
Geographic Information System (GIS) tools are increasingly being used in academic, government, and business library settings. Entry level job advertisements were analyzed for educational requirements and GIS skills. Job descriptions were compared to the American Library Association Map and Geography Round Table’s (MAGERT) published list of core competencies for map and GIS librarians. The job advertisements support three of the four broad competency groups, including requirements for technical, reference, and research skill sets. The results suggest that entry level librarians are expected to meet the basic competencies for providing GIS services in academic and special library settings. Suggestions for further study are made.

Headings:

Content analysis
Geographic information systems
Job analysis
Library schools/curriculum
GEOGRAPHIC INFORMATION SYSTEMS (GIS) COMPETENCIES FOR LIBRARIANS

by
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Approved by

_______________________________________
Evelyn Daniel
Introduction

Geospatial information is used every day by individuals and academic, business and government entities. The United States Geological Survey defines a geographic information system (GIS) as “a computer system capable of capturing, storing, analyzing, and displaying geographically referenced information… Practitioners also define a GIS as including the procedures, operating personnel, and spatial data that go into the system.” As collectors, organizers, and administrators of information, it might seem that libraries and information centers are appropriate facilitators of GIS for their communities.

My interest in the use of GIS by information professionals was piqued during a 2010 internship in a specialized information setting. I worked on a variety of knowledge management projects and provided academic and business research services. Some projects I worked on involved demographic and financial data that was international in scope. Geographic visualization was the most effective way to communicate research findings like the supply chain logistics of a specific product, or the location and distribution of airports in countries with growing populations. In order to provide accurate and useful visualizations of my research, I sought out GIS resources and instruction. I took a two-part class on using GIS software that was taught by the GIS librarian on campus. I also watched GIS tutorials on the University’s website that were created by the GIS librarian. I spent additional time searching the web and learning how to use open-source GIS applications. Based on my experience, the incorporation of GIS education into my library science coursework would have been beneficial to me professionally.
Literature Review

Literature related to geographic information systems (GIS) and spatial data in library and information science publications is focused on utilizing GIS technology to understand community demographics. Library literature related specifically to GIS librarianship decreased in the 1990s (Martindale, 2004), but a study of the quantity of general GIS-related articles in library and information science literature increased over 16 years from 1990 to 2005 (Michalec & Welsh, 2007). A limited amount has been written on the education of GIS Librarians in American Library Association (ALA) accredited programs. A few articles address GIS and library and information science (LIS) program curriculums (Weimer & Reehling, 2006; Martindale, 2004), but nothing was found that examines the role LIS graduate programs currently play in preparing graduates for obtaining or working in positions that require geographic information skills. In response to the limited GIS education in LIS programs, Weimer and Reehling proposed a model curriculum for Geographic Information Librarianship.

A common theme of articles about map librarianship, the precursor to GIS librarianship, written over the past thirty years is that education for geography and map librarianship has been sparse and inadequate. Historically, “on-the-job training” was the standard for educating map librarians through the 1950s and 1960s. An accredited course in map librarianship began in 1950 after the urging of the University of Illinois’ Geography Department Chairman (Larsgaard, 1981). By 1980, only five schools were offering courses in map librarianship. Not much changed throughout the 1980s, but authors were addressing the need for education for map librarianship at that time (Weimer & Reehling, 2006).

In 2004 an informal survey of ALA-accredited library and information science (LIS) masters programs was conducted by a GIS and Geospatial Data Librarian in an academic library (Martindale, 2004). The LIS programs were asked if there were courses containing GIS or digital geospatial data management as part of the curriculum.
Additionally, they were asked if any faculty members were interested in the area of GIS librarianship. At the time of the survey 53 percent of the programs that responded had neither faculty who were interested in GIS nor courses offered in the subject. 37 percent of the responding programs said their LIS students had opportunities to be exposed to introductory GIS through other LIS courses like “government information” or “metadata”, through instruction from visiting faculty, or through elective courses in other academic departments. In another article, a review of web pages and course catalogs of ALA accredited LIS programs showed that there were no map, GIS, or cartographic materials specializations offered (Weimer & Reehling, 2006).

The lack of formal instruction in GIS librarianship is problematic for LIS graduates seeking entry level positions requiring GIS or geospatial data management skills. In their 2006 article, authors Weimer and Reehling observed that over the course of a year there were a dozen job announcements at large academic libraries requiring GIS related skills. The authors asserted that even with a lack of published material containing content analysis of job announcements for GIS librarians, it was unclear why library schools were not keeping up with the evolution of the profession (Weimer & Reehling, 2006). In a 1997 article summarizing new jobs in librarianship via a study of online job classifieds, “Geographic Information Systems Librarian” was included in the list of new librarian job titles (Dolan & Schumacher, 1997). Content analysis of job advertisements specific to geographic information and librarianship is missing from the literature, but there is no shortage of publications that remark on the importance of GIS in library services. Michalec and Welsh (2007) wrote about the importance of GIS as a research tool, saying that “GIS organizes and presents data in ways that allow for greater understanding of information.”

Providing government information to library patrons is a library service that increasingly requires utilizing spatial data. Librarians working in public libraries or government documents settings have been affected by the transition of traditional spatial information to electronic formats. Spatial information, including maps and geographically referenced data, has shifted towards electronic delivery (Zellmer, 2008). According to Zellmer, librarians who provide GIS services should be knowledgeable in a
broad range of subjects such as geography, geology, anthropology, archaeology, history, political science, health care, social work, planning, recreation, and education. More importantly, librarians must know where to find appropriate spatial data for research in these areas. As of 2008, at least thirty-two federal government agencies produce spatial information in the form of maps or datasets (Zellmer, 2008).

Paper map librarianship is often considered the precursor to modern GIS and map librarianship. In 1988, the authors of the article “Library Education for Work with Maps” claimed that education for map librarianship was largely the domain of professional associations (Seavey & Clark, 1988). Continuing in this tradition, education for GIS librarianship has been dominated by professional associations rather than in the LIS curriculum. The subject of GIS librarianship education was addressed at the Association for Library and Information Science Education (ALISE) Conference in 2006 (Weimer & Reehling, 2006). The Special Libraries Association (SLA) created the Geography and Map Division in 1941 “to encompass all aspects of the production, procurement, processing, and utilization of geographic and cartographic materials and includes the professions of geography and map librarianship” (Special Libraries Association, 2007). In 2003 the Geography and Map Division became a section of SLA’s Social Science Division.

The Map and Geography Round Table (MAGERT), formed in 1980, is one of the American Library Association’s 15 round tables. MAGERT’s mission includes the intent “to contribute to the improvement of education and training of map and geography librarians” (ALA, MAGERT, 2007). The Education Committee of MAGERT exists for the purpose of providing “continuing education in geospatial librarianship through organizing sessions at ALA conferences, through publications, and via the World Wide Web. The Committee may also undertake projects to study and encourage education in geospatial librarianship at library schools and in other venues” (ALA, MAGERT, 2007). The Education Committee of MAGERT coordinates with the Geographic Technologies (GeoTech) Committee to propose educational workshops and conferences for librarians. The GeoTech Committee provides a forum for discussing issues with geographic information technologies including GIS and digital geospatial data metadata topics.
(ALA, MAGERT, 2007). Since the early 1990s, MAGERT’s programs at the ALA Annual Conference have consistently focused on GIS services in library environments. These programs have provided the professional librarian community opportunities to learn about locating and accessing geospatial data (ALA, MAGERT, 2007).

In 2008 MAGERT published a document that outlined core competencies for map, GIS, and cataloging/metadata librarianship. The core competencies listed were the product of the MAGERT Education Committee’s efforts at the American Library Association Annual Conference in 2007. MAGERT outlined the core competencies of the GIS Librarian in the key areas of organizational management, resource management, information services, and technological applications at three general levels of career experience. This document recognized the inherent technical skills required by even the most entry level positions. Level 1 competencies refer to skills that everyone needs to know and that entry level professionals need to master in their first two years of working. Levels 2 and 3 competencies are dependent on local user needs and organizational structure or indicate an advanced level of specialization or managerial experience. I have focused on the Level 1 competencies because this study is interested in the entry-level job market for GIS librarians and information professionals. MAGERT's list of Level 1 competencies is as follows:

<table>
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<tr>
<th>Resource Management: Technology</th>
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<tbody>
<tr>
<td>Knowledge of GPS (global positioning systems) technologies</td>
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<tr>
<td>Ability to assist patrons in downloading and utilizing GPS data in a GIS</td>
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<tr>
<td>Knowledge of computer programming and web services related to GIS</td>
</tr>
<tr>
<td>Knowledge of key GIS resources for data and software support</td>
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<tr>
<th>Information Services: Reference</th>
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</thead>
<tbody>
<tr>
<td>Knowledge of GIS tutorials &amp; training courses specific to patron needs</td>
</tr>
<tr>
<td>Ability to perform basic spatial and geo-processing activities</td>
</tr>
<tr>
<td>Working knowledge of GIS products and companies, i.e., in-depth knowledge of appropriate web resources such as company web sites (e.g., ESRI, Map Info, Idrisi)</td>
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</tbody>
</table>
**Information Services: Instruction**

- Ability to develop and deliver formal introductory GIS instruction sessions and/or workshops
- Ability to conduct one-on-one consultations
- Knowledge of instruction options and ability to manage/facilitate access to commercial options for instruction (e.g., ESRI Virtual Campus course access codes)

**Information Services: Research Consultation**

- Working knowledge of GIS software - preferably more than one GIS
- Broad knowledge of data resources and discovery tools
- Working knowledge regarding data organization and data manipulation
- Working knowledge of presentation techniques
- Working knowledge of reference techniques
- Working knowledge of GIS project planning and implementation

MAGERT’s core competencies for entry-level GIS librarians are similar to those that Weimer and Reehling identified in their curriculum model for Geographic Information Librarianship. The authors listed the following skills and knowledge for a GIS librarian as part of their model: GIS reference, GIS customer service, GIS instruction, collection development of GIS data sets, licensing and rights management, acquiring and managing hardware and supporting technology (Weimer & Reehling, 2006).

Descriptions of GIS Librarian jobs may vary depending on the type of institution. GIS Librarian Kim M. Ricker described her role at the University of Maryland’s Government Documents and Maps team as “central to collecting, managing, disseminating, and teaching about geospatial data” (Ricker, 2007, p.116). GIS Librarians work in academic, corporate, special, public, and government libraries. Possible jobs for a GIS Librarian include: finding, downloading, organizing, and instructing others on geographic data; a specialization in creating geospatial metadata; and general government documents,
business or social sciences librarian with oversight of map or GIS services and collections (Weimer & Reehling, 2006).

The purpose of this research paper is to identify competencies for GIS librarianship in job advertisements and compare them to competencies listed in professional and academic literature. After reading academic and professional literature related to GIS librarianship, I conducted a content analysis of descriptions in job advertisements in order to identify the information and technology services currently being performed by professionals in GIS librarianship, as well as the GIS and geospatial data skills employers expect from new library and information science graduates. Authors Weimer and Reehling noted a lack of published job announcement content analyses that look specifically at GIS skills as job requirements (2006). I reviewed job advertisement content analyses published in LIS literature before designing and conducting my own analysis.

There is substantial overlap in the types of information collected from content analyses of job advertisements and descriptions in LIS literature. Prior analyses collected similar types of basic information, including date, source of advertisement, position title, location, salary, type of setting or institution, educational requirements and experience level over different periods of time. A search in LIS literature for content analyses of professional library job advertisements resulted in a collection of articles in which the dates of the advertisements spanned from two months to more than two decades. Holt and Strock (2005) concluded that entry-level jobs for librarians are hard to come by in their 2005 two month analysis of jobs. The authors concluded that LIS programs were not providing sufficient practical experience for their graduates Matthews and Pardue (2009) examined information technology skill sets in librarian job advertisements posted between October 2007 and March 2008. The authors found a substantial demand for librarians with information technology skills, such as web development, project management, systems development, and systems applications. Sproles and Ratledge (2004) conducted a longitudinal content analysis of entry-level job advertisements from 1982 to 2002. The authors observed trends over this time period of increased experience requirements for entry-level positions and a decrease of on-the-job training.
Many content analyses of job advertisements for librarians and information professionals have sought to identify the educational requirements or preferences listed by employers. A content analysis of knowledge management job advertisements indicated that knowledge management employers prefer applicants to have a MLS, but the researcher did not specify if there were any accreditation standards for the MLS degree (Ling-Ling, 2005). Holt and Strock also concluded that a MLS degree is a basic requirement for professional librarians, but their results suggest a degree from an ALA-accredited LIS school is preferred (2005). Reeves and Hahn’s 2010 investigation of job advertisements for new LIS graduates did not provide any insight into the value of an ALA-accredited degree in comparison to a non-accredited degree. Their methodological design only included job advertisements that listed ALA-accredited MLS degrees as a requirement. Grimes and Grimes (2008) published results of a thirty year longitudinal study of job advertisements for academic librarians. Results of this study indicated a decline over time in the proportion of job advertisements that included a MLS degree as a requirement. The mid-1990s had the highest percentage of job advertisements requiring a MLS at 85 percent, but by 2005 this requirement dropped to only 58 percent. The authors concluded that this trend may be attributed to a perception that the library school curriculum has not kept up with the demands of the job market.

The purpose of some content analyses has been to identify general educational and employment trends in librarianship, while others have sought to identify characteristics of or requirements for a specific type of librarianship position. Reeves and Hahn conducted a study of job advertisements for new MLS graduates, in which they collected over 1000 advertisements from 2006 to 2009. According to their results, most entry-level positions were available in academic settings with a limited number of positions available in special libraries, archives, or public libraries (2010). Their conclusion that the number of entry-level positions was increasing contradicted Holt and Strock’s 2004 article that claimed entry-level positions were difficult to find. Choi and Rasmussen collected 87 job advertisements specific to digital librarianship that appeared in College and Research Libraries News from 1999 to 2007. The study showed that technological skills and experience in the digital library environment, knowledge and experience in creation and
management of digital information and metadata are the most required skills for digital librarians. Management skills, interpersonal skills, and project management skills were also highly emphasized in advertisements for digital librarians (2009). White (1999) conducted a content analysis of subject specialist job advertisements from 1990 to 1998. White examined the characteristics of business, social science, and science specialist positions in academic libraries. The author found that while some specific job responsibilities were unique to subject specialist positions, educational requirements and salary information in the job advertisements were reflective of trends in general academic librarianship. Though some specializations in librarianship have been represented in the literature, a search for content analyses of job advertisements specifically for GIS-related information professional positions did not produce any results. Content analysis of job advertisements for specializations such as GIS requires using sources of job advertisements not typically used by LIS. For example, in a paper investigating the subset of technical and knowledge management positions, non-LIS specific search engines were utilized to gather job advertisements because they were unlikely to be posted on job lists that focus on more traditional aspects of librarianship (Ling-Ling, 2005).
Methodology

This study attempts to identify the features of job advertisements containing GIS and geospatial data skills new library and information science graduates should have if they are seeking an entry-level professional position. Job advertisements were collected from four websites during the month of February, 2011. A collection period of one month was used in this analysis to create a baseline for future study. It is important to identify all aspects of the data that will be collected from the body of content before conducting longitudinal research, so it is my intent to establish a starting point for future investigations into this topic.

Two of the websites are general online job databases, and the other two websites are designed specifically for careers in and related to librarianship. Two general websites that are not specific to LIS were chosen with the intention of including jobs that are not considered librarian positions by the employers, but have requirements and skills that match those of LIS professionals. SimplyHired.com aggregates “listings from thousands of sites across the Web including the leading job boards, company career sites, newspapers, non-profits, government sites, and more” (Simply Hired Support Center, 2010). Indeed.com is also a large job search engine that covers a wide range of job fields (Indeed.com). SimplyHired.com and Indeed.com were used in anticipation of finding professional positions outside the traditional library setting. The terms ‘library’ or ‘librarian’ were entered into a optional keyword search field for terms that may appear (but not required), in addition to GIS keywords on the general job search databases SimplyHired.com and Indeed.com with the intention of improving the relevancy of the search results to the field of LIS.

Other sources used to search for job advertisements were the ALA Joblist and the website LISJobs.com. The online ALA Joblist is sponsored by the American Library Association (ALA), the Association of College and Research Libraries (ACRL), and ALA’s Human Resources Development and Recruitment (HRDR) (Who We Are, 2011).
LISJobs.com is a career information website for librarians and information professionals (About, 2011).

Additional job websites including libgig.com, USAJobs.gov, and the Special Libraries Association online career center were included in the search, but no job descriptions were retrieved and included in this analysis. Jobs that otherwise met the criteria of the search from these three websites were excluded due to being duplicates of positions found on another source or for very experienced candidates only. Several job advertisements collected appeared on multiple websites. In these cases, the job website that posted the advertisement first was identified as the source of the advertisement for data collection purposes.

Methods used in this study were modeled on existing content analysis work in the LIS field. Like content analyses I summarized in the literature review section, I collected job advertisements from multiple sources. Inconsistencies in the format and type of information provided in the job descriptions made it difficult to determine if some positions were entry-level. Prior studies have addressed this issue by determining a position is entry-level if the job advertisement is clearly stated as entry-level, if there is no mention of required professional experience, or if there is no experience or duty listed that would be impossible for an entry-level librarian to gain (Sproles & Ratledge, 2004; Reeves & Hahn, 2010). This established method was applied in this study for the purpose of determining whether the job advertisements collected for analysis were entry-level positions.

Information collected from the job advertisements for this study included: source of the job advertisement, search terms used to retrieve the advertisement, date posted (if available), date retrieved, job title, entry or mid-level status, MLS degree requirement, and setting (classified as academic or special). Additionally, the specific text of the job advertisements that matched the search terms was captured. When possible, the GIS related concepts in the advertisements were classified as being either required or preferred skills. In some cases the GIS concept or search term did not appear in a list of responsibilities or qualifications, but appeared in the job description at the beginning of
the advertisement. The information collected from each job advertisement that met the criteria listed below was stored in a Microsoft Access database. Criteria for inclusion were as follows:

1. The job description was retrieved by using the website’s search function. The search terms used were ‘GIS’, ‘geographic information system’, ‘geospatial’, or ‘geography’.
2. The job description was explicitly classified as entry-level, or the job description requested less than 2 years experience. Job descriptions that lacked specific experience requirements were determined to be acceptable for inclusion if there were not significant job requirements such as managerial tasks that would be unlikely for an entry-level LIS job seeker to meet.
3. The job advertisement was posted during the month of February 2011; or within 30 days prior to the search date.
Results

Eleven job advertisements for entry-level, professional, full-time positions that specified geospatial related qualifications were retrieved. Every job advertisement analyzed had a different job title. Titles such as “Geodata Librarian” and “Geospatial Data Librarian” are clearly associated with geographic information sciences. Others titled “Metadata Librarian”, “Research Librarian”, and “Government Documents Librarian” reflected more traditional positions. A few of the job titles collected, such as “Engineering Librarian” and “Assistant Librarian for Economics and Political Science” indicate that some subject specialist positions now incorporate geographic information skills. The majority of positions were in academic settings. Eight out of the eleven job advertisements were for positions at universities or academic institutions. The remaining three job advertisements were classified as being in a “special” library setting because they were for jobs in non-traditional library settings with government contractors.

Nine out of the eleven job advertisements specifically asked for an advanced degree in library or information science. Of those job advertisements requiring a MLS or related degree, five specifically asked for a MLS or related degree from an ALA-accredited school. Two job advertisements collected did not list an advanced degree in library or information science in the requirements or qualifications at all. The prominence of the MLS degree in nine of the eleven job advertisements suggests that some level of familiarity with geospatial data and geographic information systems is a reasonable expectation from employers of entry-level LIS professionals.
Job Titles by Setting and Education Requirement

<table>
<thead>
<tr>
<th>Type</th>
<th>Job Title</th>
<th>ALA Accredited MLS</th>
<th>MLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special Library</td>
<td>Geospatial Data Librarian</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Geodata Librarian</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Research Librarian</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assistant Librarian for Economics &amp; Political Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Digital and Rare Map Librarian</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Digital Services Librarian</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Earth Sciences Librarian and Bibliographer</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Engineering Librarian</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Government Documents Librarian</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Metadata Librarian</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>Research Library Fellow</td>
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<td>X</td>
</tr>
</tbody>
</table>

The job descriptions correspond with many of the technological and information service competencies required for entry level GIS Librarians outlined by MAGERT. A comparison of the text of the job advertisements with MAGERT’s core competencies for entry level GIS Librarians suggests that employers value the technology, reference, and research consultation skills to a higher degree than instruction skills. There were nine instances of language in the job advertisements that matched completely or in part to the technology competencies. There were eight instances of language in the job advertisements that matched completely or in part to the reference competencies.
Language closely matching the research consultation competencies appeared ten times, while only one instance of language occurred that reflected the instruction skills outlined by MAGERT. Based on the content of these job advertisements, employers are seeking information professionals with technological skills related to GIS and the ability to perform a variety of GIS reference and research functions.

<table>
<thead>
<tr>
<th>Job Title</th>
<th>ALA/MAGERT’s Level 1 Core Competencies for GIS Librarianship</th>
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<tbody>
<tr>
<td></td>
<td>Resource Management: Technology</td>
</tr>
<tr>
<td>Geospatial Data Librarian</td>
<td>X</td>
</tr>
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</tr>
<tr>
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<td>X</td>
</tr>
<tr>
<td>Assistant Librarian for Economics &amp; Political Science</td>
<td>X</td>
</tr>
<tr>
<td>Digital and Rare Map Librarian</td>
<td>X</td>
</tr>
<tr>
<td>Digital Services Librarian</td>
<td>X</td>
</tr>
<tr>
<td>Earth Sciences Librarian and Bibliographer</td>
<td>X</td>
</tr>
<tr>
<td>Engineering Librarian</td>
<td>X</td>
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</tbody>
</table>
Discussion

The short time frame used in this study only reveals a snapshot of the job market for entry level GIS librarians and information professionals. Examining job advertisements over an extended period of time would provide more insight into job market trends. For example, a content analysis of job advertisements that were posted over the course of five years might reveal an increase or decrease in the number of jobs requiring a specific technical skill, or changes in education requirements. A longitudinal content analysis of job advertisements for information professionals with GIS skills would provide useful information for library and information science schools developing elective courses or degree specializations. If GIS skills continue to appear in job advertisements, it is reasonable to expect some demand for courses or educational opportunities that reflect the job market. A curriculum that includes opportunities for technical specializations like GIS in addition to core requirements would be professionally beneficial for LIS students.

In addition to providing insight into job market trends, expanding the collection time frame would provide more reliable results. Limiting the time frame to one month removes a potentially relevant variable—seasonality of the job market. Was February a typical month for job advertisements, or was it unusual in some way that is not visible without more data from other months to compare it to? Are there more jobs in academic settings advertised at certain times of year? These questions encourage a longer study in the future. Longitudinal analyses provide insight into educational and job-market trends. However, these long-term studies of job advertisements have not been possible for career paths in librarianship that have developed as a result of rapidly changing technology, such as GIS librarianship.

Examining a larger number of job advertisements from more sources would more conclusively identify correlations between jobs in GIS librarianship with specific skills or education requirements. For example, only one instance of language occurred in a job description that mentioned the instruction skills included in MAGERT’s list of competencies. It is unclear from this small sample of job descriptions why entry level
positions do not require experience with GIS instruction. It is possible that this particular timeframe and choice of sources, which produced only one job with instructional experience as a requirement, is underreporting the demand for instructional skill and experience. Further analysis might provide insight into the educational requirements included in the job advertisements, specifically whether accredited library science degrees are required for a GIS specialization in proportion to the broader library and information science field.
Conclusion

On-the-job training and continuing education from professional organizations are important for all levels of information professionals. However, there also needs to be an opportunity for LIS students to gain classroom and practical experience with GIS while enrolled in a LIS program. LIS graduates need this education to be competitive in the entry-level job market for GIS librarianship. The entry-level positions that can be classified as GIS librarians found in this study primarily reflect the types of academic library and information settings that have GIS applications.

Professional organizations and library literature have recognized the importance of geographic information literacy for information and library professionals. In support of this, the job advertisements explored in this paper indicate that entry-level professionals are expected to have a working knowledge of the technology and applications of GIS. Coursework that integrates GIS will prepare LIS students for library work that is relevant in today’s information economy. A GIS specialization is not practical for every MLS program due to both demand and resources. However, based on the presence of the core competencies for GIS librarianship in a small sample of entry-level job advertisements, it is recommended that LIS schools offer elective courses in GIS, partner with computer science and geography departments, and encourage students to seek out resources available through the professional community.
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