2019 in parallel to a Data Science Curriculum Committee (iDSCC), to report on opportunities and possible models for DH curricula in iSchools. The iDHCC studied programs, courses, job listings, and other data sources[13]—all of which have informed and contextualized the analysis of courses presented here.

Background

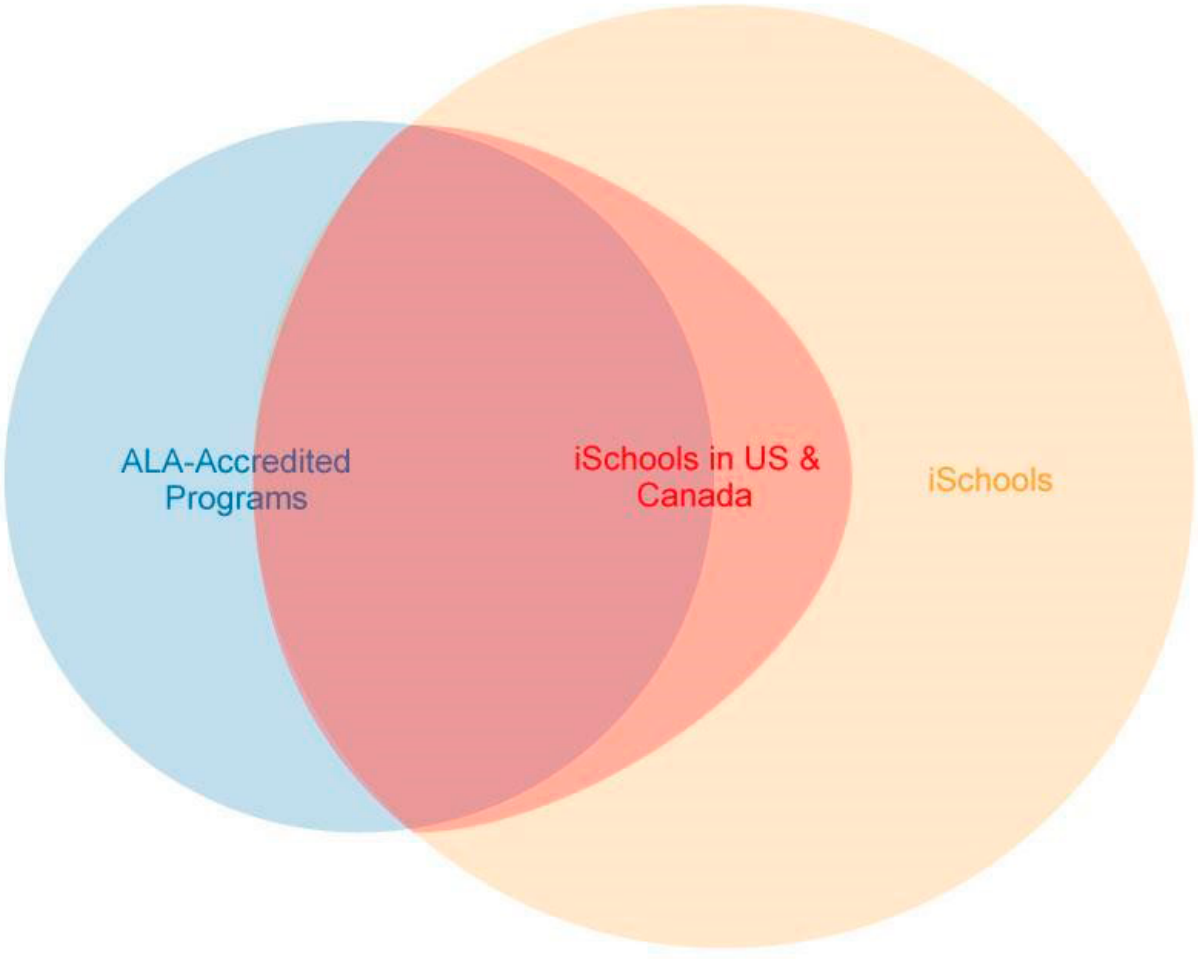
Existing studies of DH curricula at large have surveyed programs,[14] course syllabi,[15] instructors,[16] and practitioners.[17] Numerous articles have discussed the development of DH programs and courses in specific locations, such as community colleges,[18] colleges of liberal arts and sciences,[19]

graduate education,[20] and libraries.[21] While several of these studies have addressed how librarians learn and teach DH, none has systematically examined DH courses across LIS education as a whole.

This study draws on Lisa Spiro's methodology, which examines course assignments, readings, media types, key concepts, and technologies in an attempt to characterize the "hidden curriculum" found throughout DH courses.[22] That study included 134 English-language syllabi from DH courses offered between 2006 and 2011 across a range of departments, and it established a baseline for understanding DH courses one decade ago. Here, we focus on a smaller set of courses and syllabi situated more recently within LIS education, defined broadly by two groups: ALA-accredited programs and iSchools.

As of 2020, the ALA listed sixty-two programs in the United States and Canada that have undergone external review and meet the ALA Committee on Accreditation's Standards for Accreditation of Master's Programs in Library and Information Studies. The iSchools organization, founded in 2005, included 109 schools, colleges, and departments worldwide that share a fundamental interest in the relationships between information, people, and technology. Though there are overlaps between these two groups—about 80 percent of iSchools in the US have ALA-accredited programs (see figure 1)—there are also important differences, given their histories, conceptual scope, and geographic locations.

FIGURE 1
Comparison of Programs and Schools Included in this Study



Several articles and panels have explored the intellectual identity of iSchools,[23] as well as their relationship to similar schools outside of the iCaucus, including ALA-accredited programs.[24] As a whole, iSchools are said to share overlapping interests around "contextual analysis of information use in the lives of people, organizations, and cultures."[25] One example is a recent paper from iDSCC members that defines the unique disposition of data science within iSchools as "developing insights and solutions that are not only data-driven, but also incorporate human values, including transparency, privacy, ethics, fairness, and equity"[26]—values that are undoubtedly shared among humanists, including digital humanists. Beyond common interests and shared values, an analysis of their faculty diversity has found "evidence of the influence of 'local logics' on their development. That is, the form and shape of an iSchool has more to do with responding to the local environment than with any defining characteristic or shared intellectual identity across iSchools."[27] In this respect, the heterogeneity of iSchools parallels Kim Knight's description of DH as a "messy…ecology" comprising "the localized practices of [DH] practitioners," which vary among humanities computing, new media studies, digital pedagogy, and more.[28]

In contrast with iSchools, ALA-accredited programs share formal core competencies, "basic knowledge to be possessed by all persons graduating from an ALA-accredited master's program in library and information studies."[29] Among the competencies most germane to DH are those concerning information resources (especially digital resources), knowledge organization (especially cataloging and classification of DH materials), technological knowledge and skills (including the analytical, visualization, and content management tools used by digital humanists), and user services. In Table 1, we present a mapping of ALA competencies onto parent activity terms in the Taxonomy of Digital Research Activities in the Humanities (TaDiRAH),[30] which attempts to capture the "scholarly primitives" of the field.[31] This table provides a conceptual and practical alignment of the two fields, useful both in analysis of and planning for DH curricula within LIS contexts, which we discuss below.

All eight areas of the DH taxonomy are covered somewhere in the ALA competencies, especially "Storage" (including archiving, knowledge organization, and preservation) and "Meta-Activities," which combine research activities with a research object (examples include assessment, community building, and teaching and learning). The prevalence of "Storage," in particular, contrasts with previous studies of DH curricula, which have failed to find widespread mention of these activities within North American DH programs.[32] It is worth noting, however, that conceptual fit between areas and the language used to describe curricula may diverge—the latter being one way programs to attract students and the former being an abstract view of the fields as held by experts.

We approach our analysis here in terms of what is distinctive about DH in the context of LIS education and particular institutions, as well as what is shared between LIS and other disciplinary contexts of DH. Put differently, we attend to both localization of DH and more global constructions of the field. While the data on ALA schools is limited to the United States and Canada, the iSchools are international in scope, providing some perspective on DH courses worldwide. As Roopika Risam and others have noted, discussions of DH often center on North American or, at best, Anglo-American approaches, when in fact all DH practices are local and we should embrace "the dialectical relationship between global and local that manifests in our work to understand the hallmarks of the local—our accents—present in DH scholarship."[33]

TABLE 1
ALA Core Competencies Related to Digital Humanities

	TaDIRAH Activity Areas							
ALA Core Competencies (selected)	Capture	Creation	Enrichment	Interpreation	Storage	Analysis	Dissemination	Meta-Activities
2A. Concepts and issues related to the lifecycle of recorded knowledge and information, from creation through various stages of use to disposition.	X	X	X	X	X	X	X	X
2B. Concepts, issues, and methods related to the acquisition and disposition of resources, including evaluation, selection, purchasing, processing, storing, and deselection.	X				X			X
2D. Concepts, issues, and methods related to the maintenance of collections, including preservation and conservation.					X			
3A. The principles involved in the organization and representation of recorded knowledge and information			X	X				
3B. The developmental, descriptive, and evaluative skills needed to organize recorded knowledge and information resources.				X	X			
3C. The systems of cataloging, metadata, indexing, and classification standards and methods used to organize recorded knowledge and information.			X	X	X			
4A. Information, communication, assistive, and related technologies as they affect the resources, service delivery, and uses of libraries and other information agencies.							X	X
4D. The principles and techniques necessary to identify and analyze emerging technologies and innovations in order to recognize and implement relevant technological improvements.								X
5D. Information literacy/information competence techniques and methods, numerical literacy, and statistical literacy.						X		X
5E. The principles and methods of advocacy used to reach specific audiences to promote and explain concepts and services.								X
5F. The principles of assessment and response to diversity in user needs, user communities, and user preferences.								X
5G. The principles and methods used to assess the impact of current and emerging situations or circumstances on the design and implementation of appropriate services or resource development.								X
6A. The fundamentals of quantitative and qualitative research methods.						X		
6C. The principles and methods used to assess the actual and potential value of new research.								X
7A. The necessity of continuing professional development of practitioners in libraries and other information agencies.								X
7D. The principles related to the teaching and learning of concepts, processes and skills used in seeking, evaluating, and using recorded knowledge and information.								X
8D. The concepts behind, and methods for, developing partnerships, collaborations, networks, and other structures with all stakeholders and within communities served.							X	X

Methods

We began data collection in Spring 2020 by consulting the Directory of ALA-Accredited and Candidate Programs in Library and Information Studies (http://www.ala.org/educationcareers/accreditedprograms/directory) and the iSchool Directory (https://www.ischools.org/members) and manually inspecting all program/school entries for graduate-level DH courses. We inspected both institutional course catalogs and program/school webpages, including lists of special topics courses.

We included only those courses explicitly aligned with DH—either by naming DH in the title or by extensively referencing the field in the course description—rather than a broad array of courses that could be related to the field (e.g., digital libraries, data management, academic librarianship, and scholarly communications). Explicit mention of DH in a course title or course description is important in several respects: it signals an intent to link the course directly to the field and to prepare students for work in relevant positions. It also invokes meta-level or reflective considerations about the field, which some commentators have noted as critical in defining DH.[34] Similarly, our list does not include traditional subject librarian courses (e.g., humanities services and sources, art librarianship, or academic librarianship more broadly), which might include mention of DH as an emerging trend but not sustained focus on it. Finally, it should be noted that several institutions allow students to take courses outside of an ALA program or iSchool, and courses in these other disciplines were not included here, though they may merit further study.

A total of thirty-nine courses were identified across thirty-one institutions, and syllabi or extended course descriptions were obtained for twenty-seven courses, 69 percent of all courses identified (see appendix A for a list of institutions included in this study). About half of these syllabi (38 percent of all courses identified) were available online through department websites or through web searches; the rest were provided on request from instructors or departments. There were various reasons why the remaining syllabi could not be obtained: some courses were part of new programs and had not yet been offered, some were offered by adjunct faculty no longer teaching at that institution, and in a few cases we simply did not receive the syllabus after making several requests. Still, our success in obtaining syllabi likely reflects the values of "openness" and "collegiality and connectedness" that are said to mark DH as a field.[35]

Inspired by Spiro's study, we focus here on course titles, course descriptions, syllabus topics, learning outcomes, sources cited, and technologies. Through a combination of frequency analysis and text analysis, we explore the general DH content found in these courses, as well as LIS-specific topics, terms, and sources. In some cases, the syllabus text was preprocessed (e.g., "**digital humanities**" was converted to "**digital_humanities**" to preserve its meaning), or categories were created to group various examples (e.g., technologies), but for the most part we follow the actual language used by instructors in their syllabi.

Using syllabi as a data source necessarily brings certain limitations: we can only study what is actually written down on a syllabus. Most syllabi list readings, but some provide little or no detail on assignments, resources, and activities that occur during a class. Syllabi may be more general or more specific in the concepts and terms that they use, independent of how these are covered within the class itself. That said, other factors make syllabi a quality source of data: contemporary syllabi almost always include learning outcomes as a matter of accreditation standards, special terminology within an academic field is often more standardized

TABLE 2
Summary of Programs, Schools, and Courses Included in This Study

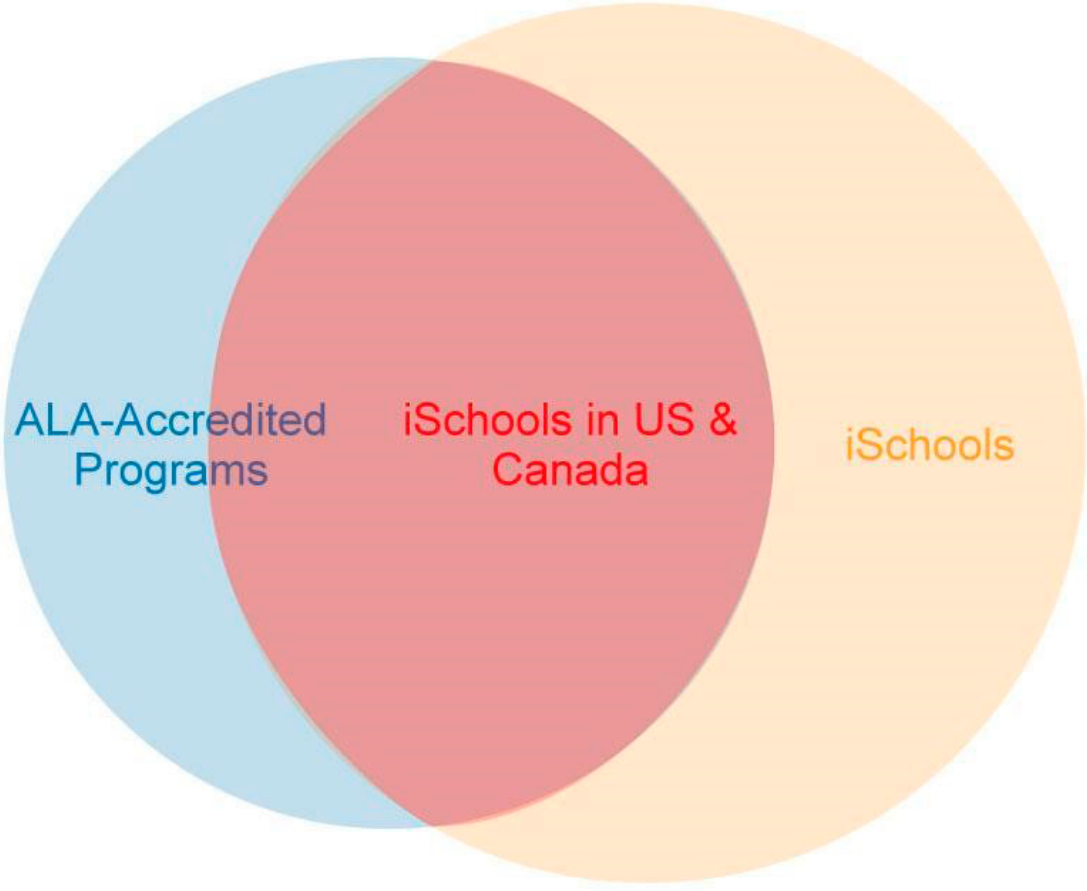
	Total Programs/ Schools Listed N	Programs/Schools Offering DH Courses N (%)
ALA-accredited programs	62	20 (32.3%)
ALA-accredited programs within iSchools	36	15 (41.7%)
iSchools within the US & Canada	48	15 (31.3%)
All iSchools	109	26 (23.9%)

than everyday discourse, and citations provide clear references to scholars and their work. These and other features suggest that syllabi can reveal a great deal about curriculum, though hidden aspects may remain.

Results and Discussion

Below, we present our findings on the presence of DH courses in LIS contexts, as well as analysis of their content. Because some course descriptions and syllabi could not be obtained and because some syllabi do not address every aspect of our analysis, the total number of items in each analysis (N) varies, depending on what is being analyzed (courses, institutions,

FIGURE 2
Comparison of Programs and Schools with Digital Humanities Courses



syllabi that mention specific technologies, etc.). Percentages are reported relative to the total number of items in each analysis.

Course Offerings

Around one-quarter of iSchools and one-third of ALA-accredited programs offer DH courses (see table 2). Again, many more schools/programs offer DH-adjacent courses, which fall outside the scope of our analysis here. Most notable is the intersection between the two groups in our study: all iSchools in the US and Canada that offer DH courses do so in the context of an ALA-accredited program (see figure 2). These fifteen institutions comprise the majority of our data here, contributing around half of all course descriptions and nearly 60 percent of syllabi to this study. Thus, this group may be considered the core of our data and the picture of DH within LIS that we present here.

While these numbers may seem relatively low, it is worth noting that DH is a specialization within LIS education and certainly not as central or ubiquitous as archives,[36] knowledge organization,[37] or even data science.[38] Not all LIS graduates become academic librarians specializing in the humanities, and not all information professionals work with(in) DH. Still, there appears to be potential for growth in DH courses offered within LIS education.

In schools/programs with two or more DH courses, the first one is routinely an introduction to theory and methods, and the second course (and sometimes following ones) covers projects or specialized methods and technologies such as text encoding, text mining, or data science (see table 3). Most of these courses contain the term "digital humanities," consistent with our selection criteria. "Information" and "introduction" are next most frequent, each appearing fewer than ten times in the thirty-nine course titles.

TABLE 3
Selected Titles of Digital Humanities courses Offered in LIS Environments

Introductory Course Titles	Advanced Course Titles
Digital Humanities	Advanced Projects in Digital Humanities
Introduction to Digital Humanities	Data Science in the Humanities
Survey of Digital Humanities	Technologies and Tools of Digital Humanities
Humanities Information	Programming for Digital Humanities
History and Theory of Digital Humanities	Digital Humanities Capstone
Digital Humanities Librarianship	Digital Humanities Practicum

Not included here are DH-related courses offered outside of ALA-accredited programs and iSchools (i.e., in other departments) that LIS students are allowed to take as part of their formal programs. In our search of program/school curricula, many of these courses were offered in computer science and various humanities departments, consistent with recent research that shows DH as a bridge between other disciplines—notably, computational linguistics and information science on the one hand, and humanistic disciplines on the other.[39] Because other departments and disciplines may already offer relevant, DH-related courses, they offer promising opportunities for engagement with LIS education, a suggestion we return to in our conclusion.

Course Descriptions and Key Concepts

We next turned to the course descriptions and what we called the "key concepts" found in

each syllabus. Course descriptions were drawn from course catalogs, or what appeared at the beginning of a syllabus. As such, we were able to include courses (N=38) even when their syllabi were missing. "Key concepts" were drawn directly from syllabi, including headings for each week or for units of a course, and any descriptions of what content was covered in them. As with the course titles, we normalized some data (as described in "Methods" above) and calculated word frequencies using Voyant, an open-source, web-based tool frequently used for text analysis by digital humanists.

Course descriptions and keywords shared about half of their most frequent terms in common, including "digital_humanities," "data," "humanities," "digital," and "information" (see table 4). However, the other top terms in the course descriptions were broader in nature ("course," "research," "students," "methods," and "tools"), whereas the key concepts focused more on the course activities and topics ("analysis," "introduction," "text," "application," and "network").

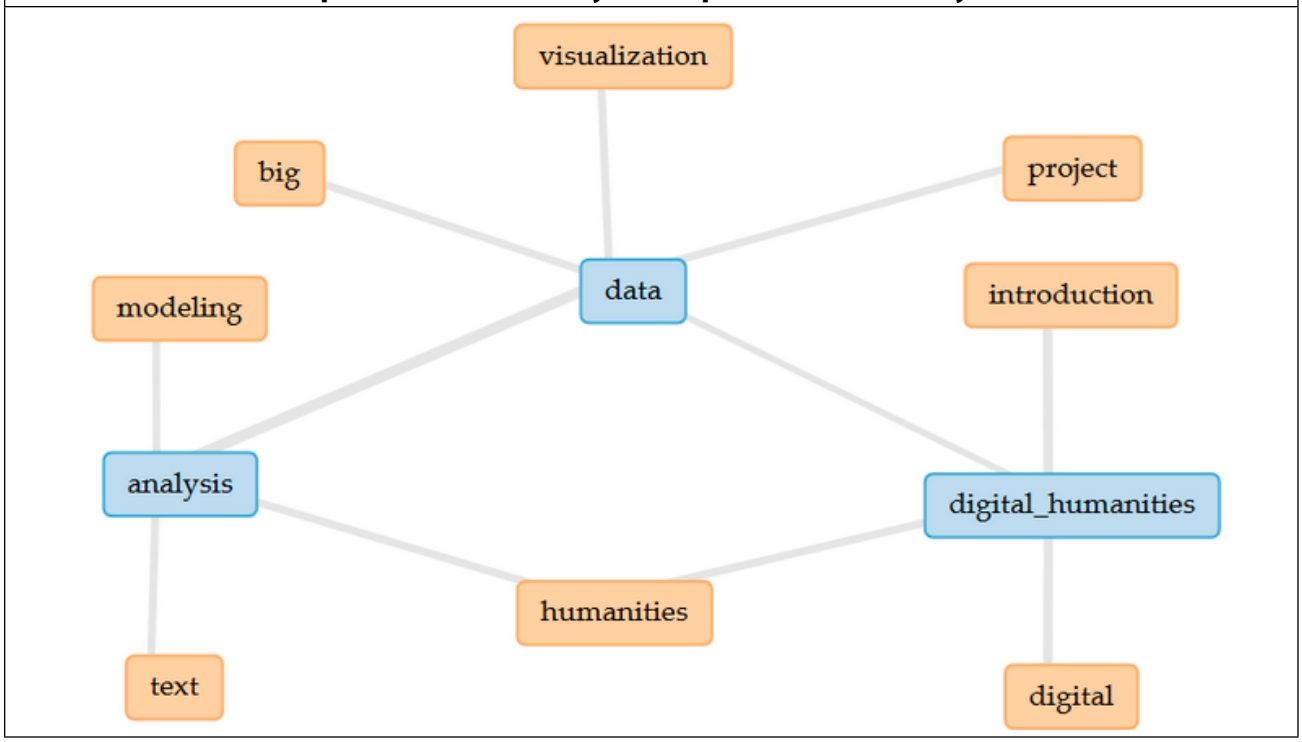
TABLE 4
Most Frequent Terms in Course Descriptions and Key Concepts Found in Syllabi. Italics Indicate Terms Common to Both Lists

Rank	Course Description Terms	Frequency (N)	Key Concepts Terms	Frequency (N)
1	*humanities*	55	*digital_humanities*	44
2	*digital_humanities*	54	*data*	43
3	*course*	53	*analysis*	32
4	*digital*	47	*humanities*	29
5	*research*	40	*introduction*	29
6	*students*	31	*digital*	26
7	*methods*	30	*text*	26
8	*data*	28	*information*	12
9	*tools*	24	*network*	11
10	*information*	19	*project*	11

We analyzed key concepts further using the "links" tool in Voyant to create a topic model visualization based on the co-occurrences of the terms. The top three terms, "digital_humanities," "data," and "analysis," were the anchors of this model, with the remaining top terms branching off from them (figure 3). This visualization surfaced key themes from courses, including data work ("big data," "data visualization," "data projects"), text analysis, and introductions to the digital humanities.

This picture resembles Tanya E. Clement and Daniel Carter's analysis of DH course categories across departments, which found that history and theory are most common, with techniques and methods as third.[40] Their second most common category was information systems and collections, which does not appear in our corpus. Also absent here are LIS-specific topics one might expect to see in a digital humanities course at an iSchool or ALA-accredited program, such as preservation, data management, metadata, or access/discovery—all of which are important issues in digital humanities where information professionals can contribute unique expertise.[41] Such concepts are presumably covered in other areas of LIS coursework besides specialized courses on DH. It remains unclear whether and how students bring these lenses to their coursework in digital humanities.

FIGURE 3
A Topic Model of the Key Concepts Found in the Syllabi.



Learning Outcomes

Nearly all syllabi (twenty-five of twenty-seven) contained learning outcomes: explicit statements of concepts and skills that students acquire in each course. We extracted these outcomes, removed preface material (e.g., "In this course, students will…"), and split compound outcomes into their separate parts (e.g., "discuss and evaluate X" became "discuss X" and "evaluate X"). We then removed common stopwords in Voyant ("the," "of," "and," "before," etc.) and visualized results using the Word Tree tool (figure 4), which sizes terms based on their frequency and arranges them in a suffix tree, helping to identify recurrences (e.g., "critically evaluate" or "analyze implications").[42]

Because learning outcomes are typically written in a similar syntax, this tree offers a common vocabulary of learning activities, as well as detail about the content of each. For example, foundational concepts are reflected in verbs such as "understand," "describe," and "articulate," while generative activities may be marked by "create" or "develop." There is frequent emphasis on critical evaluation and review, applying (things) appropriately, and analyzing implications—again, critical discussions being a hallmark of DH and the humanities more broadly. "Evaluate" also appears lower in the frequencies as a verb, especially in connection to DH projects.

These trends mirror Yin Zhang, Fangli Su, and Brenna Hubschman's analysis of DH jobs posted to the ALA JobLIST between 2006 and 2018.[43] Their study found that "project" skills (analogous to "apply," "develop," and "create" in our analysis) and "communication" skills (analogous to "describe," "articulate," and "discuss" in our analysis) were the most common required skills, present in 64 percent of ads. Moreover, 51 percent of ads mentioned being responsible for the implementation, evaluation, promotion, and integration of emerging and existing tools. "Project" was among the top ten key concepts in the syllabi we examined, and

FIGURE 4
Word Tree Visualization of Learning Outcomes in Digital Humanities Courses

both project management and communications skills appear frequently in student learning outcomes. Indeed, it would appear that DH courses within LIS anticipate needs in these areas among employers, and respond to them.

Technologies

Over half of the syllabi we obtained (55%) mention specific technologies that are covered in each course. We extracted these mentions, normalized them (by correcting spelling errors and combining variants such as "Oxygen" and "Oxygen XML Editor"), and categorized each technology into one of several broad areas (see table 5). Many syllabi mention technologies for text enrichment and text analysis—text encoding initiative (TEI) being the most frequent, which Susan Hockey highlights "above all others" as a significant advancement in and from the field.[44] Also frequent are technologies related to data, general programming languages, visualization tools, mapping software, and platforms for archives and collections—the last category despite the lack of storage-based topics we saw in earlier analyses.

TABLE 5
Technologies Mentioned in Digital Humanities Syllabi

Technology Areas	Examples of Specific Technologies	Frequency
Text	TEI, Voyant, AntConc, Mallet	23
Data	R, OpenRefine, Excel	15
Programming	Python, Jupyter Notebooks, HTML	11
Visualization	TimelineJS, Tableau	10
Mapping	StoryMaps, QGIS, Carto	10
Archives & Collections	Omeka, Scalar, Manifold	10
Other	sensors, games, 3D printing	7
Media	Audacity	3
Networks	Gephi	2

Returning to Zhang, Su, and Hubschman's analysis of DH job ads, data visualization (in 23% of ads), text mining (22%), and languages (20%)—both programming and non-English spoken languages—were all frequently mentioned, as well as technologies and standards such as XML, TEI, MODS, METS, and GIS (17%).[45] Though there are some differences in the relative frequencies of various technology areas between our study and theirs, there is generally wide agreement between the specific technologies covered within DH courses in our study and the technologies mentioned in job ads.

Looking finally at the breadth of technologies covered, each syllabus that mentioned technology did so in at least two areas, usually three or more. While some areas were found together more often (e.g., data and text-related technologies), most syllabi include a wide range of technologies across different areas, suggesting that DH information professionals are trained to be generalists, familiar with many different technologies and their accompanying methods. To some extent, this may differ from non-LIS-based DHers, who may focus on particular methods and tools associated with their topical interests. DH librarians have been described as "specialized generalists,"[46] knowledgeable about a wide range of technologies without necessarily having deep experience with them: "It's not necessary that we know all the technical aspects of these technologies, but we should be able to connect professors with these technical resources."[47] That said, many DH librarians do have specialization in particular areas based on their elective coursework, research, or previous degrees—and particular technological foci may travel with them, or develop over the course of work at a particular institution, given faculty and student interests.

Sources

Most syllabi (twenty-three of twenty-seven) included references, totaling 860 citations, one-quarter of which were marked as optional readings. We include these optional readings in our analysis below to paint the most inclusive picture of the sources assigned in courses. Generally speaking, these syllabi fall into one of two broad groups: those that assign a wide range of articles and websites (often forty or more sources across the semester) and those that assign one or more books, especially textbooks (more often found in technology-heavy courses, such as Text Mining).

Each citation was examined to determine the authors(s) and source title. Around 20 percent of all citations are to tutorials, webpages, Wikipedia, and other entries for which no author is named in the syllabus. Over 500 names appear across the syllabi, though all but the most frequent (table 6) have only a few mentions. For comparison, we include the number of times each source appears in the Open Syllabus (https://opensyllabus.org) corpus, a database of more than seven million college course syllabi.

TABLE 6
Most Frequent Authors and Sources Assigned. (Full references are provided in Appendix B)

Authors	Sources	Frequency in Syllabi in this Study (N)	Frequency in Open Syllabus Corpus (N)
Gold, M. K. (Ed.)	*Debates in Digital Humanities* (2012)	16	350
Gold, M. K., & Klein, L. F. (Eds.)	*Debates in the Digital Humanities* (2016)	6	2
Posner, M.	"No Half Measures: Overcoming Common Challenges to Doing Digital Humanities in the Library" (2012)	5	12
	"How Did They Make That?" (2013)	5	–
	"What's Next: The Radical, Unrealized Potential of Digital Humanities" (2015)	5	–
Schreibman, S.,	*Companion to Digital Humanities* (2004)	9	321
Siemens, R. & Unsworth, J. (Eds.)	*A New Companion to Digital Humanities*, 2nd edition (2016)	5	82
Muñoz, T.	"Digital Humanities in the Library Isn't a Service" (2012)	4	–
Muñoz, T. & Rawson, K.	"Against Cleaning" (2016)	3	19
Muñoz, T. et al.	(various other publications)	4	–
Underwood, T.	"Topic Modeling Made Just Simple Enough" (2012)	4	–
	(various other publications)	6	–
Burdick, A., Drucker, J., Lunenfeld, P., Presner, T. & Schnapp, J.	*Digital_Humanities* (2012)	8	90
Nowviskie, B.	"Skunks in the Library: A Path to Production for Scholarly R&D" (2013)	5	8
	(various other publications)	3	–

TABLE 6
Most Frequent Authors and Sources Assigned. (Full references are provided in Appendix B)

Authors	Sources	Frequency in Syllabi in this Study (N)	Frequency in Open Syllabus Corpus (N)
Kirschenbaum, M.	"What Is Digital Humanities, and What's It Doing in English Departments?" (2010)	3	131
	"What Is 'Digital Humanities,' and Why Are They Saying Such Terrible Things about It?" (2014)	2	10
	Mechanisms (2007)	2	185
	"Digital Scholarship and Digital Studies: The State of the Discipline" (2014)	1	11
Risam, R.	"Beyond the Margins: Intersectionality and the Digital Humanities" (2015)	2	–
	(various other publications)	6	–
Sula, C. A.	"Digital Humanities and Libraries: A Conceptual Model" (2013)	4	16
Weingart, S. B.	"Demystifying Networks" (2011)	4	–

The top sources assigned include several collected volumes and textbooks that are staples found in DH courses across various contexts, including the *Debates in the Digital Humanities* series and the two versions of *Companion to Digital Humanities*. More unique to this list are the number of sources specific to DH in libraries, which are less frequently found outside of LIS contexts.

The most cited single author in these syllabi is Miriam Poser, whose works here span project design, DH in academic libraries, and humanistic reflections on datasets. Her "How Did They Make That?" series, which reverses engineers well-known digital projects to introduce students to new tools and technologies, is widely recognized in the field,[48] as are her very practical reflections on doing DH in academic libraries, ranging from issues of training and infrastructure to authority and institutional commitment. Also prominent is Trevor Muñoz's work with collaborators on data curation and DH librarianship, especially with reference to access and sustainability.[49] These authors and their views (among others) give us a sense of what LIS contributes uniquely to DH—what parts of DH come by and from LIS as a field.

To highlight only one critical contribution that LIS has made to DH, we might look at the debate around librarians and the notion of service in DH. In part, the idea of service arises from an antiquated view of librarianship as handmaiden to the other disciplines, producing only secondary or derivative scholarship, as opposed to its own objects of inquiry.[50] Many commentators, including Posner,[51] have challenged this notion, instead positioning librarians as coresearchers and cocreators in the field. Service becomes collaboration; library labor shifts from instrumental to integral and essential in projects. Brett D. Currier, Rafia Mirza, and Jeff Downing link this development to new positions in the field: "As positions in scholarly communication, digital humanities, data, and e-science have increased, there has been a shift from librarians as content and knowledge curators to knowledge and content creators."[52] These

interlocutors and others have added much to the literature on collaboration, collegiality, and values in DH[53] through their specific discussion of libraries and librarians.

Conclusions

Key findings of this study include the following:

- While DH is reflected in LIS course offerings, there remains potential for growth in many institutions. Most programs/schools lack a DH course, and many others offer only a single introduction to the field—though DH-adjacent offerings may be more prevalent.
- Where DH courses are offered, there is significant overlap between iSchools and ALA-accredited programs, suggesting that libraries and librarians are especially relevant to DH among information professionals.
- The terms and concepts, learning outcomes, and technologies covered in these courses reflect other representations of DH, including studies that analyze LIS job ads and interviews with information professionals. It also appears that formal training, where available, indeed reflects work in the field.
- Though DH courses both inside and outside of LIS share many readings in common, a distinctive set of readings focused on libraries and librarians appears frequently within LIS-based courses. This subset raises important issues about data curation, project management, and labor in the academy—important not only for information professionals but also for DH as a whole.

As we have noted above, these results are presented with several cautions, including general limitations of syllabus studies and restrictions imposed by our selection criteria for courses. To supplement these findings, we have referenced other studies[54] that rely on alternative data sources, including job ads and interviews with practitioners, and critical debates in the field. Several points of agreement between these studies and ours suggest that our corpus of DH syllabi indeed reflects the needs and experiences of working in the profession. Still, we have some reservations about our conclusions, particularly with respect to a more global and inclusive picture of the field.

Of the twenty-seven syllabi we collected, twenty-two (81%) are from institutions located in either the United States, the United Kingdom, or Canada, locations that represent 74 percent of all courses we identified. There were no courses, let alone syllabi, identified from institutions in South America, Africa, or Southeast Asia, even though these regions clearly are sites of DH. Even among the courses we did study, there was not enough data to make interesting distinctions between the US/UK/Canada and other areas in Europe, the Middle East, and China. For this reason, we must acknowledge that our results reflect a largely Anglophone picture of DH courses within LIS education. This is a well-established critique of DH[55] and of scholarship more generally.[56] Whether it is a special problem within LIS education is yet unclear and remains a question for future research. Such work will be aided by continued outreach to and awareness of DH efforts across the globe.

In parallel with global efforts, we also note the potentials for local outreach within one's own institution and region. Where DH courses do not exist in LIS curricula, it may be possible to cross-list courses offered elsewhere or include such courses in elective options for students. Where DH courses do exist in LIS curricula, their success may depend on integration with other degrees, departments, and consortia.

A particularly telling example may be the longstanding success of the University of Alberta, which offers several DH courses within its ALA-accredited program. These courses are

also part of an interfaculty joint degree program offered between the Master of Library and Information Studies (MLIS), founded in 1970, and the Master of Arts (MA) in Digital Humanities (formerly, "Humanities Computing"), which admitted its first cohort in 2001. As some of its earliest faculty members note, the development of the DH program was

> shaped to …local circumstances [that] include specific areas of expertise of the two new faculty members…, the research projects and teaching interests of other colleagues at U of A, the physical infrastructure available on campus (such as the types of computer labs already existing or that could reasonably be built), the strengths of the private sector in the regions where some students are most likely to seek employment, and, of course, the interests of the students themselves.[57]

This multifaceted picture of the motivations and constituencies behind U of A's DH program speaks to the many local contexts that guide curricular development and doubtless reflects the genealogies of many of the DH courses we have considered here.

In surveying the landscape of DH courses within LIS education, we have developed a picture of the extent and content of these courses and discussed their relationship to recent studies of employment in information settings. This representation is useful both abstractly, showing where LIS-inflected DH converges with and diverges from the larger field, and practically, especially for those wishing to develop or expand DH offerings at their own institutions. To that end, we have provided many examples of course titles, learning outcomes, readings, and technologies.[58] Much of our discussion points back to the very themes and values that are said to define DH: interdisciplinarity, collaboration, and critical approaches. Though LIS has instantiated its own versions of these, the DH courses offered in LIS environments still reflect these familiar, albeit varied, hallmarks of the field.

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Appendix A

List of institutions offering at least one DH course included in this study (those providing syllabi to the study are marked with an asterisk). For a complete list of current ALA-accredited schools please see http://www.ala.org/educationcareers/accreditedprograms/directory. For the current list of iSchools please see https://www.ischools.org/members .

Institution	iSchool	ALA-accredited
Bar-Ilan University	x	
CUNY Queens College		x
*Dominican University	x	x
Hong Kong Baptist University	x	
*Indiana University	x	x
*Linnaeus University	x	
*National Taiwan Normal University	x	
*Pratt Institute	x	x
Renmin University	x	
*San Jose State University	x	x
Shanghai University	x	
*Simmons University	x	x
St. Catherine University		x
*Syracuse University	x	x
The Catholic University of America		x
*University College London	x	
University of Alberta		x
*University of Amsterdam	x	
*University of Colorado	x	
*University of Glasgow	x	
*University of Illinois at Urbana-Champaign	x	x
University of Iowa	x	x
University of Missouri	x	x
*University of North Texas	x	x
*University of Pittsburgh	x	x
*University of Regensburg	x	
*University of Texas at Austin	x	x
*University of Washington	x	x
University of Western Ontario (Western University)		x
University of Wisconsin-Madison	x	x
Wuhan University	x	

Appendix B

List of most frequent authors and sources assigned in courses in this study (in alphabetical order).

Anne Burdick et al., *Digital_Humanities* (Cambridge, MA: MIT Press, 2012).

Gold, Matthew K., *Debates in the Digital Humanities* (Minneapolis: Univ Of Minnesota Press, 2012), https://dhdebates.gc.cuny.edu/projects/debates-in-the-digital-humanities.

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Posner, Miriam, "No Half Measures: Overcoming Common Challenges to Doing Digital Humanities in the Library," *Journal of Library Administration* 53, no. 1 (January 1, 2013): 43–52, https://doi.org/10.1080/01930826.2013.756694.

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Underwood, Ted, "Topic Modeling Made Just Simple Enough.," *The Stone and the Shell* (blog), April 7, 2012, https://tedunderwood.com/2012/04/07/topic-modeling-made-just-simple-enough.

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Notes

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