

No Research About Us Without Us: A Quantitative Critical Investigation of Supportive Environment Scores for Disabled Students

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Abstract

Disabled students account for one of the largest underrepresented groups on college campuses. However, engagement research of this group has used large subgroups (e.g., students with sensory disabilities), leaving practitioners without the specificity to understand disability in useful ways; for example, blind and Deaf students are from distinct communities and have distinct needs. Using updated disability measures from the 2021 National Survey of Student Engagement, we used quantitative critical analysis methods and a Community-Based, Participatory Research approach to investigate supportive environments for over 22,000 disabled students. Our findings demonstrated that students with disabilities consistently reported lower Supportive Environment scores compared with the general population. Specifically, we found that students with mental health or developmental disabilities shared the lowest Supportive Environment scores compared with other disability categories. This research is crucial to understanding which groups of disabled students feel less supported on campus and provides opportunities for institutions to consider how to prioritize disability equity.

Keywords: disabled students, supportive environments, National Survey of Student Engagement, Community-Based Participatory Research (CBPR), quantitative critical analysis

Although disabled students are prominent on college campuses, studies show achievement gaps between disabled and nondisabled students (Akin & Huang, 2019; Fleming et al., 2017), but little is known about the extent to which institutional support is equitable (Price et al., 2017). The National Survey of Student Engagement (NSSE) is annually administered to first-year and senior students at participating four-year institutions, measuring behaviors related to educationally purposeful activities both inside and outside the classroom (National Survey of Student Engagement, n.d.-a). Recently, the NSSE expanded their disability questions to 15 items, providing a new opportunity to study distinct categories of disabilities that have yet to be researched. The purpose of the present study is to identify whether disabled students at four-year institutions experience varying levels of support in their educational environments compared to nondisabled

students. We leverage new NSSE data using advanced statistical methods, data disaggregation, and Community-Based Participatory Research (CBPR) principles. The following research question guided our inquiry: Accounting for student backgrounds, are there significant differences in Supportive Environment scores between students identifying from 15 disability categories and the general population?

The focus of our research on Supportive Environment is an Engagement Indicator of the NSSE that measures student support services, such as academic services, social opportunities, wellness resources, and campus programming (Kuh, 2001; McCormick et al., 2013). This aspect of engagement was selected for the current study because it measures institutional responsibilities rather than student behavior. Foundational research from Chickering and Gamson (1987) suggests institutions are responsible for fostering sup-

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portive environments to enhance student learning and development. Tinto's (1986) Interactionist Theory also emphasizes the responsibility of the institution to create supportive environments to enhance student well-being and success. Recent research has related this measure to persistence (Griffin et al., 2022) and goal orientation (Miller et al., 2021).

Please note that throughout this article we use identity-first language (disabled person) rather than person-first (person with a disability) as person-first language tends to distance a person from their disability and thus the negative stigma of disability as a whole, while identity-first reclaims disability and recognizes the role of inaccessibility and oppressive systems in making someone disabled (Association on Higher Education and Disability, 2019). Identity-first language is the preferred terminology by a number of U.S. disability activists (National Center of Disability and Journalism, 2021) and by the Disabled¹ authors of this manuscript.

Literature Review

The Americans with Disabilities Act (ADA) of 1990 forbids discrimination against people with disabilities. Under the ADA, a disabled person may be defined as a person with a physical or mental impairment limiting one or more activities of daily living, an individual with a history or record of possessing a limiting impairment, and/or is perceived by others as having a limiting impairment. Disability is known as a "slippery" concept as it can vary in onset, daily functioning, bodily systems, duration, and appearance (Shildrick, 2009, p. 4; see also Evans et al., 2017). Snyder et al. (2019) found that 19.4% of all undergraduate students identified as having a disability. Disabled students frequently contend with lower retention rates, higher dropout rates, and longer degree completion times (De Los Santos et al., 2019). Several prominent barriers impacting disabled students include faculty perceptions, peer stigma, and difficult experiences with support service personnel (Hong, 2015). Additional obstacles to success for disabled college students include lack of awareness about campus resources, inability to provide sufficient disability documentation, and lack of access to useful accommodations (Toutain, 2019). The following review focuses on four components of creating a supportive environment: (a) academic accommodations, (b) stigma and disclosure, (c) faculty perceptions of disabled students, and (d) student affairs and supportive environments.

Academic Accommodations

A core component of creating a supporting environment is ensuring disabled students have access to academic accommodations, including knowing the process and feeling comfortable seeking the support needed. The academic accommodations process generally requires a letter of accommodation (LOA) (Barnard-Brak, 2010). The LOA outlines a student's specific academic accommodations that are to be provided by faculty, which is furnished by a disability resource office (DRO). Some students note that providing these LOAs to faculty has resulted in mixed results: some read them closely, others simply sign and move on (Barnard-Brak et al., 2010). Whatever the response by faculty is to the LOA can send a message to the student regarding the support or acceptance of their identity. Unfortunately, some students have experienced challenges when coordinating with faculty to gain academic accommodations (Sarrett, 2018). For instance, some students have noted that they have had interactions with faculty who believe certain academic accommodations may provide an unfair advantage compared to other students (Sarrett, 2018; Stein, 2013). Stein (2013) argues that an important way to remedy this conflict is to educate faculty on the need for, and importance of, supporting disabled students. The implementation of these accommodations can be problematic as well, especially if faculty do not respect confidentiality. Stein (2013) notes that participants who requested a notetaker in class, for example, often experience a breach of confidentiality when faculty state the name of students requiring notetakers to the entire class.

Furthermore, Barnard-Brak et al. (2010) outline three key themes related to academic accommodations for disabled students: scripting disclosure, negotiating academic accommodations, and downplaying their disability. *Scripting disclosure* refers to when disabled students prepare a script ahead of an attempt to engage with faculty regarding their disability. Negotiating academic accommodations with hesitant faculty is something each member of this referred study spoke of. While it is a violation of the ADA of 1990 to not provide accommodations that are duly required, the participants of Barnard-Brak et al.'s (2010) study often chose not to report violations as they felt that it was not effective and often caused more harm than it is worth. Finally, downplaying one's disability is exceedingly problematic. Although each student has a different perspective and experience, downplaying one's disability to faculty so they

¹ One of our scholars, who organizes our campus' Disabled Student Union and engages with other Disability organizations, noted that in modern groups the D is capitalized when discussing the Disabled community as a cultural group and identity rather than people who experience disability as a whole, modeled after the use of capitalization in the Deaf community.

can be “...treated like a normal person” reflects inherent dominant narratives related to disability stigma (Barnard-Brak et al., 2010, p. 420).

Although faculty are required by law to implement the academic accommodations afforded to disabled students, it is often the DRO that coordinates and creates the LOA. In a study on academic accommodations for students on the autism spectrum, Sarrett (2018) found that the majority of participants had positive relationships with the DRO. The DRO office is not just for accommodations, but seeks to be a welcoming environment where students not only feel like they are not alone but are in a supportive, caring environment (Stein, 2013).

Disability support staff also help students learn vital time management skills and assist with advice throughout the semester. Sarrett (2018) identified the top five academic accommodations as “extended test time, note takers, distraction-free test areas (i.e., in a quiet room, testing alone), flexible or extended due dates for assignments, and the use of technology in the classroom (e.g., laptops, smart pens, etc.)” (p. 685). Furthermore, some students may choose to employ academic accommodations in some classes, but not all. This choice depends on several factors, namely the student’s perception of their ability to succeed in a given class. Not only can institutional processes within academic accommodations and disability resource offices influence success, but the powerful social forces of stigma and disclosure also impact the ways in which disabled students experience accessing academic accommodations and navigate their campus environment.

Stigma and Disclosure

Academic accommodations or accommodations in general can be made challenging by the fear and/or effects of stigma around disclosing. The impacts of stigma and disclosure can come not only from classmates and peers, but also from faculty and staff. For instance, in their investigation into the experiences of disabled students, Francis et al. (2019) found that faculty and staff have both perpetuated stigma related to disability. Specifically, participants in their study note that faculty often do not read the accommodations section of the syllabus aloud, which sends a message to disabled students that they must advocate for themselves or that they are not valued. Although it was noted earlier that students have a generally positive perspective of DROs, the participants in this referred study had particularly harmful experiences with their campus DRO center, noting that staff in these offices have questioned students about their disabilities. This disconnect between students and staff demonstrates

how unique the experience of disabled college students is when it comes to support and belonging.

Some students may feel comfortable sharing personal information about their disability, even finding it cathartic to do so, while others may choose not to disclose due to fear of stigma (Barnard-Brak et al., 2010). Unlike K-12 education in the United States where local education agencies identify disabled children, disabled students in higher education must self-disclose their disability if they wish to pursue academic accommodations (Cole & Cawthon, 2015). Less than a third of students with individualized education plans while in high school disclosed their disability to their colleges or universities (Newman & Madaus, 2015). Further complicating this dynamic, disabled students do not have to disclose their disability to faculty at all and can instead circumvent this conversation by disclosing to a DRO, and having the office facilitate the LOA with the list of accommodations (Stein, 2013). This flexibility in disclosure is essential for fostering inclusive learning environments that respect the diverse preferences and needs of all students.

Kranke et al. (2013) offer three pathways for disclosure for disabled students. First, some students tend to immediately inform faculty that they have a disability in attempts to heighten their professor’s awareness. Second, some students may choose to delay disclosing their disability until they begin to struggle and acknowledge that academic accommodations would help them succeed. Third, some students simply never disclose because they feel as if they are not struggling at the moment or for other personal reasons. Regardless of the pathway students employ, if a student wishes to gain accommodations, they must formally disclose their disability to their institution’s DRO. These three pathways demonstrate not only the complexity of identifying as Disabled but also implores scholars and practitioners to recognize that there are many reasons why a student may or may not elect to disclose their disability to others. Scholars have argued that the visibility of one’s disability may be related to whether they will disclose or not. Specifically, O’Shea and Meyer (2016) found that students with non-apparent (less visible/invisible) disabilities have more options related to disclosing their disability, whereas some with visible disabilities are unable to conceal their disability even if they wish to do so.

Sense of Belonging

One way to address stigma is to ensure disabled students can develop a sense of belonging on campus. A sense of belonging is one in which students feel like their campus is inclusive of who they are as a person and whether they feel valued on campus (Vaccaro

et al., 2015). Research has noted that students with more than one disability associate their campuses as less supportive of their needs, underscoring the difficulty of assessing how the co-occurrence of disability impacts how students view their campus (Francis et al., 2022; Zilvinskis et al., 2021a). Fleming et al. (2017) confirmed the claims by Vaccaro et al. (2015) that supportive environments can help improve belonging for disabled students. These scholars found that student support services (such as those provided by student affairs educators) helped disabled students in their study feel like they belong on campus. Belonging was also a main finding in Lindell et al.'s (2021) study of students with intellectual disabilities. In that study, students shared how community is more than a campus and its furnishings; staff, faculty, and student peers all have a role in ensuring students feel a sense of belonging in their education environment.

Vaccaro and Newman (2016) investigated belonging for privileged and minoritized disabled students. Their findings include three major themes: environmental perceptions, involvement, and relationships. Specifically, these researchers found privileged students tended to notice more positive components of their environment than did students from minoritized backgrounds. Privileged students also tended to involve themselves in campus activities revolving around “fun” (p. 935), whereas students of minoritized backgrounds involved themselves in activities where they could be their authentic selves. Finally, the role of relationships was different for privileged and students of minoritized backgrounds, with the former prioritizing fun and accessing task-related support, and the latter seeking deeper, authentic social relationships.

Faculty Perceptions of Disabled Students

When faculty treat academic accommodations as a way to improve access to their course material, students feel more included in the classroom and on campus (Fleming et al., 2017). The work of Baker et al. (2012) found that faculty were likely to view their campus as welcoming and inclusive but also understood that they needed better professional development to help all students feel comfortable talking about disability and asking for help. Hong (2015) used reflective journaling of 16 students to learn about the experiences of disabled college students, and found faculty perception to be a major theme. Students in this study noted that they were treated differently than their peers by faculty throughout their education, and that their past experiences informed whether they would disclose to faculty, with some going so far as to avoid disclosing entirely. This finding is reinforced

by the work of O'Shea and Meyer (2016) who found that the choice for students to disclose their disability to faculty is heavily informed by their prior experiences both in high school and in college. Through interviews with four disabled college students on the efficacy of an expressive arts program, Murray and LaPorte (2022) found that faculty have a direct role in supporting disabled students, but they need more education on how to be effective allies.

Supportive Environments for All Disabled Students

Faculty are not the only ones on campus who might hold specific perceptions of disabled students. Academic support and student affairs professionals also need to be aware of how they think about and support disabled students, including disabled students from minoritized backgrounds. Zilvinskis et al. (2020) found that academic advisors tend to treat disabled students differently than other students, noting they are less likely to recommend learning opportunities like “study abroad, internships, [and] research projects” (p. 28). When disaggregating engagement outcomes by race, Zilvinskis et al. (2021a) called for practitioners to employ cultural knowledge when designing procedures and policies to ensure students have equitable access to such opportunities. Further research indicates that student affairs professionals should examine preconceived notions they may have on disability, and work to destigmatize it on their campus (Squires et al., 2018).

The benefits of institutional support, such as those offered by student affairs professionals, has been noted in the literature on disabled students in higher education. Using the Community College Survey of Student Engagement, Zilvinskis (2022) found that academic and career counseling are positively related to engagement outcomes for disabled students, particularly if they are first-generation students too. Other analysis on first-generation disabled college students found that these students have lower GPAs, less family and peer support, and endure greater financial stress (Lombardi et al., 2012). Lombardi et al. (2012) call for DROs to think critically about the needs of disabled students, particularly those who are first-generation students, when crafting support plans, policies, and procedures.

For example, to ensure supportive environments, Vaccaro et al. (2015) recommend that DRO staff avoid a deficit lens that treats disabled students as if they are at a disadvantage because of their disability. Doing so can ensure that disabled students feel welcomed instead of intimidated, which can have an avoidance effect (Hong, 2015). Overall, student affairs staff should understand that supportive environ-

ments, when implemented well, can increase disabled students' feelings of belonging and self-advocacy.

Theoretical and Research Framework

The current study drew upon ideas from quantitative critical research and Community Based Participatory Research to inform research design.

Tenets of Quantitative Critical Research

The following tenets of quantitative critical research guided the design of this study. First, Kimball et al. (2016) argued that using advanced statistical methodologies provides an opportunity for wider readership while diversifying analyses tailored to disabled students in higher education. For this study, we employed 15 distinct regressions to identify Supportive Environment scores for the many disability categories within the NSSE. Many scholars have also employed advanced statistical methodologies to study disabled college students, such as mediation analysis (Fleming et al., 2017), hierarchical linear modeling (Herrick et al., 2022), and structural equation modeling (Zilvinskis et al., 2023).

Second, disaggregation of data enhances scholars' understanding of this student population as disabilities are comparable across 15 specific categories (Vaccaro et al., 2015). Employing advanced statistical methods and data disaggregation in this study provided a nuanced understanding of disabled students' experiences across 15 categories within the NSSE. Scholars have practiced disaggregation for studies of disabled students not only to identify differences across disability groups, but for racial/ethnic groups as well (Harris et al., 2017; Ngo & Sundell, 2023; Zilvinskis et al., 2021a). Complementing these statistical techniques was building a research team composed of the subject we wanted to study—disabled college students.

Community-Based Participatory Research

One of the most unique aspects of this research was our use of a Community-Based Participatory Research (CBPR) approach to engage with members of the Disabled community and to emphasize their inclusion in the research process (Peña et al., 2020). According to Hacker (2013), "CBPR is built on a foundation of social justice and empowerment, with its roots in feminist theory and community organizing" (p. 4). The CBPR process is iterative, and aims to improve the collaboration and connection between academics and the communities they study. This type of research is used to highlight both the knowledge gleaned from scholars and the lived experiences of community members to produce findings that can

also be utilized by practitioners and advocates (Cashman et al., 2008). Hacker (2013) refers to CBPR as "co-learning," meaning that the academics can learn from the community as the community learns from the academics (p. 43). Some of the many strengths of CBPR include the depth of knowledge that can be produced with the inclusion of insights from the community being studied, the nuance offered during the interpretation stage, and the ability of the research findings to support social action (Hacker, 2013). The strength of CBPR to collaborate with disabled individuals has been shown by other scholars. For example, Nicolaidis and Raymaker (2015) partnered with several universities, community leaders, and disabled individuals to create an accurate and accessible survey to learn about violence against individuals with developmental disabilities. Stack and McDonald (2018) also worked with community partners with developmental disabilities and found that their use of CBPR facilitated a pathway to empowerment for the individuals they collaborated with.

In this research, the community that engaged with this investigation was a team of nine university students ranging from the undergraduate, master, and doctoral levels. Overseeing the student team was an associate professor with extensive experience in disability research. All but one of the students identify as Disabled or as having a disability, as does the faculty member. This group was formed to collaborate on the research because we represent a community of researched-disabled college students in higher education.

This CBPR project was conducted in May 2023. The students and the faculty member met in person, from 9 a.m. until 4 p.m. for an entire week to do this work. The students were financially compensated for their contribution to the project. During the week of the project, students were taught the history of the NSSE and informed on how it has changed to more accurately collect information about diverse disability groups. The students also worked together to prepare an annotated bibliography and become familiar with the existing literature about disabled students. The first day of the week was devoted explicitly to this preparatory work; the faculty member explained the process of preparing a journal article for publication, including how to follow author submission guidelines and co-writing on a shared document. The remainder of the week featured small writing groups where students continued to review relevant literature, cowrote different sections of the article, and volunteered their personal reflections of what they were learning while the faculty member provided guidance and answered questions. Each member of the research team has their writing showcased in this article along with their

insights and reflections presented using footnotes. These considerations situate the experiences of disabled college students by providing real examples of how they are impacted by their campus environment.

Additionally, students learned how to interpret regression findings. During this interpretation phase, students discussed the coefficients of each disability group and related it to their own experiences.² Students worked both in small breakout groups and as a collective to workshop their ideas, tell stories, and discuss their own experiences. While preparing the manuscript, the research team used a text-to-speech program to listen to each sentence that was written and share feedback. The group would pause to discuss potential edits and did not move forward until the full team gave their approval of the work.

An important tenant of CBPR is that the partnership is equitable in all phases of the research (Hacker, 2013). As such, all students who participated in this research are authors of this text, and their reflections and recommendations are presented throughout the article to offer the lens of college students who have personal experiences related to their supportive environments. Shared authorship was also a priority for this project because ownership of the research produced is a notable strength of CBPR. In sum, the CBPR approach was used as a tool for empowerment with the ultimate goal that this study's findings lead to practical and effective change.

Methods and Results

Data Source

The NSSE surveys over 1,700 public and private four-year institutions and 250,000 students annually (National Survey of Student Engagement, n.d.-a). The survey gathers responses from first-year and senior students to gauge their engagement throughout their education. The survey collects information on 10 engagement indicators (Higher-Order Learning, Reflective & Integrative Learning, Learning Strategies, Quantitative Reasoning, Collaborative Learning, Discussions with Diverse Others, Student-Faculty Interaction, Effective Teaching Practices, Quality of Interactions, Supportive Environment). In 2021, the NSSE conducted a major revision of the disability item on the survey from a medicalized perspective to one more aligned with the social model of disability (Zilvinskis et al., 2021b). Informing the model design of this study, other NSSE research has found engage-

ment to be related to other aspects of identity, such as gender (Rocconi et al., 2015), race and ethnicity (Fosnacht & Nailos, 2016; Harris & BrckaLorenz, 2017), and transfer status (Webber et al., 2013).

Sample and Measures

NSSE data were used with permission from the Indiana University Center for Postsecondary Research and the sample included 66,032 first-year and 81,058 senior students. Of these respondents, 15.0% identified as having a disability with 85.0% included in the general population (i.e., students who answered No to the question, "Do you have a disability or condition that impacts your learning, working, or living activities?"). The dependent variable, Supportive Environment, is the average of eight survey items standardized on a 0 to 60 point scale ($M = 32.22$, $\alpha = .89$). The Supportive Environment engagement indicator is based on responses to the following sub-questions within the overarching survey item stem, "To what extent does your institution prioritize the following?"

1. Providing support to help students succeed academically
2. Using learning support services (tutoring services, writing center, etc.)
3. Encouraging contact among students from different backgrounds (social, racial/ethnic, religious, etc.)
4. Providing opportunities to be involved socially
5. Providing support for your overall well-being (recreation, health care, counseling, etc.)
6. Helping you manage your nonacademic responsibilities (work, family, etc.)
7. Attending campus activities and events (performing arts, athletic events, etc.)
8. Attending events that address important social, economic, or political issues

(National Survey of Student Engagement, n.d.-b)

Independent variables included 15 categories of disability, each with a separate multiple regression model; these categories are not mutually exclusive as respondents could select all that apply. Miller et al.'s (2021) research on this outcome guided covariate selection including measures related to gender (33.2% men), race and ethnicity (58.4% white), transfer sta-

² Students shared that the experience of this week-long research project was extremely meaningful because they got to build community with other disabled students at the same university. Specifically, students shared that this opportunity was the first time they could confidently identify with the Disabled community and feel supported in this setting with other students who understood their experiences.

tus (30.3% transfers), grades (62.3% mostly A's, see Table 1). Prior to analysis, each variable was checked for multicollinearity; the largest relationship existed between seniors and transfer measures ($r = .38$). For each model, independence of residuals was tested and resided within acceptable parameters ($1 < \text{Durbin-Watson} < 3$). Considering that the smallest subgroup is quite small (162 respondents with an intellectual disability) a moderate level of significance was used for this analysis ($p < 0.05$).

Results

Across all demographic variables reported in Table 1, disabled students reported lower mean scores for supportive environment compared to the general population. Some of the largest variations between disabled students and the general population included gender differences, class standing, and race. Specifically, disabled students who identify as men ($M = 29.42$) had lower mean scores compared to general population men ($M = 31.84$), and disabled women ($M = 30.56$) also exhibited lower mean scores compared to their general population counterparts ($M = 33.11$). In terms of class standing, disabled seniors ($M = 29.51$) reported lower mean scores compared to seniors from the general population ($M = 32.14$). Meanwhile, disabled Asian students ($M = 30.09$) and disabled Black or African American students ($M = 31.01$) reported lower mean scores compared to their general population counterparts ($M = 32.89$ and $M = 33.29$ respectively). As a whole, disabled students report lower mean scores for supportive environment than the general population across all demographic variables.

Unstandardized coefficients were consistently negative; however, their magnitude is less than the mean difference between groups, indicating some inflation before accounting for student background (see Table 2). Models' results indicate a statistically significant difference in average general population Supportive Environment scores and the average scores for almost all disability categories. The lowest supportive environment scores for disabled students included: another mental health or developmental condition ($B = -2.93, \beta = -0.04, SE = 0.23$), followed by depression ($B = -2.74, \beta = -0.05, SE = 0.14$), and anxiety ($B = -2.34, \beta = -0.05, SE = 0.13$), attention deficit or hyperactivity disorder ($B = -2.24, \beta = -0.04, SE = 0.17$), traumatic or acquired brain injury ($B = -2.21, \beta = -0.01, SE = 0.57$), autism spectrum ($B = -2.14, \beta = -0.02, SE = 0.39$), speech or communica-

tion disorder ($B = -2.11, \beta = -0.01, SE = 0.75$), chronic medical condition ($B = -2.04, \beta = -0.03, SE = 0.22$), disability or condition not listed ($B = -1.97, \beta = -0.02, SE = 0.37$), learning disability ($B = -1.67, \beta = -0.02, SE = 0.26$), mobility condition that does not affect walking ($B = -1.64, \beta = -0.01, SE = 0.61$), Deaf or hard of hearing ($B = -1.63, \beta = -0.01, SE = 0.47$), mobility condition that affects walking ($B = -1.60, \beta = -0.01, SE = 0.38$), and blind or low vision mobility condition that affects walking ($B = -1.21, \beta = -0.01, SE = 0.47$). Predictably, considering that statistical significance can be influenced by sample size, the exception was the smallest subgroup (Lomax & Hahs-Vaughn, 2012).

Discussion

Advanced statistical methods were employed, revealing significant differences in average Supportive Environment scores between the general population and 14 disability categories when accounting for other student demographics. Through disaggregation, we found that students with mental health or developmental disabilities averaged lower Supportive Environment scores than students with physical, sensory, and other disabilities. Interestingly, Mental Health and Developmental Disability were the largest subgroups, but the students in these subgroups reported the lowest levels of support.³ Nonetheless, because disabled students reported lower mean scores for supportive environment than the general population across all demographic variables, the following discussion offers ways for institutions to improve the environment for all disabled students.

In the context of the overarching disability categories that the NSSE collects—sensory disability, physical disability, mental health and developmental disability, and other disabilities and conditions—it is important to distinguish how students who identify within these groups benefit from different kinds of support. These four overarching categories align with the format of the new NSSE disability item. Respondents are able to select each disability, but the response options are placed under each category as a heading (see Zilvinskis et al. (2021b) for item formatting). Below we discuss each of the discrete disability categories, provide context to the specific barriers students from these groups have experienced, and provide actionable recommendations for faculty and practitioners to improve the supportive environment for these specific disabilities.

³ Student team members with invisible disabilities identified professor flexibility and empathy as essential aspects of support. This includes inviting student questions, breaking assignments into manageable components, creating definitive syllabi and rubrics, and granting extensions (from members with ADHD).

Table 1*Sociodemographic Characteristics of Sample and Supportive Environment Mean Scores*

	Disabled Students			General Population		
	<i>n</i>	%	<i>M</i>	<i>n</i>	%	<i>M</i>
Sample	22,115		30.07	124,975		32.60
Class standing						
First-year students	9,804	44.3	30.77	56,228	45.0	33.17
Seniors	12,311	55.7	29.51	68,747	55.0	32.14
Gender						
Man	5,540	25.1	29.42	41,433	33.2	31.84
Woman	14,872	67.2	30.56	81,413	65.1	33.11
Another gender identity	1,117	5.1	28.71	785	0.6	29.57
Prefer not to respond	586	2.6	26.15	1,344	1.1	26.87
Race and ethnicity						
Asian	747	3.4	30.09	9,494	7.6	32.89
Black or African American	1,287	5.8	31.01	10,976	8.8	33.29
Hispanic or Latina/o	1,385	6.3	30.53	13,858	11.1	33.51
Middle Eastern or North African	104	0.5	29.40	1,032	0.8	33.10
Multiracial	2,791	12.6	30.32	12,206	9.8	32.42
Another race or ethnicity	311	1.4	27.57	1,265	1.0	32.24
I prefer not to respond	734	3.3	25.20	3,199	2.6	28.26
White	14,756	66.7	30.19	72,945	58.4	32.51
Transfer status						
Transfer	7,514	34.0	29.13	37,846	30.3	31.48
Non-transfer	14,601	66.0	30.55	87,129	69.7	33.09
Grades						
Mostly As	11,528	52.1	30.99	77,818	62.3	33.43
Mostly Bs	8,537	38.6	29.63	41,592	33.3	31.58
Mostly Cs	2,050	9.3	26.69	5,565	4.5	28.70

Table 2

Descriptive Statistics and Regression Models Results Comparing Supportive Environment Scores Between the General Population with Disability Categories

	Supportive Environment		Regression Coefficients			
	<i>n</i>	<i>M</i>	<i>B</i>	<i>SE</i>	β	<i>p</i>
General population	124,975	32.60	-	-	-	-
Sensory disability^a						
Blind or low vision	687	30.54	-1.21	0.54	-0.01	0.03
Deaf or hard of hearing	944	29.98	-1.63	0.47	-0.01	0.00
Physical Disability						
Mobility condition that affects walking	1,424	30.03	-1.60	0.38	-0.01	0.00
Mobility condition that does not affect walking	548	29.88	-1.64	0.61	-0.01	0.01
Speech or communication disorder	357	28.99	-2.11	0.75	-0.01	0.01
Traumatic or acquired brain injury	618	29.11	-2.21	0.57	-0.01	0.00
Mental health or developmental disability						
Anxiety	14,648	29.66	-2.34	0.13	-0.05	0.00
Attention deficit or hyperactivity disorder	8,099	29.41	-2.24	0.17	-0.04	0.00
Autism spectrum	1,398	29.05	-2.14	0.39	-0.02	0.00
Depression	11,754	29.14	-2.74	0.14	-0.05	0.00
Another mental health or developmental disability (schizophrenia, eating disorder, etc.)	4,030	28.86	-2.93	0.23	-0.04	0.00
Another disability or condition						
Chronic medical condition (asthma, diabetes, Crohn's disease, etc.)	4,361	29.95	-2.04	0.22	-0.03	0.00
Learning disability	3,090	30.04	-1.67	0.26	-0.02	0.00
Intellectual disability	162	29.23	-2.07	1.12	-0.01	0.06
Disability or condition is not listed	1,498	29.67	-1.97	0.37	-0.02	0.00

Note. Regression coefficients are independent variable effects for 15 regression models, which included covariates accounting for student class standing, gender, race and ethnicity, transfer status, and grades.

^a These four overarching categories align with the format of the new NSSE disability item. Respondents are able to select each disability, but the response options are placed under each category as a heading. See Zilvinskis et al. (2021b) for item formatting.

Sensory Disabilities

The term “sensory disabilities” refers to neurological disorders that affect a person’s ability to process information, including visual, hearing, and tactile disorders. Within the sensory disability category, there are many strategies institutional faculty and staff can use to create a supportive environment. For example, students who identify as blind or low vision have been found to benefit from strategic support from faculty and staff in seeking out not only on-campus support but support from other means off campus (Schuck et al., 2019).

To offset the deficit of support found in this study, educators should be cognizant of how disabled students experience and express disability. For example, although Deaf or hard-of-hearing students are listed under the “sensory disability” section on the NSSE, not all who are Deaf view their condition as a disability. For those in the Deaf community, “Deaf” refers to a “linguistic and cultural group rather than a form of impairment” (Evans et al. 2017, p. 5). It is traditional within the Deaf community to use the capital “D” Deaf to refer to those who identify as members who are Deaf and engage with Deaf culture, such as using sign language. The lowercase “d” deaf is used for those whose deafness is primarily an audiological or medical experience (Pudans-Smith et al., 2019). Knowing how auditorily disabled students identify is key to creating a supportive environment.

To improve support within classroom environments, scholars provide specific challenges and barriers that sensory disabled students can experience in the classroom, such as difficulty in loud class discussions and understanding when emergency sirens are active. Educators should seek to reduce these barriers, by trying to maintain a distraction-free classroom, allowing students to work in smaller groups or in a quiet environment (such as break-out sessions), and ensuring that students do not talk over one another. This practice reminds students that each voice in the classroom is valued, and everyone has a perspective worthwhile to share.

Physical Disabilities

Physical disabilities is another group in which there is much diversity. However, students and scholars have noted many barriers to engagement. First, physically disabled students note that at times, they have felt as if people on campus refuse to look at them and that others assume that because they are physically disabled, they must also have a cognitive disability; along with other harmful stereotypes

which negate the value and perspective these students bring to the campus community (Bialka et al., 2017). To offset these stereotypes, it is recommended that staff and faculty participate in anti-ableism training and other educational opportunities. Substantiating our study’s trend, Carroll et al. (2020) found physically disabled students are less engaged compared to those without physical disabilities often because of the location of activities and events.

For physically disabled students, especially those who are disabled in a way that impacts their ability to walk on campus, institutions must seek to remove physical barriers. Accessible entrances and bathrooms may be available, but inconvenient, or they may ostracize physically disabled students by forcing them to travel to access services.⁴ Fortunately, the ADA of 1990 mandates that new construction be accessible, but educators and institutional staff must challenge whether the accessibility is equitable. Such a task can be difficult for campus constituents who may not have the power to incorporate such progressive changes, but faculty and staff can use their voice to educate those who may not understand this importance. Further, faculty can seek to ensure their classes are held in accessible locations and collaborate with DRO staff to ensure this happens.

Traumatic Brain Injuries (TBI) are another category of disability within the NSSE’s disability item. Some of the most common symptoms associated with TBI include “headaches, dizziness, memory and balance/coordination problems” (Krause & Richards, 2014, p. 1305). Childers and Hux (2016) investigated the experiences of college students with mild TBI and noted barriers, such as requiring extra time to process and complete assignments, trouble initiating tasks, changes to emotional regulation, and “perceived invisibility” of their condition (p. 399). Krause and Richards (2014) found that providing students with structure, staying true to the course syllabus, having extra exam time, and a quiet testing location were all effective in supporting the success of these students. Ensuring these types of support for TBI disabled students can help these students feel like they are valued members of the campus community.

Speech or communication disorders (also known as fluency disorders) include stuttering, cluttering, and other conditions that impact how an individual expresses themselves vocally; such disorders are often apparent to others (Evans et al., 2017). In a study conducted on stuttering students, Werle and Byrd (2022) found that students experienced negative perceptions and stereotypes from every level of in-

4 One member of the research team who uses a variety of mobility aids noted they have been in classrooms that were inaccessible for larger mobility aids, limiting the support and therefore safety they were able to use going to those classes.

structor, from primary school through college. Their study also found that if students self-disclose their speech or communication disorder, professors then tend to act against the negative stereotypes they may have, ultimately improving their perceptions about the student. Self-disclosure for disabled students is a deeply personal decision that may not always happen (Barnard-Brak et al., 2010). Since many speech and communication disorders are apparent, it is important for faculty to be accepting and seek to learn about speech and communication disorders to prevent stereotypes from forming or being acted upon.

Mental Health and Developmental Disabilities

Mental health and developmental disabilities are another group within the disability community that experience unique barriers to their success and engagement. For instance, Sniatecki et al. (2015) investigated faculty perceptions of disabled students and found that faculty note they do not know enough information about these students. Thus, training on all disability types is needed. Particularly damaging, however, is the notion that faculty had the least positive attitude toward mental health disabled students (Sniatecki et al., 2015). This finding is especially concerning, as the rate at which mental health disabled students enroll in higher education only continues to grow (Evans et al., 2017). To address the concerns of the level of support found in this study, training for faculty in this area is sorely needed to deconstruct stigma and preconceived notions. Depression and anxiety are quite common on college campuses (Evans et al., 2017), and scholars have noted the importance of faculty openness and understanding in supporting students struggling with their mental health. Such support was especially needed during the COVID-19 pandemic (Grineski et al., 2024), highlighting the important role that faculty have in supporting their students.⁵

Attention-deficit/hyperactivity disorder (ADHD; sometimes referred to as attention-deficit disorder [ADD]) is another category of disability with unique needs. Costello and Stone (2012) note that a challenge for ADHD disabled students is lecture-style classes where students must sit and listen to a professor for nearly an hour (or longer) at a time while being expected to take notes. This challenge is magnified for some with ADHD because information processing can be difficult without “the metacognitive skills needed to receive information, evaluate it, select what is important, and produce a written summary within a matter of seconds” (p. 121). Other challenges as-

sociated with ADHD are memory and concentration (Turnbull et al., 2010) and executive function (Parker et al., 2011). To support ADD or ADHD disabled students, it is recommended that faculty and DRO staff implement “positive psychology,” which can involve having a syllabus with clear expectations, invitations to speak with faculty when feeling challenged, and tips for how to be successful in the course (Tincani, 2004). In addition to these interventions, it is recommended that support staff provide opportunities for ADD or ADHD disabled students to set realistic goals for the semester and utilize counseling or peer mentoring (Brown et al., 2010).

Developmental disabilities, such as Autism or Autism Spectrum Disorder (ASD), are another aspect of the mental health or developmental disability group on the NSSE. Hewitt (2011) noted the specific challenges that autistic students can experience in their transition to higher education, such as navigating social situations, making eye contact, and challenges with executive function. Between these unique needs and lower levels of support found in this study, these students require tailored support. Brown (2017) notes that while nearly all institutions provide some type of academic accommodations to help students in the classroom, only 28% of institutions offer specific services for autistic students. DRO staff should seek to provide tailored support. Workshops or programs can be designed with students, which can help earn buy-in and ensure services meet their needs.

Another Disability or Condition

The last main category of disability used on the new NSSE update is composed of four groups: chronic medical conditions, learning disabilities, intellectual disabilities, and disability or condition not listed. Chronic medical conditions can be quite complex, and it is recommended that faculty seek to reduce pressure on these students. Evans et al. (2017) notes that classroom attendance policies can be difficult for chronically disabled students to adhere to, as some days their condition may be harder to manage. Faculty should not be expected to overlook their attendance policies but should revise them to meet the needs of the current classroom of students. Faculty could consult with the campus DRO office and the students themselves. Speaking with the students to learn how best to support them is vital to ensuring that those who are chronically disabled can be active class members but not feel pressured to attend class when ill.

Learning disabilities can be diverse and affect students in many different ways. For college students,

⁵ Students shared that when faculty are open about their own experiences with mental health, it makes them more comfortable approaching those professors when they need additional support (from students with depression, anxiety, and OCD)

learning disabilities can manifest in ways that impact how a student reads, writes, and recalls memory (Costello & Stone, 2012). Cawthon and Cole (2010) identify student-faculty interaction as a barrier for some students with learning disabilities, noting that while faculty may believe an interaction they had with a learning disabled student was positive, the student may not feel the same way. Specifically, Cawthon and Cole (2010) identify gaps in faculty knowledge about how to support learning disabled students, especially with accommodations. Other challenges noted by learning disabled students include faculty who are unwilling to provide accommodations, difficulty scheduling meetings with faculty, and trouble scheduling with a counseling center. A recommendation for faculty working with learning disabled students is finding time to meet with students promptly and seeking out opportunities to educate oneself on the unique experiences, barriers, and how to sponsor success for this student group.

Intellectually disabled students were the smallest in our sample ($n = 162$) and the only nonsignificant finding, but they too have unique characteristics and needs for support to ensure their success. For instance, common challenges intellectually disabled students note are microaggressions, both individual and institutional (Eisenman et al., 2020). Of these, the most glaring is the notion that intellectually disabled students in their study felt like they were being treated like children. When looking for best practices to support intellectually disabled students, peer mentoring is popular since it provides the student with a peer who can help them learn campus culture, engage with others, and serve as an advocate for their success (Kleinert et al., 2012). For faculty with intellectually disabled students, it is important to treat them as adults who belong in the classroom. This involves communicating with these students, learning about disability, and seeking out opportunities to engage with intellectually disabled students on campus.

Implications for Practice

Implications for practice compel educators to make environments more supportive for all disabled students by recognizing their self-defined needs, providing accessible mentorship, creating assistantship opportunities, and interacting with the Disabled community outside the classroom and beyond the university (Brown & Broido, 2020). Additionally, institutions can adjust the campus environment to better support disabled students by implementing training for new

hires, removing physical barriers, and providing reasonable accommodations (Aquino & Plump, 2022; Evans et al., 2017).⁶ Educators can also employ Universal Design principles, such as equitable, flexible, simple and intuitive use, perceptible information, tolerance for error; and low physical effort, while designing spaces that are physically accessible for all (Evans et al., 2023). A recurring theme throughout this article is education. Education is important for faculty and staff on the diversity within disability, but also on the unique challenges and needs that students with diverse disabilities need for success.

The findings of this study coupled with the literature on disabled college students outline specific implications for DRO staff as well. For instance, DRO staff should seek to reframe the accommodations process, from a transactional process wherein students disclose a disability and then receive accommodations (Strimel et al., 2023) to a process that promotes a personal relationship with the students the office serves. Doing so may create opportunities where students feel comfortable sharing their experiences with faculty and DRO staff, as well as how supportive their campus feels. In their work on the positive implications of disability cultural centers in higher education, Chiang (2020) argues that partnering with student organizations can result in a wider reach. This approach shows the campus community that the DRO office is not just for specific groups of people, but that they too have a role in dismantling institutional ableism, have a presence on campus, and are consistently advocating for greater accessibility. Finally, across higher education, DROs often have terms like “support” and “services” embedded within promotional materials, the name of their office, or possibly even their mission statement (Thornton & Downs, 2010). These offices should discuss the message this may send to disabled students and the greater campus community and seek to remove medicalized messaging and terminology (such as “handicapped” or “special needs”) or in favor of that which is more in line with the social model of disability.

DRO staff could also partner with faculty to implement disability-specific courses, such as a first-year experience/seminar. Such coursework may introduce students to the DRO early in their academic career to reduce disability stigma and promote proactive engagement with their office (Herbert et al., 2020). Moreover, every student is different, so there is no one-size-fits-all solution. Instead, institutions must create a culture wherein faculty, staff, and administrators are regularly learning about the students

6 Further, institutions should ensure programming is accessible to all students (from our research team members with Auditory Processing Disorder and Behcet's Disease).

they serve and the best practices to ensure their success. Creating this culture is a challenge, but it is vital to ensure that disabled students feel a sense of belonging on their campus and that their institution actively fosters their inclusion and success.

Limitations

A few limitations should inform the consideration of this research. Our findings may have been influenced by the recent update of the NSSE disability item, as 2021 was the first year students could answer the additional disability subgroup items on the survey (Zilvinskis et al., 2021b). Without combining multiple years of data, some of the subgroups were small, which may have contributed to the only insignificant relationship modeled (i.e., students with intellectual disabilities). Further, if the Bonferroni Correction were applied, considering that we created 15 models, the new standard for significance ($p < 0.003$) would preclude a few more categories achieving statistical significance. The decision not to use a Bonferroni Correction was made to balance between controlling for Type I errors and preserving statistical power, particularly given the exploratory nature of the research, the potential impact on small sample sizes, and the need for cautious interpretation and further validation in future studies. Also, the practical significance indicated by the standardized coefficients was small in magnitude (Mayhew et al., 2016), which shows that more research must be done to triangulate these findings before they represent the overall population of first-years and seniors at four-year institutions.

Compared with the national participation rate for disabled students (19%), the NSSE sample rate was smaller (15%), which may be due to a number of factors. First, the majority of disabled postsecondary students enroll at two-year institutions (Newman et al., 2011). Second, NSSE designers (2023) claim that the survey should take approximately 15 minutes to finish; however, for some disabled students, the time to complete the assessment may take much longer leading to noncompletion. Third, the language of the disability question may lead some respondents with a disability to be included in the general population if (a) they do not identify as Disabled personally, (b) have yet to be diagnosed, or (c) if their disability treatments result in limited impact on learning, work, or life. Another limitation of the current study was disability co-occurrence was not accounted for. Considering that a majority of respondents in our disabled subgroup selected more than one disability, this is an important area of research that was beyond the scope of the current work (see future research). Finally, an important limitation is the lack of consensus in the

field regarding disability categorization. Specifically, this study used the NSSE's categorization of disability, but other scholars, disabled people, and practitioners may disagree with which disabilities make up each category.

Future Research

We encourage other scholars to incorporate a CBPR approach to their research when studying the experiences of disabled students. CBPR is a way to provide students with new skills and ensure that, as the stakeholders of the research, they are being meaningfully represented. Additionally, the insights and nuances that students can offer are extremely valuable when providing recommendations to other academics. Future research could also include a support services staff as part of the research team to allow for their unique perspectives.

The current study is only the beginning of new research that can be performed using NSSE's updated disability items. Future research can focus on other aspects of engagement, such as interaction with faculty, and participation in High-Impact Practices, such as undergraduate research. We urge educators to address low support for disabled students; however, more robust studies are needed to further explore the engagement of students with diverse disabilities. For example, the intellectual disability category had a sample size of 162 students, compared with the anxiety category reporting 14,648 students; meanwhile, the four smallest subgroups reported a p -value above 0.00 (see Table 2). Future research is required to build a multi-year dataset to study and measure the co-occurrence between these smaller subgroups. Many disabilities co-occur together, such as anxiety and depression (Levine et al., 2023) and ADHD and autism (Zablotsky et al., 2020). Therefore, the category with the largest effects, "another mental health or developmental disability" is overgeneralized. Similarly, ADHD and learning disabilities often co-occur, and this can manifest in and out of the classroom, especially related to tasks that involve writing (DuPaul et al., 2013). To further demonstrate challenges with studying co-occurrence of disability, it is known that TBI and depression also have higher rates of co-occurrence (Sullivan-Singh et al., 2014). Co-occurrence challenges societal understanding of disability, reiterating that disability is not a monolith and people are impacted in a multitude of ways by their disability or disabilities (Peña, 2014). Although accounting for co-occurrence was beyond the scope of this research, additional studies of these overlapping categories and/or a potential update to the survey item may clarify these subgroups specific demographics.

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