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Let's Talk about Disability: Disability Justice in Engineering Librarianship

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Let’s Talk About Disability:

Considering Disability Justice in STEM Librarianship

Abstract

Despite efforts to improve DEI on college campuses, bias and discrimination still exist in higher education settings, particularly for disabled students, who are often forgotten or less emphasized in DEI efforts. In some disciplinary areas, such as in science, technology, engineering, and math (STEM) fields, disabled students are more likely to experience discrimination due to a reportedly more competitive and less flexible and supportive environment. Academic librarians and other educators can make a difference for these students by contributing to a more inclusive campus environment for disabled people in STEM by implementing universally accessible and inclusive pedagogy, resources, services, and spaces. Such efforts are more effective when they incorporate a disability justice perspective, which provides an intersectional framework to understand how individuals experience disability. This paper will present a disability justice-informed perspective in hopes of allowing librarians who work with disabled STEM student to gain a more nuanced understanding of ableism and the many barriers disabled people encounter in STEM fields as well as more broadly in higher education.

Introduction

In recent years, there has been a significant and much needed focus on diversity, equity, and inclusion (DEI) in academia. Although some progress has been made regarding DEI policies, programs, and awareness [1], [2], critics have pointed out there is still much to be done, noting that many students and scholars continue to regularly experience oppression and discrimination on college campuses, within their academic departments, and in degree programs [3], [4], [5], [6]. Exclusion and bias are particularly prevalent in science, technology, engineering, and mathematics (STEM) fields, where research has found that people with dominant identities (i.e., male, non-disabled, white, heterosexual, cisgender) disproportionally benefit from societal support and encouragement, financial rewards, and preferential access to educational, research, and professional opportunities [7]. In a technologically-oriented global economy, STEM fields offer a growing number of employment opportunities that could be beneficial for a more diverse workforce, who, in turn, would enrich and enhance these disciplines with their knowledge, perspectives, culture, experience, skills, and creativity [8], [9].

Disabled students and scholars are among those who experience ongoing discrimination and underrepresentation in STEM disciplines. Despite the fact that approximately 20% of Americans have disabilities [10] and that disabled students enroll in higher education at a similar rate of representation (19%) [11], they are significantly underrepresented in STEM fields [12], [13]. The National Center for Science and Engineering Statistics (NCSES) [2023] states that there is limited information on how many STEM students are disabled, but their data show that in 2021, doctoral degree recipients with at least one disability had lower representation in STEM (10.8%) than in non-STEM fields (13%). The discipline with the lowest rate of degree earners with a disability was engineering (8.2%) [14]. Additionally, the National Science Foundation [15] reports that disabled scholars receive less funding and had lower employment rates than their non-disabled peers, and the National Institute of Health (NIH) [16] found that the percentage of disabled people in professional STEM fields grew only 3% (from 6% to 9%) between 1999 and 2019, but that the number of people in STEM fields overall increased approximately 79% since 1990 [17]. Poignantly, research has also shown that there is a significant disparity between disabled STEM students who have dominant identities and those who have what are considered multiply-minoritized identities, particularly feminine presenting-people of color [18].

There are many factors that contribute to disabled students' low representation in STEM fields and education, including, but not limited to: discouraging experiences in their primary and secondary schooling, struggles to receive and maintain often-inadequate accommodations, bias and discrimination towards disability, a lack of accessible instruction, labs, and tools, poor mentorship, as well as exclusion from social and research opportunities [19], [20], [21], [13]. In their paper, "Examination of Ableist Educational Systems and Structures that Limit Access to Engineering Education through Narratives," Autumn Cuellar, Brady Edward Webster, Sakashi Solanki, Catherine Mcgough Spence, and Marissa Tsugawa [2022] relay the personal experiences of disabled engineers in higher education; their vivid first-hand accounts provide examples of many of the ways in which academic institutions inhibit success and create barriers for disabled students in STEM educational settings [22]. Clearly, there is work to do to increase representation, retention, and the success of disabled people in STEM.

Academic librarians, who have long considered themselves to be advocates for student success and engagement, can contribute to supporting disabled students and scholars in their academic communities. Library and information science (LIS) scholarship promotes the central role of academic libraries and librarians in higher education, highlighting their contributions to student retention, learning, well-being, empowerment, and even personal development [23], [24], [25]. Academic librarians describe themselves as an integral part of the student experience due to their provision of academic supports and services, spaces, tools and resources for academic work and collaboration. Additionally, academic librarians and libraries encourage and foster a sense of belonging for students via events, programs, and employment, as well as by helping them develop academic and job-relevant skills [26], [24], [27]. These many student-centered efforts can, and often are, implemented to support specific under-represented populations, such as disabled students. With focused intention, self-education, and sustained effort, librarians can build in support for disabled students and scholars in their work, including practices such as the implementation of inclusive pedagogies in library instruction, developing awareness of ableist language and microaggressions, providing inclusive and accessible collection development, events, and outreach, collaborating with disability support offices, and finding ways to help disabled students feel like they belong in their disciplines and at their institutions, with particular emphasis in STEM and other fields which are reputed to be less supportive of such students' success.

However, the efficacy of librarians' efforts to support disabled students and researchers could be improved and augmented by incorporating a Disability Justice lens in their design and implementation. Disability Justice scholars argue that an individual's experience of disability and being disabled is impacted by many aspects of their identity, including factors such as race, socioeconomic status, gender identification, sexuality, religion, and other group affiliations, and that access and inclusion for disabled people must take the intersectional nature of their identities into account [28], [29], [30], [31]. In her article, "Making a New Table: Intersectional Librarianship," Fobazi Ettarh [32] emphasizes the inadequacy of what she calls "single axis thinking," by which she means addressing disability issues without an intersectional lens. Ettarh argues that solutions and support efforts that fail to address intersectionality are limited and often unsuccessful because they fail to consider how disabled people with varying layers of identity experience discrimination and barriers to participation in academia. By maintaining an intersectional perspective when developing student supports, librarians and educators can shift away from the minimal goal of merely providing access to disabled people in higher education to welcoming, including, and valuing their participation and contributions.

Disability and ableism in higher education

Disability has many definitions[1]; a problematic but often-cited one is offered by the *Americans with Disabilities Act* (ADA), which states that a person with a disability "has a physical or mental impairment that substantially limits one or more major life activities" [34]. In their article, "Access is Not Problem Solving: Disability Justice and Libraries," Alana Kumbier and Julia Starkey argue that this definition serves to represent disability as "a medical problem," that is "something to be rehabilitated or treated at the individual level" [31, p. 472]. They discuss how this definition aligns with what is known as the "medical model" of disability, which understands disability as an individual "flaw" that must be "fixed" via medical diagnoses and interventions. These interventions, commonly referred to as "accommodations," allow a disabled person to participate in a society (or, more specifically, an institution, class, program, activity, etc.) that was designed in a way that otherwise excludes them. Kumbier and Starkey argue that this method of addressing disability is highly problematic in that it puts the responsibility for finding ways to access resources, such as spaces, education, information, transportation, services, and other aspects of modern life, on the disabled people themselves, rather than demanding that society and institutions take responsibility to provide access to all members of society through universal design and inclusive policies.

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[1] For an in-depth discussion of issues faced by disabled people, see *Disability: the Basics* by Tom Shakespeare [33]. It is important to note that disabilities are highly variable and include physical, neurological, medical, psychological, and other types of conditions.

This systemic and pervasive eschewal of responsibility to include disabled people allows society and its institutions to continue ignoring the disparate and grossly unequal access to resources for people who do not conform to specific social norms. Kumbier and Starkey recognize that the medical model and its accommodations system is, unfortunately, the dominant paradigm; however, they argue that there is better, more equitable way to approach disability, which is commonly known as the "social model" perspective, which seeks to investigate and rectify the way society imposes barriers and limitations on disabled people. Kumbier and Starkey contend that a just and inclusive society values all its members; they believe that the responsibility falls to everyone to help design systems that allow all people—including disabled people—the opportunity to participate in society and gain access to resources.

Unfortunately, as Sins Invalid [28][2] discusses, such a society does not yet exist. It is well-documented that disabled people, regardless of whether their disability is visible, invisible, or intermittent, experience various forms of ableism [35], [36]. *Ableism* refers to bias, discrimination, and exclusion imposed on disabled people by individuals, systems, and society due to their disability, as well as the privilege experienced by nondisabled/minded people in society and institutions [37], [38]. Another term, *disableism*, refers to the negative portrayal of disability as a deficiency and inadequacy that has no positive value or attributes [39], [40].

Disabled people experience ableism in a variety of ways, such as discriminatory structures, policies and systems; inaccessible spaces and resources; negative portrayals, beliefs, and stereotypes; or harmful behavior [41], [35]. Some expressions of ableism are overt and aggressive, such as violence, housing discrimination, derogatory language and insults, or avoidance and exclusion [42], [43]. Other variations are more subtle, such as expressions of pity, paternalism, unearned or exaggerated praise, unwanted assistance, or "inspiration porn," which refers to depictions of disabled people used to inspire and motivate nondisabled people [42], [44].

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[2] According to their website, Sins Invalid is Sins Invalid is "*a disability justice performance project that centers people of color, queers, nonbinary and trans people with disabilities*." For more information, visit https://www.sinsinvalid.org/.

Ableism is very much present in higher education settings. In his book, *Academic Ableism,* Timothy Dolmage [2017] provides an in-depth exploration of the history of ableism in academia, where disabled people have long been treated as inferior or faulty specimens to be studied, rather than as vibrant, valuable, contributing members of the scholarly community [40]. Although disabled students and scholars gained a certain degree of legal protection in educational settings under the Americans with Disabilities Act (ADA) in 1990, this protection did little to change the fact that post-secondary environments are designed for non-disabled people. Instead of creating authentically inclusive learning spaces, institutions of higher education developed systems based on the medical model of disability, which provide accommodations to qualifying disabled individuals to provide them with basic access to instruction, resources, and spaces. Moeller [45] refers to accommodations as “retrofits” to emphasize how they are, essentially, afterthoughts or workarounds to systems designed without consideration for disabled people and that often fall short of providing adequate support and access to resources students need to succeed.

Although they are the way most institutions of higher education fulfill their legal duty to make education accessible to disabled students [31], accommodations are problematic in many ways. Due to the complicated and time-consuming application process, accommodations are frustrating and time-consuming for students and scholars to secure, are often inadequate, and are difficult to adjust or change due to the arduous process disabled people must go through to receive accommodations [46], [47], [48]. Even when accommodations are helpful, students must be willing to make themselves vulnerable to disclosing their disability to be able to access them, which can be stressful and may have other negative impacts, such as being judged as unable to do their work or studies, being shamed, or experiencing hostile responses and non-compliance from faculty or employers [49], [22], [48].

Additionally, not all students who could benefit from accommodations receive them. Disability Justice scholarship asserts that due to intersectional identities, many disabled students and scholars do not receive the same levels of access to accommodations as some of their peers, who may have increased access due to their more privileged identities [30], [31]. Also, students may have undiagnosed disabilities, or may choose not to apply for accommodations due to the difficulty and frustration of the process, or because they no longer want to identify as disabled or believe they no longer need support [46]. Research shows that students who have invisible disabilities[3] are particularly unlikely to declare their disabilities due to fear of prejudicial treatment and challenges to the legitimacy of their disabilities and accommodation requests [46], [47], [50], [51].

Regardless of the reason students do not receive accommodations, research shows that due to the inaccessible and ableist nature of higher education, disabled students have better outcomes when they are able to access accommodations [46], [52]. However, a more inclusive design of services, spaces, and resources can help minimize disabled students' reliance on the accommodation system and provide support for a variety of student needs, regardless of their official disability status [47]. In contrast to the accommodation/medical model-based system, many disability rights, social justice, and disability justice scholars promote methods of supporting disabled people based on the social model of disability, recognizing that society, institutions, and systems create the barriers that exclude disabled people and that inclusion requires the proactive design of spaces, resources, systems, and policies [29], [53]. Universal Design for Learning (UDL)[4], Universal Design for Instruction (UDI)[5], Design Justice [55][6] and other inclusive pedagogies

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[3] Invisible disabilities include a range of disabilities that are not immediately apparent to an observer, such as medical issues, learning disabilities, anxiety, mental health issues, and a whole range of other conditions. For more information, see: https://invisibledisabilities.org/what-is-an-invisible-disability/ and https://www.invisibledisabilityproject.org/.

[4] Developed by CAST (the group's original name the Center for Applied Special Technology), Universal Design for Learning (UDL,) which is described on the CAST website as "a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn," is heavily addressed in the scholarly literature. See the CAST website at https://udlguidelines.cast.org/ for the basic outline of this method of accessible instruction. A search of UDL will result in many books, articles [54], and videos about using UDL principles as well as challenges and critiques of the method.

[5] See S. Burgstahler's article, "Equal Access: Universal Design for Instruction" for a description of UDI, which is a modification of UDL. Available at https://www.washington.edu/doit/equal-access-universal-design-instruction.

[6] According to Sasha Costanza-Chock, author of *Design Justice: Building the Worlds We Need*, an open access book published by the MIT Press, "Design justice" is "an approach to design that is led by marginalized communities and that aims explicitly to challenge, rather than reproduce, structural inequalities. It has emerged from a growing community of designers in various fields

approach disability by looking for ways to change systems, instruction, spaces, materials, tools, knowledge assessment, and resources to maximize accessibility for all members of an academic community.

Challenges for disabled students in STEM

Disabled people face a broad range of barriers and challenges to participating in academia, such as bias, non-inclusive policies, having to self-advocate, needing to manage their disability in addition to the demands of their work or coursework, a lack of accessibility to instruction, spaces and materials, and inadequate accommodations [56], [46], [57]. Disabled students in STEM experience additional barriers specific to their disciplines [58], [59], including having to face a strong cultural bias about what a “good” STEM student should be like, inaccessible lab spaces and research tools, inflexible course and degree requirements, unrealistic expectations in research settings, a lack of instructor education about disability, inadequate mentoring, and a lack of feeling like they belong or that they are valued for their contributions [12], [60], [61]. Many disabled students report that these barriers are significant enough to discourage them from completing a STEM degree, influencing some to change to a non-STEM major, or to leave higher education altogether [58].

Scholars note that disabled students are discouraged from even entering STEM fields in several ways. Starting early in their educational experiences, few disabled students are encouraged by teachers to pursue STEM subjects or participate in STEM-related activities (such as math or science clubs) due to a biased assumption of inability [19]. In post-secondary education, many introductory courses in STEM disciplines are not accessible to disabled students: lectures are taught in large, distracting auditoriums where technology may or may not be digitally accessible, lab sections are often held in physically inaccessible spaces, with tools designed for non-disabled

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who work closely with social movements and community-based organizations around the world.” The book is available at https://designjustice.mitpress.mit.edu/.

users, and which may be taught by graduate students with no teaching experience or understanding of inclusive instruction [19]. Additionally, disabled students report that they are often unsure about what supports may be possible for them to receive; many report that they are not informed about what accommodations are available or possible. This lack of information prevents disabled students from making informed decisions about accommodation requests [46], [62]. If disabled students are not diagnosed, do not feel safe to declare their disability, or have inadequate or not appropriate accommodations, they may not be able to succeed in what is often described as a competitive environment with inflexible requirements, timelines, and assessment methods [19], [63], [22]. Additionally, disabled graduate students in STEM report a lack of supportive and informed mentorship, information or help securing appropriate accommodations, inaccessible tools, as well as inflexible expectations in labs, timelines, and degree requirements [48], [60], [52], [64].

Another significant barrier to the success and well-being of disabled students and researchers in STEM fields is that many do not feel like they "belong" in their discipline or within their scholarly community. Research has shown that this lack a sense of belonging is due to a variety of factors, such as experiencing microaggressions, the negative reactions of classmates, faculty, and colleagues to the disclosure of disabilities and requests for accommodations, as well as to their not fitting the stereotype or productivity level expected of the "successful" or "good" STEM student or professional [62], [63], [65]. Due to these pressures, disabled people may feel pressure to "pass" as nondisabled by hiding their disability, which can prevent them from fully engaging with peers [22], [51]. Additionally, disabled students may have less time to socialize with colleagues due to the time they must spend managing their disabilities or completing assignments and work, which may be more time consuming due to issues related to the use of assistive technologies or other factors related to their disabilities [66], [67], [68].

Research reveals the vital importance of inclusion in educational settings for student well-being, emotional and academic support, and motivation [69]. Such feelings have been shown to increase disabled students' and scholars' success and engagement in their field [18], [70]. Joanna West [2022] argues that this sense of belonging is the "emotional counterpart to inclusion" and that without this feeling, students do not believe that they are accepted by others or that they are heard, respected, or understood. West notes that a student's sense of belonging creates a positive educational experience that is essential to retention efforts, especially among students from non-dominant groups [70]. Additionally, social support and belonging help increase students' resiliency when facing significant stress and contribute to a student's perseverance in higher education [71].

How Librarians and Educators Can Support Disabled Students and Scholars

In light of the barriers disabled people experience in STEM fields, it is imperative that academic librarians, educators, and colleagues in other institutional roles find ways to create a more inclusive environment. To do this work effectively, librarians and educators must commit to ongoing engagement with disability inclusion and self-education. Research shows that non-disabled people rarely have accurate or current knowledge of disability and thus do not know how to interact with, respond to, or provide services for disabled people in a supportive manner[7] [56]. Since librarianship is a profession that is dominantly white and non-disabled [73], [74], academic librarians must regularly investigate and discuss ableist policies, practices, and behaviors to maintain awareness of both continuing and emerging issues faced by disabled people. This knowledge and attention can help them create an inclusive environment that allows disabled people to thrive and demonstrate their strengths, abilities, and value to their fields [12].

Fobazi Ettarh [32] suggests that a good place to start this work is by developing an intersectional understanding of disability, which acknowledges the intersectional layers of many disabled people's identities which impact their ability to fully participate in academic settings. Ettarh also argues that to become allies to disabled scholars, educators must not only learn about the struggles, strengths, and needs of disabled people, but they must also examine their own biases, beliefs, and contributions to oppressive systems that constitute the barriers disabled people encounter.

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[7] One example of this was highlighted in an NPR story, where Imani Barbarin created the hashtag #AbledsAreWeird to share her uncomfortable experiences with ableist attitudes and behaviors [72].

As Ettarh recommends, self-education is a vital component to the process of creating inclusion; there are many topics allies must learn about which directly impact disabled students, disabled researchers, and disabled library colleagues [52], [53]. In addition to the more technical focus of digital accessibility and ADA compliance for spaces, educators must familiarize themselves with inclusive pedagogies (such as UDL), barriers to student belonging and inclusion, and be able to identify and counteract microaggressions[i] and bias. Disability scholarship suggest that due to the lack of societal awareness of ableism, discriminatory and pejorative expressions and sentiments towards disabled people may be more socially acceptable—and thus more likely to be expressed—than other kinds of prejudice [77]. Additionally, research indicates that unintended comments and other forms of microaggressions cause both physical and psychological harm [78], [77], [79], making it essential that STEM educators are aware of common microaggressions so they can identify them, avoid perpetrating them, and help support disabled students when they occur [80].

It is also helpful for librarians and educators to be aware of different opinions within the disabled community, so that they can be sensitive to people's preferences. For example, awareness of the debate over the use of identity first language or person-first language[ii] allows educators to carefully listen for or inquire about an individual's preferred term. Another example is to understand the potential harm that can be caused by disability simulations, which are activities designed to give nondisabled people the opportunity to "experience" a disability (blindfolding, trying out wheelchairs, and similar). Such simulations are well-meaning in that they intend to educate nondisabled people about the experiences of disabled people, but research has shown that they have the opposite impact of making participants more avoidant of disabled people, and are therefore ultimately harmful and unsuccessful in their goal of increasing empathy and understanding [86].

Self-education efforts may also include learning new strategies for inclusive instruction, such as UDL. Scholars note that disabled students are more comfortable in educational settings where their needs are met without accommodations [47], and UDL helps address this issue. Designed by the Center for Special Applied Technology (CAST), UDL's framework for inclusive instruction is based on the incorporation of three principles: presenting students with multiple means of engagement (what they call the "why" of learning), multiple means of representation (the "what" of learning), and multiple means of action and expression (the "how" of learning). One of the most popular and arguably powerful ways to make instruction accessible, UDL principles and strategies require considerable effort for instructors to learn and implement in their teaching. In their article "One Step at a Time: A Case Study of Incorporating Universal Design for Learning in Library Instruction," Samantha H. Peter and Kristina A. Clement discuss the challenges of incorporating UDL into library instruction by sharing their experience of feeling of being overwhelmed when trying to add multiple elements of UDL into their instruction. They recommend a slow approach of practicing one new technique or strategy at a time and that practitioners collaborate with colleagues with similar interests; communities of practice are helpful for instructors new to UDL to find support and encouragement as well as ideas for ways to utilize the UDL framework [54], [87]. Additionally, research about UDL and disability continually offer insights on how to improve and evolve recommended UDL practices, making it important for practitioners to regularly learn more and consider how to best support all students. This requires sustained dedication, time, and resources. Despite these challenges, UDL proponents argue that not only do instructors provide accessible education to all students, but they also benefit significantly from the implementation of UDL; by building accessibility and inclusion directly into their curriculum, instructors reduce the need to retroactively develop accommodations for disabled students [88], [89], [60].

Perhaps the most important way librarians can educate themselves about disability is to learn about it from the perspective of disabled people. Following one of the Social Justice Movement's edicts made famous by James Charlton [1998], "nothing about us, without us," to truly support disabled people, advocates and allies in higher education must engage directly with disabled students, faculty, researchers and staff and incorporate their participation and feedback in the design of systems, accommodations, supports, spaces, and resources [90]. Although getting this feedback and engagement is potentially challenging due to the low level of disability disclosure in academic settings, it could be accessed in a variety of ways, such as outreach to support centers, advisors, student groups, as well as soliciting feedback from instruction session participants, colleagues, or visitors to reference desks. Additionally, some academic research investigates disabled perspectives and can be a source of student feedback and there are excellent books, documentaries, podcasts, articles, art, music, poetry, and other works created by disabled people that give insight into their life experiences, perspectives, needs, and ideas for change. Accessing these works has the additional benefits of not imposing additional emotional labor on disabled individuals. Such resources can help nondisabled individuals, or those with different disabilities, understand individual disabled people's experiences and perspectives.

Beyond self-education, scholars note that librarians and educators can further support disabled students by strategies used for other DEI efforts, such as diversifying collections, demanding accessible content from publishers of digital collections, staff and student worker training to ensure smooth delivery of services, and outreach efforts [91], [92], [93]. Outreach efforts are a way to promote relationship development, educate students about library resources and services, and to learn about the needs of the academic community [94]. These efforts could include developing relationships with disability services offices and other offices and centers that provide direct support to disabled and struggling students, as well as to affinity groups and centers that offer community and specific supports for students with various diverse identities on campus. Building relationships with such groups could allow librarians and educators to interact directly with students, giving them the opportunity to share their experiences, frustrations, interests, and needs. Such outreach could provide insight into the needs of a wide variety of students and lead librarians to make changes and improvements to libraries and services and ultimately help create more inclusive educational environments.

Another way librarians can support disabled students and researchers is through advocacy. Much of the scholarly literature about advocacy revolves around disabled students' need to learn to self-advocate for what they need [95], but as Disability Justice scholars point out, not all disabled students feel able to self-advocate due to the multiple layers of discrimination they face [28]. In such cases, allies could help provide advocacy, but thus requires the building of relationships, understanding, and trust.

To advocate effectively, librarians and educators must first listen to and understand the voices, perspectives, and opinions of disabled members of their communities, including students, faculty, researchers, staff, and colleagues. As mentioned earlier, accessing these voices could be challenging, but may be possible with extensive outreach efforts to different campus communities, participation in or creation of campus-wide communities of practice or advocacy groups that center accessibility and inclusion, as well as by hosting disability-friendly events featuring accessibility, inclusion, and community building. Advocacy efforts may also focus on educating colleagues and administrators about disability issues.

Barriers to Librarian Supports for Disabled Students

Despite the American Library Association's declaration of diversity as a core value [96] and the profession's aspiration to support all patrons [74], academic libraries continue to lack employment diversity and fail to adequately include voices from those with underrepresented identities [97], [32], [98], [99]. This lack of diversity in libraries has ramifications for underrepresented students and scholars; research shows that patrons feel a greater sense of trust, comfort, understanding, relationship development, and belonging when working with a librarian who shares "interpersonal similarities" [100, p. 155], [101]. In the case of disabled students, few librarians are disabled or well informed about disabilities [102], [103], which may result in their lack of engaging in meaningful, consistent support for disabled students and scholars. Additionally, many academic librarians may assume that such support is not needed, as they believe that disabled members of their academic communities receive appropriate accommodations from the campus's disability services office [104]. Unfortunately, research shows that a majority of disabled students do not disclose their conditions to their institutions; this failure to disclose and the resulting lack of access to accommodations, in combination with the barriers and inaccessibility of the academic environment, results in poorer grades, greater stress, a more negative experience, and even withdrawal from the institution for many disabled students [105], [68].

This circumstance for many disabled students makes it important for librarians and educators, particularly those who work with students in competitive or less supportive disciplines such as STEM fields, strive to provide instruction, spaces, tools, and resources that are as universally accessible as possible to support a wide range of student needs. Such efforts can create welcoming spaces, provide inclusive models to other educators they work with, and add to disabled students’ sense of belonging and comfort in their institutions.

However, it is also important to recognize that academic librarians, along with other educators in the COVID-19 era, may feel overworked, have low morale, or experience burnout [106], [74]. These feelings may make it extraordinarily difficult for many librarians to add another layer of work and responsibility on top of their current job requirements. Additionally, Disability Studies scholars have noted that disability issues are often added as an afterthought to discussions of DEI, are commonly excluded from DEI training, and are often not considered to be a part of DEI work [107], [99]. If this is the case at their institutions, librarians may not have the time, awareness of disability issues, or the capacity to learn about or implement disability inclusivity measures. To counteract this possibility, librarians must engage in conversations about inclusivity with one another and create community around the goals of accessibility, support, and advocacy. Communities of practice, conferences, and professional development sessions can all offer ideas, support, encouragement, and inspiration for interested practitioners. Creating communities and relationships that reinforce this work can help keep the goal of inclusive education for all students.

Conclusion

Disability inclusion and advocacy is not something that happens quickly or easily; educators, advocates, and allies must make concerted effort over time and face their own ableist attitudes, biases, and practices to create inclusive educational environments. Much like Robin D’Angelo’s discussion of white people’s discomfort with the topics of racial bias, structural racism, and white supremacy in her book *White Fragility* [108], non-disabled people may be challenged to relate to disabled people’s circumstances, experiences, and perceptions of the world. They may exhibit significant discomfort and avoidance when asked to engage with these topics or interact with disabled people [39]. Relatedly, some disabled people are also challenged by their own internalized ableism and may struggle to understand the complexities of others’ disabilities and experiences.

It is important to understand, however, that this discomfort and lack of understanding contributes to the continuation of ableism and directly amplifying disabled individuals' feelings of not belonging and the difficulties they face in academic spaces. The centering of disabled people's voices, participation, and safety is particularly urgent now, in a time of political polarization and attacks on academic freedom that aim to limit DEI efforts in some states and institutions of higher education [109]. By engaging with these issues and conversations, STEM librarians can advocate for and support a more just, inclusive, and safe environment for all students.

Statement of Author Positionality

I am a white, educated, middle-aged, middle-class, cisgender, heterosexual, invisibly disabled woman. My disabilities consist of neurological, mental-health and medical issues. Because I can pass as non-disabled and have access to high-quality, affordable health care, I feel conflicted when calling myself disabled. If carefully managed, my disabilities rarely interfere with my work and have minimal impact on my personal life. Additionally, as an assistant professor at an R1 institution, I want to recognize my privilege based not only on the many dominant aspects of my identity, but also due to my position within an institutional hierarchy.

I want to clearly state that I am not any sort of expert on disabilities, nor do I represent the feelings, beliefs, thoughts, or wishes of any disabled groups or individuals. I am, however, passionate about engaging in the conversation of how we, as a society and as educators in higher education, can do more to move towards a more just and inclusive world by making education, and all the benefits it provides, more accessible and attainable to diverse students, including those who are disabled. I also want to recognize that I cannot and do not speak for those with different and intersecting identities and defer to their voices and experiences; I apologize for any inadvertent mistakes and am open and happy to receive feedback at elizabeth.novosel@colorado.edu. My hope in writing this paper is to share what I am learning about disability and Disability Justice and to engage others to engage in this important topic.

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[i] Some common ableist microaggressions include expressions of sympathy, excessive and inappropriate curiosity about their condition or health, unrequested acts of assistance, patronizing comments, and assumptions of helplessness, incompetency, and asexuality [75], [40], [21]. Also common are comments meant to minimize a disability, suggest a disabled person is trying to benefit unfairly from their disability, or the declaration of how much a non-disabled person would hate to have to endure the disability of the person with whom they are speaking [76]. Many microaggressions are very subtle and are embedded within daily spoken language. For example, people often express negativity, failure, ineptitude, and deficiency with vocabulary that refers to disability. Goodley et al. offer examples, such as: “We are handicapped by a lack of knowledge. Crippled with anxiety. Blind to the truth.” [39, p. 982].” A variety of organizations offer advice on disability awareness and provide lists of terms one should not use.

[ii] Another issue that educators need to be aware of is the debate regarding the use of “person-first language (PFL),” such as “person with disabilities” or “student with dyslexia,” as opposed to “identity-first language (IFL),” such as “autistic person,” “D/deaf person,” or “dyslexic student.” Like all language, the terms and names used to describe disability change over time, and people have different language preferences. Some professional organizations and style guides have, especially in the past, recommended the use of person-first language on the grounds that such language focused on the humanity of the individual rather than their disability or condition [81], [82], [83]. Critical disability scholars argue that such language is harmful to disabled people in that it promotes stigma, dehumanization and violence; they also align PFL with the medical model and perspective which views disability a deficit to be cured or “fixed” with medical intervention [84]. Monique Botha, Jaqueline Hanlon, and Gemma Louis Williams, writing about this issue in relation to critical autism scholarship, state that research and practice regarding language use should be guided by the “needs, wishes and experiences” of disabled people, who should be centered within the research and scholarship on any topic related to disability [84]. Dana S. Dunn and Erin E. Andrews (2015) add that the use of identity-first language “promotes autonomy, agency, and indicates a decision to exercise choice over one’s disability destiny” [83, p. 257]. Scholars warn, however, that individuals may have their own preferences, which should be honored, and that appropriate language use varies widely internationally [39], [85].

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