Evolving Roles of Preservation Professionals

Trends in Position Announcements from 2004 to 2015

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As research libraries continue to expand the scope of content they acquire, manage, and make accessible, the preservation charge within organizations is broadening. Libraries and other cultural heritage institutions must balance the preservation of books, manuscripts, archives, and audiovisual materials with born-digital and digitized content. As preservation challenges and strategies evolve, professional positions in preservation must also evolve to meet the needs of academic and other cultural institutions. The ability to quantify how preservation positions are changing, and to identify the required skill sets and educational backgrounds needed for preservation professionals, is central to navigating this shift. To begin to address this, the authors collected and analyzed announcements for professional preservation positions in libraries and archives from 2004 through 2015. They compared the contents of announcements between earlier and more recent years to identify potential trends in preservation employment.

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In the 1989 paper, "Evolution of Preservation Librarianship as Reflected in Job Descriptions from 1975 through 1987," Cloonan and Norcott analyzed the contents of position announcements to trace the early growth of the preservation profession.[1] During the time period that they studied, key developments took place in the field that necessitated the study of preservation employment. First, the School of Library Service at Columbia University established degree programs for conservators and preservation administrators. Second, the Association for Research Libraries (ARL) Preservation Statistics Survey documented increased grant funding and expenditures for preservation in libraries.[2]

In the years since, innumerable changes have taken place, both in the field of preservation and in libraries. In 2009, ARL discontinued its Preservation Statistics program. That same year, the University of Texas at Austin ended its conservation and preservation administration certificate programs, a program formerly hosted by Columbia University. These events signaled a time of transition, and perhaps reduction, for the profession. At the same time, one of the most significant changes for both preservation and libraries in the last few decades—the rise of digital technologies—has greatly expanded the scope and complexity of preserving content to support current and future research and scholarship. Libraries and other cultural heritage institutions now balance the preservation of books, manuscripts, archives, and audio-visual materials with born-digital and digitized content. Preservation

activities extend far beyond the traditional center of activity, the preservation department, to information technology (IT), metadata departments, collection management, and beyond. Collaborative, large-scale models for preservation have emerged, such as the HathiTrust Digital Library and shared print repository programs, such as the Western Regional Storage Trust (WEST).

As preservation challenges and strategies evolve, professional positions in preservation—both traditional and digital—must also evolve to meet the needs of research institutions. It can be challenging to measure and characterize changes in preservation positions, particularly because a set of core competencies has not been defined for the profession. This study sets the framework for the future work of determining competencies for the field. The purpose of this study is to identify the changing roles of preservation professionals in libraries, including potential changes in position functions, and changes in the competencies and credentials that employers require for preservation positions. To accomplish this, the authors examined the content of job advertisements, or position announcements, for professional positions with significant preservation responsibilities from 2004 through 2015. Administrative and other generalized positions were included, plus specialized positions, such as those that focused on digital content or audiovisual media. In undertaking this analysis, the authors sought to answer the following questions:

1. How have the range and scope of preservation responsibilities changed over time, specifically from 2004 to 2015?
2. Which educational backgrounds, skill sets, and types of experience do employers most frequently require? Have these requirements changed over time?
3. Has the role of preservation administrator changed significantly in the last decade?
4. What potential "core" preservation knowledge and skills can be identified from studying position announcements?

Literature Review

Although the field of preservation librarianship has evolved dramatically in the twenty-seven years since Cloonan and Norcott's study, there have been no further studies on position postings and there is relatively little literature on the content of positions or employer requirements. Instead, authors have largely focused on characterizing and measuring preservation activities, programs, and expenditures through surveys, reports, and literature reviews.

In their study, Cloonan and Norcott examined the content of job advertisements and concluded that preservation librarians possessed an MLS in most instances and functioned in a largely administrative role. Their findings also demonstrated a considerable variation in the perceived roles and functions of preservation professionals. They noted that, although there was an increase in the number of positions since the first preservation librarian position appeared in 1978, "there was little consensus as to what duties this position entailed," and "there seems to be little consensus among library hiring committees about what qualifications preservation librarians should have."[3] As the number of preservation programs in academic research libraries grew nationally, authors following Cloonan and Norcott sought to define the scope of such programs. In a 1991 report recommending program models, Merrill-Oldham, Morrow, and Roosa identified ten components of a comprehensive preservation program:

1. Preservation administration
2. Environmental control
3. Replacement and reformatting
4. Conservation
5. Mass deacidification
6. Commercial library binding
7. Shelf preparation
8. Stack maintenance and collections improvement
9. Emergency preparedness
10. Staff training and user awareness[4]

The report signaled both an expansion in the scope of preservation work in libraries, with new areas such as mass deacidification, and recognition that some existing library functions, such as shelf preparation, were closely linked to preservation efforts. Several authors equated the integration of preservation with other library activities as a sign of growth in the profession. In a 1993 literature review, Drewes described the field of preservation as a maturing profession "as evidenced by its broadening base."[5] Merrill-Oldham, Morrow, and Roosa described the necessary integration of preservation work with other library functions as part of life-cycle management: "Preservation activities are being thoroughly integrated with all other library functions. Threats to the long-term survival of library material arise in every aspect of library operations . . . a sensitivity to preservation issues must be pervasive among library staff."[6] Drewes noted that preservation staff must also nurture close relationships with staff in a variety of areas of the library, because of the "interrelatedness of many issues as they affect various formats."[7] During this period, the roles of preservation administrators were also more clearly defined. Merrill-Oldham, Morrow, and Roosa asserted that this role encompassed: a) coordination of activities in balance with the library's other major programs; b) advocacy with both libraries staff and constituents; c) recommending and enforcing policies; d)

development of operational components of a preservation department; e) representation in professional forums and participation in national affairs; and f) application of standards and up-to-date techniques.[8]

In the first decade of the twenty-first century, as libraries focused efforts on digitization and, increasingly, digital preservation, the literature focused, yet again, on the expanding scope of preservation activities in academic research libraries. In the introduction of a 2002 Council on Library and Information Resources (CLIR) report on the state of preservation programs in college and research libraries, Marcum noted the concern of preservation specialists facing the increasing complexity of preserving digitized and born-digital content, and stated that preservation librarians could not successfully "meet the challenges ahead without assistance from all parts of the library organization."[9] In a 2006 ARL report on the evolution and expansion of preservation activities, Meyer asserted that preservation could not be considered the purview of a single department, and emphasized both intra- and extra-institutional collaborative approaches in providing preservation functions, such as partnerships with campus IT centers, plus third-party solutions, such as the Stanford Libraries-based LOCKSS program and Portico, Ithaka's digital preservation service.[10]

During this same period, individuals and organizations began characterizing the work associated with digital preservation, and the relationship between stewardship of physical and digital content. In 2007, the Preservation and Reformatting Section (PARS) of the Association for Library Collections and Technical Services (ALCTS) drafted short, medium, and long definitions of digital preservation. The medium-length definition states, "Digital preservation combines policies, strategies and actions to ensure access to reformatted and born digital content regardless of the challenges of media failure and technological change. The goal of digital preservation is the accurate rendering of authenticated content over time."[11] In *Digital Preservation for Libraries, Archives, and Museums*, Corrado and Moulaison divided the human resources required for digital preservation into three broad categories: technical (systems), metadata (cataloging), and collection specialists, noting that sufficient administrative structure and support was also required.[12] Some definitions of digital preservation highlighted similarities, at both philosophical and practical levels, between preservation of physical and digital formats. Meyers noted that, while the term "digital preservation" was frequently used to describe activities such as harvesting web content, the same administrative components required—resource management, storage considerations, development of policies, and implementation of appropriate preservation techniques—applied to both books and bytes.[13]

Reflecting on the development of the first digital preservation position at the University of Michigan, Zachary also noted the similarities between traditional and digital preservation positions:

> This position was highly important for each operation and each collection, but it was bigger than any of them: it needed to reach across all digital collections. In this moment, digital preservation started sounding a lot like preservation…The work is fundamentally administrative and managerial, but with a strong technical component. It bridges across all collections in the library, although different strategies might be applied to different groups of material depending on their nature, use, value, and desired longevity. Much of the effort is developing overarching policies and finding technical solutions that can make preservation happen.[14]

In recent years, efforts have been made to describe the specific areas of responsibility for digital preservation professionals. In 2012, the National Digital Stewardship Alliance (NDSA) Standards and Practices Working Group surveyed eighty-five academic institutions to learn how digital preservation functions were staffed and organized, plus what qualifications they desired for new digital preservation managers.[15] Survey results indicated that passion and motivation for digital preservation and knowledge of digital preservation standards, best practices, and tools were the most sought-after qualifications. The survey findings highlighted the complexity of digital preservation and its multifaceted nature. It also confirmed the variety of responsibilities desired by employers; when asked which activities were in scope for digital preservation positions, everything on the list was in scope for over half of the respondents, with the exception of emulation:

- Selection for preservation
- Digitization
- Metadata creation/extraction
- Descriptive cataloging
- Transformation/migration of formats
- Creation of access copies
- Normalization of files
- Fixity checks
- File format identification
- File format validation
- Emulation
- Content replication
- Secure storage management
- Technology watch
- Development and maintenance of tools
- Preservation planning
- Development of preservation policies and strategy
- Development of guidelines for content creators

- Research
- Preservation education, training, and outreach[16]

Recent literature also suggests trends for the future work of preservation professionals. Peterson, Robertson, and Szydlowski offered evidence that expenditures for some traditional preservation activities have decreased significantly.[17] They reported on findings from fiscal years 2012 to 2014 for the American Library Association (ALA) Preservation Statistics Survey, a national survey on the preservation activities of cultural heritage institutions introduced in response to the discontinuation of the ARL Preservation Statistics program. When they compared the results of the 2013 statistics with similar categories of the 2008 ARL statistics, they found that commercial binding expenditures dropped 45 percent, and expenditures for conservation treatment of bound volumes (including both circulating and special collections materials) was down by 76 percent, even when comparing only institutions that completed both the 2008 and 2013 surveys. The decrease was driven by Level 1 treatments (those which require fewer than fifteen minutes of staff time). The reduction of these activities, typically performed by paraprofessional staff, suggests a reduction in nonprofessional staffing for preservation. The survey also highlighted gaps in preservation programs; in particular, that programs continue to focus on text-based materials, with relatively little emphasis on digitization and conservation of media formats, despite the urgency of degradation of magnetic tape media.

In their 2012 review of preservation literature, Gracy and Kahn predicted that, as libraries become collaborative spaces, making more room for users and shifting print collections off-site, "preservation professionals will engage less in custodial activities and more in the work of making long-lasting, accessible digital products through the processes of digitization and digital curation."[18] In his paper, "Preservation in the Age of Google," Conway suggested a future where, following the digitization of millions of volumes, preservation work should focus on protecting physical collections through quality environments, building collaborative digital preservation partnerships, and rescuing audiovisual resources. As he noted in his conclusion, the future of preservation is where it has always been—transforming cultural heritage into usable new forms and extending its useful life.[19]

Position Announcement Studies in Library and Information Studies (LIS)

Although there are no other recent studies of job announcements in preservation, researchers have conducted numerous similar studies in related LIS areas, notably in academic librarianship. These studies were both instructive in the development of a methodology for this study, and provide insights into general trends in LIS employment in recent years. Because most preservation professionals work in academic environments, studies that consider a single position type or broader trends within academic librarianship may help to put special collections librarianship in context. In a 2011 Australian study, Wise, Henninger, and Kennan reviewed job advertisements and found that, in general, there was a "move to the generic," or a demand for information professionals to have a broader range of skills and be adaptable, with higher demands for records management skills, business content management skills, web management and management of information systems.[20] Choi and Rasmussen verified that staffing needs and required qualifications have shifted toward a focus on digital collections, services, and technology applications in academic libraries in their study on job advertisements for digital library positions.[21] Bajjaly's 2005 survey of hiring managers in academic libraries found that personal qualities, along with less specialized qualifications, were most valued in the final consideration of a candidate.[22] White's study of subject specialist librarians in 1998 found generalized qualifications such as communications skills to be the most commonly cited. Han and Hswe's survey of cataloging and metadata librarian job descriptions, posted over a nine-year period, showed that the most important qualifications were flexibility in work and the ability and willingness to learn new skills.[23]

A number of studies also considered employment prospects for new graduates, or examined the relationship between graduate education and employment. Beile and Adams's 2000 study found that less than 20 percent of positions in academic libraries were suitable for new graduates.[24] Hansen's 2011 study on special collections positions available for recent LIS graduates suggested a possible gap between the expected duties and qualifications that hiring institutions look for in an entry-level candidate, management and administration, suggesting that employers are willing to allow applicants to develop the necessary skills and competencies on the job.[25] Other studies compare LIS curriculums with job advertisements. In 2015, Maceli compared North American ALA-accredited LIS program curricula with jobs listed on Code4Lib, a popular discussion list that covers LIS-related job listings, to understand what technology topics dominate current course offerings, and what technology skills employers are seeking in technology-related job listings.[26] Cragin and her colleagues examined data curation job postings to investigate the educational background and skills needed for data curation, and to characterize the data curation employment landscape.[27]

Numerous papers also compare job advertisement content with the standards for proficiencies and core

competencies within a given field. Gold and Grotti investigated the extent to which the skills and proficiencies mentioned in the Association for College and Research Libraries (ACRL) Standards for Proficiencies for Instruction Librarians and Coordinators are represented in job advertisements.[28] In a 2008 IMLS-funded survey of digital curation professionals, Tibbo, Hank, and Lee studied digital job advertisements to identify primary competencies for digital curation professionals.[29] Kim, Warga, and Moen expanded upon their work in 2013.[30] While these papers vary widely in subject and scope, the authors almost unanimously acknowledge their limitations—studies such as these can provide insights into the past and future of the LIS profession, but are only one piece of the puzzle.

Methodology and Data Collection

To glean data from preservation job advertisements from 2004 through 2015, the authors read each advertisement, manually collected qualitative and quantitative data from them, and recorded it in a Google Documents spreadsheet. Because relatively few preservation positions are posted each year, the authors collected position listings from a twelve-year period to gather a significant amount of data. A total of 106 job advertisements were included in the study.

Job advertisements were initially collected from the ALA Preservation Administrators Interest Group (PAIG) electronic discussion list archives. The PAIG list archives were selected because of the group's relevance to the library preservation community, and since the list serves as a primary venue for communication with and among preservation professionals. Later, job advertisements were collected from the ALA Digital Preservation discussion list's archives, the Code4Lib website job board, and the Digital Library Federation (DLF) website job board. Code4Lib and DLF were selected because they represent significant communication channels for digital library and digital preservation professionals in the cultural heritage sector. The *Chronicle of Higher Education* and Higher Ed Jobs websites were also searched for job advertisements with the term *preservation* from 2004 through 2015.

In some instances, employers posted an abbreviated position description and referred the reader to a web page, which did not persist beyond the position's posting period. In these instances, the authors contacted the institutions and requested the full description. When a more complete description was received, it was included; if the description was too brief to provide essential job functions, it was omitted from the study. Re-postings of the same job advertisement were eliminated from the study, but iterations of a position that were posted multiple times over the twelve-year period were included. When two versions of a

job posting were found, the most complete one was used. Authors saved all job postings gathered online in PDF format, so that they had access to original job listings throughout the research study.

Selection Criteria

The study's scope was limited to positions that met two basic criteria. First, the position must be primarily comprised of preservation-related responsibilities, as described in the literature review. Conservation positions were not included, unless there was a significant preservation administration component present. While conservation and preservation are closely related, *preservation* emphasizes collection-level strategies for protecting cultural heritage, whereas *conservation* focuses on treatment of individual items.[31] Second, the position must require a master's degree. Initially, the scope of the study was limited to positions that required a Master of Library Science (MLS) or Master of Information Science (MIS) degree. After an initial review of job advertisements, the authors found that many employers required an MLS/MIS *or* an equivalent degree, and they determined that limiting the study to positions that require an MLS/MIS would eliminate many otherwise pertinent positions.

With the exception of these criteria, advertisements were collected to reflect the majority of professional preservation positions available in libraries in the US in the last twelve years. These included generalized, administrative positions, and positions that were more specialized and focused on preservation of a particular format (such as audiovisual media or born-digital content) or a specific method of preservation (such as digitization). Job advertisements were collected from a variety of institutions, including private and public academic libraries.

Data Processing and Coding

A system was developed to analyze job advertisement content by coding individual elements in a Google spreadsheet. The elements were identified in a pilot, in which the authors reviewed a sample of advertisements that spanned the period of the study. The descriptions were examined independently by both authors, who compared assessments and developed a common understanding of specific position characteristics, functions, and qualifications. The authors captured the following types of data from position announcements:

- Position title
- Year position posted
- Institution type and ARL membership
- Position status (whether the position was permanent, full-time, tenure-track, new, or combined with other, non-preservation duties)

- Salary
- Job duties/responsibilities
- Required education, experience, skills, and knowledge
- Preferred education, experience, skills, and knowledge

Position responsibilities and required and preferred qualifications were further categorized. Each category was coded "1" for information present, and "2" for information not present. Institution type, degree required, and salary information were coded into categories. Notable text, particularly regarding position responsibilities and qualifications, was also recorded. With the exception of ARL membership status, only data that was available in the position description was included in the study.

Figure 1. Distribution of Professional Preservation Postion Listings by Year, 2004–15

Study Limitations

Although the collected data provide some indication of trends, it is also too incomplete to provide definite conclusions. The position descriptions collected for this study cannot be considered a full set of data for several reasons. Preservation positions may be advertised via many sources, or, in cases where positions are filled within the institution, they may not be advertised. When positions were listed on a website, expired listings may be unavailable. There are other inherent limitations to a study of position descriptions; some duties may not be explicitly mentioned in the announcement but are implicit; for example, *program planning and oversight* may have been listed, but not *budget oversight*, although the two are interrelated. The data analysis is largely qualitative, and therefore, subjective. Due to the small sample size, true statistical analysis was not possible, so trends are identified rather than measured. Additionally, job postings reflect the ideal candidate, and candidates who possess all the qualifications listed may not exist. Finally, there is variability in both the terms and the level of specificity used to describe positions; this is especially true for emerging areas like digital preservation.

Findings and Analysis

To identify potential trends, the authors analyzed data over the twelve-year period and compared data collected from earlier position listings (2004–2010) with that of more recent listings (2011–2015). The year 2011 was identified as significant because it was when the first position comprised entirely of digital preservation responsibilities appeared among the collected listings. It also marked the beginning of a general decrease in the number of positions with no digital component.

Demographic Data

A total of 106 position listings were analyzed. The number of listings collected for a single year ranged from four positions in 2011 to sixteen positions in 2005 (see figure 1). While the number of collected positions fluctuated from year to year, the data suggests a slight decline from 2008 through 2011. Over the course of the twelve-year period, the top employers of preservation professionals were public academic research libraries (36 percent), private academic research libraries (29 percent), state and federal libraries and archives (14 percent), and non-profit preservation organizations (12 percent). Out of the total 106 position postings, 57 percent were from ARL institutions. Among job listings from institutions eligible for ARL membership (private and public academic research libraries, public, special, and state or federal libraries), 89 percent were ARL libraries. The number of ARL and non-ARL positions that were collected fluctuated proportionally over individual years.

Of the total number of listings, 85 percent of the positions were permanent. The majority of the term, or temporary, positions were from public and private academic research institutions. A total of 9 percent of listings indicated that the position was new; 69 percent did not indicate whether the positions were new or established. The vast majority of positions were full-time (97 percent). Among positions at academic research institutions, 17 percent of listings indicated that the positions were tenure-track or equivalent, 46 percent indicated that they were not tenure-track, and 36 percent did not specify. During the twelve-year period, no trends were observed in the number of term, full-time, new, and tenure-track positions available.

While salary data was collected for the study where it was present, 74 percent of position listings did not include minimum salary information, and 80 percent did not include maximum salary information. Because little salary data was collected for individual years, the authors were unable to analyze trends in salary for preservation positions.

Position Responsibilities

The duties and responsibilities sections of position listings were reviewed and coded into twenty-five types of responsibilities falling into four major categories: planning and administration, care and treatment of physical collections, digitization, and digital preservation. Each category is explained further below.

Planning and Administration

For the purposes of the study, the planning and administration duties included responsibilities in six areas: preservation planning, assessment, and prioritizing; development of policies, standards, and best practices; budget administration; education, outreach, and training; grants and donor relations; and professional involvement. These categories align closely with Merrill-Oldham, Morrow, and Roosa's characterization of administrative duties.[32] If one component of a category was present (such as "planning" from preservation planning, assessment, and prioritizing) the listing was recorded as having that responsibility. While it was assumed that planning and administration responsibilities cover a range of collection formats and content types, some administrative responsibilities pertaining to digital preservation were assessed separately and are discussed under "digital preservation"; these included preservation planning, assessment, and prioritizing, policy development, establishing standards and best practices, and budget administration.

Preservation planning, assessment, and prioritizing was present in 85 percent of positions from 2004 to 2010, and 60 percent of positions from 2011 to 2015 (see figure 2). From 2004 to 2010, 89 percent of listings included a planning, assessment, or prioritization component for either physical or digital collections, and 22 percent mentioned both. This ratio continued in more recent years; from 2011 to 2015, 88 percent of listings included a planning, assessment, or prioritization component for either physical or digital collections, and 24 percent mentioned both.

Development of policies, standards, and best practices was present in 55 percent of position listings from 2004 to 2010, and 54 percent of positions from 2011 to 2015. When position listings from preservation organizations are omitted from the total, the percentage increased only slightly to 60 percent from 2004 to 2010, and 59 percent from 2011 to 2015. Preservation organizations may recommend policies,

best practices, and standards to organizations in a consulting capacity, but lack the authority to establish them. From 2004 to 2010, 64 percent of listings included a policy development component for either physical or digital collections, and 14 percent mentioned both. This increased moderately in recent years; from 2011 to 2015, 76 percent of listings included policy development for either physical or digital collections, and 24 percent mentioned both.

Budget administration was present in 28 percent of all job listings from 2004 to 2010, and 18 percent of position listings from 2011 to 2015. Looking across all types of preservation positions (including positions that were specifically digital preservation), no digital positions mentioned budget administration from 2004 to 2010, and 23 percent mentioned some budget administration component from 2011 to 2015.

Education, outreach, or training was present in 56 percent of position listings from 2004 to 2010, and 42 percent from 2011 to 2015. The authors hypothesized that these percentages might decrease if listings from preservation organizations were removed from the analysis since almost all positions in this category included a significant education component. Rather, they found that when preservation organizations were excluded, the numbers dropped proportionally to 50 percent and 39 percent over the two date ranges.

Professional involvement, including representing the institution at conferences and scholarly contributions to the profession, was present in 54 percent of all job advertisements from 2004 to 2010, and 38 percent from 2011 to 2015. Grants and donor relations was present in 39 percent of all job advertisements from 2004 to 2010, and 22 percent from 2011 to 2015. The majority of listings specified grant writing as a position responsibility. Among the thirteen listings that included only digital preservation responsibilities, 13 percent included education, outreach, and training, 20 percent included professional involvement, and none listed grants and donor relations.

Care and Treatment of Physical Collections

The authors identified nine position responsibilities pertaining to care and treatment of physical collections, including print and photographic collections, microforms, and audiovisual media. Categories included: conservation, circulating book repair program, binding and shelf preparation, enclosures and rehousing, vendor relations, environmental monitoring, security, emergency planning and response, and exhibition preparation (see figure 3). The term "conservation" was used broadly in position announcements, in some instances to indicate specialized treatment, and in others to indicate more generalized collections care. If a position announcement specified repair, repair was coded. If the position listing specified collections care conservation,

conservation was coded. In some cases, the institution posting the position did not specify special collections conservation, and it was not always clear whether conservation referred to special or circulating collections treatment.

In each of these nine areas, the presence of these responsibilities decreased from the period of 2004 to 2010 to the period of 2011 to 2015. The most dramatic decreases were in binding and shelf preparation (46 percent to 14 percent), circulating book repair treatment (41 percent to 11 percent), and emergency planning and response (from 69 percent to 31 percent). Other categories decreased to a lesser extent: position listings with conservation decreased from 43 percent to 33 percent; environmental monitoring decreased from 34 percent to 27 percent; vendor relations (not necessarily specific to physical or digital collections) decreased from 33 percent to 20 percent. The authors did not separate conservation responsibilities by format (e.g. book and paper, photographic, objects), but the vast majority of references to conservation focused on paper-based materials. Peterson, Robertson, and Szydlowski also highlighted this in their survey, where they found that bound volumes and unbound documents made up 89.8 percent of items that received conservation treatment.[33] Over the twelve-year period, the percent of position listings with responsibilities related to physical collections only (meaning they included no digitization or digital preservation duties), decreased gradually (see figure 4).

Digitization and Reformatting

The authors examined digitization and other reformatting duties with respect to both general programmatic oversight and format-specific responsibilities, including books and paper, media, and microforms (see figure 5). When the position listing did not cite specific formats to be digitized, only digitization oversight was coded. From 2004 to 2010, 54 percent of positions included some type of digitization responsibility, which decreased to 42 percent from 2011 to 2015. "Digitization oversight" was the most common responsibility listed and dropped from 38 percent to 33 percent; "book and paper digitization" decreased from 34 percent to 11 percent, audiovisual media digitization decreased from 18 percent to 11 percent,
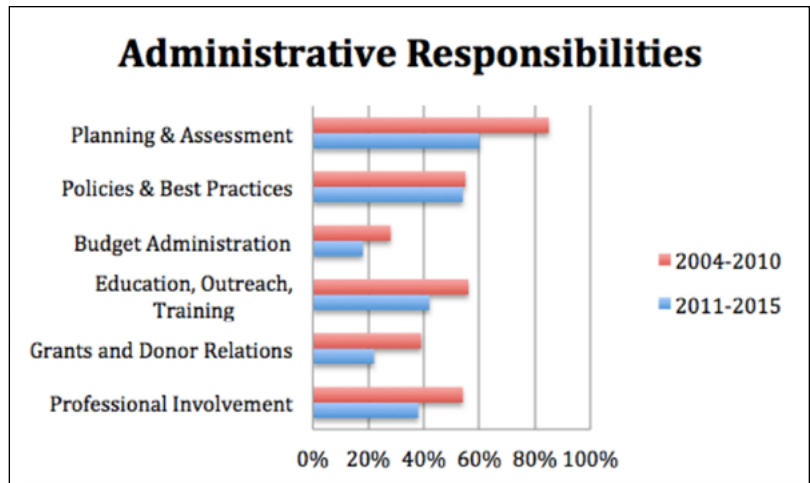

Figure 2. Percentage of Administrative and Outreach Responsibilities Present in Position Listings, 2004–10 and 2011–15
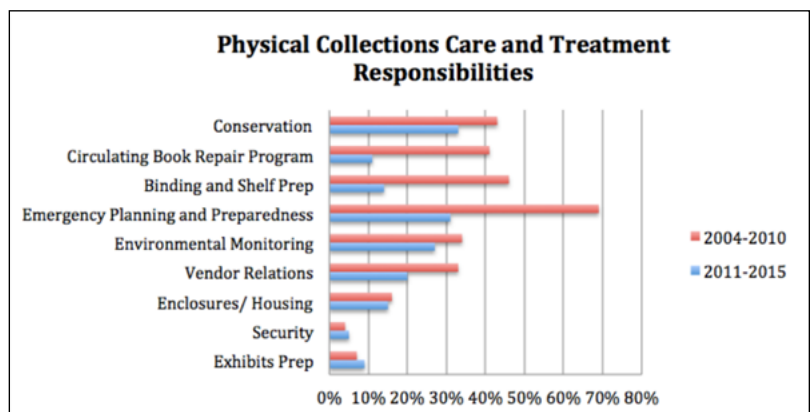

Figure 3. Percentage of Physical Collections Care and Treatment Responsibilities Present in Position Listings, 2004–10 and 2011–15
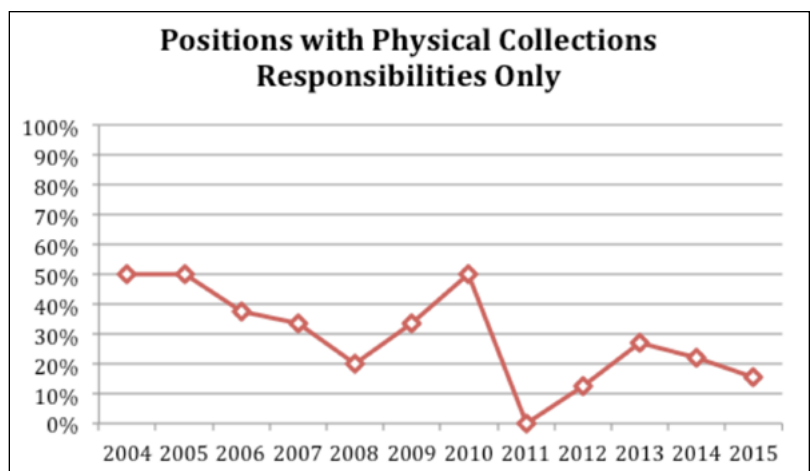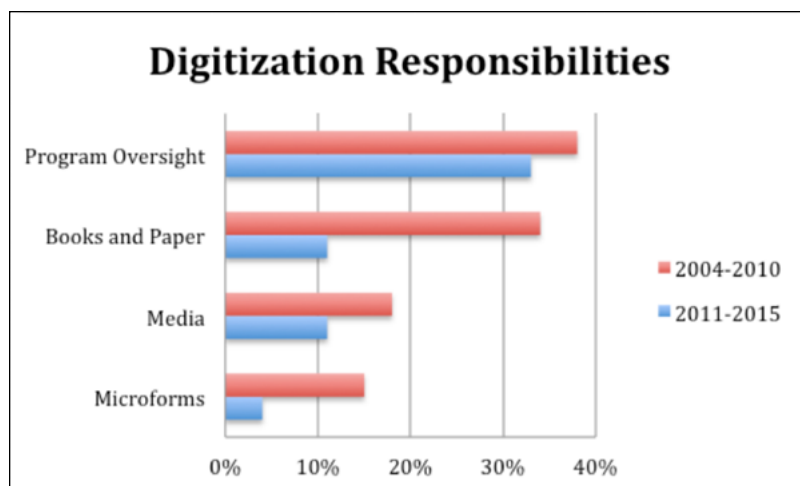

Figure 3. Percentage of Position Listings with No Digitization or Digital Preservation Responsibilities By Year, 2004–15

Figure 5. Percentage of Digitization Responsibilities Present in Position Listings, 2004–10 and 2011–15

and microfilm digitization dropped from 15 percent to 4 percent.

Digital Preservation

Identifying categories for digital preservation duties proved challenging. First, the earlier position announcements tended to be less specific, often describing digital preservation responsibilities in general administrative terms, such as "develop, document, and implement a digital preservation program." This could indicate a lack of technical expertise or understanding by administrators, or a desire to provide digital preservation staff with flexibility to define the responsibilities of a new position or department as deemed appropriate. A second related issue is the complexity of digital preservation and considerable number of responsibilities and variety of skills needed to address digital preservation issues. This was made evident by the substantial number of digital preservation responsibilities identified by library administrators in the survey conducted by Atkins et al.[34]

Following the pilot review of position listings, the authors initially identified the following responsibilities for coding: digital preservation planning, assessment, and prioritizing; development of policies, standards, and best practices for digitized and born-digital content; developing and maintaining external partnerships; collaboration with a diverse range of library staff (curators, IT, archivists, collection managers); disaster planning and response; and budget management (see figure 6). Planning, assessment, and prioritization was present in 26 percent of position postings from 2004 to 2010, and 51 percent from 2011 to 2015. Developing policies, standards and best practices for digitized and current digital holdings also increased dramatically from 11 percent to 49 percent. Developing

external partnerships such as the Stanford University Libraries-based LOCKSS Program and HathiTrust Digital Library increased from 3 percent to 18 percent, and collaboration with other libraries units increased from 13 percent to 44 percent of position listings. The scope of collaboration described in position listings ranged from the advisory (for example, "advises staff and digital content creators all phases of the life cycle of digital content") to the technical (for example, "works with Archives, Knowledge Services, IT, and other experts to research, test, specify, and implement technology for a sustainable digital preservation repository system," or "work closely with others to understand the complexities of technical and administrative metadata associated with digital objects"). Budget administration for digital preservation was not present in listings before 2011, and only 4 percent of listings from 2011 to 2015. The absence of budget responsibilities from position listings may be attributed to the fact that, at least initially, new digital preservation programs may lack an established budget line. Another possibility is that budget responsibilities are implicit where other administrative responsibilities (such as planning) are listed. Collections emergency response for digital preservation was similarly represented, with no mention in listings prior to 2011, only 7 percent of listings from 2011 to 2015. This may be because emergency planning and recovery activities are under the purview of campus information technology departments, or it may indicate a significant gap in emergency preparedness efforts in libraries.

While coding position listings, the authors also recorded notable text. The following job responsibilities were identified in at least 4 percent of positions from 2011 to 2015; metadata policy and creation workflows, digital repository development oversight, and digital preservation program oversight.

Digital preservation responsibilities were first included in position listings in 2005, and, as previously noted, the first position listing comprised entirely of digital preservation duties occurred in 2011. From 2011 to 2015, 29 percent of position listings included exclusively digital preservation duties. From 2004 to 2010, 31 percent of listings included some digital preservation duties, compared with 64 percent from 2011 to 2015.

Qualifications Summary

The authors reviewed and coded required and preferred qualifications, including degree, years of general and supervisory experience, knowledge, and expertise and skills. As

with position responsibilities, trends in qualifications were assessed by comparing the time periods 2004 to 2010 and 2011 to 2015. Qualifications that could be applied broadly to professional positions, such as "problem solving skills" or "ability to work in a collaborative environment," were not analyzed. When a job listing included qualifications but did not specify between preferred and required, the qualifications were categorized as required.

Degree

As noted in the Methodology section, position listings were limited to those that required a master's degree. The vast majority of listings stated that a Master of Library Science (MLS) or Master of Information Science (MIS) degree was required, or offered the option of an MLS/MIS *or* another degree (see figure 7). From 2004 to 2010, 52 percent of position listings stated an MLS/MIS was required, compared with 40 percent from 2011 to 2015. Sixteen percent of listings from 2004 to 2010 stated that an MLS/MIS "or equivalent" was required, which increased to 27 percent from 2011 to 2015. The increased use of "equivalent" is perhaps an acknowledgement that no one degree can cover all of the skills and knowledge needed for the position, while allowing employers to attract and hire candidates from a broader range of disciplines.

Some listings specified an alternative degree to an MLS/MIS. The most commonly listed alternative was a graduate degree in Conservation, which appeared in 13 percent of all job listings from 2004 to 2010, and 2 percent from 2011 to 2015. Conservation appeared even more frequently as part of a list of several possible MLS/MIS alternatives, which included graduate degrees in fine arts, museum studies, or archival studies. Computer science first appeared as an acceptable alternative in 2012. From 2011 to 2015, a total of 4 percent of institutions specified that a graduate degree in computer science was acceptable,

Of the job listings that included only digital preservation responsibilities (beginning in 2011), 62 percent required an MLS/MIS, 23 percent required "LIS or equivalent," and 15 percent required an advanced degree in computer science.

In addition to graduate degree requirements, 2 percent of job listings also required an advanced certificate in preservation, and 6 percent listed a certificate in preservation as a preferred qualification (all of these positions were posted before 2011). Several listings did not explicitly require a preservation certificate but required an MLS/MIS "with
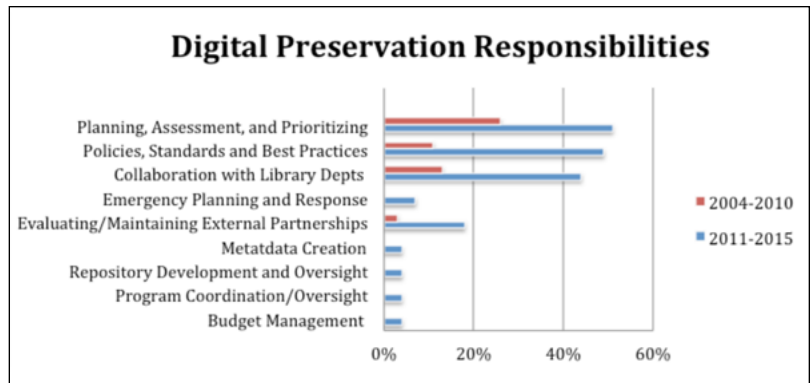

Figure 6. Percentage of Digital Preservation Responsibilities Present in Position Listings, 2004–10 and 2011–15
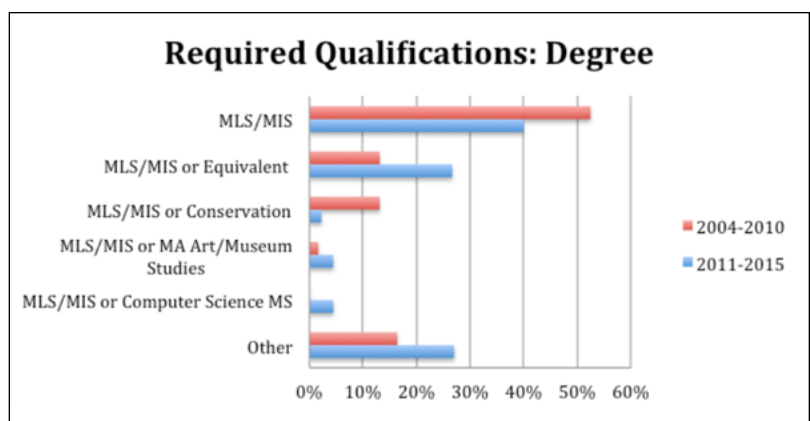

Figure 7. Percentage of Graduate Degree Requirements in Position Listings, 2004–10 and 2011–15. "Other" category includes listings that identified more than two possible alternatives to MLS/MIS.

advanced study in preservation or conservation," a "master's degree from a recognized preservation or conservation training program," or a "master's degree with a specialization in Preservation Management." Several others required an emphasis on audio and/or moving image preservation studies.

Years of Experience

Qualifications for years of experience included both years of experience performing similar work and years of experience with supervising staff (see figure 8). No trends were observed over time, so percentages include all positions from 2004 to 2015. Eight percent of announcements did not specify a requirement for similar work experience. Of the position listings that specified some type of required or preferred experience, 33 percent required one year or less related experience. Forty-nine percent of listings required 2-3 years of experience, and 16 percent required 4-5 years of experience. Less than 1 percent required more than five

Required Qualifications: Years of Experience

Figure 8. Distribution of Experience Requirements in Position Listings by Year, 2004–15

years of related experience. Since 2011, the majority of listings required less than three years of experience. Across all twelve years, 73 percent did not indicate a preferred amount of experience, but the most frequently stated preference, at 17 percent, was two years.

Supervisory experience requirements were mentioned in 37 percent of listings; of those that required this, 21 percent required one year or less experience, 16 percent required 2-3 years of experience, and none required more than three years supervisory experience. The terms "supervisory ability" or "supervisory skills" frequently appeared as an alternative to specifying a number of years; the authors noted them in at least 12 percent of positions. Where supervisory experience was listed as a preferred qualification, again the most commonly stated preference was two years.

Experience, Skills, and Knowledge

The authors determined general trends for desired qualifications through an analysis of both required and preferred qualifications. They identified common categories of knowledge, skill and experience qualifications that encompassed traditional and digital preservation, plus overall professional requirements. Knowledge of preservation principles, practices, and issues was required in 70 percent of positions from 2004 to 2010, and 56 percent of positions from 2011 to 2015 (see figure 9). Knowledge of digital preservation principles, practices, and issues was a requirement in 11 percent of positions from 2004 to 2010, and 44 percent of positions from 2011 to 2015. Experience with professional engagement was required in 29 percent of positions from 2004 to 2010 and 27 percent from 2011 to 2015 (see figure 10). Project management and assessment experience was required in 34 percent of positions from 2004 to 2010 and 44 percent from 2011 to 2015. Both of these were listed as a preferred qualification

approximately 10–11 percent over the twelve-year period. Digital repository development and management experience was required in 11 percent of positions from 2004 to 2010 and 27 percent of positions from 2011 to 2015; as a preferred qualification it rose from 3 to 7 percent. Grant writing experience was required in 8 percent of positions from 2004 to 2010, and 7 percent of positions from 2011 to 2015. Grant writing was included more frequently as a preferred qualification and was listed at 16 percent and 11 percent during the two time periods. Experience treating physical collections (most frequently listed as book repair) was listed consistently at 15 percent and 16 percent over the two time periods, but was almost never included as a preferred qualification. Other required and preferred qualifications noted by the authors included experience with general digital preservation program coordination oversight, digital conversion, digital curation, using Machine Readable Cataloging (MARC) 21, and using markup languages such as XML and HTML. Several employers also listed "strong computing" or "strong technology" background from 2011 to 2015. The authors noted that experience with creating preservation metadata and/or experience with metadata standards appeared in at least 16 percent of position listings from 2011 to 2015.

Preservation Administrator Positions Overview

The authors assessed announcements for preservation administrator positions to identify trends. Merrill-Oldham, Morrow, and Roosa defined the preservation administrator position as a senior library officer who "is responsible for recommending preservation policy and has the authority to enforce policies that have been approved by library administration."[35] The authors identified preservation administrator positions both by the presence of administrative duties and that the individual in the position oversaw a department, regardless of the number of staff in the department. Because only information present in position listings were used, this was sometimes difficult to ascertain, and the numbers may not fully represent the number of positions that meet this definition. Overall, approximately 55 percent (or fifty-eight) of the total number of positions fit this definition for preservation administrator positions. This was consistent across the twelve-year period of the study (the number increased slightly from 54 percent to 56 percent between 2004 to 2010 and 2011 to 2015). Among these positions, there were a variety of position titles, but those most frequently used were "Preservation Librarian" and "Head of Preservation." This remained relatively constant over time,

and as equivalent positions for digital preservation began to appear, the most frequently used titles were "Digital Preservation Librarian" and "Head of Digital Preservation."

The first position listing to include digital preservation duties, which appeared in 2005, was a preservation administrator position. From 2004 to 2010, 39 percent of the positions included digital preservation duties. This increased to 72 percent from 2011 to 2015, although nine positions were administrative positions in digital preservation; 56 percent of general administrative positions included responsibilities in digital preservation.

Discussion

The data yielded from this highly qualitative study confirmed some suspicions and revealed some surprises. It highlighted a number of areas where preservation employment has changed relatively little over the twelve-year period. The types of institutions offering professional positions, and the ratio of positions offered by each type of institution, remained relatively constant throughout the period studied. Private and public academic research libraries were consistently the top two employers, and the vast majority of these were ARL institutions. The authors hypothesized that, during periods when the number of positions decreased in cultural heritage institutions, there might be a corresponding increase in demand for outsourced preservation work, creating an increase in positions in preservation service providers, including vendors and non-profit preservation organizations. Instead, position offerings in libraries and preservation service providers increased and decreased proportionally over the twelve-year period.

Regarding other general employment characteristics, the authors also observed relative stability. There were no significant shifts observed in the ratio of permanent to term positions, or full- or part-time positions over the course of the study. The vast majority of positions were permanent and full-time. Prior to surveying position listings, the authors hypothesized that there might be a growing number of positions that combined significant preservation responsibilities with those from other areas in technical and collection services, such as collection development and management. However, no significant shifts were observed in this area either. Because of the limitations of studying position listings, further study is required to determine whether
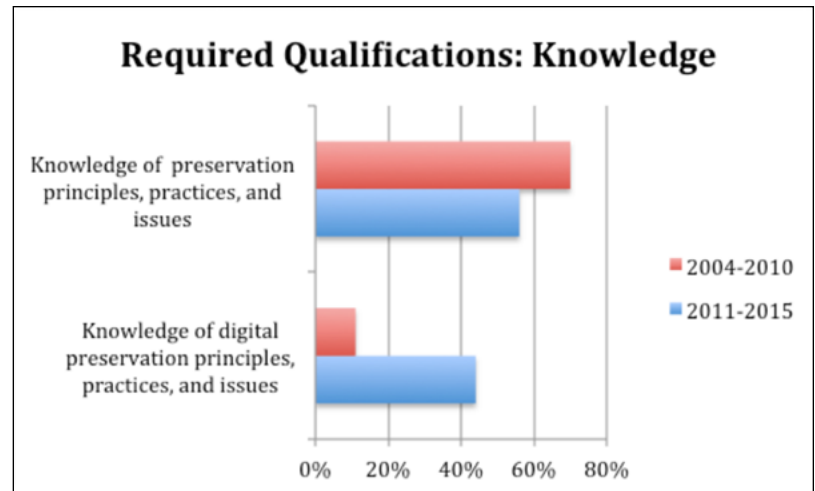

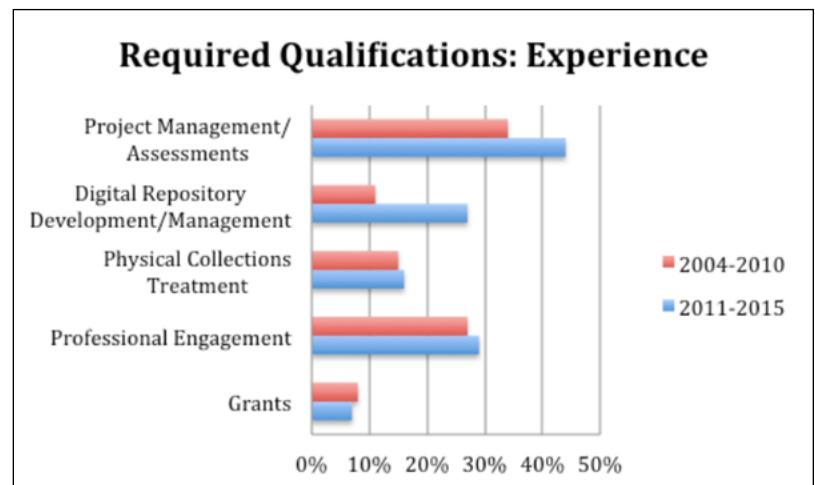**Figure 9.** Distribution of Knowledge Requirements in Position Listings, 2004–10 and 2011–15

Figure 10. Distribution of Most Frequently Listed Experience Requirements in Positon Listings, 2004–10 and 2011–15

meaningful changes have taken place in the number, or percentage, of tenure positions offered by academic institutions. However, the data indicates that, among the institutions that indicated whether a position was tenure-track, the percentage of tenure-track positions has remained relatively stable over time.

While some aspects of preservation employment appear relatively unchanged, in comparing two time periods, 2004 to 2010 and 2011 to 2015, the authors identified some significant shifts in position listings. Among the most intriguing findings were dramatic changes in the frequency with which some responsibilities appeared in position announcements between the two time periods. For example, binding and book repair responsibilities dropped by 32 percent and 30 percent, respectively, between the two time periods.

Collection emergency planning and preparedness was also mentioned significantly less in recent years, despite the ongoing and universal need for this activity. The authors anticipated that responsibilities specific to physical collections might decrease in recent years, and these changes may simply reflect the shift towards electronic-only acquisitions, and/or a decreasing emphasis on physical, circulating collections. But while the decrease in references to these activities may not be surprising, it is unclear whether it truly represents a decrease in the perceived importance of some traditional library preservation activities, or it is because some activities are viewed more broadly as a library responsibility rather than a preservation responsibility. Despite an overall decrease in references to physical collections care and treatment, references to conservation decreased to a lesser extent. Conservation is far more likely to fall squarely under preservation, while activities such as binding may be located in other departments that process physical materials. A third explanation is that some traditional preservation duties may be considered implicit in a generalized preservation position. For example, many institutions, particularly those with well-established preservation programs, have mature collections emergency plans that require maintenance rather than development.

As previously noted, because the language used to describe digital preservation responsibilities varied significantly, coding for these positions was limited and the authors did not fully capture the scope of responsibilities addressed in position announcements. To some extent, this may parallel Cloonan and Norcott's experience of reviewing preservation positions in 1989, where they also noted a lack of consensus in what the position detailed.

Finally, there are two areas that the authors did not originally code that were listed so frequently that they merit mention. The first was knowledge of copyright issues, which was listed frequently as a required or preferred qualification. It was most often referenced in conjunction with digitization or digital preservation. For example, desired qualifications in this area included "Demonstrated understanding of copyright laws and rights management issues in a digital environment," and "Basic knowledge of copyright and fair use as it relates to digitization and format conversion." Preservation work in libraries has long required understanding of and application of Section 108 of United States copyright law for microfilming and other reformatting programs, but these references may reflect the increasing complexity of applying Section 108 and the Digital Millennium Copyright Act (DMCA) to digital formats requiring multiple redundant copies and ongoing migration and maintenance.

The second was collaboration, which was one of the most prevalent themes across all preservation positions. It was so pervasive in the sample of digital preservation positions that the authors coded both internal and external collaboration as a position responsibility for the study. While not surprising, it is notable in that it suggests the level of emphasis placed on intra- and extra-institutional cooperation in tackling preservation challenges.

For Future Investigation

While analyzing listings for positions produced valuable data about trends and changes in the preservation specialization of librarianship, there are numerous areas where further study is necessary to draw definite conclusions. For example, a follow-up study might include surveys or interviews with recently-hired preservation professionals to determine whether their current positions have aligned with or differ from the responsibilities outlined in the position announcement. A complementary study might focus on interviewing employers to characterize the perceived future needs for staffing for preservation, how preservation is situated within an organization, and how institutions characterize preservation activities. This would be a timely study; as leaders in the field who began their careers in the late 1980s and early to mid-1990s retire, the profession will need to consider how organizations will plan for the next generation of preservation administrators.

There is also a need for research that addresses the relationship between preservation employment and graduate education. Further study is needed to determine whether LIS graduate programs are responding to the needs of preservation employers and how educators and employers are influencing and communicating with each other. Finally, further study and discussion is needed to develop a set of core competencies for preservation, or perhaps, more realistically, several competencies that outline basic requirements for generalists and specialists in digital and media preservation.

Conclusion

This paper explores a set of interrelated research questions about the role and responsibilities of preservation professionals.

1. How have the range and scope of preservation responsibilities changed over time, specifically from 2004 to 2015?

The survey indicates that the range and scope of possible responsibilities have broadened in recent years. For general positions (those that include responsibilities over a range of formats), newly hired preservation professionals are far more likely to have responsibilities over a mix of physical and digital collections. The data underscores, in recent years, de-emphasis on many aspects of treatment and care of circulating collections. Conversely, the data also indicates

that responsibilities such as environmental monitoring and special collections conservation are more likely to remain present.

2. Which educational backgrounds, skill sets, and types of experience do employers most frequently require? Have these requirements changed over time?

The data indicates that employers are amenable to hiring relatively new professionals; the vast majority of positions consistently required three or fewer years of related experience, and a new graduate with one year or less experience would be eligible for about one-third of the positions. Throughout the study, many employers indicated that an MLS or MIS degree was required; however, the percentage of employers explicitly requiring an MLS or MIS appears to be decreasing. Additionally, an increasing number of employers are listing an MLS/MIS "or equivalent," requirement, which suggests that, while flexibility in degree requirements is necessary to recruit the best applicants, and MLS/MIS continue to be preferred by employers, including those posting digital preservation positions.

When examining all preservation positions (physical and digital), knowledge of physical preservation principles, practices, and issues is a moderately decreasing requirement, and knowledge of digital preservation principles, practices, and issues is increasing significantly. Several experience requirements that spanned digital and traditional positions remained consistent or increased in significance over the twelve-year period, including professional engagement experience and project management and assessment experience. Although digital responsibilities are increasing, and physical care duties are decreasing, physical preservation duties are still required at a higher level, demonstrating that they are core to preservation positions.

3. Has the role of preservation administrator changed significantly in the last decade?

The most significant change in the last decade is the dramatic increase in digital preservation responsibilities for preservation administrators. The majority of preservation administrator positions now include some digital preservation responsibilities, including oversight of digital preservation staff. However, it remains unclear what level of technical expertise in digital preservation is required of administrators in generalist positions. For administrators with digital preservation positions, the data suggests that some traditional responsibilities associated with preservation administration, such as grant writing and education and outreach, are emphasized less in their positions than in those of their traditional counterparts.

4. What "core" preservation knowledge and competencies can be identified from studying position announcements?

Several areas for possible core competencies were identified based on the data. Because they were represented in 20 percent or more of the positions included in the study, the authors suggest the following for preservation professionals in generalist positions:

- Developing and establishing policies, standards, and best practices for physical and digital resources
- Planning, assessment, and prioritizing for physical and digital resources
- Grants and donor relations
- Education, outreach, and training
- Conservation knowledge
- Emergency planning, and response
- Environmental monitoring
- Vendor relations
- Digitization

However, further work is needed to develop a set, or sets, of core competencies for preservation professionals, particularly for digital preservation professionals.

Overall, the study underscored that, while much has changed in the preservation profession in the last twelve years, core elements, including policy development and assessment and prioritization, remain intact. Additionally, a continuing emphasis on collaboration conveys an understanding that preservation requires communication and partnership between those with technical knowledge and those with collection knowledge to ensure that availability of cultural heritage for future generations.

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