"It is So Exhausting to Constantly Have to Explain to People": Exploring the Effects of Faculty Interactions on Disabled Students

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Introduction

"I'm always very nervous about using my disability placard in my car because I park in the disabled spot a lot. At least for those first 30 seconds of getting out of the car, it looks like I'm just a teenager that parked there. I'm always worried that someone's going to come up and yell at me about it… And so that has definitely made me nervous about taking the accommodations that I do need just because *it is so exhausting to constantly have to explain to people*."

-Susan, Co-researcher

Current reports show that approximately one in five U.S. undergraduates have a disability (NCES, 2019). Although the number of disabled students in higher education has slowly increased (Cunninghame et al., 2016), this group still remains largely underrepresented in STEM disciplines (Moon et al., 2012). This discrepancy in representation reflects larger issues of marginalization in STEM fields and higher education at large. Current support structures for disabled people remain ineffective, as accessing necessary resources requires navigating physical, cultural, and bureaucratic barriers (Groen-McCall et al., 2018). These barriers only continue to widen for disabled students planning to pursue engineering careers (Prema & Dhand, 2019), as seen in the high unemployment rate for disabled scientists and engineers, which is greater than that of the entire U.S. labor force (Lee, 2010; NSF, 2017). Yet, disability is rarely included in any conversations surrounding broadening participation and educational justice in engineering or higher education (Madaus et al., 2018; Newman et al., 2020; Slaton, 2013), leading to disabled students being largely ignored and minoritized.

Through this research, we explored how disabled students' learning experiences are affected by the intentionally upheld systemic ableism in higher education. Building on past research regarding disabled student experiences in engineering (Figard & Carberry, 2022; Groen-McCall et al., 2018), this study initiates the long overdue conversation regarding inequitable barriers in engineering education for disabled students by addressing the following research question: How does faculty's treatment of disability impact disabled student experiences in the engineering classroom?

Conceptual Framework

Critical Disability Theory [CDT] (Hall, 2019) and the Design Justice framework (Costanza-Chock, 2020) were used as lenses to guide our research. CDT is a framework used for the analysis of disability through the centering of disability and challenging of ableist assumptions surrounding disability. CDT describes disability as the complex relationship between the medical contributions of disability and the barriers imposed on the concept of disability by the social environment (Hosking, 2008). The Design Justice Framework analyzes how design works to benefit and burden different groups of people by elucidating how design

reproduces and/or challenges the matrix of domination (i.e., white supremacy, ableism, capitalism, and other forms of structural inequities) (Costanza-Chock, 2020).

CDT and the Design Justice framework combined to inform all stages of our research process. In our recruitment process, we reflected on the ways in which privilege presents itself amongst different populations within the disabled community and how that impacts who does and does not have access to disability accommodations. This study is being conducted in the United States, where financial privilege and access to consistent, quality healthcare are particularly prevalent barriers to accessing disability accommodations. As a result, we decided to recruit through two avenues, the first being the university's Disability Resource Office and the second being engineering departments. We also specified in our recruitment that students do not need to be formally diagnosed to partake in the interview process. During the interview protocol's development, we crafted the questions to ask about the oppressing person, thing, or system that heightened their experiences as disabled students. Our goal during interview transcript analysis was to highlight students' marginalizing experiences while not placing blame on the student for their experience. Instead, we sought to identify the individuals who cultivated and power structures that incubated those experiences. As CDT is a consciously political theory, we attempt to provide practical and actionable suggestions for advancing the needs of disabled students. We also carefully considered our own privileged identities that may bias the analysis, namely, being white, English-speaking, U.S. citizens in academia.

Methods

The findings presented here are a subset of a larger project and data collection effort focusing more broadly on the experiences of disabled students. Complete methodological details can be found in (Figard et al., 2023).

Research Design

The primary data sources for our study are ten semi-structured interviews with disabled engineering students. These interviews were conducted at a single site by the first author in Fall 2022. Interview transcripts were analyzed in two rounds by using thematic analysis with a critical lens. Open coding was used during the first round of analysis and pattern coding was used during the secondary round.

A composite narrative approach was used to answer our research question. Composite narratives are first-person accounts, typically presented in the form of vignettes, that combine data from multiple interviewees to highlight a specific theme or finding from the interview transcripts (Johnston et al., 2021). Composite narratives also provide greater anonymity to those who are interviewed, which was particularly important to this research, as disabled students represent a diminutive percentage of the engineering student population.

Positionality

       The first author identifies as a disabled white cis-gender woman and at the time of data collection, analysis, and drafting of this document, is pursuing a doctoral degree in Engineering Education. The author also shares many of the same or similar disabilities with those who were interviewed. Although this alignment was unintentional, it ended up being an integral aspect of the interview process that allowed for greater comfortability and vulnerability in interviews. We believe that this aspect of shared identity amongst the researcher and students helped foster richness in the data and a deepened understanding of student experiences during analysis.

       The second author holds identities as a disabled white cisgender woman, tenure-track engineering professor, and engineering education researcher. She comes to this research both having encountered many of the same inequities the co-researchers discuss in her own lived experience and recognizing the privileges afforded to her by her statuses.

       The third author engages with this research through her identities as a white woman who is a tenured engineering professor and an engineering education equity researcher. Through this research process, she strives to maintain simultaneous awareness of not sharing the disabled identity shared by co-researchers and co-authors in this study along with the privilege that her identities afford her inside and outside the academic institution.

Co-researchers

       In alignment with the Design Justice framework (Costanza-Chock, 2020), we refer to the interviewed students as "co-researchers," as opposed to "participants," in order to emphasize the development of community-shared inquiry and action. We note that the co-researchers participated in the research process in the same capacity as "participants" would. Changing the verbage was an intentional measure we took to denounce whiteness, maleness, and ableness in academia, while allowing the disabled community to retain power in the research process.

       This study presents the lived experiences of ten disabled engineering students. Included in this sample are eight undergraduate and two doctoral engineering students. Six participating students identified as male and four as female. The representation of the sample's race and ethnicity makeup include: Black ($n=1$), Hispanic or Latino ($n=1$), Middle Eastern ($n=2$), and white ($n=6$). Table 1 provides additional co-researcher demographic information, as reported in the screening survey.

Table 1
Co-researcher Demographic Information

Pseudonym	Race	Gender	Disability(s)	Engineering Major	Year-in-School	International Student (Y/N)
Joe	Middle Eastern	Male	Learning	Civil	First-year	Y

Sammy	Middle Eastern	Male	Cognitive, physical	Electrical	Ph.D.	N
Demetri	White	Male	Cognitive, learning	Chemical	Third-year	N
Jake	Hispanic	Male	Learning	Mechanical	First-year	Y
Susan	White	Female	Multiple physical disabilities	Aerospace	Third-year	N
Christopher	White	Male	Multiple physical disabilities	Biomedical	Third-year	N
Lucy	Black	Female	Cognitive, learning	Civil	Third-year	Y
Nolan	White	Male	Cognitive, physical	Electrical	Third-year	N
Aria	White	Female	Cognitive	Industrial	Ph.D.	N
Claire	White	Female	Cognitive, learning, physical	Computer Science	Fourth-year	N

Co-researcher Recruitment

This study was conducted at a large, research-intensive university in the Southwestern United States. Emails and flyers distributed by the university's disability resource office and engineering departments were used to recruit co-researchers. Recruitment flyers described the eligibility criteria (i.e., currently enrolled in an engineering program and identified as being disabled or having a disability). The flier invited eligible co-researchers to reflect on their experiences with accessibility at their current institution and outlined the process for participation. The flier also noted that co-researchers would receive a $25 gift card as compensation for their contributions to the study.

Recruitment closed after two weeks and we received 134 responses from individuals indicating interest in participating in the study. Of those, 74 individuals qualified for the study. We limited the study to ten interviews, which was determined as appropriate to reach saturation (Guest et al., 2016). The ten interviewed co-researchers were carefully selected in an attempt to diversify the study's representation of gender, race and ethnicity, engineering major, and year-in-school.

Data Collection

All data collection was carried out following appropriate human subjects research procedures, approved under the university's IRB. To first determine eligibility, co-researchers completed a screening and demographic survey. Then, eligible co-researchers were contacted to take part in a 45 to 90-minute semi-structured interview (average 57 minutes in length) conducted virtually via Zoom. Each interview was audio recorded and then transcribed through a commercial transcription service.

Interviews were led by the first author, a current engineering doctoral student. Co-researchers were told that anything said during the interviews would not be judged or questioned. This sentiment was particularly important, as the co-researchers (along with the

larger disabled community) frequently endure instances of non-disabled individuals not understanding their experiences and subsequently questioning, denying, or negating those experiences. During times of vulnerability or hesitancy within the interviews, the interviewer affirmed and shared their own related experiences of being disabled in higher education as a way to build trust with the co-researchers.

The interview protocol had seven questions and related probes designed to expound upon the co-researchers' experiences relating to accessibility in engineering and suggestions for improved support. The interviews began with the question, "What motivated you to pursue your current engineering discipline?" Co-researchers were then asked generally about their experiences in engineering and to reflect on their experiences with accessibility in educational settings. Each time students mentioned negative experiences related to accessibility or their disability(s), they were asked to reflect on what could have improved their experience or would have been the ideal response/reaction in that situation.

Data Analysis and Trustworthiness

Transcripts were de-identified before analysis to maintain co-researcher confidentiality. Transcripts were uploaded to Dedoose (2021) after de-idenitification to code and analyze the interview data. Data analysis was conducted through thematic analysis (Braun & Clarke, 2006) with a critical lens. Salient themes within the transcripts were identified through a two-round constant-comparative, open coding process (Saldaña, 2016). The first round of coding used open coding to identify meaningful and recurrent aspects of disabled student experiences in engineering from the transcribed interviews. The second round of coding used pattern coding to organize these aspects of student experiences into sub-themes along the dimension of faculty responses to disability. Codes associated with the theme, corresponding definitions and descriptive quotes are given in Table 2.

We implemented multiple measures throughout the research process to ensure trustworthiness and quality (Tracy, 2010; Saldaña, 2016). We worked carefully to reflect on how their positionalities could influence or bias the work along all stages of the research process. During the data collection development, the interview protocol was grounded in the study's conceptual framework and peer-reviewed before interviews were conducted. Co-researchers were sent their interview transcripts after data collection to allow them to redact, clarify, or expand upon anything said. This provided an additional opportunity for co-researchers' involvement in and contributions to the research process.

We met multiple times throughout the data analysis process to provide diverse perspectives and obtain agreement amongst the interpretations. Results were triangulated to verify that the findings were reported by various co-researchers (Creswell, 2013). The final interpretations were audited by a group of researchers external to the data analysis team.

Table 2

An overview of the study's theme and codes, along with associated definitions and sample quotes

Theme	Codes	Definition	Descriptive Quote
Faculty Responses to Disability		How students described the interactions with faculty in regards to their disability, including how faculty perceived them as a disabled student, disability, and/or accommodations.	"I [have] depression and it's like when I'm really down and I'm just not having a good time, [and people say] like, 'Oh, think about the happy things.' It's very invalidating of like that's not the experience that I'm coming from. So when [faculty] are like, 'Oh just do this. Just do that.' I recognize that they're trying to help but at the same time it's not the way my brain works and it makes me very frustrated as well because it's like, 'Okay, why doesn't my brain work that way if this seems to work for so many different people?'"
	Inflexibility	Faculty members' aversion to change which resulted in unwillingness to provide accommodations, alter courses or course material, and/or provide extra assistance.	"Yeah, with some of the professors I have to give a bucket list of excuses and then my accommodations on top of everything just for them to budge a little bit."
	Lack of understanding	A faculty member's lack of awareness or understanding of disability, which resulted in intentional or unintentionally made inflammatory comments and inadequately provided accommodations.	"I would say it was really interesting on a social kind of point because while growing up, I wasn't really understanding how come things were harder for me than my siblings or my friends. Back there, they don't really acknowledge this is [a disability] or anything like that. They're like, if you not able to do a task it's because you [aren't trying hard enough]. That was really a big struggle for me."
	Arbitrariness to accommodation decisions	Faculty deciding to provide seemingly random decisions to student's accommodation requests, such as arbitrary extension deadlines and attendance policies.	"But usually after being like, 'Hey, I really, really need this extension, I really need you to give it to me.' They'll finally be like, 'Okay, well you get two extra days.'"
	Repeated refusals	Negative perceptions of disability exemplified by adherence to the disabled students needs only when forced to do so. Examples of this include denying accommodations until disability resource centers become involved or repeated persistence from the student.	"Sometimes [faculty] will just kind of put up a fight and be like, 'Well, I gave you plenty of time in the first place so I don't see why you need this extension and things like that.' I've ended up divulging health information that I don't think was truly necessary, to try and get them to understand the gravity of what was happening. And usually that kind of scares them into being like, 'Okay, fine… yeah, just stop emailing me.'"

Composite Narratives

The focus of this study is less about the institution and ten individuals, and more about the collective experiences of being disabled in engineering, with emphasis on the marginalizing forces that contributed to those experiences. To emphasize these collective experiences, we decided to compile interview quotes into composite narratives (Willis, 2019) rather than sharing individual co-researcher's quotes. Johnston et al. (2021) elevate composite narratives as a way to present findings that enhances the research impact and tailors the findings for purpose-specific and end-user dissemination.

The composite narratives were constructed in three steps. First, we exported all of the codes and their associated excerpts into a word document. Second, we grouped the excerpts for each code into thematic sections. For example, for the code, "Faculty responses to disability," we grouped the excerpts into five categories: inflexibility, lack of understanding, arbitrariness to accommodation decisions, blissful ignorance, and repeated refusals. The grouping of these excerpts helped ensure congruence among the selected excerpts before combining them into a single, composite narrative.

Lastly, we condensed the grouped transcript excerpts into a single, composite narrative by weaving together three to five raw transcript excerpts for each code (Willis, 2019). All quotations came directly from interview transcripts and were not edited (except when grammatical changes or redaction of identifying information were needed). Any altered words or phrases in the excerpt are placed in brackets. We did not impose any of our own judgment or assumptions in the narrative. Instead, we placed our analysis after each narrative to separate our interpretations from the co-researchers' spoken experiences.

Results and Discussion

In this study, we examined the impact of faculty responses on disabled student experiences navigating through higher education. Our analysis identified the theme, "Faculty Responses to Disability." Salient amongst this theme were influences of faculty's (1) inflexibility, (2) lack of understanding, (3) arbitrariness to accommodation decisions, and (4) repeated refusals related to granting student requests for accommodations.

Sub-themes are represented through a composite narrative of interwoven co-researchers' quotes. 'Maya' was formed as the persona to articulate the impacts of these collective experiences through a single person. Maya is a fourth-year undergraduate engineering student at South Harmon Institute of Technology (S.H.I.T.) who identifies as disabled. Maya speaks about her journey through the disability accommodation process. Through this journey, she must navigate faculty's reactions, including their unwillingness to provide and lack of understanding of disability accommodations. As a result, she sacrifices her own needs in order to receive an only minimally accommodating learning environment.

Inflexibility: I have to give a bucket list of excuses just to get them to budge a little bit;

> "[My experience with receiving disability accommodations] hasn't been overly negative, but it hasn't been overly positive either. Usually the first time that I send in a request for either extension or absence, I will say, 'Hey, I'm registered with the disability resource office.' Sometimes [professors] will just kind of put up a fight and be like, 'Well, I give you plenty of time in the first place so I don't see why you need this extension and things like that.' With some of the professors, I have to give a bucket list of excuses and then my accommodations on top of everything just for them to budge a little bit. I've ended up divulging health information that I don't think was truly necessary, to try and get them to understand the gravity of what was happening. And usually that kind of scares them into being like, 'Okay, fine. Yeah, just stop emailing me.' But I've had some professors that just don't. They're all like, 'No, I'm going to do the same thing every year. Because I don't switch the curriculum year to year. Because I don't listen to my reviews. Because it's my class and I'm the only one that teaches it.' I find a lot with [more senior] professors where they're like, 'This is the way that I've done it since the first day I taught here. You will come to class, you will be in this seat, you will get your homework done on time' type thing."

Faculty members' inflexibility and lack of understanding in situations regarding Maya's disability has caused increased hardship for receiving her disability accommodations. Consequently, she creates a running list of "excuses" to just get professors to "budge" a little bit- not even meet her minimum accommodations. When faculty members are still inflexible in providing her legally mandated request for accommodations, she resorts to divulging sensitive health information. Maya's experience disclosing her disability and need for accommodations are not isolated incidents. Disability in higher education continues to be regarded via medicalized lenses, which has an impact on the policies and practices that universities implement (Brown & Ramlackhan, 2022). A major challenge in the disclosure of disabilities is the accommodation request process (Lindsay et al., 2018). We know that the number of students disclosing their disability to their university is exceedingly low in comparison to the total number of disabled students at that university (Newman et al., 2020; Newman et al., 2011). Students often weigh the costs and benefits of disclosing their disability(s), as disclosure is a complex, sensitive, and emotionally taxing event (Brown, 2020).

Lack of understanding: It was like we always had to do it his way, not what was actually best for us;

> "I've had bad professors in general that are just not great with students, but I think some of my issues with professors have been those that just do not understand the need for extensions or flexible attendance and stuff like that, where they make such a big deal about [it]. They're usually pretty good about it, but definitely felt sometimes they were like, 'Oh, okay. Well, I guess…' [I had one professor who] said he didn't have a problem

with accommodations and obviously legally he has to follow them, but it was like we always had to do it in his way, whatever way that he felt like our disabilities needed to be handled, not what was actually best for us and what helped us succeed."

Maya describes her experiences with professors who express reluctance with providing her disability accommodations due to their own lack of understanding around disability. Through these experiences, she has recognized faculty member's responses to these requests were often rooted in their own desire for convenience. Like Maya, other students experienced reluctance and/or denial for providing accommodations due to faculty members prioritizing their needs and beliefs over the students. These instances of ableism (in the form of denied accommodations) negatively impact students far beyond their experiences in class. Along with Maya's ultimate feeling of needing to divulge health information, other co-researchers expressed how these experiences contributed to worsened health issues, reluctance to self-advocate, and feelings of worthlessness and self-hate.

Arbitrariness to accommodations: So I think people are ok with it as long as it works for them;
"I think a lot of the issues with disability is that the greater society wants us to be isolated because it is beneficial to push disabled people into a corner and be like, they don't exist. You don't have to worry about them. That way we don't have to provide accessibility measures because that would be annoying. And whenever I try to say, 'Hey, that's just not going to work with my body.' They're like, 'Well, I don't see why you should be any different than any other student.' And I'm like, 'Well, because I am different than other students physically.' And [they're] like, 'Well, I don't see that, you should be able to attend as anyone else.' And so usually then I will continue to be like, 'Hey, this is something that I need and if I have to get my [DISABILITY RESOURCE OFFICE] rep involved…' But usually after being like, 'Hey, I really, really need this extension, I really need you to give it to me.' They'll finally be like, 'Okay, well you get two extra days.' So I think that there's a lot of times that people are okay with it or they will accept it as long as it works for them. And that's very frustrating."

When Maya is yet again faced with reluctance from faculty regarding her accommodations, she expresses feelings of frustration and insignificance because of the constant reminders of needing to inconvenience herself for the sakes of others. Co-researchers described the arbitrary nature to which faculty, serving as an institutional gatekeeper, decided the extent to whether and how much to adhere to their university-approved accommodations. The process of managing and advocating for needed accommodations can create added stress and anxiety for disabled students that is unrelated to their course content and not experienced by their non-disabled peers (Pearson Weatherton et al., 2017).

Repeated Refusals: So, I don't really try to use my accommodations anymore.

"With the [S.H.I.T] community, it made me feel like I can't depend on the admin, I can't depend on my advisor, I can't depend on my teachers for the most part. I feel like I can't depend on just the people that work at [S.H.I.T]. It feels like they just want my money at this point. So I definitely feel slighted and that definitely made me feel like I couldn't turn to my advisors for help especially. Especially when it comes to [my disability]. It's just [frustrating] trying to explain to adults where I'm like, 'Hey, you are the adult in this situation. You should be able to do this.' They make a big deal about you need[ing] all that stuff. I don't really [rely on my accommodations] anymore just because I knew that it's not something I could depend on. Not something I really should be depending on either. That's what I felt like. So, I don't really try to use [the accommodations] much anymore. But everybody told me that."

Maya experienced unmet accommodations, unwillingness from faculty to provide accommodations that were outside their own realm of comfort, and a resulting hesitancy towards self-advocacy. Now, Maya reaches a breaking point in her academic journey where she realizes that she has to navigate engineering unsupported. During this breaking point, she decides that accommodations are just something that she should no longer rely on. Although this may be an affordance she can (but should never have to) make, the decision is not as simple for others. Other co-researchers described how their experiences with denied accommodations resulted in worsened grades, health and learning outcomes, failing and/or repeating courses (sometimes multiple times) and the decision to switch majors. Key amongst these experiences was the articulation of continued exhaustion from students- that sometimes it felt easier to accept defeat than to constantly explain and fight for their accommodations.

Limitations

We recognize that no study is faultless and that each has its own set of limitations. For our study, we identified two main limitations. First, this study was conducted at a single institution. Disabled student experiences can and will vary drastically by institution due to a variety of factors such as institutional climate, size, location, access to resources, and public or private classification. Second, even though an effort was made to include a variety of voices from the student population of disabled engineers, many voices are still unrepresented. Our findings cannot be applied to disabled transgender and nonbinary engineers as our data collection included all cisgender people. White people made up 60% of the interviewed population, therefore we were unable to fully represent the experiences of many other racial and ethnic groups. We also acknowledge that one student cannot represent the entire population of Black, Hispanic, female, etc. disabled students. This study offers initial findings regarding these identities but more disabled students who identify with multiple marginalizing identities must be interviewed before transferring findings.

Implications for Teaching and Practice

Faculty Accountability and Responsibility

Several implications for teaching and advocating alongside disabled students emerge from this work. Faculty are in immensely influential positions to either positively or negatively impact the systems that disabled students navigate throughout college. Promoting authentic change for the disabled community must extend beyond simply granting students' accommodation requests to include critical faculty self-reflection into the ways they perpetuate ableist practices and undue harm in their classrooms. Faculty are encouraged to constantly examine their own privilege along with their preconceived and espoused notions about disabled students. Borrowing from the Design Justice framework (Costanza-Chock, 2020), this could look like: developing an understanding of the affordances and disaffordances that we encode into research and education (research and educational values); who gets paid to do research and who controls the research process (research practices); the stories we choose to tell about the research (research narratives); reflecting on how inclusion and exclusion of disabled populations prevents access to privileged educational and research locations (research and education sites); reflecting on the methods we use to learn about diversity, equity, and inclusion, specifically relating to disabilities (pedagogy); and ensuring that funding for any marginalized group initiatives includes not only money for launching, but also maintenance funding (support and sustainability).

We also urge researchers to avoid theories, frameworks, and references to other research that exclude the voices of disabled people in written and scholarly forms of activism. Centering and amplifying disabled voices is an imperative first step to address the barriers faced by disabled students in higher education.

Start Saying "Disabled"

"In the United States, one out of five people identify as having a disability and there are 6.7 million students classified with having a disability, making up about 14 percent of total public-school enrollment. Yet, teachers remain largely unprepared to talk about disability in their classrooms," (Arvey Tov, 2023, p. 53). Part of this unpreparedness is rooted in the erasure of disabled terminology, as scholarly organizations such as the American Psychological Association (APA) have previously advocated towards the transition from identity-first to person-first language (APA, 2022). However, the loss of the terms "disabled" threaten one's visibility in their identity, resulting in potential loss of services, resources, and opportunities (Andrews et al., 2019). As increasing legislative efforts have been made to weaken, defund, or eliminate services disproportionately relied on by disabled people (Andrews et al., 2019), the labeling of a collective identity for disabled people becomes unequivocally important. Whatever term you may use, we encourage continued reflection into the unintended consequences that erasing identity-based language has on the disabled community.

Conclusions and Future Work

A more comprehensive understanding of the interplay between disabled student's experiences and faculty's roles in these experiences has great potential to promote movement towards disabled equity. This study adds new insight to the little body of research on faculty members' impact on disabled student's experiences in higher education settings. Our findings show that disabled students face accumulated exhaustion from gatekeepers both directly (through the adherence of accommodations) and indirectly (because the policies faculty are applying were created elsewhere) involved in the disability accommodations process. This research supports the recent and increased calls for a larger representation of disabled students in STEM and efforts to address systemic inequities along the higher education pathway. Still, more research is needed to understand how to address such inequity from disabled students' perspectives.

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