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Taking a Diversity, Equity, Inclusion & Accessibility Lens to Engineering Librarian Job Postings: Recommendations from an Analysis of Postings from 2018 and 2019

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Full-Length Paper

**Taking a Diversity, Equity, Inclusion & Accessibility
Lens to Engineering Librarian Job Postings:
Recommendations from an Analysis of Postings
from 2018 and 2019**

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Abstract

Objective: While diversity, equity, inclusion, and accessibility (DEIA) principles and practices have been incorporated into much of academic librarianship, there has been less focus on the job postings

Methods: In order to quantify ways in which DEIA is being integrated into job postings, we analyzed 48 job positions for engineering librarians posted in 2018 and 2019 via deductive thematic analysis, looking for trends in salary and qualifications related to education and academic or professional experience.

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Data Availability: The dataset from this study is openly available at <https://doi.org/10.13020/7743-vf17>.

Disclosures: The authors report no conflict of interest.

Abstract Continued

Results: Of postings that listed a quantitative salary value, salary ranged from \$45,000 to \$81,606; the median was \$60,750. However, only 33% ($n = 16$) of positions listed a quantitative salary value. For educational qualifications, we found that 98% of job postings ($n = 47$) listed a Master's in Library and Information Science (MLIS) as a required qualification; however, 34% of these postings ($n = 16$) would accept an equivalent degree in lieu of the MLIS. Additionally, 73% ($n = 35$) of positions sought candidates with an MLIS and another degree; 91% of these positions ($n = 32$) wanted the additional degree to be in a science, technology, engineering, and mathematics discipline. For academic or professional experience, 56% of positions ($n = 27$) sought candidates with previous academic library experience.

Conclusions: Using this data, we provide actionable recommendations on how to incorporate DEIA principles into any academic librarian job posting. Our study provides quantitative data and evidence-based recommendations that can be used to make DEIA an integral part of the job postings in academic librarianship.

Introduction

Diversity, equity, inclusion, and accessibility (DEIA) principles and practices are increasingly being incorporated into higher education (Moody 2020; United States Department of Education, Office of Planning, Evaluation and Policy Department 2016) and academic libraries (Cruz 2019; Schonfeld and Sweeney 2017). This work has often focused on making our libraries welcoming and inclusive to our users (for example, see Smallwood and Becnel's 2013 book *Library Services for Multicultural Patrons: Strategies to Encourage Library Use*). In addition to this crucial work, we need to work on making our libraries welcoming and inclusive to our existing and prospective staff, including throughout the hiring process. Science, technology, engineering, and mathematics (STEM) librarianship has long lacked diversity (Bright et al. 2006; Harrick and Fullington 2017). Considering the dearth of librarians with STEM backgrounds (Clarke and Kim 2018) and the general lack of DEIA in the academic hiring process (Sensoy and DiAngelo 2017), we, as STEM librarians, need to change our recruiting and hiring practices otherwise our profession will not diversify. As Sensoy and DiAngelo (2017) note, we must demonstrate our commitment to DEIA through our actions, otherwise "in good conscience we should stop making the claim that we are campus communities that promote diversity, respect, and inclusion" (577). Or, more specifically, our hiring practices will continue to be, as Brown et al. (2018) say, another "astounding reminder of our field's propensity for lip service over action" (168).

In this study, we focused specifically on engineering librarians due to our disciplinary knowledge. We chose to analyze job postings because they are the portion of the hiring process that is publicly available and can provide a perspective from universities across the United States (US). Job postings have a large impact because they are the first way that many candidates become familiar with an academic library's or institution's values and priorities (Defa 2012). But, more importantly, writing job postings with a DEIA lens is "an important and necessary first step" towards recruiting a more diverse applicant pool (American Library Association 2021) and ultimately diversifying STEM librarianship.

Macroscopically, we acknowledge that the entire hiring process oppresses people outside of dominant groups and needs to be overhauled to remove barriers that have historically benefitted whiteness and those in power. Further, we acknowledge that retention practices are just as vital to consider as hiring practices when striving to create a work environment that embodies DEIA values (Brown et al. 2018). Aspects of the hiring process besides job postings are outside the scope of our study but are a valuable area of future study.

When analyzing these job postings, we did not analyze explicit mentions of DEIA but instead dug deeper to explore how libraries are upholding or dismantling systems of oppression through the language used for salary, education, and professional or academic experience. We wanted to make explicit the often-implicit connections between DEIA and these common job posting components. They were

selected because they are where many social inequities within systems of oppression appear. It is these specific areas that continue to uphold whiteness, prevent power from being redistributed, and harm marginalized communities. Looking critically at them provides opportunities to dismantle unnecessary barriers and center DEIA within these documents. These areas are an opportunity to help us move beyond performative DEIA statements to make real, sustainable changes in one portion of the hiring process.

We aimed to answer the following research questions:

1. What is the salary range and median for these engineering librarian job positions?
2. What education is commonly listed?
3. What other types of academic or professional experiences are commonly listed?

After presenting the Results, our Discussion focuses on how these three components of STEM librarian job postings can be improved by centering on DEIA. In the Conclusion, we provide practical and actionable recommendations to help incorporate DEIA principles and practices into all academic librarian job postings.

With any research, it is crucial to position ourselves as authors within library and information science (LIS) and our greater society because “whenever diversity is an add-on, we normalize Whiteness rather than diversity” (Sensoy and DiAngelo 2017, 563) and “it is difficult to call out and name the issues within our profession” (Brown et al. 2018, 166). Joanna Thielen is a cisgender, white, heterosexual, able bodied female. Wanda Marsolek is gender non-conforming, white, queer, able bodied person. Both authors are employed as engineering librarians at large and wealthy doctoral granting institutions. We want to expressly note that our positions give us extreme privilege within LIS and our greater society. For example, our whiteness allows us to work in spaces where we look like the majority of our colleagues and patrons; we are not judged by the color of our skin like BIPOC folx, nor are we subjected to constant racial or cultural microaggressions. Acknowledging positionality is critical in our research because it impacts how we move through and experience the world. It also structures our lens for this research, our other professional work (including our experiences with the hiring process), and our personal lives. We recognize that DEIA in job postings is a small portion of much larger conversations that need to happen and policies that need to change in academic libraries around anti-racism, systems of oppression, and social justice. We hope that our research can be a contributor to these necessary conversations.

Literature Review

Conducting content analyses of job postings has long been used in the library literature (Kim and Angnakoon 2016). Job postings describe “the duties and responsibilities of the available position; the experience, education, skills,

knowledge, and/or other attributes required for the job; and the hiring organization, salary range, and other benefits” (Kim and Angnakoon 2016, 327). They are how academic libraries publicize the skills and qualifications that they are looking for in new hires (Kim, Warga, and Moen 2013). Most LIS job posting analysis studies quantify information that is directly articulated in the posting, rather than connecting the information to larger professional issues. We connect our quantitative data to DEIA, demonstrating the social inequities present in job postings. We then use this data to make actionable recommendations for writing more equitable job postings.

The benefits of incorporating a DEIA lens in higher education (United States Department of Education, Office of Planning, Evaluation and Policy Department 2016; Moody 2020), STEM (Allen-Ramdial and Campbell 2014; Bilimoria and Singer 2019; McNeely and Fealing 2018), and academic librarianship (Brook, Ellenwood, and Lazzaro 2015; Cruz 2019; Schonfeld and Sweeney 2017; Schlesselman-Tarango 2017) are common in the literature, but there is room for expansion, including how to incorporate it into job postings. In terms of change, Cizkek (2020) states “academic librarians must critically evaluate policies, practices, and the power structures in which we are complicit to truly create a just society and ensure the diversity, equity, and inclusion that we hold as core professional values” (5). Job postings are no exception. Cizkek (2020) goes on to say, “librarians must become aware of our own privilege and craft ways to use it to dismantle our own racist, misogynistic, and homophobic systems, policies, and practices” (9). Brook, Ellenwood, and Lazzaro (2015) reiterate that “racism is embedded in academic libraries and that realigning librarianship with antiracist values and practices will enable libraries to better serve their communities by working for the collective goal of antiracist social justice” (248). Rethinking how our institutions write job postings is a tangible way to put the thoughts of Cizkek (2020) and Brook, Ellenwood and Lazzaro (2015) into action; it is a way for us to acknowledge and combat longstanding, inequitable (racist, classist, ableist, etc.) practices and policies. In *Knowledge justice: Disrupting library and information studies through Critical Race Theory* (2021), Leung and López-McKnight caution us that while it is important to name and understand the problem, “we must also develop solutions or we will be caught in an endless cycle of naming and understanding, never making progress towards measurable, concrete actions” (11). We must move forward with actions to break the cycle.

Carmichael (2020) recommends that employers and search committees recruit from as large an applicant pool as possible. It is easy to say we want larger applicant pools, but the hard work is attracting qualified candidates to apply. The 2017 Ithaka S&R report *Inclusion, Diversity, and Equity: Members of the Association of Research Libraries: Employee Demographics and Director Perspectives* found that the applicant pool is the biggest barrier in the hiring process when it comes to recruiting and hiring employees with respect to race/ethnicity, people with disabilities, and veterans. This does not mean that recruitment should focus on any one group, rather, job postings are a way to create equitable opportunity for all those who are qualified. A first step is to

acknowledge that whiteness is currently the norm of the profession (Brook, Ellenwood, and Lazzaro 2015; Nataraj et al. 2020; Schlesselman-Tarango 2017) and then actively work to disrupt it. Leung and López-McKnight (2021) are adamant when they plead “the profession has to get to race if the long-standing structured inequities are going to change” (318).

Methods

We collected engineering librarian job postings that were posted from January 1, 2018 to December 31, 2019 and analyzed them via deductive thematic analysis. The postings were gathered from the following electronic mailing lists:

- Association of College and Research Libraries (ACRL) Science and Technology Section Discussion List (ACRL Science and Technology Section Discussion List 2020),
- Chemical Information Sources Discussion List (CHMINF Archive 2020),
- American Society for Engineering Education Engineering Libraries Division Discussion List (ELDnet-I 2020), and
- Special Library Association Physics-Astronomy-Mathematics Division Discussion List (PAMnet Archive 2020).

Note that, for the latter two electronic mailing lists, the viewer must be a member before accessing the list, but anyone is allowed to join. These lists were chosen because they attract job postings from a wide range of academic libraries and provide access to job postings during the chosen time frame. Five postings were excluded because the full posting could not be located.

To determine if a job posting met our inclusion criteria, we first evaluated postings based on the job titles. Titles that included words such as engineering, science, or STEM were saved for further analysis. We then reviewed each posting to ensure that it met the following three inclusion criteria:

1. Full time, permanent position
2. Located in a US academic library
3. Responsibilities include providing direct support to the curricular and/or research needs of engineering students, faculty and staff (i.e., an engineering discipline needed to be explicitly mentioned in the job posting). Supervisory or managerial positions were only included if they directly supported these needs.

In total, eight postings were excluded because they did not meet the inclusion criteria. After the job posting met the three inclusion criteria, we recorded its metadata, including university name, job title, and posting date (supporting information for this study, including job posting metadata, can be found at: <https://doi.org/10.13020/7743-vf17>).

In total, we gathered 50 full engineering librarian job postings. However, this corpus contained duplicates; job postings from the same university posted within 12 months of each other were targeted as possible duplicates. Several factors were scrutinized to determine if the postings were duplicates of the same position, including job title, responsibilities, and qualifications. If the postings had 25% or more difference in the description of responsibilities or qualifications, they were not considered duplicates and each posting was kept in the corpus. We reviewed potential duplicate postings individually and determined if the posting should be included or excluded. Then, together we discussed our individual decisions and came to an agreement on the inclusion or exclusion for each posting. If postings were duplicated, the posting with the most recent posting date was kept. In total, three postings were removed as duplicates, leaving 47 job postings, which corresponds to 48 job positions (one job posting was for two positions).

To determine patterns in the salary and qualifications related to education and academic or professional experience for engineering librarian positions, we took a confirmatory approach using deductive thematic analysis. Thematic analyses “move beyond counting explicit words or phrases and focus on identifying and describing both implicit and explicit ideas within the data, that is, themes” (Guest, MacQueen and Namey 2012, p. 10). Essentially, this method yields richer results than word frequency analysis because it can “captur[e] the complexities of meaning within a textual data set” (Guest, MacQueen and Namey 2012, 11). Specifically, in deductive thematic analysis, codes are pre-determined, either from hypotheses or existing sources, prior to data analysis (Guest, Namey and Mitchell 2013). In exploratory approaches (such as grounded theory), codes are derived from the data. We chose deductive thematic analysis because we were looking to analyze the presence of specific codes in the job postings. Additionally, this methodology has been previously applied to the analysis of job posting within academic libraries. Hall-Ellis (2005; 2006) used this confirmatory method to track changing expectations and requirements for entry-level cataloger positions and managerial cataloger positions, respectively, over several years.

A codebook of variables and attributes for each variable was created prior to analyzing the job positions, based on previously published codebooks (Hall-Ellis 2005, 2006; Thielen and Neeser 2020). Supporting information for this study, including the codebook of 16 variables, corresponding attributes, and operational definitions can be found at: <https://doi.org/10.13020/7743-vf17>. Each variable in the codebook was operationally defined in order to avoid ambiguity. Descriptions for when each variable should or should not be used were included. For each of the 16 variables, the attribute of location in the job posting was coded (see Table 1 for list of attributes). If the variable was mentioned in multiple locations in a job posting, only one location was recorded, based on the following hierarchy: required qualifications > preferred qualifications > responsibilities > description.

Table 1: Attributes for the variable 'MLIS Degree'. Synonyms for each attribute are shown in parenthesis.

Variable =	MLIS Degree				
	Attributes				
Location in the job posting	Required qualifications (Minimum requirements; basic requirements)	Preferred qualifications (Desired qualifications)	Responsibilities (Duties)	Description	Not applicable

We coded all job postings independently to ensure consistency and reliability. Initially, we coded a small corpus of five job postings. After coding this small corpus, we refined the codebook to define variables more clearly, add additional variables, eliminate unneeded variables, and revise attributes. After these revisions, we coded the entire corpus of 47 job postings. Coding discrepancies were resolved through discussion. Coding reflected a high level of intercoder agreement; percent agreement was 82%, which is higher than the threshold of 80% for good agreement (Guest et al. 2012).

Results

We examined a total of 47 engineering librarian postings that corresponded to 48 positions (one posting was for two positions): 19 from 2018 and 28 from 2019. The postings were located in 26 states and at 28 universities. The majority of positions (69%, $n = 33$) were from institutions that are classified as Doctoral Universities: Very High Research Activity by the Carnegie Classification for Institutions of Higher Education (Indiana University 2017). Eight positions were from institutions classified as Doctoral Universities: High Research Activity and seven positions from Master's Colleges & Universities: Larger Programs. Of the 48 positions, there were 36 different job titles. The most common job title was STEM Librarian ($n = 7$).

What is the salary range and median for these engineering librarian job positions?

Almost two-thirds of job positions ($n = 31$, 65%) mentioned salary (Figure 1), quantitatively, qualitatively or both. Most commonly, salary was only described qualitatively ($n = 15$, 31%), using words such as 'commensurate' or 'competitive.' Seventeen percent ($n = 8$) described salary both qualitatively and quantitatively; another 17% ($n = 8$) only mentioned salary quantitatively. Of the positions that gave a quantitative salary, eight positions (50%) gave a salary range and three positions (19%) gave two salary levels, based on rank upon hire.

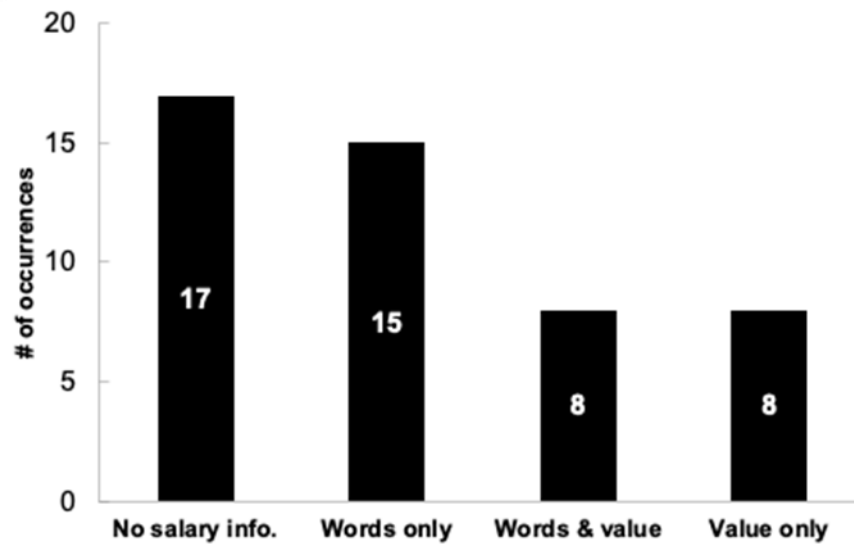


Figure 1: How salary was described in the job positions ($n = 48$)

The range of salaries for all positions that listed a quantitative value was \$45,000 to \$81,606 (including all salary levels, if two were listed). The median salary was \$60,750 with a standard deviation of \$7,329 (calculated using the lowest salary level, if two were listed; calculated using median value of salary range, if range was listed). The majority of salaries ($n = 10$, 63%) were clustered between \$56,000 - \$65,000 (Figure 2).

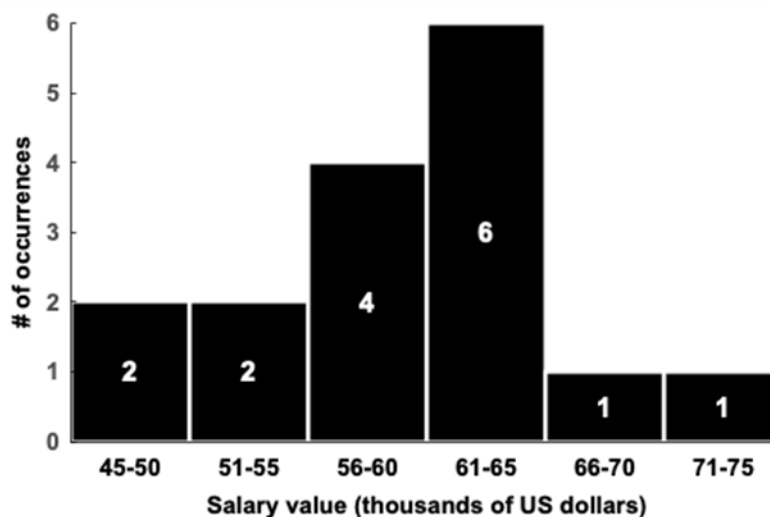


Figure 2: Histogram of salary values for positions that gave a quantitative value ($n = 16$). If a salary range was given, the median salary was used. If two salary levels were listed, the lower level was used.

What education is commonly listed in these positions?

All positions (100%, $n = 48$) listed a Master's of Library and Information Science (MLIS) degree from an ALA accredited program as a qualification: 98% ($n = 47$) as a required qualification and 2% ($n = 1$) as a preferred qualification. Sixteen positions (33%) also accepted an equivalent degree in lieu of the MLIS; all mentions were as a required qualification. The most frequently mentioned level of this degree was Advanced ($n = 11$; Table 2). Only one equivalent degree level was mentioned in each position. Equivalent degree discipline varied, and multiple disciplines could be mentioned (Table 3). The term 'relevant' was most frequently used ($n = 7$) to describe the discipline of this degree.

Table 2: Level of equivalent degree required ($n = 16$); synonyms for advanced were graduate and professional; a synonym for doctorate was terminal.

Equivalent degree level	<i>n</i>
Advanced	11
Doctorate	2
Not specified	2
Masters	1

Table 3: Discipline of equivalent degree required; Synonyms for relevant were related, appropriate, and comparable. Multiple disciplines could be listed.

Equivalent degree discipline	<i>n</i>
Relevant	7
Engineering	4
Not specified	4
STEM	3
Life sciences	1

An additional degree (beyond the MLIS or an equivalent degree) was mentioned in 73% of the positions ($n = 35$). Of those that mentioned an additional degree, 31% ($n = 15$) mentioned two acceptable levels (undergraduate and graduate) for the additional degree; in all 15 positions, the levels were connected with 'or.' meaning that either level was acceptable. For example, one job position listed "undergraduate or graduate degree in a STEM field." An additional degree (with one- or two-degree levels) was most commonly mentioned in the preferred qualifications (Table 4). As for the level of the additional degree, the most frequently mentioned were Advanced ($n = 20$) and Bachelor's ($n = 18$; Table 5).

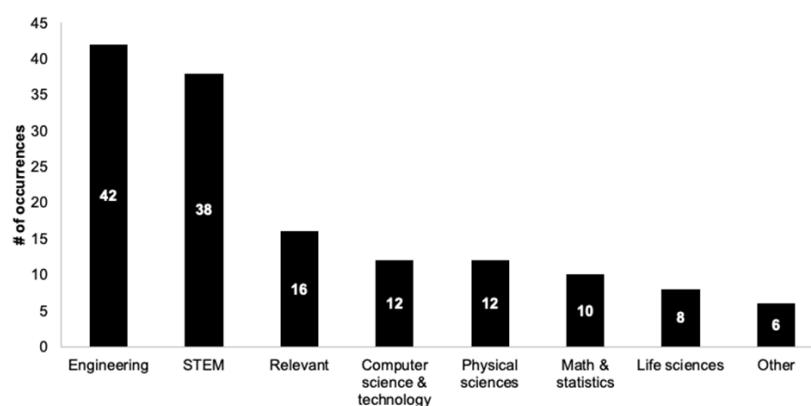
Table 4: Locations of additional degrees (one degree level or two degree levels).

Location of additional degree	One level	Two levels
Mentioned in required qualifications	4	4
Mentioned in preferred qualifications	16	9
One mentioned in required qualifications, and one mentioned in preferred qualifications	Not applicable	2

Table 5: Additional degree levels. Synonyms for advanced were graduate and professional. Multiple levels could be listed.

Additional degree level	<i>n</i>
Advanced	20
Bachelor's	18
Not specified	10
Master's	2

Of the positions that mentioned an additional degree, 32 (91%) wanted this degree to be in a STEM discipline. Positions could list multiple disciplines for the additional degree, with engineering being the most common discipline mentioned ($n = 42$), followed closely by STEM ($n = 38$; Figure 3). Interestingly, when positions mentioned both two-degree levels, STEM ($n = 29$) was mentioned more frequently than engineering ($n = 17$).

**Figure 3:** Disciplines listed for an additional degree. Multiple disciplines could be listed. The STEM discipline includes mentions of this acronym and mentions 'science' as a discipline. Synonyms for relevant were related, appropriate, and comparable. Examples of disciplines in the Other category include data science, data-driven field, and informatics.

What other types of academic or professional experiences are commonly listed in these positions?

Previous academic library experience was mentioned in 56% of positions ($n = 27$). Mentions of this experience were almost evenly split between the required qualifications ($n = 14$) and the preferred qualifications ($n = 13$). Positions did not often list a length of time needed for this qualification ($n = 13$; Table 6). Under the parameters of this study, positions could also list a specific type of academic library experience: twenty-three positions did not specify a type; six positions specified experience working at a STEM library; two positions specified experience working at a special library. (Positions could list multiple types.)

Table 6: Length of time for experience working in an academic library as a qualification.

Academic library experience length of time	<i>n</i>
Length not specified	13
1 - 2 years	10
3 - 5 years	3
5 + years	1

Almost 80% ($n = 37$, 77%) of positions were seeking more general types of previous academic or professional experience. These mentions occurred more frequently in the preferred qualifications ($n = 24$) than the required qualifications ($n = 13$). (Positions could list multiple types of experience.) Knowledge of, coursework in, or an academic background in a discipline was mentioned most frequently ($n = 32$), followed by professional or work experience ($n = 13$) and lab or research experience ($n = 5$). While this terminology seems vague, it does mirror the language used in the job postings. An example of professional or work experience was "experience working with engineers or in an engineering field."

Discussion

What is the salary range and median for engineering librarian job positions?

In this study, only one-third ($n = 16$, 33%) of the engineering librarian positions provided a quantitative salary value. This is slightly higher than Sterner's (2020) study, which found that 25% of STEM librarian positions listed one. We cannot determine if the salary range and median in our study are representative of engineering librarianship. A previous study also noted this phenomenon: lack of salary values in job postings does not allow for generalizable conclusions (Kim and Angnakoon 2016). Listing a quantitative salary range centers DEIA in the job posting. Librarians from underrepresented groups have acknowledged that listing a

salary is a more equitable practice (Hodge and Anantachai 2021). On a larger scale, the state of Colorado's Equal Pay for Equal Work Act requires job postings to list hourly or salary compensation and benefits (Equal Pay for Equal Work 2019). The sponsors of this law specifically cite the persistent and pervasive gender and racial pay gaps as the justification for the law. Additionally, providing a salary level for each possible rank upon hire (three positions in this study did so) indicates that candidates with varying levels of experience would be considered for the position, which could make the position attractive to a more diverse candidate pool. It also shows how a librarian's salary can increase with promotion or tenure.

Furthermore, there are several pressing pragmatic reasons for listing a quantitative salary range. First, a recent study by LinkedIn showed that potential applicants look at salary first when reading a job posting, giving postings with this listed a competitive edge (Maurer 2018). Another important consideration is that some job lists will not include a job posting without salary information. Acting on salary as an equity issue, We Here, a community for Black, Indigenous and People of Color (BIPOC) in LIS, has a weekly mailing list of job opportunities and they explicitly state, "if an actual salary, range, or hourly rate is not included, we will not share this job, so please do not send it" (We Here 2020). It is possible that other job lists will enact similar policies. These two points may be ways to convince skeptical colleagues that a quantitative salary range is an imperative part of a job posting. A better DEIA practice would be to provide as much information about salary as possible, including a quantitative range (Geraci and Farrell 2019; Weak 2014).

Merely using qualitative salary descriptors (words like commensurate and competitive) favors those already working in academia (Laganse and Ng-Chan 2020). For example, prospective applicants with an academic library work history are more likely to have the resources and network to determine what a competitive salary is than a recent engineering PhD graduate. However, adding the word 'negotiable' with a quantitative salary range is a good DEIA practice (Thielen and Neeser 2019). This word indicates that the library is willing to negotiate with a candidate. In one study, when "salary is negotiable" was added in the job posting, men and women were equally likely to negotiate but, if this phrase was missing, women were half as likely to negotiate (Leibbrandt and List 2015; note that this study only looked at gender as a binary construct). In our study, only 4% of positions ($n = 2$) used this word to describe salary. When asked about negotiating compensation during the hiring process, many librarians wanted explicit signaling that negotiation was expected and accepted (Geraci and Farrell 2019). Geraci and Farrell remind us that "it is not enough to encourage the act of negotiation; we must also understand what is at stake, what works best, and what can be won through strategic action, individually and collectively" (2019, n.p.). It is this type of strategic action that is necessary to advance DEIA in academic librarianship.

Finally, while salary may be rigidly defined, there are other ways to highlight the financial aspects of the position. Explicitly call out inclusive benefits such as tuition

waivers or reimbursements, dependent care subsidies, or professional development funds. While not salary, these benefits can make a huge financial contribution to employees and a sense that the organization values an employee's growth and success. Benefits illustrate concrete ways the university is being inclusive and equitable. The recent study on recruitment noted that listing noncash benefits (paid time off, health and dental insurance, etc.) in job postings increased the number of applicants, showing that articulating these benefits helps to expand candidate pools (Appcast 2018).

What education is commonly listed in these positions?

An MLIS degree was a required qualification in 98% of positions ($n = 47$). A recent survey of STEM librarians also found that 98% were required to have an MLIS degree (Sternier 2020). However, 33% of positions ($n = 16$) in our study accepted an equivalent degree in lieu of an MLIS. Requiring an MLIS degree will deter candidates without this degree but who have relevant STEM disciplinary knowledge and experience. While Gohr (2017) does not argue that the advanced library degree should "be done away with entirely, it is important that we recognize that offering multiple alternative paths to librarianship is critical to ensuring a more equal participation ... especially [for] oppressed groups" (51). Hiring applicants without an MLIS degree is common in public libraries but is becoming more accepted in academic libraries (Crumpton 2015; Hawthorne 2016). Two-thirds of positions ($n = 32$, 67%) desired an applicant with both an MLIS degree and a degree in a STEM field. More specifically, 44% ($n = 21$) of all positions were looking for a candidate with both an MLIS degree and an engineering degree (although other disciplines could be listed). For an additional degree level, an advanced degree ($n = 20$) was mentioned most frequently. This indicates that the positions were often looking for candidates who have multiple graduate degrees. This is a startling result when considering that, in 2018, only 10% of the US adult population had a Master's degree and only 2% had a doctoral degree (Oh and Kim 2020).

These data about degrees are troubling from a DEIA perspective because there are major societal barriers to accessing higher education, including the untenable tuition increases and the subsequent student debt crisis (Mitchell, Leachman and Masterson 2017), racist entrance exams (Soares 2020), difficulties transferring credits (especially from two-year institutions to four-year institutions; Malcom and Feder 2016), and many others. Within STEM fields, there are additional, unique barriers to degrees, including but not limited to 'gatekeeper' courses that are prerequisites for STEM degrees (Gasiewski et al. 2012), and lack of adaptive aids, accessible facilities, and accommodations for students with disabilities taking STEM lab courses (Thurston et al. 2017). Many of these significant cultural and institutional barriers disproportionately affect underrepresented groups in STEM: women, BIPOC, people with disabilities, members of the LGBTQ+ community, etc. It is not surprising then that, according to the National Center for Education Statistics, Hispanic, Black, and American Indians/Alaska Natives received only 22% of STEM bachelor's degrees and 9% of STEM doctorate degrees (United

States Department of Education Office of Planning, Evaluation and Policy Development 2016).

Weak (2014) notes the importance and value of compassionate hiring practice, saying “if you write a realistic [job posting] that reflects the character of your workplace, you will draw in the candidates best suited to work with you” (3). Sterner (2020) found a disconnect between responsibilities and qualifications in the job postings when compared to what STEM librarians’ thought was necessary to complete their job. Librarians whose job postings required an advanced STEM degree felt that it was not necessary, but rather it is “more important to have a willingness to learn and ability to build positive relationships with people.” (Sterner 2020, 15). When writing a job posting, have a frank conversation about which degrees will help the person to fulfill the job responsibilities. Resist the mindset of justifying degrees by ‘this is how we have always done it.’ This mindset is not centering DEIA within the hiring process; it favors those on the inside and from dominant groups. For this reason, the reuse of previous job postings is highly discouraged, even if there is only a few years between searches (Defa 2012; Hawthorne 2016). Each posting should be treated uniquely, even if it is a long-standing position in the library.

From our data and the myriad of societal inequities related to higher education, we believe that it is neither the MLIS degree nor STEM degree that is the barrier; it is the combination of the two that is the barrier. We specifically suggest doing an analysis of which degree is more relevant for a position: the MLIS degree or the STEM degree. List the more relevant degree as a required qualification and the other degree as a preferred qualification. Or consider not listing the less relevant degree. We believe that to make STEM librarianship more diverse, the MLIS degree should be a preferred qualification (or not listed at all). As Beck and Callison (2006) note, STEM librarians without a formal STEM education bring other perspectives and strengths to the field. More broadly, Gohr (2017) states that, “to argue that an MLIS is the only way to ensure a competently and fully ‘credentialed’ librarian is a relic of capitalist, patriarchal, white supremacist, classist argument that fails to consider not only the changing landscape of education in the information age and the disproportionate threat of the digital divide, but also those skills that are not taught in library school” (47). Recruiting people outside of the traditional LIS pipeline has been noted as one important way to diversify academic librarianship (Cruz 2019). Another way to be more inclusive is to specify ‘STEM’ as the degree discipline, rather than only engineering. But the most inclusive practice is to not list degree disciplines; rather include explicit language that candidates need not have a STEM background and you are seeking to hire someone with a willingness to learn about STEM. When considering degree requirements, it is important to remember that only 11% of librarians have a background in any STEM discipline and less than 3% specifically have a background in engineering or computer science (Clarke and Kim 2018). Continuing to write job postings with both the MLIS degree and a STEM degree as required qualifications is not going to improve the diversity of STEM librarianship.

What other types of academic or professional experiences are commonly listed in these positions?

While overwhelmingly the positions' top requirement was for applicants to have an MLIS degree, academic or professional experience was listed in 77% of positions ($n = 32$). Interestingly, this type of experience occurred more frequently than previous academic library experience ($n = 27$). Accepting academic or professional experience (such as coursework, a certificate, or experience working with engineers), instead of an additional degree, is a more inclusive practice because it takes societal inequities into account. These experiences are ways for candidates to demonstrate their interest in or knowledge of STEM, without needing a degree. Beck and Callison (2006) agree, saying that search committees should "recognize that all of a candidate's experiences, rather than just a certain degree alone, are what is needed to make a good employee" (93) and focus on applicants who "are able to cultivate their skill sets, backgrounds, and experiences to benefit the organization" (95).

Fifty-six percent of positions ($n = 27$) were looking for a candidate with previous academic library experience. The majority did not specify the type of library this experience occurred at, but six positions specified experience working at a STEM library and two positions specified experience working at a special library. (Positions could list multiple types.) We believe that it is a more inclusive practice to not specify a type of library. Many potential candidates may not have had the opportunity to work in a STEM library. Also, not listing a specific amount of time for this experience is an inclusive practice for these same reasons.

Overall, we feel that many of these positions were written with a 'this is how we have always done it' mentality. We found in multiple postings that text had been copied verbatim from engineering librarian postings from other institutions, indicating that an individualized analysis of responsibilities and qualifications was not conducted for the position. In quantifying the qualifications for education and academic or professional experience in these postings, we have clear evidence that candidates for engineering librarian positions are expected to fit a very specific mold: 67% ($n = 32$) of positions wanted a candidate with both an MLIS and a STEM degree. In order to truly commit to DEIA, the mold needs to expand; otherwise, the status quo will not change, and STEM librarianship will not diversify. As Gohr (2017) states, "hiring practices within libraries should be radically redefined to consider varying levels of equal but different education and experience" (51).

This study has several limitations. The scope of job postings analyzed was limited to positions with liaison duties to engineering disciplines that were posted in 2018 and 2019. A longitudinal study on the same area could look for how these variables have changed over time. Additionally, only full job postings could be analyzed; five postings were excluded because the full job posting could not be located. Additionally, future studies could look at additional variables related to DEIA, such as benefits information and mentions of anti-racism.

It is important to acknowledge that our study offers a snapshot of very privileged work in academic libraries because only full time, permanent positions in the US were included. A recent study found that 33% of job postings at Canadian academic libraries from 2017-2019 were for precarious work, such as contract or part-time work, and this percentage had increased over time (Henninger et al. 2020). Precarious positions have many DEIA issues. A future study could investigate the same variables in this study (salary, education, and experience) for these types of positions.

Conclusions

Our research sheds light on a small part of a larger problem within academic librarianship: lack of DEIA in the hiring process. We have shown that job postings have much room for improvement in terms of incorporating DEIA principles and practices. But change can happen. Libraries must move beyond performative words (like merely including a generic DEIA statement) to concrete actions (like listing a quantitative salary range) in their job postings, as one step towards addressing systemic oppression within our institutions. Libraries need to adopt what Brook et al. (2015), call “antiracist social justice-oriented thought and practice” to help resist “normative notions in librarianship that uphold racist, classist, transphobic, sexist, ableist, and heterosexist practices” (249) in all areas of our work, including job postings.

Let this study serve as a call to action: we hope it motivates readers to completely reevaluate how their institutions write job postings. While this study focused on engineering librarian job postings, our data has informed the development of a set of recommendations that are applicable to all academic library job postings. These recommendations, while not an exhaustive list, demonstrate how to put this research into action. They will fundamentally challenge how job postings are written and, therefore, may be met with resistance. But, as Sensoy and DiAngelo (2017) articulate, “institutions can and do change policies all the time. But we must have the will. Centuries of exclusionary policies will not shift without commitment and the courage to fight resistance” (577). To truly incorporate DEIA, there must be uncomfortable conversations and difficult decisions about job postings. We hope that our study and recommendations make you feel empowered to do so.

Here is our list of recommendations:

Limit the number of qualifications, both required and preferred.

One position in this study had 16 required qualifications and six preferred qualifications. A large number of qualifications may deter applicants (Mohr 2014); additionally, it makes it difficult for applicants to write concise, yet effective, cover letters (Weak 2014). When developing a job posting, the posting should reflect the responsibilities of a single person and only list qualifications that help fulfill those responsibilities (American Library Association 2021). Explicitly remind candidates that not all of the preferred qualifications need to be met in order to apply.

Show. Do not tell. Include concrete ways your institution is committed to DEIA.

Go beyond the generic DEIA statement by including DEIA and anti-racism statements that address specific social oppressions (such as non-discrimination policies and employee protections for marginalized groups). Adding specificity to these statements makes your institution more attractive to applicants from marginalized communities (Ford 2018) and furthermore demonstrates how your institution has put these statements into action. Show that systemic and institutional changes are being made by listing your tangible DEIA work, such as inclusive collection policies, changes to cataloging vocabulary, and work to divest from products of prison labor. Otherwise, potential applicants have to do the research themselves, which is adding to their burden and ultimately may deter them from applying. Additionally, list the geographic location of your institution clearly. Location is crucial for members of marginalized communities because they need to evaluate the geographic location of a job, in order to ensure that they are safe and that the laws of the state protect their human rights. For example, housing discrimination based on sexual orientation or gender identity is legal in 21 states (Movement Advancement Project 2021).

Avoid generic phrases; be as specific as possible.

An example of a generic qualification to avoid is 'MLIS degree or equivalent combination of education and experience.' How is a candidate supposed to determine if their education and experience is equivalent to an MLIS degree, especially if they do not have an academic library work history? Ambiguity deters people from applying. The above qualification could be revised to say, 'MLIS degree. An equivalent combination of education and experience in a STEM field may be accepted. If you have questions about your education and experience being acceptable, contact [appropriate point person, such as the search committee chair].' Be explicit if it is entry level. Possible language to indicate this includes: 'must have completed degree before start date.' This phrasing indicates that the candidate must have the degree before starting the job, but not before applying.

Include anti-racist language in job postings.

Being silent on systemic racism in our society condones it. Garcia (2020) urges the inclusion of explicit language in job postings to show clearly that your institution is committed to hiring anti-racist people. Consider asking candidates to write an anti-racist statement, rather than a DEIA statement, or make anti-racism a required qualification. At the same time, it is important to acknowledge that candidates may not have had the opportunity to pursue anti-racism in their work so recommended language for a required qualification could be 'prior experience or demonstrated potential to incorporate anti-racism in daily work and advocate for an anti-racist institution.'

Ask questions and start conversations, even if you are not in a position to change how job postings are written.

Some of these recommendations you may not be able to implement due to existing structures in your library or institution. However, you can start asking the why questions. Why do candidates need an additional graduate STEM degree? Why do candidates need to have three years' experience working in a special library? You may find out that there is not a valid reason, rather 'this is how we have always done it.' You may not have control over human resources, library, or institutional requirements for job postings. But you can start asking questions and hopefully inspire your colleagues to do the same. Ultimately these questions will lead to permanent and meaningful change.

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Supplemental Content

Tables & Figures

An online supplement to this article can be found at <https://doi.org/10.7191/jeslib.2022.1212> under "Additional Files".

Data Availability

The dataset from this study is openly available at <https://doi.org/10.13020/7743-vf17>. The authors strongly encourage re-use of this dataset.

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