Digital Humanities Job Requirements and Functions in the Library and Information Science Field Abroad: An Analysis Based on ALA JobLIST (Postprint)

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Abstract

[Purpose/Significance] By evaluating the knowledge and skill requirements described in job advertisements related to the digital humanities field, this study identifies the qualifications and functional responsibilities required of practitioners in the domain. [Method/Process] Using digital humanities-related job advertisements from the American Library Association (ALA) from 2006 to 2018 as the data source, the study collected 72 core positions containing "digital humanities" in their job titles and 232 related positions containing "digital humanities" in their job descriptions, analyzing their job titles, educational background requirements, experience requirements, knowledge and skill requirements, and functional responsibilities. [Results/Conclusion] Demand for library and information science talent in the digital humanities field has increased year by year. Library and information science can participate in the digital humanities domain through digital projects, management, area studies/subject specialists, information literacy/training, and reference services. The required skills mainly include: research tools and technologies related to digital scholarship and digital humanities; knowledge of programming, scripting languages, software, and platforms; publishing, teaching experience, and communication capabilities.

Full Text

Preamble

Abstract: [Purpose/Significance] This study assesses the knowledge and skills requirements described in job advertisements to identify the qualifications and functional responsibilities needed for practitioners in the digital humanities field. [Method/Process] Using job advertisements related to digital humanities from the American Library Association (ALA) JobLIST between 2006 and 2018 as

data sources, we collected 72 core positions containing “digital humanities” in their titles and 232 related positions containing “digital humanities” in their job descriptions. We analyzed position titles, educational background requirements, experience requirements, knowledge and skill requirements, and functional duties. [Result/Conclusion] The demand for library and information science talent in digital humanities is increasing year by year. Library and information science can participate in digital humanities through digital projects, management, regional research/subject expertise, information literacy/training, and reference consultation. Required skills mainly include: research tools and techniques related to digital scholarship and digital humanities; knowledge of programming, scripting languages, software, and platforms; and publishing, teaching experience, and communication abilities.

Keywords: digital humanities; content analysis; ALA JobLIST; library and information science

Digital humanities is a diverse research field that integrates a range of scholarly practices with the rapidly evolving digital era of recent decades [1]. Digital humanities practice includes digitization, crowdsourcing, archives and databases, digital curation, textual editing, visualization, geospatial analysis, gaming, and coding [2].

Digital humanities research remains exploratory, but certain themes have attracted significant attention from researchers, including the state of higher education in digital humanities and directions for improvement. According to recent studies, undergraduate teaching in digital humanities remains inadequate. C. Gaffield notes that efforts to cultivate students’ ability to handle data in humanities disciplines to better serve digital humanities have only just begun [3].

Identifying the specific competencies required for digital humanities work—such as knowledge and skills—based on the current state of digital humanities education and practice is an important foundation for designing educational and professional frameworks for digital humanities professionals. This study attempts to determine the competencies required for practitioners in the digital humanities field by evaluating the knowledge and skills requirements described in relevant job advertisements, thereby providing assistance for better integration of library and information science into digital humanities and for curriculum design and talent cultivation in digital humanities. Specific research questions include: (1) What are the common position titles in the digital humanities field? (2) What are the most critical knowledge and skill requirements in digital humanities job advertisements? (3) What are the core functions of digital humanities work? (4) What do the specific responsibilities of digital humanities work entail?

Digital humanities librarian has become an actual job title and position in university libraries, but the American Library Association (ALA) has not yet established a core competency framework for this emerging profession, and library and information science (LIS) education has not begun to design specialized curricula for this rapidly growing and expanding field. Digital humanities librarians

face challenges in policy, resources, infrastructure, outreach, awareness, and organizational culture [4].

2 Literature Review

2.1 Digital Humanities and Libraries

2.1.1 Foreign Research Digital humanities is a multidisciplinary research field, but among all related disciplines, library science is the most discussed because the values of university libraries are very similar to those of the humanities [5]. Consensus has been reached in the digital humanities field that libraries are playing an increasingly important role in digital humanities [6]. Even in places where digital humanities initiatives have not yet launched and infrastructure remains incomplete, librarians have the capacity to establish digital humanities-centered services [7].

Published research on digital humanities and libraries has primarily focused on how to better integrate library infrastructure and personnel into digital humanities research processes. M. D. Poremski notes that the main roles libraries can play in digital humanities are "outreach, project management, content selection, and digitization" [8]. However, embedding library science into digital humanities research processes remains fraught with challenges, the most common being lack of resources, support networks, and training opportunities [9]. This places librarians in a difficult position where they cannot define themselves as true digital humanities librarians due to insufficient resources to genuinely participate in digital humanities activities.

2.1.2 Domestic Research **(1) Introduction and Reference of Foreign University Library Digital Humanities Services.** Tian Yanfei et al. used web surveys and case analysis to examine 10 U.S. university libraries from the perspectives of digital humanities consulting services, data management, technical support, and assistance with funding applications, summarizing characteristics of U.S. university library digital humanities services and their implications for China [10]. Su Min et al. analyzed the world's top 20 comprehensive universities, examining digital humanities librarian position settings, responsibilities, qualifications, organizational structures, and education and training, suggesting that Chinese university libraries should establish digital humanities librarian positions suited to their development needs and construct organizational management structures for digital humanities librarians [11]. Tang Le investigated Yale University Library's digital humanities service practices, analyzing funding and personnel composition, service content and internal/external cooperation, research projects and scholarship funding, evaluation and reflection, and external learning exchanges [12].

(2) Theoretical and Practical Research on Library Digital Humanities Services. Zhou Chen proposed a development path for library digital humanities construction from four levels: clear positioning, resource integra-

tion, service evaluation, and talent cultivation [13]. Wang Xinyu argued that university libraries urgently need to return to digital humanities value concepts, reorienting libraries to form truly equal partnerships with digital humanities through establishing mature, open, and diverse institutional environments, forming matrix-structured digital humanities teams, designing project management plans based on complete cooperation cycles, and establishing digital ecosystems with balanced internal and external elements, thereby promoting sustainable development of digital humanities in libraries [14]. Yang Zirong et al. noted that libraries can provide support for digital humanities development in areas such as resource navigation, tool application, project maintenance, digital preservation, metadata management, copyright guidance, academic evaluation, and digital publishing, and can develop training programs, optimize curriculum design, open research spaces, and carry out collaborative practices [15]. Wang Xinyu analyzed the promotional effect of digital humanities on library service innovation, constructed a library knowledge service model oriented toward digital humanities, analyzed its mechanism, and proposed knowledge service strategies for digital humanities from aspects such as enriching knowledge service product forms, optimizing literature resource integration, and leveraging the role of digital humanities librarians [16].

(3) The Role of Library and Information Science in Digital Humanities. Xie Huan proposed that library and information science should seize the opportunity of digital humanities for disciplinary self-reflection and work self-reflection, participating in digital humanities from three aspects—resource integration, strengthening communication with humanities scholars, and embedding in life—to demonstrate the role and status of library and information science in digital humanities [17].

2.2 Content Analysis Based on Job Advertisements

2.2.1 Foreign Research Content analysis of library-related job advertisements is very common, as analyzing library job advertisements can promote library and information science education. By understanding the needs of different types of librarians, LIS curriculum developers can better implement curriculum development and teaching method design to cultivate suitable candidates for new library positions [18]. J. Kim et al. analyzed job advertisements in the digital curation field, using data sources including ALA JobLIST, and used NVivo software to code and analyze position titles, institution types and locations, education, experience, knowledge and skills, and duties [18]. H. R. Khan et al. analyzed job advertisements for data librarians in U.S. academic libraries, collecting 50 data librarian job advertisements from ALA JobLIST, Indeed, Glassdoor, and the International Association for Social Science Information Services & Technology (IASSIST) website, using NCapture and NVivo for content analysis to extract qualifications and competencies required for data librarians [19]. C. Sproles et al. analyzed recent trends in government documents librarian job advertisements, using 75 advertisements posted on Govdoc-L and

ALA JobLIST between 2010-2016, classifying duties in each advertisement and finding that most academic libraries view government documents as a public service rather than a technical service [20]. K. M. Thompson et al. analyzed Australian library job advertisements, using 96 advertisements from major Australian library job search engines, focusing on diversity and inclusion in the Australian library profession [21].

2.2.2 Domestic Research Ye Huanhui analyzed job postings for digital humanities librarians at well-known foreign university libraries, focusing on job responsibilities and requirements, and proposed the necessity of establishing digital humanities librarian positions in Chinese university libraries, offering suggestions on selection, recruitment, and knowledge updating for digital humanities librarians [22]. Jin Lingjuan analyzed digital humanities librarian position settings at U.S. university libraries, examining 21 university library digital humanities librarian positions from platforms such as Code4lib, Dh+lib, DLF Jobs, and ChronicleVitae.com between 2013-2017, conducting content analysis on position titles, departments, job responsibilities, and knowledge and skill requirements, and suggested that Chinese university libraries should establish suitable digital humanities librarian positions, expand library digital humanities work areas, strengthen skills training and knowledge reserves for digital humanities librarian positions, and advance digital humanities services [23].

3 Data Sources and Research Methods

3.1 Data Sources

ALA JobLIST (https://joblist.ala.org/) is a recruitment website for "Library and Information Science and Technology Jobs," a service site of the American Library Association and the Association of College and Research Libraries, with job postings primarily targeting LIS graduates.

From August 2006 to April 2018 (data collected in April 2019, as ALA does not provide job advertisements within one year), ALA JobLIST posted a total of 24,058 job advertisements, some of which were repeatedly posted until suitable candidates were found. Therefore, this study first conducted data deduplication. ALA JobLIST data nodes include: position title, job ID, posting time, state, country, zip code, company name, job type, job description, job requirements, minimum education, minimum work experience, salary (high/low/type), deadline, and job function.

(1) Core Job Dataset Extraction. The standard English translation for digital humanities is "digital humanities," though some institutions also use "digital scholarship." Based on the following criteria, we collected 72 core positions in digital humanities: position titles containing "digital" AND "humanities," or containing "digital scholarship" with job descriptions containing "digital humanities."

(2) Related Job Dataset Extraction. Based on the following criteria, we

collected 232 related positions in digital humanities: job descriptions containing "digital humanities," excluding the core positions above. Although these positions did not include digital humanities in their titles, their specific job functions contained relevant content.

The final collected samples were mainly distributed in academic/research institutions (colleges/universities) for the following reasons: First, the job advertisement list from which we obtained samples is library-centered. Second, this demonstrates the increasing demand for digital humanities activities in academic universities and research libraries, reflecting that libraries are increasingly participating in digital humanities.

3.2 Research Methods

To identify characteristics and patterns of digital humanities job requirements, we analyzed datasets of 72 core positions and 232 related positions, focusing on six aspects: year of job advertisement posting, position title, degree requirements, knowledge and skill requirements, and functions and responsibilities.

SCI2 is a modular toolset specifically designed for scientific research, supporting network analysis and visualization of academic datasets [24]. We identified keywords contained in position titles, then imported these keyword data into SCI2 to obtain core keywords appearing in position titles.

We manually reviewed all system-provided job descriptions and requirements, manually extracted specific degree requirements, knowledge and skill requirements, and responsibilities, imported them into VOSviewer to obtain frequency and co-occurrence networks of keywords in knowledge/skills and job responsibilities, thereby identifying core job skills and responsibilities needed in the digital humanities field.

Additionally, this study used Pajek for community division of knowledge and skill requirements and job responsibilities, then exported the co-occurrence network diagrams and community divisions from Pajek to VOSviewer to achieve visualization of network communities.

Through analysis of 12 years of core and related job advertisements in the digital humanities field from ALA JobLIST, we understood the qualification requirements and job functions of digital humanities work, providing recommendations for digital humanities education and further clarifying the role and positioning of library and information science in the digital humanities field.

4 Results Analysis

4.1 Yearly Distribution of Digital Humanities Job Demand

As shown in Table 1 , the first digital humanities core job in the sample was posted in 2006—a digital humanities services director position at the University of Virginia to maintain its international reputation as a center for digital

scholarship culture. In 2007-2008, ALA posted only 2 digital humanities core jobs each year. In 2009-2010, there were no digital humanities core jobs on ALA's job list. During 2011-2018, demand for digital humanities core jobs became stable, with job advertisements accounting for 1.39%-20.83% of total job advertisements each year. In 2012-2013 and 2014-2015, the number of core job demands experienced significant growth. The number of positions in 2018 decreased due to incomplete data for that year.

Related digital humanities jobs entered a period of rapid growth starting in 2012, reaching 62 positions in 2017. From the distribution of core and related job numbers, we can see that demand for library and information science talent in the digital humanities field is increasing year by year, and that libraries are increasingly participating in digital humanities.

4.2 Position Title Analysis

For job seekers, position titles are preliminary indicators of whether a position is suitable and represent the most core summary and distillation of a job requirement. Figure 1 [Figure 1: see original paper] shows position titles that appeared at least twice in digital humanities core job demands. The title "Digital Humanities Librarian" appeared most frequently, with 17 occurrences in the sample, followed by "Digital Scholarship Librarian" with 16 occurrences. Other titles included "Digital Humanities Specialist," "Director of Digital Scholarship Services," "Digital Humanities Designer," "Digital Humanities Developer," "Digital Humanities Postdoc," etc. All core job titles contained "digital humanities" or "digital scholarship," requiring practitioners to be responsible for and complete core functions of digital humanities.

Figure 2 [Figure 2: see original paper] shows position titles that appeared at least twice in related digital humanities jobs. Position titles were very dispersed, with "Humanities Librarian" appearing most frequently (8 times), followed by "Digital Projects Librarian" (5 times). Other titles included "Research and Instruction Librarian," "Data Services Librarian," "Special Collections Librarian," "Reference and Instruction Librarian," "Head of Digital Research and Publishing," "Data Services and Government Information Services Librarian," etc., indicating that digital humanities work is becoming more common and that many other positions involve digital humanities responsibilities.

To better explore the content and scope of position title meanings, this study divided all position titles into keyword phrases. The frequency of different terms extracted from position titles is shown in Table 2 :

Table 2 Distribution of Keywords in Position Titles

Analysis of terms extracted from core job titles shows that the most common job type is librarian, followed by director and specialist. Other job types include coordinator, developer, postdoc, project manager, assistant director, associate director, consultant, designer, researcher, head, and professor. Disciplines re-

lated to digital humanities include humanities, American history, art, English, British literature, history, and social sciences. Main work includes services, research, digital research, scholarly communication, technology, design, instruction, learning, literary studies, and teaching.

Analysis of terms extracted from related job titles shows that digital humanities-related work includes digitization, research, collections, special collections, services, instruction, and liaison.

4.3 Qualifications/Requirements Analysis

4.3.1 Degree Requirements All 72 digital humanities core job advertisements included educational background requirements. The distribution of minimum degree requirements is shown in Figure 3 [Figure 3: see original paper]. Five positions required PhD holders; 60 positions required master's degrees, with 16 preferring PhD holders; the remaining 7 positions only required bachelor's degrees, but 4 of these preferred master's or PhD holders.

Among the 232 related job advertisements, 228 had minimum degree requirements. The most common minimum requirement was a master's degree (206 positions). Fourteen positions required a bachelor's degree as the minimum.

Discipline requirements for digital humanities job advertisements are shown in Figure 4 [Figure 4: see original paper]. Among the 72 core job demands, 54 listed specific discipline requirements, while the rest only mentioned "relevant major or relevant advanced degree."

(1) In core job demands, 48 of 52 advertisements listing discipline requirements (89%) mentioned a master's degree in library and information science, with 8 preferring a second degree in a relevant humanities discipline.

(2) Besides library and information science, humanities were mentioned 26 times, social sciences 13 times, and other disciplines only 1-2 times.

Among the 232 related job demands, 191 listed specific discipline requirements, while the rest only required an advanced degree in a relevant discipline.

(1) Of the 191 job advertisements, 180 (94%) mentioned a master's degree in library and information science, with 61 preferring background knowledge in other majors.

(2) Besides library and information science, humanities were mentioned 21 times, history 14 times, and social sciences 11 times.

Since the sample selected from ALA JobLIST primarily targeted LIS graduates, 48 core job samples required ALA-accredited MLIS degrees, but some jobs simultaneously required knowledge in other fields. Required domain knowledge appeared in specific academic areas including humanities, social sciences, British literature, computer science, art, and American literature, indicating that digital humanities professionals in this field may need to manage specific domain

knowledge. This study can help students interested in digital humanities work better prepare.

4.3.2 Knowledge and Skill Requirements In the core job sample, 69 samples allowed extraction of specific knowledge and skill requirements from job descriptions and system-provided requirements. In the related job sample, 227 samples allowed extraction of specific knowledge and skill requirements. Table 3 shows keywords and frequencies of knowledge and skill requirements for digital humanities work.

Core job knowledge and skill requirements include three aspects:

(1) **Research tools and techniques for digital scholarship and digital humanities.** Main requirements include: digital humanities (e.g., digitization, text mining, data visualization, mapping, image analysis, augmented reality), digital content creation, data management, digital publishing and web publishing, library technology and applications, project management, workflow analysis, database design, writing, and other research tools, techniques, and methods.

(2) **Programming, scripting languages, software, and platforms.** Main requirements include: programming languages (JavaScript, Julia, Python, R, XQuery), digital scholarship platforms (Fedora, Omeka, DH Press), repository tools (DSpace, Fedora), OCR, Photoshop and other tools and technologies, and media digitization (images, audio, video).

(3) **Publishing, teaching experience, and communication abilities.** Main requirements include: research ability, publication record or professional presentation experience, teaching experience, collaboration with colleagues, faculty, staff, students, stakeholders, and diverse groups, excellent communication, presentation, and interpersonal skills, rights management, copyright management, and social media and outreach tools.

Related job knowledge and skill requirements can also be divided into three aspects: digital project management, data management, software such as Python and Java, scholarly communication, and interpersonal skills; collection management, library services, information literacy, writing, and student activities in humanities and history-related disciplines; archives, special collections management, collaboration with universities and libraries, and teamwork.

The main skills required for digital humanities core jobs include: data visualization, text mining, records management, publishing, communication, and image analysis. The main skills required for related jobs include: management, scholarship, interpersonal relationships, software use, data management, and digital scholarship.

Based on keyword co-occurrence of knowledge and skill requirements, we constructed co-occurrence networks and used the Louvain method in Pajek to divide

skill requirements for core and related jobs into three clusters each, representing three major categories of requirements, as shown in Figure 5 [Figure 5: see original paper] and Figure 6 [Figure 6: see original paper].

This study observed qualifications and functional responsibilities for digital humanities work. Unsurprisingly, many job descriptions mentioned skills needed to work in information technology-intensive environments and specific tools, techniques, and applications for digital humanities. A. J. Bradley noted that digital humanities work mainly includes text editing and mining, visualization creation of past and present data, and even applying virtual technology to archaeological discoveries [1]. This study found substantial demand for knowledge of research tools and techniques in the digital humanities field (such as digitization, text mining, data visualization, mapping, and image analysis).

4.4 Job Functions/Responsibilities Analysis

4.4.1 Digital Humanities Job Function Analysis Among the 72 core job advertisements, 67 had one or more system-assigned job functions. Among the 232 related job advertisements, 210 had one or more specific job functions designated by employers. Job function frequencies are shown in Figure 7 [Figure 7: see original paper].

The most important job function for core jobs is digital projects (47), followed by regional research/subject expertise (12), administration/management (7), research (7), information technology/systems (6), and training technology (6), all appearing more than 5 times in the job function list and representing main functions of digital humanities work.

The most important job function for related jobs is also digital projects (63), followed by administration/management (49), regional research/subject expertise (32), research (27), information literacy/training (25), reference (24), information technology/systems (22), and special collections/archives (22), all appearing more than 20 times.

In digital humanities job advertisements, positions with "digital projects" functions averaged 65% of all advertisements, followed by regional research/subject expertise at 17%. Meanwhile, "project management experience" was the most common expression in knowledge and skill requirements. This confirms the observation of B. D. Currier et al., who noted that "in the project management process, three of the four project phases pose unique challenges for digital humanities projects, and librarians have already mastered the skills necessary for all stages of project management" [25].

4.4.2 Digital Humanities Job Responsibility Analysis In the core job sample, 69 samples allowed extraction of specific responsibility requirements from job descriptions. Table 4 shows keywords and frequencies of responsibility requirements. The main responsibilities for digital humanities core jobs include:

data visualization, text mining, records management, publishing, communication, and image analysis. The main responsibilities for related jobs include: management, scholarship, interpersonal relationships, software use, data management, and digital scholarship.

Based on keyword co-occurrence of job responsibilities, we constructed co-occurrence networks and used the Louvain method in Pajek to divide responsibility requirements for core and related jobs into 2 and 3 clusters respectively, as shown in Figure 8 [Figure 8: see original paper] and Figure 9 [Figure 9: see original paper].

Core job responsibilities include two aspects:

(1) **Digital humanities research, technology, tools, practices, services, and training in universities and university libraries.** Main responsibilities include: leadership, collaboration, and technical support for digital humanities projects; creation, use, and preservation of original digital scholarship; promoting the use of digitized materials in digital humanities projects and exhibitions; developing and implementing research methods and tools for digital humanities and social sciences; developing and managing specific humanities and social sciences; conducting workshops on digital research methods, tools, platforms, and best practices; providing training on digital scholarship tools and methods for faculty, graduate students, and undergraduates; best practices for text analysis research methods, tools, platforms, and best practices; best practices for digital project development, preservation, accessibility, copyright, and open access; establishing communities of digital scholarship practice and evaluation; and developing campus digital humanities communities.

(2) **Collaboration, scholarship, publishing, and liaison with libraries and librarians.** Main responsibilities include: collaborating with colleagues in library and information technology services; managing library digital repositories, publishing, and reformatting programs; leading libraries in creating new, customer engagement-centered service models; designing and developing library collections; providing expert consultation to help arts and humanities scholars and students identify technologies, tools, and unique collections to facilitate their teaching, learning, and research; promoting successful use and integration of digital methods in research, teaching, and learning; serving as liaison to academic departments or programs; connecting with relevant regional research departments and multidisciplinary research centers; serving as subject librarians and special collections curators for arts, humanities, or social science disciplines; providing strategic resources on digital arts and humanities trends for libraries; promoting new models of digital publishing engagement; providing collection and maintenance services for digital scholarship publishing and preservation; and creating resources on digital publishing and copyright information.

Related job responsibilities can be divided into three parts: Development, creation, integration, and practice of information, data, metadata, and digital collections; Planning, development, management, preservation, operation, supervision, policy, and budgeting of digital scholarship and digital humanities projects; Research support, liaison, and reference consultation services for university arts, humanities, history, and social sciences.

Liaison and training skills are frequently mentioned in job descriptions, indicating that these digital humanities professionals often need to provide specialized research consultation and guidance/reference services for faculty and students. Additionally, they need to conduct outreach activities to promote resources and services in designated subject areas.

5 Implications and Recommendations

Content analysis of ALA job advertisements provides a detailed portrait of the rapidly evolving demands and responsibilities of professionals in the digital humanities field. Employers are seeking qualified candidates for digital humanities positions. The analysis reveals required or desirable attributes such as education, knowledge, skills, and abilities, as well as position duties and responsibilities, and also provides pathways for library and information science to participate in digital humanities activities. The findings offer the following implications for digital humanities education in China's library and information science field:

5.1 Emphasize Interdisciplinary and Cross-disciplinary Education

Digital humanities is a typical interdisciplinary research and practice field. The process of digital humanities discipline independence and domain construction reflects the integration of multiple disciplines, understanding each other, and developing new research areas. Interdisciplinary collaboration is a fundamental characteristic of digital humanities. Based on degree requirement analysis for digital humanities work, a large proportion mention that on the basis of a master's degree in library and information science, it is preferable to have background knowledge in other majors or a relevant second degree. Therefore, we should actively promote the integration of library and information science with other humanities disciplines, history, geography, computer science, art, museum studies, and archival science.

5.2 Build a Multi-level Digital Humanities Talent Training System

Building a multi-level digital humanities talent training system can proceed from three aspects:

(1) **Digital humanities major construction and curriculum development.** Digital humanities major and curriculum system construction at the undergraduate level is very important because digital humanities has

posed increasingly severe challenges to traditional disciplines, and future development is immeasurable. We need to use comprehensive major design and curricula to prepare students for future digital humanities challenges.

(2) **Carry out digital humanities education based on library and information science.** Library and information science has close connections with digital humanities. Digital humanities work has great demand for LIS graduates, and the LIS field can rely on its advantages in information management to integrate relevant forces from the university's humanities, social sciences, and natural sciences to actively promote digital humanities education.

(3) **Library participation in digital humanities education and training.** Libraries possess numerous paper collections, digital collections, and digital humanities projects. Libraries' natural collections provide favorable resource foundations for digital humanities education. Libraries can establish characteristic library curriculum systems to supplement deficiencies in digital humanities professional education, deeply combine various digitization technologies that libraries excel in with humanities research and work scenarios, and provide training on digital scholarship tools and methods for faculty, graduate students, and undergraduates.

5.3 Design Multi-level Digital Humanities Curriculum Systems

The demand for library and information science talent in digital humanities is increasing year by year, and more and more LIS graduates will work in the digital humanities field in the future. This necessitates offering digital humanities-related courses to cultivate students' ability to use big data and literature information to promote and enhance humanities and social sciences research. Based on skill requirements for digital humanities work, curriculum systems can be constructed hierarchically and categorically: The first level includes digital humanities technology foundations (digitization, text mining, data visualization, mapping, image analysis, augmented reality, etc.), digital content creation, data management, and digital and web publishing; The second level includes programming languages (JavaScript, Julia, Python, R, XQuery, etc.), digital scholarship platforms (Fedora, Omeka, DH Press, etc.), repository tools (DSpace, Fedora, etc.), OCR, Photoshop and other tools and technologies, and media digitization (images, audio, video); The third level includes general courses on project management, workflow analysis, writing, and communication.

5.4 Develop Project-based Digital Humanities Education

Digital humanities is a highly practical discipline, with teaching content and research results often derived from and reflected in practical project outcomes. Based on job advertisement analysis, many digital humanities positions are related to "project management," and "project management ability" is also an important skill requirement appearing in job advertisements. Currently, China

has completed or is conducting numerous research projects in the digital humanities field. Future digital humanities education can promote this "project-based learning" approach, allowing students to work and learn simultaneously, combining theory and practice through project platforms.

5.5 Cultivate Students' Innovative and Collaborative Thinking

Digital humanities skill requirements include "ability to work with diverse teams and communicate effectively," "excellent communication, presentation, and interpersonal skills," and "ability to collaborate with a wide range of stakeholders to further develop digital scholarship." Related responsibilities include "serving as liaison to academic departments or programs," "connecting with relevant regional research departments and multidisciplinary research centers," and digital humanities librarians need to conduct outreach activities to promote resources and services in designated subject areas. Therefore, collaborative thinking is a basic requirement for digital humanities practitioners. Personality requirements include creativity, vision, and charisma.

5.6 Establish Digital Humanities Communities and Build Academic Communities

Establish vibrant, inclusive digital humanities communities with strong academic atmospheres, integrated with university academic culture and quality services, to build academic communities. Relying on the strength of academic communities, obtain faculty support from the community, acquire teaching content models from community research results, and enhance the feasibility of digital humanities education programs in Chinese higher education institutions. Collaborate with university libraries and various related colleges to establish communities and promote digital scholarship, developing campus digital humanities communities.

This study has certain limitations. For example, the research is limited to job advertisements on ALA JobLIST from 2006-2018, without other sources of job advertisements. Future research needs to expand the scope of job advertisements to discover broader sources of job demands and provide more and more detailed information about digital humanities competencies. Additionally, future research needs to supplement other research strategies, such as surveys or interviews with practitioners in the field, to understand larger patterns and trends in digital humanities.

This study provides a concrete blueprint for job demands in the digital humanities field. Digital humanities professionals should closely monitor job demands to ensure their skills, knowledge, and abilities keep pace with the times. Library and information science education should also keep up with trends in this rapidly developing field to ensure its curricula and educational programs are suitable for preparing digital humanities professionals for new roles.

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The "名家视点" book advertisement section has been omitted as per instructions to skip garbage text.

Note: Figure translations are in progress. See original paper for figures.