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From the Editors

Roughly one year has passed since we first joined the *Journal of Postsecondary Education & Disability* as co-editors. During that time, we have often reflected on how the editorial process works and how we can make it function more effectively for the dedicated editorial board members as well as the talented scholars who submit their manuscripts to *JPED* for publication consideration. Recently, we have examined two different sources of data that have helped us to think a bit differently about the review process.

First, we looked at a wide range of recent reviewer reports. These reviews were written by different people about different manuscripts, which themselves used a wide variety of methods. It was therefore quite interesting to us to note that the vast majority of the reviews contained quite similar feedback. Most reviewers noted either a need for a more robust literature review or praised the quality of the literature review because, to paraphrase: “Our readership values empirical scholarship that simultaneously frames its research problem in terms of what is already known and anchors its finding by noting specific, substantive contribution to the literature.” Although nearly all scholarly journals require literature reviews, we realized that *JPED* reviewers paid extra attention to this section of the manuscript. They endeavored to make sure that manuscripts were not monologues contributing findings in a vacuum but part of sustained dialogues with the field. As we considered why this feedback recurred so frequently, we noted the diversity of fields, disciplines, methodologies, and philosophies of practice that motivate the work of the *JPED* readership. Simply put, we think that literature reviews might matter more for our readership because they come from a broader array of intellectual traditions than in many other communities of practice that form around a scholarly journal. For our authors, the literature review is a key way of inviting people to consider new ways of thinking about disability in higher education, and for our readers, the literature review can be a way of orienting oneself to unfamiliar conceptual terrain.

Second, we regularly receive readership reports from the databases through which readers can access the *Journal of Postsecondary Education & Disability*. In reviewing a recent version of one of these reports, we noted something striking: most of the pieces included therein were either literature reviews or manuscripts wherein great care had been taken to position the studies they described relative to a much larger body of literature. These included five literature re-

views focused on topics such as accommodations, ADHD, student identity, and universal design. The remaining five empirical studies covered a similarly broad range of topics— including self-advocacy, universal design trainings, access barriers, and autistic student support. Notably, of these empirical studies, three had a literature review that was unusually well-organized, unusually long, or both. In short, these three empirical studies were supported by a highly-effective review of the literature, which relied on strategies such as clearly demarcated subheadings, sustained engagement with texts, and concise topical sentences in order to present a clear argument. Thinking about these trends in empirical studies in tandem with the five article length literature reviews among our most read articles helped crystallize the conclusion that *JPED*’s readers appreciate work that both codifies existing knowledge and contributes new knowledge to the field.

This issue of the *Journal of Postsecondary Education & Disability* certainly reflects the intentionality with which authors can approach a deep engagement with prior work as well as think intentionally about how their own manuscripts move the field forward. For example:

- In our first article, “Predicting Assistive Technology Service Utilization and Grade Point Average for Postsecondary Students with Disabilities,” Claire Simpson, Marla Roll, and Matt Malcolm undertake a secondary data analysis to explore the interconnections between assistive technology use, academic success, and disability identity. They anchor their work in a comprehensive discussion of assistive technology, the legal requirements for auxiliary aids for disabled students, the academic performance of assistive technology users, and the Human Activity Assistive Technology (HAAT) model.
- The next article, “Disability Cultural Centers in Higher Education: A Shift Beyond Compliance to Disability Culture and Disability Identity,” by Toni Ann Sala uses qualitative interviews to illuminate the experiences of students utilizing the University of Arizona’s Disability Cultural Center— making the argument that the move toward these sorts of approaches to disability inclusion mark a shift away from compliance and toward a programming model that centers disability identity

and culture. To support this argument, the author reviews literature related to recent demographic trends, common barriers to inclusion, microaggressions, and cultural centers.

- “Above Average Student Loan Debts for Students with Disabilities Attending Postsecondary Institutions,” this issue’s third article, by Kim Billington, Kaycee Bills, David Thomas (West), and William Nuckols draws on Baccalaureate and Beyond data to analyze how race and disability shape student debt for disabled Black students. In order to help understand the disparate patterns that they observed, they review literature related to discrimination, the college experiences of disabled and Black students, intersectionality, student debt, and student veterans.
- This issue’s fourth article, “Self-Determination and Quality Indicators for Assistive Technology in Postsecondary Education,” by Robert Gould, Amy Heider, Sarah Parker Harris, Robin Jones, Janet Peters, Yochai Eisenberg, and Kate Caldwell uses a Delphi study to understand expert judgment related to self-determination’s relationship to assistive technology use. To help orient the reader to their study, the authors describe general trends shaping the experiences of disabled people, the importance of assistive technology and relevant legal frameworks for understanding its implementation, and self-determination theory before providing a comprehensive review of literature related to barriers to assistive technology use and the role of self-determination in assistive technology.
- In the fifth article, “Academic Performance and Mobile Technology Use During the COVID-19 Pandemic: A Comparative Study,” by Catherine Fichten, Mary Jorgensen, Alice Havel, Anick Legault, and Jillian Budd, uses survey data to compare the academic performance and technology use of disabled and non-disabled students during the COVID-19 pandemic. To help contextualize this study, the authors provide a thorough review of empirical and conceptual work detailing the impact of the COVID-19 pandemic on PK-20 schools as well as a discussion of mobile technology in schooling generally and among disabled students particularly.
- The sixth piece in this issue, a practice brief by Alicia Drelick, Justin Freedman, Casey Woodfield, and John Woodruff, is titled “Promoting Student-Generated Applications of Universal

Design to Address Accommodations.” This piece frames observations about universal design derived from an action-based project in course for pre-service educators using literature related to disability justice, access to accommodations, and universal design.

- The final piece included in this issue is a book review by Christa Miller focused on *Reach Everyone, Teach Everyone* by Thomas Tobin and Kirsten Behling. While all book reviews are intrinsically engaged in a conversation about relevant literature, this piece is particularly noteworthy for its extensive use of references and deep engagement with the ongoing conversations about universal design happening among disability educators in higher education.

In noting the exemplary attention to relevant literature displayed in this issue’s manuscripts, we do not intend to suggest that this trend would not also be observed in many of our past or future issues as well. Indeed, we think it would. What we really want to point out is the exceptional care that the authors, reviewers, and readers of the *Journal of Postsecondary Education & Disability* take in connecting the new ideas shared in each issue with long-running discussions in the field.

Ezekiel Kimball, Ph.D.
Ryan Wells, Ph.D.
Executive Editors

Predicting Assistive Technology Service Utilization and Grade Point Average for Postsecondary Students with Disabilities

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Abstract

Assistive technology (AT), an essential accommodation for postsecondary students with disabilities (SWD), is intended to increase equitable access to physical and virtual educational environments. Limited evidence exists to demonstrate who is using AT or its impact on objective measures of academic performance, such as GPA. The purposes of this study were to (1) identify predictors of AT service utilization amongst postsecondary SWD, and (2) determine the extent to which AT service utilization or personal/contextual factors (e.g., first-generation status, disability category, gender, race/ethnicity, socioeconomic status, academic major) predict GPA. Results of this study indicate first-generation students were 52% more likely to seek AT services, while students with cognitive and psychological disabilities were 35% and 51% less likely, respectively. SWD who utilized AT services earned a 0.14 higher GPA than their peers who did not use AT. These findings have implications for institutions and disability service providers to strategically and proactively promote their services to students who need and benefit from using AT services.

Keywords: assistive technology, postsecondary education, students with disabilities, first-generation college students, grade point average

Postsecondary students with disabilities (SWD) experience many barriers to learning and increased risk for academic performance issues that impact academic outcomes (Koch et al., 2018). In fact, postsecondary SWD are approximately 24% less likely to graduate than their peers without disabilities (Newman et al., 2011; U.S. Department of Education, 2012), which has lifelong implications for achieving job security and living wages. Adults who do not earn a postsecondary degree earn less money on average, are more likely to be unemployed, live in poverty, or be unsatisfied with their career (Pew Research Center, 2014). Accommodations to reduce barriers and ensure greater academic success are essential, especially given the rapid increase in SWD postsecondary enrollment over the last decade with recent figures suggesting they comprise nearly 20% of the postsecondary student population. (Snyder et al., 2019).

The provision of assistive technology (AT) supports and services is an accommodation intended to lessen and remove barriers faced by postsecondary

SWD. Assistive technology is defined as “any item, piece of equipment, software program, or product system that is used to increase, maintain, or improve the functional capabilities of persons with disabilities” (Assistive Technology Act [ATA], 2004, p. 1710). In the postsecondary educational environment, AT enables students to independently access learning materials in a way that works for them by providing alternative means of performing aspects of reading, writing, note-taking, studying, etc. For example, a student with dyslexia may use text-to-speech software to listen to their textbooks. The National Center for Education Statistics found that 70% of postsecondary institutions deem AT to be a fundamental support for SWD (Snyder & Dillow, 2013). Assistive technologies commonly used in postsecondary education include high-tech, low-tech, and mainstream devices and programs. High-tech devices include, but are not limited to, text-to-speech and audio reading software, screen readers, refreshable braille, dictation software, screen modification tools, recording device-

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es, captioning tools, and mind-mapping programs. Low-tech devices include, but are not limited to, positioning devices, handheld magnifiers, and reading rulers. Finally, mainstream supports may include time-management apps, project planning tools, and more (Malcolm & Roll, 2019; Ofiesh et al., 2002).

The provision of auxiliary aids (i.e., AT supports and services) are mandated by the Americans with Disabilities Act of 1990 (ADA), Americans with Disabilities Act Amendments Act of 2008 (ADAA), Higher Education Opportunity Act Reauthorization of 2008 (HEOA) and Section 504 of the Rehabilitation act of 1973 (Section 504) (Americans with Disabilities Act Amendments Act, 2008; Higher Education Opportunity Act Reauthorization, 2008; U.S. Department of Education, 2018). Despite these legislative mandates and postsecondary institutions recognizing the importance of AT, a significant proportion of SWD who could benefit from AT services do not utilize them. For example, Malcolm and Roll (2019) found 55% of SWD did not follow through with a referral for AT services. Often, these students are unaware of available services due to insufficient transition planning (Newman & Madaus, 2015) or they may not believe they need or will benefit from accommodations (Collins & Mowbray, 2005). Additionally, some students do not wish to disclose their disability and therefore, choose not to pursue accommodations and AT services. They may fear stigma and discrimination from peers and professors (Hartman-Hall & Haaga, 2002; Martin, 2010). There is a critical need to better identify factors that predict a student's decision to use AT services so universities and AT service providers may more effectively promote their services and strategically target outreach to SWD who may need AT services.

When postsecondary SWD do utilize AT services, they report substantial increases in their academic performance and satisfaction (Malcolm & Roll, 2017a). SWD also report using AT helped them earn better grades and persist in their classes. While these findings demonstrate the benefits of AT supports and services on college SWDs' perceptions of their academic performance, little is known about how AT services relate to objective academic outcomes such as GPA. GPA is an important academic performance outcome for postsecondary SWD because it is directly related to both retention and graduation (Pascarella & Terenzini, 2005). For example, Nakajima et al. (2012) found those who earned a higher cumulative GPA were twice as likely to persist in their schooling. We posit that AT service utilization is related to GPA, but we also recognize the importance of many other factors.

Both AT services and AT research must be considered from a client-centered, multifactorial, and ecologically-valid perspective. The Human Activity Assistive Technology (HAAT) model is the guiding framework used by service providers in our AT service center and was also chosen as a framework to guide selection of relevant variables for inclusion in this study. The foundational concept for this model describes a person engaging in an activity and using AT, within their natural context (Cook & Hussey, 1995; Cook et al., 2019). Thus, the focus is on the person, promoting client-centered practices, but equal consideration is given to the activity, AT, and pervasive influence of social, cultural, and physical context for determining the outcome. The HAAT model has been utilized in other studies to provide context, guide study design, and guide interpretation of results (Giesbrecht, 2013). Applying the HAAT model to postsecondary education, the client is the student, the activity may be any number of learning or academic-related tasks (e.g., test-taking, taking notes, etc.), and the context is the physical, digital, social, and cultural postsecondary environment. The inclusion of AT as a distinct yet critically important element in this model warranted consideration of the unique influence that AT service utilization may have on GPA within this study. Person-factors (e.g., gender, race/ethnicity, disability), activity demands (e.g., academic major), and contextual factors (e.g., first-generation status, socioeconomic status) were then considered as additional variables to examine when predicting AT Service Utilization and GPA.

Previous research has found demographic variables such as gender, race, and disability to be significantly related to GPA. Kim and Lee (2016) found that white students earned a higher GPA than their non-white peers, females earned a higher GPA than males, and students with multiple disabilities earned a lower GPA than students with a single disability. Further, Malcolm and Roll (2017b) reported self-perceived academic performance and satisfaction after utilizing AT services increased more substantially for students with mood disorders than any other disability category. First-generation college students have demonstrated different academic needs and outcomes compared to continuing-generation college students. Lombardi et al. (2012) classified first-generation SWD as facing a "dual challenge or cumulative risk" (p. 811), suggesting the intersectionality of first-generation status with disability is cause for differential academic outcomes when compared with continuing-generation SWD. They further suggest the importance of researching disability services utilization among this specific population. Additionally, financial stress and

low socioeconomic status have been shown to be related to decreased academic performance (Joo et al., 2009), and this finding was supported by Lombardi et al. (2012) among first-generation college SWD as well. Finally, Moon et al. (2012) suggest that because science, technology, engineering and math (STEM) courses have very different pedagogies than non-STEM courses, SWD in STEM majors have more complicated accommodation needs and STEM instructors are less prepared to accommodate. While these trends previously reported in the literature indicate the impact of various factors on GPA, there is limited information about the role AT service utilization may have among these other factors in predicting academic performance.

The purpose of this study was to identify predictors of AT utilization among postsecondary SWD and to determine the extent to which AT utilization and other factors predict GPA. The specific study aims were to determine the extent to which 1) personal, activity, and contextual factors of first-generation status, disability category, gender, race/ethnicity, socioeconomic status, and STEM major relate to AT service utilization; and 2) AT service utilization along with personal, activity, and contextual factors predict GPA.

Methods

Study Design

This study employed a retrospective analysis of secondary data collected during regular service provision in the AT service center at a mountain-west public doctoral granting Land Grant university. Because this was a retrospective study of secondary data, the Institutional Review Board (IRB) did not consider this research data, and therefore obtaining informed consent from participants was not necessary. De-identified data were retrieved from the AT center's database for students, including graduate and undergraduate students, who were referred to or sought AT services between fall 2015 and summer 2019. The AT center's data were then matched with demographic and academic performance records from the university's Institutional Research office. All data were checked to ensure there were no multiple data entries. Participants were excluded from the final analysis if data were missing for any of the predictor variables described below.

AT Service Process

At the university in which the present research study was conducted, AT services fall under the jurisdiction of a distinct and specialized AT services of-

fice, housed within an academic occupational therapy program. This contrasts from a common AT service provision model at many postsecondary institutions, in which AT services are provided by the general disability services office along with other academic accommodations. Many students who self-identify with the student disability center to receive academic accommodations for their disability are referred to the AT center. The AT center is staffed by occupational therapists, occupational therapy graduate students, information technology (IT) professionals, and one assistive technology professional (ATP). The AT service process is highly individualized and dependent on the unique student's needs. Therefore, the length and intensity of intervention and training varies. Students who initiate services with the AT center go through an initial evaluation meeting, in which the AT service provider thoroughly assesses the student's academic strengths and barriers using a semi-structured interview and a modified version of the Canadian Occupational Performance Measure, a commonly used outcome measure in the field of occupational therapy. Main areas of focus include reading, writing, note-taking, studying, and time management/organization. During follow-up meetings, students work together with AT service providers to find and trial AT solutions and strategies that fit their academic needs. Many of the technologies offered by the AT center include software or applications that can be installed on the student's personal computer, phone, or tablet, or are implemented in a campus computer lab, library assistive technology rooms, or study room of the student's choosing. Other technologies include hardware, which the student can trial or check out as a loan from the AT center. AT service providers then train the student to use and apply any new technologies or strategies to their academic tasks. The student and AT service provider may meet several times until both parties feel confident that the student is comfortable and competent with using any technology and able to apply the tools to meet their academic needs. After regular service meetings, the service provider will check in with the student by email or phone periodically to answer any further questions or training needs that may arise. There is no cost to students for any services provided by the AT center.

Aim 1 Variables—AT Service Utilization

The goal of Aim 1 was to identify predictors of AT service utilization. Predictor variables examined included first-generation status, disability category, gender, race/ethnicity, socioeconomic status, and academic major. The dependent variable for Aim 1 was AT service utilization, which was handled as a bina-

ry variable (AT service-recipient vs. referral-only). The services group included students who received AT services. The referral-only group included the students who were referred by the disability services office but never sought AT services.

Each variable was handled as a binary variable. First-generation college students were those who do not have at least one parent who earned a Bachelor's degree or higher, as defined by our university's Institutional Research Office. During the admissions process, students indicated if they are a first-generation or continuing-generation college student. These data were collected by Institutional Research. Data about disability were extracted from the AT center database, and grouped into five categories: The cognitive disabilities category included students who identified as having attention deficit disorder/attention deficit hyperactivity disorder, autism spectrum disorder, cognitive or intellectual disability, learning disability or traumatic brain injury (TBI). The psychological disabilities category included students who identified as having mental illness or psychological conditions. Physical disabilities included students who identified with a mobility limitation or orthopedic impairment. Sensory disabilities included students with visual or hearing impairments, and multiple disabilities included students with multiple disabilities reported. Students with a disability listed as "other" in the database were excluded from this study. Each disability category was binary-coded as present or not present. Although gender is not binary, it was treated as a binary variable (male or female) for the purposes of this study and students with nonbinary, unknown, or missing gender data were excluded from analysis. Race/ethnicity, also collected by Institutional Research during the admissions process, was transformed into minority race/ethnicity vs. non-minority race/ethnicity. Major was transformed into STEM vs. non-STEM major according to the STEM-Designated Degree Program List (U.S. Immigration and Customs Enforcement [ICE], 2012). Pell Grant recipient was a binary variable indicating whether or not a student has received a Federal Pell Grant, which is partially contingent upon financial need and therefore an indicator of socioeconomic status (U.S. Department of Education, 2015).

Aim 2 Variables—GPA

The goal of Aim 2 was to determine if final cumulative GPA can be predicted by AT service utilization, first-generation status, disability category, gender, race/ethnicity, socioeconomic status, and major. The dependent variable for Aim 2 was final cumulative GPA, a continuous variable. Final cumulative GPA

was recorded for each student at the end of their final term at the university. For students who graduated or left the university prior to summer 2019, this represented their cumulative GPA for their entire postsecondary career at this university. For students in the dataset who were still attending the university, their cumulative GPA in the summer of 2019 was recorded as their final cumulative GPA.

Independent variables were the same variables used in Aim 1, with the addition of AT service utilization. For this aim, AT service utilization was not treated as a binary variable (as in Aim 1), but rather as a three-level categorical variable: referral-only, intake-only, intake+ follow-ups. Students in the referral-only group were referred by the student disability center to the AT center but never received AT services. Students in the intake-only group were referred and came to the AT center for an initial meeting but never returned for a follow-up. This was a distinct service level because students in this group may have received the supports they were seeking within the first meeting or they may have decided not to return for other reasons. Students in the intake + follow-ups group were referred, came for an initial appointment, and then returned for one or more follow-up appointments.

Statistical Analysis

IBM SPSS Statistics 26.0 was used to conduct all statistical analyses for this study (IBM, 2019) and alpha set at $\alpha = 0.05$ for all analyses. For Aim 1, binary logistic regression was used to assess the relationship between the binary dependent variable, AT service utilization, and the independent variables, gender, first-generation status, minority race/ethnicity, Pell Grant recipient, STEM major, and disability category. The forced entry method was used to enter independent variables into the regression. *Nagelkerke* R^2 was used to assess the proportion of variance in AT service utilization associated with the independent variables.

For Aim 2, multiple linear regression was used to assess the relationship between the dependent variable of final cumulative GPA and the independent variables of AT service utilization, gender, first-generation status, minority race/ethnicity, Pell Grant recipient, STEM major, and disability category. The forced entry method was used to enter independent variables into the regression. The coefficient of determination, R^2 , was used to explain the proportion of variance in final cumulative GPA predicted by this model. The coefficient of determination, R^2 , is a value between $0.00 \leq R^2 \leq 1.00$, with 0.00 indicating no relationship and 1.00 indicating 100% of variance in

GPA can be explained by this combination of independent variables.

Results

Descriptive Data

There were 956 SWD in the dataset, though not all students had complete data for all variables of interest. Total sample size for each variable and characteristics are represented in Table 1. Gender was fairly evenly split among this sample, with 47.4% of the sample identifying as male and 52.6% female. Of the total sample of SWD, 22.0% were first-generation, 20.0% identified as a minority race and/or ethnicity, 24.7% received a Pell Grant, and 46.5% were STEM majors. The largest disability category was cognitive disability, which included 54.9% of students, and the smallest category, sensory, included 4.2% of students. All students in the sample were referred for AT services; however, 34.3% never followed up on the referral (referral-only group), 17.5% completed the intake process and appointment with the AT office (intake-only group), and 48.2% sought services and continued services after their intake appointment (intake + follow-up). The average final cumulative GPA was 2.78 ($SD=0.78$).

Aim 1—AT Service Utilization

Table 2 displays AT service utilization regression results. The full model for predicting AT service utilization was not statistically significant ($\chi^2 = 15.62$, $df = 10$, $p = 0.11$, Nagelkerke $R^2 = 0.026$), indicating the independent variables did not collectively predict whether or not a student would utilize AT services. Examination of independent predictor variables revealed that first-generation students were 52% more likely to seek AT services than continuing generation students (Odds Ratio [OR] = 1.52, 95% confidence interval [CI] = [1.020, 2.263]). Additionally, when compared with students in other disability categories, students with cognitive and psychological disabilities were 35% (OR = 0.65, CI = [0.442, 0.964]) and 51% (OR = 0.49, CI = [0.395, 1.574]) less likely, respectively, to seek AT services. Gender, minority race/ethnicity, Pell Grant recipient, STEM major, physical, sensory, and multiple disabilities, were not significantly related to AT service utilization.

Aim 2—GPA

Table 3 displays GPA regression results. The full model for predicting GPA was statistically significant ($F = 2.81$, $df = 694$, $p = 0.001$) and explained 4.3% of variation in final cumulative GPA ($R^2 = 0.043$). Being a first-generation student was associated with 0.16

lower GPA compared with continuing-generation students ($B = -0.16$, $CI = [-0.311, -0.011]$). Each increase in AT service utilization level (e.g., intake-only to intake+ follow-ups) was related to a 0.14 grade point increase in GPA ($B = 0.14$, $CI = [0.070, 0.200]$). For example, if a student who was referred for AT services but never scheduled an appointment with the AT services office (i.e., referral-only) earned a 3.00 GPA, the student who initiated AT services but only attended one appointment (i.e., intake-only) would earn a 3.14 GPA, and the student who attended multiple AT services appointments (i.e., intake + follow-ups) would earn a 3.28 GPA. Being in a specific disability category was generally unrelated to GPA, but having multiple disabilities was associated with a 0.25 higher GPA ($B = 0.25$, $CI = [0.005, 0.496]$). Gender, minority race/ethnicity, Pell Grant recipient, and STEM major were not statistically significant predictors of final cumulative GPA.

Discussion

Aim 1—AT Service Utilization

Not all students are equally likely to seek AT services after being referred (Malcolm & Roll, 2019). Identifying factors associated with a student's likelihood to seek AT services is necessary for increasing outreach. Malcolm and Roll (2019) found that as class-level increased, students were more likely to seek AT services. Our research adds to this finding, showing generation status and disability category were also related to likelihood of seeking AT services.

First-generation SWD were more likely to seek AT services than their continuing-generation peers. Lombardi et al. (2012) similarly found first-generation SWD were more likely to seek general disability accommodations than continuing-generation SWD. However, these findings do not mean that efforts to promote services specifically to first-generation SWD should be decreased or diverted towards other students. Rather, they may reflect a need for first-generation students to depend on institutional supports more than familial supports (Lombardi et al., 2012). First-generation students tend to experience more challenges in their transition from high school to postsecondary school and they may have different financial, emotional, and social supports from their families than do continuing-generation students (Bryan & Simmons, 2009; Pascarella et al., 2004). Therefore, colleges and universities must ensure first-generation students have access to all available support services.

Students with cognitive or psychological disabilities were less likely to seek AT services. Newman

Table 1*Characteristics of the Sample*

Variable	Frequency (<i>n</i>)	Percent (%)
Gender		
Male	453	47.4
Female	503	52.6
Total	956	
Generation status		
Continuing generation	746	78.0
First-generation	210	22.0
Total	956	
Race/ethnicity		
Non-minority	728	80.0
Minority	182	20.0
Total	910	
Pell Grant Recipient		
No	720	75.3
Yes	236	24.7
Total	956	
Major		
Non-STEM	460	53.5
STEM	400	46.5
Total	860	
Disability category		
Cognitive	463	54.9
Psychological	86	10.2
Physical	54	6.4
Sensory	35	4.2
Multiple	205	24.3
Total	843	
AT Service Utilization		
Referral-Only	323	34.3
Intake-Only	165	17.5
Intake + Follow-ups	453	48.2
Total	941	

Table 2*Binary Logistic Regression Results*

Predictors of AT Service Utilization							
Dependent variable	AT service utilization						
Regression result	$\chi^2 = 15.62, df = 10, p = 0.11, Nagelkerke R^2 = 0.026$						
Coefficients							
Predictor variable	B	S.E. B	Wald χ^2	p	Odds Ratio	95% C.I. for Exp (B)	
						Lower	Upper
First-generation	0.418	0.203	4.224	0.040*	1.519	1.020	2.263
Gender	-0.146	0.156	0.877	0.349	0.864	0.637	1.173
Race/ethnicity	0.077	0.190	0.165	0.684	1.080	0.745	1.566
Pell recipient	-0.166	0.187	0.785	0.375	0.847	0.587	1.222
STEM major	-0.005	0.154	0.001	0.974	0.995	0.736	1.345
Cognitive disability	-0.426	0.199	4.604	0.032*	0.653	0.442	0.964
Psychological disability	-0.718	0.292	6.057	0.014*	0.488	0.275	0.864
Physical disability	-0.237	0.353	0.453	0.501	0.789	0.395	1.574
Sensory disability	0.368	0.492	0.557	0.455	1.444	0.550	3.790
Multiple disabilities	-0.103	0.298	0.118	0.731	0.903	0.503	1.619

Note. * indicates statistical significance

Table 3*Multiple Linear Regression Results*

Predictors of final cumulative GPA							
Dependent variable	GPA (continuous)						
Regression result	$R^2 = 0.043, F = 2.81, df = 694, p = 0.001^*$						
Coefficients							
Predictor variable	B	S.E. B	β	t	p	95% C.I. for B	
						Lower	Upper
AT Service utilization	0.135	0.033	0.154	4.080	<0.001*	0.070	0.200
First-generation	-0.161	0.076	-0.086	-2.110	0.035*	-0.311	-0.011
Gender	0.109	0.062	0.069	1.769	0.077	-0.012	0.230
Race/ethnicity	0.047	0.075	0.024	0.632	0.528	-0.100	0.195
Pell recipient	0.067	0.072	0.038	0.940	0.348	-0.073	0.208
STEM major	-0.062	0.061	-0.039	-1.014	0.311	-0.182	0.058
Cognitive disability	0.046	0.076	0.029	0.606	0.545	-0.103	0.196
Psychological disability	0.032	0.116	0.012	0.277	0.782	-0.196	0.260
Physical disability	0.216	0.155	0.056	1.391	0.165	-0.089	0.521
Sensory disability	0.130	0.165	0.032	0.792	0.428	-0.193	0.454
Multiple disabilities	0.250	0.125	0.084	2.001	0.046*	0.005	0.496

Note. * indicates statistical significance

and Madaus (2015) similarly found students with learning disabilities were less likely to seek general disability support services. This problem warrants attention because each of these disability categories comprise large numbers of SWD. Among our sample, the cognitive disability category was the largest, and the number with psychological disabilities has been rising in our center similar to the national incidence among college-age adults (National Institute of Mental Health, 2019). Both of these disability groups have reported substantial academic benefits of utilizing AT services (Malcolm & Roll, 2017b). Notably, cognitive and psychological disabilities tend to be non-apparent disabilities compared to physical disabilities such as mobility-related disabilities. Hamblet (2009) noted students with non-apparent disabilities may be less likely to receive accommodations in grade school or even less likely to be screened and identified as having a disability. Without prior experience with AT and other accommodations during K-12 education, students with these non-apparent disabilities are likely less aware of available resources to support their learning-related needs during postsecondary education. Alternatively, many students with learning disabilities or mental health diagnoses do not seek accommodations because they worry they will be stigmatized or discriminated against (Hartman-Hall & Haaga, 2002; Martin, 2010). Taking our findings that students with cognitive and psychological disabilities were less likely to participate with services and Malcolm and Roll's (2017b) findings that these students benefit when they do participate with AT services, should motivate postsecondary institutions and AT service providers to undertake targeted outreach to these students.

Other variables were not significantly predictive of AT service utilization including gender, minority race/ethnicity, Pell Grant recipient, STEM-major, and diagnosis of physical, sensory, or multiple disabilities. Similarly, Newman and Madaus (2015) reported gender, and race/ethnicity were not related to general disability service utilization, but alternatively found household income was significantly related to service utilization. While household income and Pell Grant are both indicators of family socioeconomic status, they may not capture the same students because there are additional criteria (beyond income) a student must meet to receive a Pell Grant (U.S. Department of Education, 2015).

Aim 2—GPA

Objective outcomes for AT service utilization among postsecondary SWD are underreported in the literature. Research that captures the subjective ex-

perience of AT users found 84% of students believed using AT services benefited their grades (Malcolm & Roll, 2017a). The present study adds objective academic data that parallels and extends previous self-perceived academic benefits of AT services. A few studies have examined AT among other disability accommodations but did not find AT to be a significant or positive predictor of GPA (Chiu et al., 2019; Kim & Lee, 2016). Research with a specific focus on AT services is needed because AT tools uniquely help students gain equal access to digital educational materials, which is increasingly important in postsecondary education (Schmid et al., 2014). While AT service utilization is underreported, other student characteristics have repeatedly been shown to relate to GPA among the general college student population, and therefore, were also accounted for in our study. We found AT service utilization, generation status, and having multiple disabilities to be significantly related to GPA.

Each level of service utilization (referral-only, intake-only, intake + follow-ups) predicted an increase in final cumulative GPA. This finding differs with previous research that found no relationship (Chiu et al., 2019) or a negative relationship (Kim & Lee, 2016) between AT use and GPA. Chiu et al. (2019) and Kim and Lee (2016) examined the provision of multiple academic accommodations, including AT, provided by their university's general disability services office. At our university, many students who seek accommodations from the general disability services office are referred for AT services, provided through a distinct and specialized office. We believe our focus and specialized knowledge of AT may result in more thorough evaluation, training, and follow up, which could certainly result in different academic performance outcomes. Additionally, Chiu et al. (2019) defined AT utilization as being approved to use AT, and therefore concluded a failure to verify AT use may have been the reason for their non-significant findings.

Although the first Aim of our study found first-generation SWD had higher AT service utilization, this group tended to earn a lower GPA than their continuing-generation peers. This finding was consistent with Lombardi et al. (2012), who concluded the intersecting first-generation and disability identities foster a "cumulative risk" (p. 811) for lower academic performance outcomes. SWD may find it harder to adapt to the new expectations and requirements of the postsecondary educational environment (Finn, 1998), and may encounter inaccessible physical and virtual environments, ignorance, stigma, and discrimination (Francis et al., 2019). Similarly, for first-generation

students, the risk of being from a low-income family and/or low socioeconomic background is greater and has been linked to increased non-persistence in postsecondary education (Chen, 2005; Wagner et al., 2004). First-generation students also tend to work more during school, which decreases time available for studying and assignments, and they are less likely to go on to graduate programs after college (Pascarella et al., 2004). Lombardi et al. (2012) posit that being a first-generation student consistently stands out as a significant variable to impact academic outcomes among many personal and contextual factors. This warrants consideration of the specific needs and attributes of this population when promoting and implementing services for SWD and our findings help validate this assertion.

Finally, we found that students who reported multiple disabilities earned a higher GPA than their peers who identify with a single disability. This is an important finding that differs from previous work. For example, Kim and Lee (2016) predicted a significant decrease in GPA for students with multiple disabilities. There are several possibilities for why this difference may exist. One explanation is that students in our sample with multiple disabilities were more prone to seek services and supports. In contrast to students with a single cognitive or psychological disability who are less likely to have received accommodations in secondary school (Hamblet, 2009), students with multiple disabilities may be more likely to have received academic accommodations or used AT in secondary school. This may explain why, within our sample, approximately 71% of students with multiple disabilities sought AT services, compared with approximately 62% of students from all other singular disability categories combined.

Other variables were not significantly predictive of GPA including gender, minority race/ethnicity, Pell Grant recipient, STEM-major, or the singular disability categories cognitive, psychological, physical, or sensory disability. Previous research has suggested that gender is usually not a factor involved in academic performance, especially when the use of technology for academic tasks is incorporated (Dockrell et al., 2015). However, we were surprised to find there was no significant relationship between GPA and STEM major because Moon et al. (2012) suggested content of STEM courses tends to require more involved accommodations for SWD and Malcolm and Roll (2019) reported there are less AT options compatible with STEM courses. We classified each student's final major at our university as either STEM or non-STEM according to the list provided by U.S. Immigration and Customs Enforcement (2012). How-

ever, students often change majors and take courses outside of their major. These reasons may explain the lack of predictive validity we had expected related to STEM majors.

Although our model to predict final cumulative GPA was statistically significant, it only accounted for ~4% of variation in final cumulative GPA, indicating there are additional variables to explore. According to the HAAT model, "the performance of the entire system, rather than evaluation of human performance, [is] considered paramount" (Giesbrecht, 2013, p. 231). Therefore, we must consider the myriad other personal, activity, and contextual factors that influence GPA for postsecondary SWD who use AT. Other variables related to the human may include self-efficacy, self-advocacy, motivation, post-graduation goals, pre-college variables, and the use of other disability services. For example, number of credits attempted, self-advocacy skills, and academic self-efficacy, or confidence in one's own academic capabilities have been shown to positively predict GPA among student-veterans with disabilities (Eakman et al., 2019; Kinney & Eakman, 2017). Tinto's (1993) institutional departure model suggests pre-college variables and postsecondary goals contribute to academic performance. Variables related to the context may include campus-wide social attitudes towards diversity and disability, attitudes of professors towards students with accommodations, disability policies, financial aid resources, and campus-wide accessibility initiatives. Herbert et al. (2014) explored financial aid and living situation but did not find these factors to be predictive of graduation for college SWD. Variables related to the activity may include credit load, course requirements, mode of instruction, and format of learning assessment (i.e., tests, papers, projects, etc.). Variables related to the use of AT include adoption vs. abandonment of AT (Cook et al., 2019).

Implications for Disability Service Providers

In light of these findings, there are several important implications for disability service providers who serve the nearly 20% of SWD in their postsecondary institutions. First and foremost, the study results may assist these providers to recognize and advocate for the important role AT supports and services play in the academic success of postsecondary SWD. While our study was among the first to demonstrate a significant and meaningful positive relationship between AT service utilization and GPA, other research has revealed other benefits of AT utilization. For example, a recent systematic review by McNicholl et al. (2019) analyzed 26 studies and found that AT enhanced academic engagement, learning, and performance for

postsecondary SWD. McNicholl and colleagues also suggested that AT service delivery may be equally important in fostering academic success as the technology itself, which highlights the value of a robust AT service-provision approach. Accordingly, our AT service provision emphasizes thorough evaluation, device trials, and personally/contextually relevant training, and follow up. While evaluation of different AT service models is beyond the scope of this study, we do suggest that a comprehensive approach to service delivery is critical to a student's ability to realize the academic benefits of AT. Finally, our results underscore the importance of considering personal, and contextual characteristics of SWD to strategically promote services to underserved groups or individuals with increased academic risk, such as students with cognitive disabilities, psychological disabilities, and first-generation college students.

Limitations and Future Research

This research was conducted using secondary data from a single university, and therefore results may not be generalizable to all postsecondary institutions or AT settings. Furthermore, the university in which this study was conducted may follow a relatively unique AT service model in which AT services are not provided out of the general disability support services office, but instead out of a distinct office, the AT center, staffed by occupational therapists, information technology specialists, and an assistive technology professional. Services provided by the AT center follow the occupational therapy process and the HAAT model to provide comprehensive and thorough evaluation, training, and follow up with all students who receive services. This model is believed to increase adoption of AT and foster improved performance of academic tasks using AT. While this is a strength of the AT center at our university, it is a limitation to our research because it further limits generalizability to other institutions that follow different service models. A multi-university study comparing AT service models is needed to understand how students may benefit differently from receiving AT services under different service models.

Conclusion

While disability accommodations and AT services exist in postsecondary settings to support SWD and minimize barriers to achieving academic success, a discrepancy in academic outcomes for SWD persists. The present research study investigated predictors of AT service utilization and GPA for SWD, adding new findings to the evidence base that are relevant

to AT service providers, postsecondary institutions, and SWD. Factors related to disability category, and first-generation status predict AT service utilization and should be considered when promoting such services to SWD. Furthermore, AT service utilization, first-generation status, and having multiple disabilities are related to final cumulative GPA. More research is needed to determine other factors associated with both outcomes as we continue to build evidence about services and outcomes for SWD who use AT so that institutions and service providers can best serve and promote equitable learning opportunities for postsecondary SWD.

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Disability Cultural Centers in Higher Education: A Shift Beyond Compliance to Disability Culture and Disability Identity

Toni Saia¹

Abstract

This qualitative study focused on the role of a disability cultural center in higher education from the perspective of disabled students, using a social constructivism lens to examine how disability is conceptualized through a medical versus social model on a college campus. The intent of this study, which framed disability as an identity, was to explore the disability experience as well as the role that a disability cultural center could play in addressing social inequities faced by disabled students. Importantly, this study was one of the first to focus on how a disability cultural center can create a more welcoming campus climate for disabled students within higher education. The themes that emerged from the qualitative interviews with six disabled students highlighted a clear distinction between how participants believed the institution viewed the disability experience compared to the disability cultural center. Generative insights from the interviews, which recognized disability as a form of diversity, revealed broad benefits of a disability cultural center beyond the accessibility role of a disability resource center. The results of the present study may inform the development of new disability cultural centers across the United States to challenge ableism, including non-disability privilege and oppression. With this in mind, implications for institutions are presented to inform higher education and shift the narrative of disability from a medical diagnosis to a valid identity on campus.

Keywords: disability identity, disability culture, diversity, higher education students, ableism

Today, nearly all universities and colleges in the U.S. maintain professionally staffed offices for disability services (Zehner, 2018). The fact that institutions of higher education are committed to accessibility has directly resulted in the number of disabled students increasing in higher education. For the 2015-16 year, the National Center for Educational Statistics (NCES) reported 19.4% of undergraduate students and 11.9% of graduate students reported having a disability. While there is growth in numbers, there is limited research about the social and cultural factors that influence the persistence, retention, and ultimate graduation of disabled students in postsecondary education (Kimball et al., 2016). According to the National Longitudinal Transition Study-2 (2011), graduation rates of disabled students were lower than those of similar-aged students in the general population; 41% vs. 52%. Additionally, they were less likely than their non-disabled peers to complete 4-year college programs; 34% vs. 51%.

For Hong (2015), the problem is that many col-

leges are still unprepared to support disabled students beyond legally mandated equal access and accommodations. This unpreparedness might be because, as Hadley (2011), states “disabilities have been viewed traditionally as a negative characteristic addressed by disability services” (p. 79). As a result, while disability services on campuses operate with the intention of supporting students, students have reported feelings of shame, discomfort, and stigma from being viewed as different and requiring accommodations (Kattari, 2015). In their study, Kimball and colleagues (2016) noted that many “disabled students experience a ‘chilly’ campus climate involving stereotypes, microaggressions, misconceptions and exclusion” (p. 1).

While legal mandates have created more access to higher education for disabled students, “significantly less attention has been given to ableism and the privilege of those who do not have disabilities” (Kattari, 2015, p. 37). “Microaggressions are the brief and commonplace daily verbal, behavioral, and environmental indignities, whether intentional or un-

¹ The University of Arizona

intentional, that communicate hostile, derogatory, or negative racial, gender, sexual, and religious slights and insults to the target person or group” (Sue, 2010, p. 6). There are many examples of microaggressions toward disabled students, such as telling someone they speak well for a deaf person. Other examples of disability microaggressions include “good to see you out,” “let’s race,” “you look so normal,” or “do you have a license to drive that thing” (referring to a wheelchair). It can also take the form of asking everyone in a group to stand for an activity (with the assumption that everyone can stand), or telling someone they are “lucky” that they are able to bring their support dog to class with them (Kattari, 2015). Disabled students who have invisible impairments tend to experience utter exhaustion, having to consistently withstand ableist microaggressions while having others determine their “right” to identify as disabled and utilize accommodations (Kattari et al., 2018). These experiences can make it hard for disabled students with invisible impairments to form a disability identity (Kattari et al., 2018).

Similar to other groups of minority students, microaggressions can make it hard for disabled students to find a sense of belonging, membership in the cultures and subcultures on their campuses, or opportunities for identity development (Kattari et al., 2018; Fleming et al., 2017). Zehner (2018) reported “at large public research universities, students with disabilities are significantly less satisfied with campus climate compared to students who do not have disabilities” (p. 145). In fact, the campus environment often includes ill-prepared advisors, negative faculty perceptions, and stigma due to separation from peers. For example, a study by Kurth and Mellard (2006) found that the accommodation process resulted in a divide and a difference in experience between the disabled student and their nondisabled peers when they leave the classroom for tests. Similarly, Marshak et al. (2010), found that students frequently avoided accommodations out of fear of being singled out, embarrassed, stared at, and judged. Several students in the Kurth and Mallard (2006) study reported believing their peers were thinking their disability meant receiving special treatment or the disability was simply being used as an excuse to receive accommodations. Students also reported feeling frustrated because their peers and faculty viewed them as helpless, not expecting them to do anything great. Furthermore, Elliot, Gonzalez, and Larsen (2011) found that disabled students felt disrespected and uncomfortable in the classroom environment due to offensive language and class activities that invalidated their disability experience. For example, the classroom may

be physically accessible but an activity in class might require physical effort or visual capability. Such a design does not ensure an equitable classroom experience for disabled students, highlighting that good intentions towards disabled students are not sufficient (Jensen et al., 2004). In many ways, disabled students are invisible on campus “because others see their disability only as a need for an accommodation rather than as an identity” (Abes & Wallace, 2018, p. 551). The very assumption that all disabled students require accommodations is an assumption grounded in ableism (Kattari, 2015).

According to Renn (2011), cultural centers help students from similar backgrounds find one another, and they create a sense of critical mass to support one another. Disability culture is best understood as a social movement that champions “a sense of common identity and interests that unite disabled people and separate them from their nondisabled counterparts” (Barnes & Mercer, 2001, p. 522). Disability culture offers disabled people another framework of possibility or choice to pursue their own or shared goals. Peters (2000) describes three possible worldviews for considering disability culture: in terms of a community with a common language and history, a way to organize collective efforts towards social justice by challenging historical and ongoing oppression, and as a personal disability identity characterized by pride. There is a further presumption that disability culture rejects the notion of impairment as a symbol of shame or self-pity and instead stresses solidarity and a positive identification. However, the transition from a medicalized, impairment-based self to a disability identity and consciousness is not necessarily one-directional or one-dimensional (Barnes & Mercer, 2001). Disability identity refers to possessing a sense of self and feelings of connection to and solidarity with the disability community, likely to help individuals adapt to a disability and thrive, including the successful navigation of social pressures and societal stigma (Murugami, 2009). Dunn and Burcaw (2013) suggested that the salience of disability identity is likely to shift based on context of how the individual or the sociocultural environment such as a higher education institution defines disability. This context will have a huge impact on individuals’ recognition and acceptance of their disability identity.

Higher education has improved in providing accommodations but lags far behind in recognizing, celebrating, and incorporating disability as a cultural identity (Davis, 2011). In fact, legal debates about disability-related accommodations tend to divert attention from disability as a powerful, yet consistently marginalized identity (Grigely, 2017). Segregating

disability from other forms of diversity is problematic because it reinforces a disconnect that disability is not a form of diversity (Gabel et al., 2017). Higher education must become vigilant in targeting new and effective ways for improving student services beyond federal mandates or disabled students will continue to encounter frustrations, making it difficult to explore their disability culture and identity, inevitably leading to premature departure, increased financial burden, and unfavorable employment outcomes (Hong, 2015). Disability cultural centers can fill a tremendous gap by emphasizing the need to improve inclusion of disabled students who are often omitted from campus conversations on diversity (Chiang, 2020).

The Present Study

Literature pertaining to disability cultural centers with dedicated staff, funding, and space and disability as an aspect of diversity in higher education is virtually nonexistent. The lack of research on disabled students is not only concerning, it is representative of the lack of attention given to disability as a socially constructed identity. This qualitative study used a social constructivism lens to examine how disability is constructed from a medical versus social model on college campuses. This approach is consistent with the phrase captured by Charlton (1998), *"Nothing about us, without us"* (p. 3), because it gave voice to disabled students. Specifically, the present study explored the role of disability cultural centers in higher education from the perspective of disabled students, a population consistently overlooked and underrepresented in higher education. Informed by disability studies, disability is shaped by dynamics of privilege, power, and oppression and can be compared to the experiences of other subordinated social groups (Kraus, 2008). Disability is no longer an individual problem tied to the functional limitations of the bodies of people with impairments. Rather, the social model emphasizes the interaction of that individual with society, where disabling environments are the root cause of disability (Swain et al., 2003). The results from this qualitative study can be generative regarding the potential impact of a disability cultural center on a college campus.

Identity-First versus Person-First Language

Disability, like other identities, is a socially constructed phenomenon with far-reaching political, societal, and economic implications. To remain consistent with disability as a sociopolitical construct, this article will use **identity-first language** such as disabled as an adjective or qualifier (i.e., disabled

individual and disabled student). Identity-first language differs from **person-first language** where the emphasis is placed on the person (i.e., student with a disability). Person-first language is considered less offensive within the dominant culture, as "no one with a disability should be referred to in monolithic terms (i.e., a diabetic), because it effectively objectifies the person by focusing only on the impairment" (Dunn & Andrews, 2015, p. 258). Disability studies scholars challenge the use of person-first language because if disability is socially constructed and the environment bears responsibility for the experience of disabled people, then person-first language implies disability is an individual's own. The use of identity-first language is intentional and gives disabled individuals the opportunity to reclaim the word as an expression of solidarity and pride in one's disability identity and to challenge terminology historically used to pathologize the disability experience (Dunn & Burcaw, 2013).

Researcher Positionality

Disability is a life experience I share with the participants and by which I define myself: I proudly identify as a disabled woman and I am an insider in the disability community. Sharing some commonalities with interviewees regarding my own disability experiences as a college student created a level of comfort for genuine conversation to take place. On the other hand, being an insider can problematize data collection as interviewees may suppress feelings and experiences out of fear of being shunned by the disability community. With this in mind, I was careful to ask neutral interview questions and ask clarifying questions with the intent of understanding participants' perspectives, rather than sharing my own thoughts and experience.

Another important dynamic to address is my professional role at the University of Arizona as the first program coordinator of the disability cultural center. In this role, I am very familiar with both campus and community climate around disability and invested in understanding the role that a disability cultural center can play on a college campus. To avoid a power dynamic in which participants may be reluctant to critique the disability cultural center, I did not discuss professional commitments during interviews and consistently presented myself as a researcher rather than as the program coordinator of the disability cultural center.

Method

With approval from the Institutional Review Board (IRB), data for this study derived from disabled students from the University of Arizona (UA) who each participated in one interview. The six participants include Joseph, Lori, Jack, AJ, Sam, and Alex (all names are pseudonyms). Several participants requested gender-neutral pseudonyms. Limited descriptive information is provided to protect confidentiality and identity because UA's Disability Cultural Center (DCC) is a small community.

Sampling

For this study, non-probability purposive sampling was most appropriate. According to Tongco (2007), purposive sampling is the most common form of sampling when random sampling is not possible, as it provides a method to select cases that are representative of the population the researcher seeks to understand. It is purposeful because criterion-based selection was used to create a list of attributes essential to the study (Marshall & Rossman, 2016).

Recruitment Process and Inclusion/Exclusion Criteria

Only students who were aware of the UA disability cultural center and on the listserv were aware of the study. Recruitment emails were distributed through the DCC listserv. The researcher used the DCC physical space to display flyers and the DCC social media (Facebook page) to disseminate study information. To meet inclusion criteria, participants needed to (1) have an impairment, (2) be involved/affiliated with the University's Disability Cultural Center, (3) be a student at UA, (4) speak English, and (5) be willing to be audio recorded.

Interviews

Participants were prompted with a series of guiding, open-ended questions to help provide an in-depth account of their experiences. The questions were created by a panel of five experts and were revised based on previous research, relevant literature, and the stigma associated with the disability experience. The first half of the interview questions focused on experiences prior to being involved with the disability cultural center. The second half were open-ended questions aimed to elicit perspectives on the role of a disability cultural center, including how physical space and programming can influence attitudes toward disability on campus. This format was consistent with a social constructivist perspective based on the notion that a disability cultural center cannot be constructed without input from disabled students.

Data Analysis

All participant interviews were audio recorded, transcribed verbatim, and analyzed for themes, patterns, and conclusions. Participant perspectives were analyzed for themes related to how disability is constructed from a medical versus social model. Transcribed interviews were open-coded in order to establish themes and commonalities across participants. In the second step, the codes were renamed using the Constant Comparative Method (CCM) described by Strauss and Corbin (1994). This method included data comparisons, highlighting similarities, differences, and connections (Lau & McKenna, 2002). Relationships between codes were created for preliminary analysis of the data. In the final stage of analysis, the investigator rigorously analyzed and interpreted interviews using reflexivity, taking personal beliefs and experiences into consideration (Patton, 2002).

Validity and Reliability

The investigator ensured credibility of the study through triangulation of data through cross verification from two sources. First, code patterns were triangulated by comparing across interviews to capture participants' perspectives. After the coding, member checking was performed to confirm the validity of the code patterns and to ensure that the participants' narratives were accurately coded. During the member checking, the investigator provided thick, rich description by detailing context, feelings, actions, and meanings of each of the interviews (Ponterotto, 2006). This process gave the interviewees the opportunity to check all transcriptions for accuracy. The essence of reliability for qualitative research lies with consistency (Leung, 2015). The researcher used analytic memos to continuously reflect on actions to maintain consistency across all procedures (Saldaña, 2016). Additionally, the investigator created a code manual to keep track of the evolution of coding iterations and the frequencies related to each code. Identification of themes was reviewed by two outside researchers. Throughout the process, the researcher implemented reflexivity and bracketing techniques to monitor their biases, assumptions, beliefs and presumptions.

Results

This section presents the findings that emerged after conducting interviews with six disabled students in my sample. Two central categories—(1) institution and disability and (2) disability cultural centers—emerged across participant interviews to answer the guiding research question: What is the role of a disability cultural center on campus? Across

interviews, there were clear distinctions between how participants described the institution in contrast to the DCC and the disability resource center (DRC).

Institution and Disability

Institution and disability, the first category, consisted of two related themes. The first theme was climate and attitudes with subthemes of (a) campus, (b) faculty, (c) advocacy and social change, and (d) sense of community. The second theme was ADA compliance as “functional access” with subthemes of (1) definition of disability and (2) physical space and access. The overall category of institution and disability focused on participants’ experiences as disabled students on campus, including their negative perceptions of the disability experience on campus rooted in a medical model understanding of disability.

Climate and Attitudes

Based on participants’ stories, all six participants had experienced a campus environment filled with microaggressions related to ableism, defined as the “belief that disability in and of itself makes one in some way lesser” (Slesaransky-Poe & Garcia, 2014, p. 76). Often a result of interactions with faculty, peers, and campus spaces, participants described how the institutional context influenced their own beliefs and perceptions about disability. The broader theme of climate and attitudes within the institution was broken into the subthemes of campus climate and attitudes and faculty climate and attitudes, as described in the following.

Campus. All of the participants discussed being objects of pity and inspiration, recalling uncomfortable interactions when asked the interview question, “What is it like to interact with students as a disabled person on campus,” and “How do you think your institution views the disability experience as a whole?” For instance, AJ stated:

Society thinks they need to help the poor disabled person...Disability needs to stop being seen as something that an individual needs to overcome. We are often pitied by our peers and professors or we are seen as a source of inspiration... Negative attitudes and lack of understanding about disability creates barriers.

Joseph shared that “some people refuse to make eye contact with me, you feel contagious sometimes, while others will poke my leg in the middle of class and ask me if I can feel it.” Related to pity and inspiration, other participants described how faculty and peers seemed surprised to have disabled students in the classroom; they do not educate themselves on dis-

ability, and they rely on making assumptions about what a disabled person looks like. For example, they do not expect a graduate student to be disabled. As an illustration, Lori noted:

My wheelchair is the first thing people notice when they meet me. People make assumptions, I can tell because they look shocked when I get an answer correct in class... People assume disabled students are not on campus because they assume someone with disabilities cannot succeed at the university level.

Finally, all six participants brought up the fact that they are often tokenized on marketing materials or at events to make the university look good. Jack noted:

I am tired of being a heartwarming story. I am waiting for the day after my graduation to see pictures of me on social media and the school’s website. Look at this wheelchair user rolling across the stage getting a degree. Why am I on it and not these hundreds of other graduates who got their degree? I know it is going to happen and it is frustrating.

Although other minority groups are often exploited on university websites as a strategy to make the university appear welcoming and diverse (Renn, 2011), disability is accentuated as overcoming a medical barrier, which may or may not impact cognitive and academic ability, such as the following headline from a 2019 graduation: “Giant steps: A mother’s resolve and a son’s grit give a UA student his dream of walking at graduation” (D’Anna, 2019). Rather than on an academic achievement of graduating from one of the most competitive business schools in the country, the focus is on the student’s ability to stand, unrelated to the academic accomplishment.

Faculty. Participants described interactions with faculty that were consistent with previous research that higher education is a by-product of the medical model of disability (Hong, 2015). In fact, all six participants described negative interactions with faculty members related to their disability experience when asked the question, “Describe what it is like to interact with faculty as a disabled person on campus?”

Joseph stated, “It’s patronizing sometimes. When I was applying to master’s programs, I was concerned about discrimination due to my disability and some faculty members were like, ‘They can’t discriminate against you.’” Joseph’s comment is reflective of the larger idea that faculty may view and understand the disability experience from a legalized standpoint, rather than as a lived experience. Jack went on to say,

“A lot of faculty members are uncomfortable, which tells me they never dealt with disabled students in my program; some won’t even accept an accommodation.” Finally, Lori also shared the same sentiment, stating:

I’ve always as a student had this idea that I have to prove myself more so than most students because a lot of faculty make assumptions that lead me to believe they don’t really assume I’m going to succeed in their class. I have even had incidents where they are like, “Oh, who helped you with this?” It’s like the assumption that I couldn’t have possibly done it on my own.

Finally, Sam explained that it is important for faculty to understand that the disability experience is fluid:

Like when I started using a cane on campus... the first thing one of my faculty members said was, “Oh you’re using a crutch now? Like, what’s that all about?” To the full class and you know in front of everyone. I was thinking, I really do not want to answer this to the full class. This is none of their business.

Across the data, participants revealed that faculty were, at best, naïve about disability, or, worse, unconsciously biased, perceiving of disabled students as inferior. As an example, AJ stated, “Professors support us in education but not the disability experience.” Each participant expressed concern that even when faculty were supportive and willing to listen, disability was viewed from a legal individualized accommodation perspective that emphasized medical conditions, rather than social prejudice and marginalization. Recognizing disability as a form of diversity requires faculty to be aware of the fluidity of the disability experience, including why a compliance approach is not sufficient to ensure disabled students have positive classroom experiences.

Advocacy and Social Change. Participants in the present study discussed how the Disability Resource Center (DRC) staff was the only source of advocacy on campus. While the DRC was viewed as an important ally for disability rights on campus (Kattari, 2015), participants perceived the advocacy efforts of the DRC to focus exclusively on physical access and barrier removal. Joseph shared, “The advocating the DRC does is what makes this campus physically accessible.” Lori, Joseph and AJ shared similar experiences stating, “The DRC advocates for me.” Similar to previous research by Cory (2011), the legal guidelines implemented by the disability

services office were viewed as a starting point, but not the endpoint, with advocacy involving much more than physical access. AJ went on to note: “There are some situations where I have to advocate for myself to justify my disability experience.”

Furthermore, most participants felt unsupported by the institution outside of the advocacy taking place at the DRC for disabled students. Alex shared, “The university does not really support disabled people, disabled people support each other.” More pointedly, Sam described the university’s commitment to disabled students as “no commitment... the institution doesn’t really care about us, until it’s like we want to be on a list, and look how great we are and look what we have to offer our students.” According to Sam, “The institution likes to show off the DRC as something they have to offer students; they don’t really care about the students.”

Although all participants recognized the DRC as a valuable and necessary resource for advocacy, it is equally important to note they all perceived a noticeable lack of advocacy and social support within the larger institution, outside the walls of the DRC. Participants characterized how the institution benefited from disabled students, but there was a lack of a reciprocal commitment to advocacy and institutional change in support of disability rights.

Sense of Community. Most of the participants discussed the lack of community on campus as a disabled person. Jack shared, “I avoid people on campus because they might not understand my disability.” Furthermore, AJ, Alex and Jack both shared that “it feels pretty isolating as a disabled person on campus.” These results echo previous research highlighting how students from underrepresented groups tend to feel isolated, detached, and disconnected from the college campus (Bowman et al., 2015).

In contrast to the experiences of participants on the broader university campus, several participants were able to find a sense of community within the DRC. Sam noted:

I like that DRC attracts a lot of disabled people. There are many other disabled people on campus even if we are not real close or don’t know them on a friendship level. Whether we want to acknowledge it or not there is a community of disabled people on campus.

So, too, Lori stated, “I spend a lot of time at the DRC because I know there are other disabled people there, so I feel comfortable, but that’s a place for accommodations.” Joseph noted, “I work out at the DRC, especially being a new wheelchair user—I’m always

meeting people willing to show me the ropes.” While Lori and Joseph spent time and felt comfortable at the DRC, both recognized that other disabled students would avoid the DRC because of the stigma attached to disability. Joseph explained: “I don’t necessarily feel ashamed to come to the DRC, but a lot of students do. They feel like they get looked down upon for having a disability.” While some students may avoid the DRC regardless of its location on campus, Lori commented on the location of the DRC within the larger campus: “It isn’t great that the DRC is housed within campus health, it doesn’t give much of a community atmosphere, it suggests we need help.” Lori’s point is that while the DRC offers supports for disabled students, its location within campus health reinforced disability as a medical category, rather than an identity. While the DRC offered a reprieve from negative attitudes toward disability on campus, all the participants were wary of the lack of understanding within the larger institution regarding what it meant to have a disability on campus.

ADA Compliance: “Functional Access”

In addition to climate and attitude, a second central theme emerged related to the ways in which the institution supported and failed to support disabled students, described as exclusively “functional access” according to one participant. At the institutional level, participants perceived that the aim of the institution was toward legal compliance, rather than a larger commitment to ensuring disabled students felt welcomed within the university. In many ways, students viewed the institution as promoting a medical model definition of disability that emphasized physical access. Rather than being proactive in making sure all buildings and classrooms were accessible, students believed the university approach was more reactive in nature, sending the message that disabled students are an afterthought on campus and that disability is a supplementary concern.

Definition of Disability. All participants agreed that the institution viewed their disability as a medical diagnosis, something to overcome and pity, or in terms of the Americans with Disabilities Act (ADA), a compliance framework (Zehner, 2018). Consistent with a medical model, dominant narrative of disability, AJ shared “the U of A just cares about functional access so that you can get your degree and leave.” Joseph and Alex shared similar sentiments that “the school believes if they are giving me accommodations everything is fine.” In addition, Jack and Sam also shared that disability was not seen as a valid human experience, identity, or something to celebrate; instead, you have to prove your need

for accommodations. Furthermore, once a student has received an accommodation, the university then viewed the disability as going away. Joseph captured it best by stating:

I do not think people understand disability beyond the law...I never thought about accessibility until I was a wheelchair user. I kind of assumed that all buildings are accessible. I am like it is the law, it is the ADA of course everything is accessible. And, it was not until I was a wheelchair user when I realized that was far from reality on campus. Even when spaces are technically accessible, by the law, they really are not accessible...There might be accommodations like a lift on steps. You can just tell everyone is staring at you as this clunky lift lowers with noise. Yes, it is accessible, but it is a terrible experience.

Physical Space and Access. All participants described physical access on campus as not horrible, but far from perfect. Jack stated, “Accessibility is definitely not a priority on campus, door openers never seem to work; I work with the DRC but do not always feel supported when it comes to physical access.” It is important to note that all of the participants discussed physical spaces that they avoid because they are not confident they will be accessible. Alex noted, “Activities on campus are not accessible—the solution is ‘Oh well you don’t have to participate in this part of the activity,’ but I want to so it’s not accessible for me but they really don’t care.” AJ shared, “Clubs and organizations on campus are not outwardly open and accessible to disabled people so you don’t always feel welcome to attend events.” Participants expressed frustrations about accessible entrances and accessible bathrooms. AJ noted that “there are no gender-neutral restrooms, which makes it difficult to go to the restroom with a personal care attendant.” Lori explained how “sometimes it can take 20 minutes to find the accessible entrance because it’s in the back alley or something.” Also, AJ noted that “accessible bathrooms are usually in the basement, in a locker room with a shower curtain.” Many participants had similar responses in regard to physical access, such as Joseph who stated, “There is so much emphasis on ADA compliance and nothing else about the disability experience and yet so many buildings are inaccessible.”

All participants named classrooms as the least accessible and comfortable spaces on campus with sharp fluorescent lighting, heavy doors, no space to navigate between desks, and little to no desk space. Alex, Jack, Lori, and Joseph all discussed how class-

rooms have accessible seating, but it is usually limited to one seat option in the back of the classroom, making it difficult to interact with classmates. AJ added that “things are technically accessible but you’re not a part of the class, you’re in the back of the room, and there is no space to navigate the room, so you are stuck in one spot; it’s not emotionally accessible.” These experiences highlight that physical access is vital to ensure disabled students have the same experience as their non-disabled peers.

Disability Cultural Center

The Disability Cultural Center (DCC), the second category, represented a stark contrast to the larger institution, according to the six participants of this study. Despite the fact that the DCC was a new initiative created six months prior to the interviews, all of the participants who volunteered to be part of the study were vocal about its benefits. Perceptions of the DCC included common themes and subthemes that followed a similar pattern to the first category of the institution, yet with vastly different content. The first theme related to the DCC was climate and attitudes with the subthemes of (a) campus, (b) faculty, (c) advocacy and social change, and (d) sense of community. The second theme countered the “functional access” definition of disability in the institution category, and focused on moving beyond mere compliance to culture, with subthemes of definition of disability and physical accessibility. When describing the DCC, participants shared their experiences with the DCC and how the DCC was a place that recognized and validated their disability experiences.

Climate and Attitudes

While the stories shared by participants about the institution reflected common physical, social, and emotional barriers within the postsecondary education (Kimball et al., 2016), stories about the DCC captured a much different experience. Absent were microaggressions, invalidations, and inappropriate comments, replaced with an understanding environment that valued disability and the disability experience. The broader theme of climate and attitudes in the DCC were divided into the subthemes of campus, faculty, advocacy and social change, and sense of belonging each described in the following.

Campus. In contrast to participants’ stories about disability bias, stereotypes and microaggressions implicitly and explicitly reinforced in language, media, and behavior within the larger institution (Keller & Galgay, 2010), the DCC was viewed as a step toward creating a more inclusive campus environment. When asked about the role of a DCC, Lori shared, “A

DCC can help change attitudes on disability to more positive. We do not stand out and cannot be ignored. We are here to be part of the college experience.” In fact, all of the participants discussed how a DCC can challenge misconceptions of the disability community. Throughout the interviews, participants noted many microaggressions and misconceptions they had personally experienced, including: (a) disabled people are looking for a cure, (b) disabled people cannot have kids, (c) disabled people cannot play sports at an elite level, and (d) disabled people cannot be active members of their community. Even though the DCC was relatively new, all six participants named the DCC as a significant avenue to challenge disability prejudice and stereotypes on campus.

Alex explained how the DCC offers a place to discuss ableism, including privilege and oppression: “The DCC is very encouraging and uplifting environment, a place you feel supported without it having to be said, a form of unspoken support.” Similarly, Joseph described the DCC as follows:

You can really feel like yourself, you do not feel like you are being judged or pitied. Because, I mean, when I am pushing around campus, I mean, as a wheelchair user, you will notice people trying not to make eye contact with you. Whereas, here, you do not feel like that. You feel like, people look you in the eye. They see you for you and want to interact with you.

In terms of challenging ableism on campus, all of the participants viewed the DCC as promoting a social and cultural understanding of disability (Kattari, 2015). Unlike the larger institutional context, participants viewed the DCC as rooted in social and cultural understanding of disability that was designed for and involved disabled students. Focused on awareness-raising, participants were hopeful that a DCC would be a place that could provide disabled students with opportunities for media expression and social activities that embraced disability as a valued identity (Kraus, 2008).

Faculty. All six participants noted that faculty need more training to understand the depth of the disability experience as an identity. However, participants were clear that the need for training was less about accommodations and more about understanding the social experience of disability, including the issue of ableist microaggressions (Kattari, 2015). Participants in the study recommended training delivered by the DCC that focused on disability as a lived experience and cultural identity. For example, Sam shared, “It is important trainings come from the

DCC, not the DRC because there needs to be more of a political lens and identity-based training.” Participants in the study pointed out a need for cultural understandings of disability as a minority identity. AJ noted, “Faculty cannot standardize their approach to disability because it is so wide ranging and diverse. Trainings need to be offered on the experiences of disabled students, so it is less clinical.” Similar to AJ, Alex stated, “Trainings on disability culture should be given proactively not after the fact when a situation arises.” Joseph shared, “DCC events have allowed me to share my experiences with faculty beyond accommodations.” In fact, Jack viewed faculty as potential allies for students:

Training should not only address the depth of the disability experience but discuss how they can be allies to disabled students and what it really means to honor an accommodation and create a universal experience for all... not just inclusive because that doesn't always mean integration and that disabled people can fully participate like their peers. The DCC is a great space to engage with faculty interested in doing disability justice work.

According to participants, the DCC's role could combat the negative interactions they described with faculty on campus through awareness-raising activities (Hutcheon & Wolbring, 2012). In this way, the participants felt the DCC offered an understanding of disability to curb faculty who seemed hopelessly naïve, uncomfortable, and biased toward disabled students.

Advocacy and Social Change. All of the participants viewed the DCC as a place to engage in advocacy that can lead to social change, using language that described the DCC as the very place to empower, advocate, and spread the word. Sam and Alex stated that the collective voice of the DCC can “talk to the higher ups, whoever the people are who make big decisions about accessibility and the experiences of disabled students.” Joseph added, “The DCC can help implement or help communicate the needs of the students to people at the university.” Most participants agreed that they would like to see the DCC do more organizing and advocacy to evoke change, including AJ who argued, “The DCC must also consider what is happening to the community outside of these walls to be truly cultural and make widespread change.” Alex added, “The DCC has left me feeling empowered, not let my frustrating experiences stop me from advocating about not just ableism but gender and classism too.” It is clear that participants view the DCC as an empowering place to organize and engage in campus-wide change for the disability community. Campus-wide visibility

of the disability community can help challenge stereotypes that disabled students are not active, or do not wish to be active members of society.

Sense of Community. All participants recalled a positive sense of community at the DCC, where they felt welcomed, validated, and connected via a shared disability identity. Jack noted, “It is helpful to have a community where you can identify and celebrate your identity without having to explain yourself.” Free from judgement, the DCC was described as part of a collective voice. Sam and Alex noted, “to not only see disabled people on campus but for us to come together...it really gives me that sense of belonging and community...we now have a presence on campus.” All participants shared similar experiences to Lori, who stated:

A community space like the disability cultural center where you can go in and be like, okay, (a), I know I'm welcome here; (b), I'm not the only person; and (c), like, if my disability is essentially celebrated, then that's a space where you can be like, okay, I'm proud to be a physically disabled person, as opposed to being like the isolated one, or even just going to the DRC and being like, "I'm here because I need help with something."

According to Joseph, “Before the DCC, I never realized, it never really occurred to me that we needed one...But now that we have one, I do not know how we could ever be without one. This is just an absolute game changer for the community.” The DCC values all aspects of the disability experience far beyond physical access. Participants seemed to suggest it offered a community where they can feel human, like they matter, be their true selves, and share frustrations free from judgement. When talking about the benefits of a DCC, AJ added the DCC means:

having that safe space for us to really be ourselves and discover our identity. Because, sometimes you feel bad, like complaining, something as simple as parking. Like, oh, someone parked in an accessible spot again. Well, there are so many other spots around campus. Yeah, I get it, you do not understand why this is a big deal. Whereas you come in here, you can vent. You can let out your frustrations and not let them bottle up. You can get support from people for every aspect, not just academics.

When asked the question, “How has involvement in the disability cultural center changed your experience on campus?” Lori shared:

My experience at the DCC has been incredibly positive, I feel like it is about damn time we have a space, we need this space, and just giving us this space is very important. I want to participate in other cultural centers, but they do not get it. The DCC has made me feel like I have a disability identity...I feel a sense of belonging seeing other folks being supportive and active in their support, taking the time to be in the space is validating.

The sense of community at the DCC is crucial for disabled students who are mingling within an institution that consistently excludes them from the campus community. As a community, it represented a safe haven where disability was more than a problem to address; being disabled was part of the student experience at the DCC. As one participant pointed out, "The DCC has helped me get out of my shell because meeting others is not my strong suit; disabled students support each other at the DCC."

Moving Beyond Mere Compliance to Culture

The second theme related to how participants described the DCC was consistent with a disability studies perspective that ensured disabled students are not excluded from social justice conversations and initiatives. Viewing the DCC as a cultural space, disability is much more than access, accommodations, and barrier removal; disability is an identity that can be explored and embraced (Bialka & Morro, 2018). Five out of the six participants linked their disability to their identity when asked the question, "How does your disability relate to your sense of identity?" Lori responded, "I would say disability is the most silent part of my identity. It's taken me a while to get there but it's the aspect of my identity I relate to most. It's who I am. I am proud to be a disabled woman." Sam added, "It took me a long time to get to a disabled identity; it's fluid. And it wasn't until after I took a disability studies class, even though I have been disabled my whole life." Alex stated, "I only recently started identifying as disabled; the DCC is helping me." Joseph shared a similar experience:

I never really thought of it as an identity until four months ago. it's still kind of forming. I have realized it is a part of who I am. It always will be. It is time I embrace it. Having the DCC has really opened my eyes to the history and activism of my community.

Participants also highlighted the positive influence the DCC has had on the campus environment specifically in relation to connections with peers and fac-

ulty, attitudes toward disability, and the narrative of disability on campus. Jack stated, "Because of the DCC I have allies and support from other groups. I am not alone... I can have fun conversations which set the stage for a welcoming space." Similarly, Sam, AJ and Joseph all pointed out their appreciation of the work the DCC does with other cultural groups. Importantly, the DCC may be able to shift the disability narrative in higher education from legal compliance to disability as an identity in an attempt to address the inequity of disabled students and strive for inclusive experiences.

Definition of Disability. All participants appreciated that disability was broadly defined and represented as a valid identity and natural part of the college experience within the DCC. Most participants used the term "neutral" when asked, "How would you like to see disability talked about in the space?" Joseph shared that the "DCC [takes] a more holistic view of disability rather than a diagnosis." Sam and Joseph have both recently started identifying as disabled and admitted the DCC helped them to find and celebrate their disability identity. In fact, both of these participants echoed a sentiment that the DCC is great for undergraduate disabled students in the process of figuring out their identity. Lori noted, "The DCC can only continue to make disability as an identity and minority group more prominent on campus and change the view of disability." AJ added, "The center helps us build our identity as a minority group and celebrate our disability not from the pity angle." All participants agreed that this was a great space to share disability history, activism, and the lived experiences of the disability community. Furthermore, all participants appreciated the value placed on intersectionality. As an example, Jack noted how "disability identity intersects with other cultures and that simple fact cannot be ignored." Lori used herself as an example:

I am proud to be a disabled woman; I wish more people understood the pride attached to the disability experience. It has taken a long time to be able to identify as disabled in a way that is not all about overcoming challenges. The DCC helps us celebrate and define our identity in a positive way.

Physical Accessibility. All participants described the physical space of the DCC as comfortable and spacious for events and trainings, highlighting the importance of having a physical space for disabled people to connect and share experiences. Alex noted, "A physical space where you can talk, laugh, be yourself, and not feel like you will be physically harmed is

important.” The comment by Alex is indicative of the fact that disabled students do not readily feel safe on campus. The creation of a safe space is vital for students to escape from the invalidating campus climate outside the walls of the DCC.

At the same time, all of the participants named the location of the DCC space (housed within the DRC) as the biggest drawback. Alex stated, “the location, it’s not well known, it’s like a hidden gem.” This is consistent with the institution’s attempt to hide disability on campus (Kraus, 2008). If the location was more centralized, it would attract a wider audience and more of the campus community may have access to reap the benefits of the space. Most participants argued that the location of the DCC is not central to campus like other cultural and resource centers. Joseph noted, “The DCC is not treated like other student organizations are. It’s treated like a subset of segregation.” Joseph is alluding to the fact that disability services and the DCC are subjected to the outskirts of campus, which further marginalizes the disability community. AJ added, “The location really hinders it; it should be moved to the student union. According to Lori, “The space sends a different message because it is connected to a space like the DRC that provides accommodations and resources.” Location communicates much more than a physical address to the campus community regarding the value placed on the disability experience, making it nearly impossible to hold disability on par with other identity groups.

Limitations

There are two notable limitations to the proposed study. First, participants were only recruited from one DCC. The small sample size makes it difficult to generalize results across populations. Based on participant quotes, it appears that within the small sample size there were more participants with visible disabilities compared to invisible disabilities. To address this concern all implications were framed in the context of higher education. Generative insights from this study can help institutions of higher education become more inclusive and equitable for all students by establishing disability cultural centers. Second, study bias may exist due to the researcher’s connection to the disability community. However, the precautions listed above were taken for data analyses to remain trustworthy.

Implications

Through advocacy and activism, the DCC maintains a progressive view of disability where the envi-

ronment, not the individual, is the root of the problem that needs to be changed or fixed. This is an important distinction because in higher education, the solution is often an accommodation to an individual problem. In contrast to the larger campus environment, where participants noted extensive accessibility issues and negative attitudes toward disability, the DCC can model and promote universal design principles across campus. At the DCC, the focus is on systemic issues that impact the disabled student experience. This, of course, involves listening to individual experiences, but the end goal is to make systemic change that can create a better campus experience for all students. The following bulleted lists were suggestions directly from participants and offer a template for how a DCC can advocate for inclusive spaces and improved accessibility across campus.

- Create appropriate space in classrooms to navigate, with easily movable furniture;
- Make various accessible seating options, not exclusively in the back of rooms;
- Make it a policy to have breaks during classes, making longer classes more feasible;
- Use microphones consistently and avoid fluorescent lighting;
- Make all class notes available to everyone prior to class;
- Use exclusively automatic doors on campus and adopt braille maps across campus;
- Increase the number of gender-neutral/non-gendered restrooms on campus

According to participants, avenues for improving climate and attitudes on the campus include:

- Trust and validate disabled student experiences to decrease disabled students’ feelings of not being trusted (regardless if the disability is visible or invisible) or making the non-disabled people the experts of the situation;
- Include disability in social justice conversations without tokenizing one disabled person;
- Infuse disability culture and history into the curriculum, beyond a single reading;
- Create a disability studies major, not housed within the department as special education;
- Respect the lived experience of disability; knowledge about disability and understanding of the lived experience are two different things;
- Host disability events to allow disabled students to share their experiences;
- Commit to a strategic plan of advocacy, organizing, and visibility to create change.

A disability cultural center cannot be established overnight. It takes a lot of thought, planning, staff, space, and, of course, funding. However, even if institutions do not have the resources for a disability cultural center, there are still ways to promote disability culture on campuses. Here are a few recommendations:

- Create a student organization or club for disabled students to connect and share experiences while navigating campus life and the college experience. The club should be run by and for disabled students to challenge the traditional power dynamic that suggests disabled people need help or need to be saved by non-disabled people.
- Recognize the role and importance of student activism initiatives across institutions of higher education to move the conversation beyond compliance to inclusion, such as The NYU Disabilities, Inclusion, and Accessibility Working Group and The Beyond Compliance Coordinating Committee at Syracuse University, Youth Legacy Foundation, which links disabled student groups at different institutions of higher education in Minnesota.
- Decorate disability service offices with artwork that represents disability history, disability culture, and disability advocacy.
- Collaborate with other minority groups on campus to infuse disability into larger discussions of social justice. If your campus has other cultural centers or student groups, host an event or discussion that links both communities, such as ableism in the LGBTQIA+ community.
- Include disability in campus-wide pride events for other minority and identity groups.
- Ensure that when discussions of diversity or diversity initiatives arise, disability is not forgotten or neglected. When you are in meetings or discussions, ask yourself the question, “Who is not (represented) at the table?” Invite disabled people; they know and understand their experience best.
- Make sure disability is represented on marketing materials. Marketing materials should be accessible to disabled students. If posters are hung so high that disabled students cannot see or reach them, they may not be aware of events or feel welcome at the event.
- Establish a disability studies major, minor, or class to expose campus to the depth of the disability experience and educate about ableism and the impact of microaggressions.
- Join the Association on Higher Education and Disability (AHEAD). Within AHEAD, there is a special interest group (SIG) focused on disability studies. The group offers resources and information on disability cultural centers through discussions, online communities, and webinars. This is a great place to make connections if your campus wants to promote disability pride or is in the consideration stage for a DCC. Additionally, attend an AHEAD conference. There are presentations dedicated to DCCs.
- Get connected with Disability Rights, Education Activism, and Mentoring known as DREAM, which is sponsored by National Center for College Students with Disabilities run for and by college students with disabilities.

The above suggestions are a starting point and by no means exhaustive. Not every suggestion is suitable or attainable for every institution. These are avenues to help address the feelings of exclusion and negative campus climate disabled students face every day (Abes & Wallace, 2018). The goal is to infuse disability as an identity across campus to challenge the dominant narrative of disability. This will help make progress towards an environment welcoming and inclusive for all students.

Conclusion

It is evident that a disability cultural center is necessary to combat ableism and the widespread disempowering views of disability that invade higher education. A DCC can act as a catalyst to shift away from the dominant narrative of disability as a medical diagnosis to disability as a valid identity. This paradigm shift will heighten awareness, increase visibility, and promote dialogue that recognizes disability rights as civil rights rather than individualized accommodations. In Vargas (2019), Anna Landre said it best: “We cannot pretend to pursue a just and equal society if we continue to leave the largest minority behind” (p. 3). Therefore, institutions must carefully examine how diversity and disability are constructed and represented to shift beyond a compliance culture to a campus culture that is welcoming and affirming for all.

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Above Average Student Loan Debt for Students with Disabilities Attending Postsecondary Institutions

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Abstract

Black students with disabilities face more hurdles to academic success and completion than do their non-Black non-disabled peers. With an increased reliance on student loans to finance higher education, this double-at-risk population is even more vulnerable than either Black or disabled students individually. This study examines whether there is an additional debt burden to this intersectional population. The *Baccalaureate and Beyond* public dataset was used to explore student debt for students who graduated in 2017. This analysis found that Black students with disabilities graduated with significantly higher debt burdens than either non-disabled Black students or students with disabilities from other racial backgrounds. Implications for research, policy, and practice are discussed. Importantly, Black student veterans with disabilities were found to have student debt even with the assistance of the G.I. Bill.

Keywords: Black college students, students with disabilities, student veterans, student loans, student debt

Black students and students with disabilities (SWDs) are recognized as marginalized identity groups that have been historically and categorically denied access to education within the last generation, remain subject to systemic discrimination to this day, and remain at high risk of being deprived of equitable access to postsecondary education (Blanchett, 2009). In light of the current Black Lives Matter movement and the 30th anniversary of the signing of the Americans with Disabilities Act of 1990 (ADA), there is increased attention being paid to the experiences of both of these historically marginalized groups. Now is the time to seriously reexamine our approach to supporting Black students with disabilities (BSWDs) and student veterans with disabilities, many of whom identify as a racial or ethnic minority, as a way to better understand the unique needs and experiences they bring with them to higher education.

There are five groups who carried higher-than-normal debt burdens for students who matriculated between 2003-2015: “veterans, first-generation college students, students without a high school diploma, stu-

dents with disabilities, and underrepresented minorities” (The Center for American Progress, 2018, n.p.). BSWDs are considered at even greater increased risk as they can plausibly belong simultaneously to all five of these at-risk categories. Because student veterans with disabilities were also identified as a higher-than-normal debt burden group, despite having access to additional funds through the G.I. Bill, we also examined their levels of student debt.

The purpose of this exploratory study was to examine which disability population has the highest student loan debt. Accordingly, the research question was:

What intersectional populations of students with disabilities have the highest student loan debt?

We hypothesized that BSWDs would have a higher student loan debt burden than non-BSWDs and that an analysis of the debt of student veterans with disabilities would yield similar results.

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Literature Review

Historically, Black people and people with disabilities in the United States have faced discrimination on two primary levels—structural and individual. Structural discrimination (i.e., macro-level) includes residential segregation, which in turn affects access to schools and creates disparities within the criminal justice system. For individuals with disabilities (i.e., micro-level), these constructs show up as the medical and social models of disability, which distinguish between the view of disability as being fundamentally caused either by an individual's medical impairment (medical model) or the societal and physical structures that do not take the needs of individuals with disabilities into account (social model) (Krieger, 2012). Included in the operational definition of individual discrimination is discrimination based on interactions between individuals in institutional roles or relationships, such as doctor/patient, as well as on the basis of immutable characteristics, such as race, gender, or disability (Office of Disease Prevention & Health Promotion, 2020).

Economically, discrimination is evident in the poverty levels of Black people and people with disabilities compared to the population-at-large. Poverty levels in the Black community have remained consistently above the national average. For example, even though the overall poverty level decreased between 2010 and 2018, the poverty level for Blacks remained elevated (27.3% versus 15.1% in 2010 and 21.1% versus 11.8%) (Semega et al., 2019). The levels of poverty among people with disabilities during this period are even more stark—since 2010, an average of 27.4% of non-institutionalized people with any disability live below the poverty line compared to 11.7% of non-disabled people; in 2018, 26% of non-institutionalized people with disabilities lived below the poverty line, while only 10% of the population-at-large did (Erickson et al., 2017). These statistics become even more revealing when examining the intersection of these two historically marginalized identities, which this study seeks to do.

Crenshaw (1989) first tackled the concept of intersectionality and challenged the single-axis analysis of identity that examines experiences on the basis of a single characteristic (e.g., race, class, gender, disability, socioeconomic status, or income as well as other sociocultural characteristics). “It is not enough to simply acknowledge that all individuals possess multiple identities and these identities interact...multiple identities must be connected to the larger social structures in which they are embedded” (Torres et al., 2009, p. 587). For the purposes of the present analy-

sis, the intersection of the Black experience and the disabled experience, as well as its overlap with that of student veterans, was examined to explore how these marginalized identities play off of one another, creating a new, unique lived experience—that of Black students with disabilities—within postsecondary education. It is because of these intersections and overlapping identities that we must better understand the multiple and varied pathways taken by these students facing significant barriers to access, especially those who persisted to graduation.

In terms of access, student loans have opened a pathway for many who would otherwise not have access to higher education. Black students take out more student loans than White, Asian, and Hispanic students (Fredman, 2019); however, doing so also increases their individual debt burdens as well as loan default rates (Miller, 2019). Student loan debt is a topic of growing policy concern in the United States with recent data showing most students who pursue a college degree are now using at least one type of loan, which has become the primary source of aid to available to students (Looney & Yannelis, 2015; Nuckols et al., 2020). As loans have displaced grant dollars, not coincidentally, student loan indebtedness has also increased at a rate almost three times faster than college costs (Merisotis & Parker, 1996). Students with disabilities' dependence on financial aid is higher for a variety of reasons: some SWDs need to take reduced course loads (Tsagris & Muirhead, 2012) or take formal or informal leaves of absence related to their disability, which results in corresponding longer times-to-degree (Knight et al., 2018; Wessel et al. 2009).

Students with Disabilities

Students with disabilities have long had a recognized presence in higher education in the United States. This history dates back at least to the early 1800s with schools for the blind and deaf (Saucier & Gagliano, 2018). Historically, students with disabilities, both physical and mental, were placed in segregated institutions with curricula and standards tailored specifically, and often solely, to address their disability-related needs (Nielsen, 2012). The education afforded students at these institutions included vocational training, life skills, and basic literacy and communication skills. Today, the changing concept of disability in higher education has grown from the intersection of lived experience of disability, civil rights legislation such as the ADA and Section 504 of the Rehabilitation Act of 1973, and the increased agency that results from greater legal protections.

In 2015, 19% of undergraduates self-reported having a disability as defined by the ADA (National Center for Education Statistics, 2019a). SWDs who enter postsecondary education face a number of barriers not encountered by their non-disabled peers. These include physical, procedural, and programmatic barriers, which the ADA seeks to remove through a variety of means, including ramps, automatic or power-assisted doors, accessible restrooms, the ability to record lectures or to have extra time on exams (Singh, 2003) and positive and negative interactions with other students (Barnard-Brak & Sulak, 2010).

In addition to these individual barriers to access, students with disabilities also experience systemic administrative barriers to access caused by the transition between being covered by the much broader protections afforded by the Individuals with Disabilities Education Act (IDEA) in pK-12 to Titles II and III of the ADA, which provide these protections in postsecondary settings but with a greater portion of the responsibility shifted to the student. Under the ADA, in postsecondary education, the responsibility for requesting and documenting disability and accommodation falls primarily on the student, who retains the sole responsibility to self-advocate in stark contrast to the IDEA (ADA, 1990; Kutscher & Tuckwiller, 2020). Not only are these barriers difficult to navigate and overcome, but they may also be further exacerbated for SWDs, who tend to also be more likely to be members of other marginalized groups because of the effects of disability on the intersection of other identities (Crenshaw, 1989).

Intersectionality

Crenshaw's (1989, 1991) intersectionality framework revolves around issues of inequality, power, and politics and the discrimination that marginalized and oppressed groups face because of their intersecting identities. Thus, intersectionality is grounded in the fact that membership in multiple at-risk identity groups has a significantly increased impact on students as compared to previous single-axis frameworks, which examines membership on the basis of a single characteristic, such as race or sex. Crenshaw argued that there is no singular, monolithic experience that can be captured by analysis of any single characteristic and that only in the intersections of these identities can a person's lived experience be understood. Meaning the experience of a man is substantively different than that of a woman and that of a White woman is different than that of a Black woman, and the experience of a Black woman with a disability is different than that of a Black woman without a disability, and that each of these multifaceted aspects

of identity carries with it the combined stigma and systems of oppression attendant with their associated identities. A Black female participant in Peterson (2009) captures this sentiment well: "If it's not my race, it is other things, like being a woman or my disability" (p. 436). Thus, it is important to acknowledge the power and effects of these intersectional identities and that these effects are not limited solely to academic success but play out in other areas as well, such as financial burdens.

Student Debt

The concept of student debt has shifted from something hardly dreamt of to a topic that has caused many Americans to lose more than a night's sleep in less than half a century. While the cost of goods and services, including tuition and fees, associated with higher education have continued to rise, the American middle-class has also experienced continuing wage stagnation since the 1970s (Sacerdote, 2017). During this same period, the continuous reduction of funding to higher education by lawmakers has turned the economic model from one of scholarships and grants to a system dominated by loans with grants and scholarships now making up a only minority of student aid (Baez, 2013; Kelchen, 2018). This is mirrored by a shift in the perception of higher education in American culture from being viewed as a fundamental part of a society willing to fund its future to one that is viewed chiefly as a personal investment (Baez, 2013; Nuckols et al., 2020).

With degree attainment increasingly viewed as a private good rather than a public benefit, the trend is to measure the value of college attendance primarily in financial terms such as investment and return on that investment (Fergus, 2018; Hensley et al., 2013). Dougherty and Natow (2020) consider motivation through such material inducement (e.g., measuring a degree's value in an ROI approach) a neoliberal strategy. As these perceptions of higher education acquiesced into neoliberalism at the outset of the 21st century, more individuals saw money borrowed to pay for education as an investment in their future (Hensley et al., 2013; Marginson, 2007), and such investment in the hope of a better tomorrow has also resulted in increases in the percentage of degrees attained by adults 25 and older (U.S. Census Bureau, 2020).

The rise in educational attainment has a direct relation to the increases in the number of students borrowing at least a portion of their higher education costs, the overall student debt load, and the amount of that debt that is in default. From 2008 to 2018, the percentage of Americans between the ages of 25-34 who had obtained at least a baccalaureate degree

increased from 41% to 49% (OECD, 2019). This increase has contributed to the 44 million current student loan borrowers with an accumulated debt nearing \$1.6 trillion and rising. What is more revealing is that nearly 12% of borrowers are currently in default or in a late status (Board of Governors of the Federal Reserve System, 2019; Experian, 2018; Federal Reserve Bank of New York, 2018). With nearly 1.7% of the annual U.S. GDP in the form of private spending on postsecondary education, America's student loan debt is predicted to top \$2 trillion by the close of 2021 (Byrne, 2018; OECD, 2019).

Black Students and College Success

Tucker and McKnight (2019) define at-risk students as those who belong to one or more of the following groups, which have been identified as predictors of non-completion: low income, first generation, academically disadvantaged, and minority racial or ethnic status. Six-year completion rates at four-year institutions show that Black students had the lowest graduation rates (45.9%) as compared to their White peers (62.7%) (Shapiro et al., 2017). Although minority enrollments in higher education are significant, Black college students' success has been shown to be lower, especially when they attend Primarily White Institutions (PWIs) over Historically Black Colleges and Universities (HBCUs; Campbell et al., 2019). HBCUs tend to have lower graduation rates accompanied by an average 45.9% six-year completion rate, which is lower than their non-HBCU counterparts (National Student Clearinghouse, 2017) and have been traditionally underfunded compared to PWIs at both the state (Mitchell, Jr., 2013) and federal levels (Johnson et al., 2017; Lee, Jr., & Keys, 2013). In 1976-77, HBCUs conferred 35% of bachelor's degrees; in 2017-2018, that number dropped to 13% (NCES, 2020). Black students also take on more debt (72%) than their White peers (56%) (Musu-Gillette et al., 2016). Moreover, mere academic ability and preparedness may not be enough to overcome the non-academic factors contributing to students' stopping out prior to graduation.

Black Students with Disabilities

In terms of attendance in higher education, the period between 1990 and 2005 saw an overall increase in postsecondary enrollment among Black students; however, this trend did not hold true for traditional four-year colleges and universities and was only seen in business and vocational colleges or community colleges (Newman et al., 2009). Although these data are over a decade old, they are the most recent available.

BSWDs come from as diverse backgrounds as any other group. Their experience is not monolithic; however, the intersection of their race with their disability requires them to navigate the challenges, discrimination, and stigmas associated with both disability and race, while frequently coming from disadvantaged socioeconomic backgrounds and the accompanying social issues that may entail (Mayes & Moore, 2016). For Black students, their racial identity cannot be secondary to their disabled identity because their racial identity will always prove the more salient, or at least significantly contributory, often causing them to reject or find ways to pass as non-disabled with regards to their disabled identity, if possible (Gill & Cross, 2010). Creating and maintaining a strong cultural identity helps individuals endure and overcome stress and allows students to address the apprehension related to intersecting identities (Tovar-Murray et al., 2012).

Student Veterans

Student veterans, as a distinct constituency, have been a fixture on college campuses since the introduction of the Servicemen's Readjustment Act in 1944. A second significant influx of student veterans entered postsecondary education when the Post-9/11 G.I. Bill was introduced in 2008, considerably expanding the benefits available under previous iterations of the bill (U.S. Department of Veterans Affairs, 2018). The G.I. Bill provides education benefits, among others, to people who have served in the military. This benefit helps many who may not otherwise be able to afford postsecondary education and helps to potentially reduce their overall debt burden. Student veterans, as a group with inherently more diverse backgrounds and life experiences, come to campus with a variety of needs that set them apart from their other non-traditional peers. Included among these unique needs are dealing with issues of difficulty moving from a rigid identity to one that is more unstructured and fluid (Kirchner, 2015; Morris et al., 2019), feelings of alienation (Morris et al., 2019; Morissette et al., 2019), living far away from campus (Jenner, 2019), and dealing with more administrative barriers related to the processing of paperwork to access their G.I. Bill benefits (Semer & Harmening, 2015; Shackelford, 2009). Many of today's veterans are first generation college students (Bozick & DeLuca, 2011; Jenner, 2019), have significant gaps in their formal education (Jenner, 2019), are considered low income (Burdman, 2005; Jenner, 2019), and almost 30% identify as non-White (Cate & Davis, 2016). Barriers such as these can have a noticeable impact on academic success. Student veterans also bring a wealth of leadership ex-

perience that traditional undergraduates are lacking (Ackerman et al., 2009; Phillips & Lincoln, 2017), are highly autonomous and independent (Borsari et al., 2017), and are mission-driven (Ford & Vignare, 2015) with a strong work ethic (Blaauw-Hara, 2016; Institute for Veterans and Military Families [IVMF], 2019), a majority range from age 24-40 (IVMF, 2019; Postsecondary National Policy Institute, 2019), and they tend to have higher GPAs than their traditional-aged peers (Cate et al., 2017). However, despite these otherwise advantageous qualities, the barriers to access they face can have an overwhelming influence and overpower their academic success.

Black Student Veterans

Military members are more diverse culturally and ethnically and, logically, that carries over into the student veteran population. In 2014, 17% of student veterans identified as Black and 6% identified as “other” or “multicultural” (Postsecondary National Policy Institute, 2019). Outside of identifying Black student veterans by race (e.g., Borsari et al, 2017; Cate, 2014; Walton-Radford et al., 2009), very few studies have explored the academic barriers for Black student veterans (Brawner et al., 2019; Cole-Morton, 2013; Herbold, 1994; Hewitt, 2017; Humes, 2006; Lewis & Wu, 2019; McArdle, 2017). Brawner et al. (2019) qualitatively examined the experiences of seven Black student veterans on multiple intersecting identity dimensions while they were pursuing engineering degrees. Lewis and Wu (2019) used Schlossberg’s 4S transition model to evaluate the relationship of combat exposure to depression scores for veterans attending an HBCU. Cole-Morton (2013) interviewed a Black male student veteran to understand his “diverse needs, experiences, and expectations.” Despite their making up a significant portion of the military, there remains a dearth of literature on the specific needs of Black student veterans as a specific and significant subpopulation of veteran students.

Student Veterans with Disabilities

Along with the growth of student veterans on college campuses, the number of veterans with disabilities and specifically those with mental health impairments has grown proportionally (Government Accountability Office, 2014; Vance & Miller 2009). Military veterans can have service-connected disabilities, which are physical (~10%), mental (~20-46%) (Wagner & Long, 2020), or sensory impairments (~25%) (National Alliance on Mental Illness, 2018), or a combination thereof, and some of these may be invisible, or not immediately apparent. Also, depending on the severity of the impairment and the situa-

tional barrier being faced, student veterans may not seek out the accommodations they are afforded under the ADA or Section 504 of the Rehabilitation Act (Kranke et al., 2017). Barry et al.’s (2014) analysis of 13 peer-reviewed studies revealed student veterans have “higher rates of health risk behaviors and psychological symptoms and personal and educational adjustment difficulties” (p. 30) compared to their non-veteran peers, and are twice as likely to have a disability (National Survey of Student Engagement, 2010).

Physical impairments for veterans range from minor to severe and have an equally varying effect on student success. Physical and sensory impairments for veterans include pain and fatigue (Eakman et al., 2016; Rudd et al., 2011), impairment to hearing or vision (Kinney & Eakman, 2017), spinal-cord injury and/or amputation (Bilmes, 2007; Borsari et al., 2017) just to name a few. Mental health impairments for veterans also range from minor to severe and affect student success to varying degrees. Post-traumatic stress disorder (PTSD) and traumatic brain injuries (TBI) are the more well-known mental health impairments which disproportionately affect veterans, but depression, suicidal ideation, and limited communication skills (Valenstein et al., 2020) can also impact learning and persistence. Several studies point to the fact that student veterans are hesitant or unwilling to seek accommodation for disability status (Bagby et al., 2019; Kranke et al., 2017) because it disagrees with the warrior ethos—the thought that asking for help takes away from their power as a warrior who has survived struggle (Lowery, 2019; McNally & Frueh, 2013). Further, some student veterans do not know they are eligible for accommodations (Dudley-Miller & Radcliff, 2020) or did not know how to seek and/or ask for them (Madaus et al., 2009; Wagner & Long, 2019). However, student veterans who do request and use accommodations tend to be more academically successful, and this is beginning to trend more positively with regard to seeking accommodations, especially with Post-911 veteran students (Kraus & Rattray, 2013; McNally & Frueh, 2013; Shackelford, 2009).

In some of the literature, student veterans were examined in terms of their levels of persistence and attainment. For student veterans who enrolled as first-time students in 2011-2012, 33% reported having a disability, and 67% were enrolled in public higher education institutions (HEIs). First-time veteran students with disabilities were more likely to be enrolled in associate degree programs, completed their degrees more slowly than their non-disabled veteran peers, and 47% of the 2011-2012 cohort left without completing their degrees by 2017 (Ochinko & Payea,

2020). It is necessary to have pathways for student veterans with disabilities that provide appropriate resources to help them navigate the unique barriers to academic success.

Methods

This study examined data from the 2016-17 *Baccalaureate and Beyond* (B&B) public dataset to explore factors influencing the degree of federal student loan debt among bachelor graduates with a disability (NCES, 2019b). This dataset is a nationally representative study conducted by the National Center for Education Statistics in the United States. This dataset is in accordance with human subject guidelines and has received Institutional Review Board human subjects approval as exempt from Fayetteville State University (approval #18-04527).

Sample

The sample for this study was undergraduate students with disabilities ($N = 2,100$); missing cases were excluded from the sample. Of this sample, 42.6% identified as male and 57.5% identified as female. When examining disability status, approximately 8.1% reported having a documented disability, and 91.9% reported not having a disability. The racial demographics of the sample were 73% White, 8.6% Black or African American, 9.2% Asian, 0.4%, and 3.1% identifying as other. There were no weights applied to the regression.

Analysis and Measures

A linear regression was conducted in NCES PowerStats, the online interface for NCES data analyses. Since this was an exploratory study, the overall model fit and each significance test was measured using a 0.05 significance level (Cohen, 1968).

The dependent variable was measured by the dollar amount of federal student loans the participants had accrued after completing their bachelor's degree. Independent covariates in the regression model included: gender, race, institution type (public, private non-profit, private for-profit), and veteran status. These independent variables were empirically and theoretically supported covariates related to degree completion among college students (Ishitani, 2006).

Results

Descriptive statistics reveal that the average federal student loan debt among graduates with disabilities is approximately \$27,490 ($M = 27,480.11$, $SD = 14,951.33$). The overall linear regression model was statistically significant ($R^2 = 0.30$, $F [11, 190]$

$= 23.93$, $p = 0.04$). When observing the R^2 , the regression model explained 30% of variance related to the amount of federal student loan debt that students with disabilities had accrued after completing their bachelor's degree requirements. Other significantly associated variables included identifying as racially African American/Black ($b = 6,197.21$, $p < 0.001$) and attending a for-profit university ($b = 13,053.4$, $p = 0.001$), and being a military veteran ($b = -4,806.12$, $p = 0.01$).

In other words, BSWDs had approximately \$6,197.21 more in federal student loan debt than White SWDs. Students who attended a private for-profit university had approximately \$13,053 more in federal student loan debt than those who attended a public university. Lastly, being a veteran with a disability resulted in having \$4,806.12 less in federal student loan debt in comparison to students with a disability who were not veterans (See Table 1).

Discussion

Black students are already more likely to face barriers to entering postsecondary education, which places them at a disadvantage when compared to their non-Black peers, and the review of literature shows that often Black student veterans come to campus with even greater numbers of disabilities and face increased barriers to successful completion (Bagby et al., 2019; Kranke et al., 2017; Valenstein et al., 2020; Wagner & Long, 2020). Students with disabilities also face increased barriers to access due to the inherently ableist design of most aspects of higher education. Understanding this and the influence of these intersectional identities can aid higher education institutions in planning appropriately for accessible programs and reasonable accommodations as provided for under the law. The hypothesis that BSWDs would generally carry a higher debt burden was statistically confirmed. While Black student veterans with disabilities have a lower debt burden than non-veteran Black students, generally, and those with and without disabilities, this is most likely attributed to the use of the G.I. Bill. When compared with their White SWD veteran peers, this population still had a higher debt burden further illustrating the independent influence race exerts on student debt.

Implications

The following implications are provided for research, practice, and policy. It is our hope that the findings from this study can help better the experiences for BSWDs and Black student veterans with disabilities.

Table 1*Linear Regression Model*

Variable	<i>B</i>	95% <i>CI</i>		<i>t</i>	<i>p</i>
Gender (ref = male)					
Female	1292.28	-690.74,	3275.30	1.29	0.20
Race (ref = white)					
African American or Black	6197.21	1732.28,	10662.10	2.74	* 0.001
Hispanic or Latino(a)	-2854.07	-6055.59,	347.45	-1.76	0.08
Asian	-4693.94	-10836.8,	1448.92	-1.51	0.13
Other	-459.93	-4823.58,	3903.61	-0.208	0.84
Institution Type (ref = public)					
Private non-profit	-711.87	-2508.21,	1084.46	-0.781	0.44
Private for-profit	13,053.4	10904.57,	15202.23	11.98	*0.001
Veteran Status (non-veteran)					
Veteran	-4806.12	-8581.15,	-1091.07	-2.547	*0.01
<i>R</i> ²	0.30, 95% CL [11, 190]				
<i>F</i>	23.93 (<i>p</i> < 0.04)				

Research

There is a serious gap in research when it comes to Black student veterans with disabilities. When their experiences are discussed in research, student veterans are often viewed as a subpopulation of students with disabilities or are hard to find because many do not disclose either their veteran identity, their need for accommodation, or both (Kranke et al., 2017). Having datasets like the *B&B* that delve deeper into students' specific impairments could help uncover more avenues to assist students by impairment classification. Using the *B&B*'s longitudinal data to examine participants by cohort year (1993, 2000, 2016) could also help provide a comparison for BSWDs from previous years to see if the findings in the present study are consistent with comparable trends in previous years. Further examination of dual- or multiple-at-risk populations can also shed light on how to help these students persist to graduation. Further research should explore the effect of student debt on completion rates of BSWDs to examine whether the amount of debt has an effect on persistence/drop out.

Practice

Practitioners in higher education, particularly those who work in accessibility offices, need to be more aware of the unique experiences and needs that

BSWDs bring to campus. There is a need for cultural competency programming for faculty and staff around the experiences of BSWDs and student veteran populations, because they have similar and differing needs. Practitioners should also be aware that military culture has long stigmatized asking for help, and while this is starting to change, student veterans on campuses now are still coming with the mindset that asking for help shows personal weakness (Shackelford, 2009). Having faculty and staff who are familiar with the needs and mindsets of student veterans, establishing student veteran groups, and having veteran-specific student orientations have proven to be effective measures to help student veterans persist (Southwell et al., 2018; Wagner & Long, 2020), but these are not always available and may, indeed, not always be necessary on every campus. Financial literacy programs should be instituted that address the needs of students who often do not have any sense of generational wealth or the long term risks and benefits associated with financing options. These programs should focus on SWDs and student veterans with disabilities, so they understand that they may have added costs. However, higher education institutions should also take a hard look at the added costs for SWDs, such as medical bills, the costs of assistive technology, and the limited ability to work and attend

school simultaneously, and attempt to mitigate those to increase persistence to graduation. Understanding how a student's intersectional identities can affect student performance is also important to understanding how to best support student success. Programs that encourage intersectional awareness and include a robust faculty and administrative staff training component focused on intersectionality are important.

Policy

Policymakers should start with the fact that there is an increased student debt burden for BSWDs and enable policies to help reduce the hidden and additional costs associated with higher education for this dually-at-risk population. The over-reliance on evidence from students' high school accommodations by an institution's disability resources office may also be a contributing factor. This could be because students were never identified as having a disability at the primary or secondary levels, but it is important to note that this can have an even deeper ripple effect for non-traditional students, like student veterans, who may have been away from high school for many years and may not have benefited from more recent developments in disability education law governing pK-12. Disability status as a factor in consideration for financial need for grants and loans as well as simplification of grant and loan program applications, and transparency in expected costs for higher education should be clearly communicated. HEIs should also examine minority student outcomes and find ways to increase their academic, social, and graduation achievement. HBCUs have been the recipients of increased federal funding since 2009 (U.S. Department of Education, 2016) and the Obama-era initiative on HBCUs (extended by the Trump administration) needs to be maintained while ensuring HBCUs are being good stewards of these resources. HBCUs are 3% of HEIs and enroll 10% of African American students (United Negro College Fund, 2020) and are an important pathway to degree attainment.

Limitations

This study did not examine BSWDs who did not complete an undergraduate baccalaureate degree. It only examines data from the 2017 cohort of baccalaureate-level graduates. This study is further limited by aggregating disability into one binary category (yes or no); while this is common in disability research, there needs to be more focus on the classifications impairments themselves. The *B&B* dataset does not allow for comparison of BSWDs and veterans and cannot account for students who chose to not disclose a disability when entering postsecondary education

(approximately 25-30%) which results in an underreporting of the data (Newman et al., 2011).

Future Directions

More quantitative research is needed to help uncover the number of minority racial/ethnic SWDs, student veterans, and those with multiple and intersecting barriers to academic success. Qualitative research can help shed light on the lived experiences, voices, and particular needs of BSWDs. Examining the needs of student veterans with disabilities, whether visible or invisible, would also add significant value to an area in which the literature is sorely lacking, and doing so in various subpopulations such as underrepresented minorities, first generation students, or by gender identity would prove to be valuable lines of inquiry. Being able to examine BSWDs, and other races and ethnicities, by their individual impairment and the barriers to access they face would also allow for better services more individually tailored to the student keeping in line with the ADA's requirement that accommodations be determined through an individualized, interactive, iterative process. An interaction effect could be applied in future studies to see if the different types of institutions attended impacted race and disability. The preliminary findings of this study point to the need for longitudinal studies that specifically examine BSWDs' student loan debt, which would also greatly aid understanding how HEIs can best support and benefit this doubly-disadvantaged population.

It is encouraging to see that there is currently discussion surrounding student debt and free college at the federal level; however, there is still a long way to go before higher education begins to approach being affordable for all. It is time for higher education to return to its former status as a public benefit and move away from its perception as a private good. Doing so would allow the United States to be in a much stronger position in terms of world rankings of HEIs. The United States is currently ranked 10th in the world for the number of 25-34 year-olds in higher education with 49% of 25-64 year-olds having a college degree (OECD, 2019).

Overall, this study has highlighted a need to examine why the student debt burden is higher for BSWDs and Black student veterans with disabilities. While this study does not provide the answer to the causes, we do show that there is a need for further examination into why any student should have to incur disproportionately more student loan debt than other students. Disabilities, by definition, present barriers to access, but certainly, adding more debt on top of these pre-existing barriers to

access and success could have negative undue effects on the academic success of BSWDs. It is time to change the way students with disabilities, particularly those from disenfranchised populations, are treated on college campuses and bring about more equitable learning opportunities that do not create an added debt burden for students who are less likely to be able to assume it in the first place.

It is important to highlight and confirm that BSWDs need more resources to be successful. While we report that HBCUs have lower overall graduation rates, it is also important to mention that the HBCU experience is one that is overwhelmingly positive and affirming for most students who attend them. While examining retention tools for their students, HBCUs should pay particular attention to their SWDs and their student veterans in order to ensure that they have the best possible accommodations, supports, and other tools for success. Non-HBCUs should do the same—BSWDs should no longer be marginalized, rather we should provide them with the disability-specific tools they need to ensure success while creating pathways to graduation in order to shorten their time-to-degree and increase their collegiate success while on campus and beyond.

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Self-Determination and Quality Indicators for Assistive Technology in Postsecondary Education

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Abstract

The purpose of the research is to identify and collate a list of indicators of self-determination related to assistive technology (AT) use and acquisition. We explore how aspects of self-determination may shape a student's ability to effectively use and obtain AT in postsecondary education. To accomplish this, the research team convened a group of national experts ($n = 12$) to participate in a Delphi Panel and create an item bank of AT related knowledge, skills, and beliefs. These three key constructs are components of self-determination, and each of the items relates to a different factor that may impact a student's ability to effectively use and obtain AT. This paper describes the research process that led to the development of the item bank and presents a discussion about its relevance to the study of AT and self-determination in postsecondary education. The panel identified 39 indicators of student self-determination in relation to AT use. The items that were ranked as the most likely to impact students' performance related to: students' understanding of how their disability impacts academic performance, knowledge of accessibility features and AT devices, and understanding how AT enhances one's ability to perform specific tasks related to individual goals. Findings will inform the delivery of services through the Quality Indicator for Assistive Technology in Postsecondary Education (QIAT-PS) collaborative, a technical assistance and training program to identify and remove barriers to effective AT use in postsecondary settings. Findings may also be used to guide future research and training related to self-determination AT use.

Keywords: self-determination, academic performance (postsecondary), rights, assistive technology

Assistive technology (AT) is an integral part of *self-determination* for many students with disabilities in postsecondary education. As a psychological concept, the theory of self-determination suggests that fulfilling the human needs for "competence, autonomy and relatedness" leads to greater intrinsic motivation and effective functioning (Deci & Ryan, 2015, p. 486). Self-determination models, such as the Field and Hoffman (2015) Action Model for Self-Determination, have shaped recent conversations in disability services to focus on both individual and environmental factors that support self-determination. Looking for evidence-based practices and environmental characteristics that support self-determination in

postsecondary education is a shared research priority in higher education and disability services (Getzel, 2014). Postsecondary students with disabilities face difficulties in exercising their right to self-determination when it comes to using or acquiring AT. Many of these difficulties are rooted in institutional barriers such as costs, difficulties in procuring appropriate devices, lack of trained AT support, and stigmatizing attitudes that dissuade students from using needed devices (McNicholl et al., 2019). Individual barriers to effective AT use are often related to knowledge and self-advocacy skills as well as the need for training and evidence-based resources for student services professionals in postsecondary institutions (Goegan, et al., 2019).

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The identification of strategies and evidence-based practices to support effective AT use can help individuals and professionals navigate the aforementioned barriers. It is important to specifically identify practices that align with the principles of self-determination because personal investment through user-engagement in choosing devices and services increases the likelihood that AT will be adopted long-term (Howard et al., 2020). The purpose of this study is to describe the results of a process to determine indicators of self-determination in relation to AT use in postsecondary educational settings. The research process included convening a panel of national experts through a *Delphi Panel*. The panel members were asked to provide feedback on indicators of the attributes of self-determination that students with disabilities need to most effectively use AT in postsecondary educational settings. The items identified in this study are critical for helping students navigate barriers to technology acquisition and use in a manner that may positively shape students' academic performance.

Findings from this research inform the technical assistance efforts of the Quality Indicator for Assistive Technology in Postsecondary Education (QIAT-PS) collaborative project. QIAT-PS began in 2009 to examine several dimensions of AT service delivery and outcomes for two major populations: students who were matriculating to higher education and were AT users, and staff in disability service offices in higher education settings. Given the lack of evidence-based practice related to AT services in high education settings, QIAT-PS was developed based on the success of the Quality Indicators of Assistive Technology (QIAT) program, an evidence-based tool for the delivery of AT services to students with disabilities in K-12 settings (Zabala et al., 2000). QIAT for primary and secondary schools has been included in a wide range of publications and recommended by several state departments of education as a best-practice standard for the provision of AT services. QIAT-PS is achieving similar success in reaching educational institutions interested in delivering high quality AT services (Bowser & Peters, 2016). The program currently includes support for conducting self-evaluations of AT service systems to identify institutional barriers to effective service delivery. This research is being conducted to support the development of future research and training tools to assess barriers to effective AT use in the postsecondary environment.

Background

People with disabilities are twice as likely to be unemployed (8.0%) compared to the general popu-

lation (3.7%) and the labor force participation rate has remained relatively stagnant for more than 30 years (Bureau of Labor Statistics, 2018). Participation in postsecondary education is one strategy that may help to improve labor force participation for many people with disabilities. People with disabilities are on average less likely to complete college than their non-disabled peers and take longer to complete courses; although some recent studies at some universities have shown concordant graduation rates among peers with and without disabilities (Kutscher & Tuckwiller, 2019). AT access and use is associated with multiple important factors that impact retention in post-secondary education including psychological well-being, social participation, and overall academic engagement, which is enabled by access to instructional content (McNicholl et al., 2019). In the past decade, there has been mounting interest in identifying and improving the outcomes of youth with disabilities in postsecondary education settings (National Council on Disability [NCD], 2016). AT services have been found to increase postsecondary students with disabilities ranking of their academic performance and satisfaction generally across gender, impairment types, and socioeconomic status (Malcolm & Roll, 2017). Therefore, AT is considered an instrumental part of achieving these positive outcomes for students with disabilities.

The Assistive Technology Act of 2004 (ATA), which applies to educators at all levels, defines AT as "any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities" (Section 300.5). ATA is implemented at the state level through four programs: AT Demonstration, AT Loan/Borrowing, AT Reutilization, and AT State Financing. Analysis looking at return on investment for AT shows that these programs result in substantial savings over time. In fiscal year 2019, a total of \$28 million was invested in state AT programs, which resulted in a return of more than \$67 million in savings and benefits, and provided direct services to nearly 500,000 individuals (Association of Assistive Technology Act Programs, 2019).

In postsecondary education, the purpose of AT is to maximize students with disabilities' independence, participation, and social integration by addressing barriers encountered in their environment. AT allows students with disabilities to access the same materials, environments, and educational opportunities as their peers. Equal access and independence are critical for building self-determination, or the autonomy a student with a disability has over their academic and

life decisions (Wehmeyer, 2015). Self-determination in relation to AT means that students have control regarding the use, acquisition, and support of technology. It also means that students are able to identify, use, and maintain devices and supports to achieve academic goals that are of personal interest (Söderström et al., 2019). To foster a sense of self-determination students must be equipped with the necessary tools and support to navigate systemic barriers to inclusion and lead efforts to combat them.

At the individual level, self-determination is not an intrinsic attribute, and rather reflects the collective outcome of a set of learned skills, behaviors, and knowledge (Field & Hoffman, 2015). Self-determination is also shaped by the environment, which includes educational settings, policies, and procedures. Sparse resource or supports, discriminatory practices in relation to one's impairment or intersectional racial-ethnic background, and an inaccessible environment may diminish one's agency to become more self-determined (Shogren et al., 2018). Realizing the right to self-determination requires removing systemic barriers to inclusion, increasing or maintaining institutional supports, and equipping individuals with the resources and tools to navigate postsecondary settings and obtain necessary technology. Self-determination and access to technology in general have a reciprocal relationship (Pacheco et al., 2019). AT is often critical for individuals to pursue educational pathways of personal interest. Students with disabilities also must develop a strong sense of self-determination to claim their rights to receive or use AT. The ability to exercise one's rights and to make choices is integral to self-determination in relation to AT use.

Barriers to Postsecondary AT Use and Acquisition

Given the critical role that AT plays in self-determination for students with disabilities, it is essential to understand the barriers to using and acquiring AT in postsecondary educational settings. There is a growing body of research on barriers to using and acquiring AT in postsecondary settings. For example, Lang et al. (2014) conducted a review of the provision and continued use of AT support, and found barriers to be due to either one or a combination of three factors: institutional factors, AT device/software factors, and student (e.g., individual level) factors. Meanwhile, McNicholl et al. (2019) conducted a systematic review on the impact of AT use for students with disabilities in higher education and identified a number of factors associated with diminished effectiveness of AT services such as limited option or choices of AT devices, arduous documentation processes required to receive AT, and limited access to maintenance ser-

vices. Additional reviews have focused on people with specific impairment types. For example, Boot et al. (2018) find that funding and costs are the largest barriers to AT use amongst people with intellectual disabilities. There has even been inquiry into the internalized impact of these barriers revealing the fact that stigma and prejudice also present a barrier to ongoing AT use (Perelmutter et al., 2017). A common conclusion across this growing body of research is that there is a need to equip disability services providers and students with disabilities with evidence-based tools to address these barriers.

Many of these barriers to AT use and development of one's sense of self-determination must be addressed at the systemic (policy) or institutional level. A number of environmental barriers can significantly impact the acquisition and effective use of technology. Environmental barriers such as accessibility, integration, and stigmatizing attitudes may supersede the positive impact of AT use (Ripat et al., 2020). Institutional factors limiting AT use relate to funding, faculty knowledge and motivation, and students and staff training on AT operation. Beyond cost, another issue is stigma and discrimination. Negative attitudes towards disability may impact students' willingness to disclose and receive appropriate accommodations related to AT use and acquisition (Lang et al., 2014). It is necessary to address such barriers to enhance postsecondary students' self-determination in assistive technology use. While there is a growing number of initiatives to address systematic barriers to AT acquisition and use at the campus level (including the QI-AT-PS campus self-evaluation matrix), there remains a broader need to support students with disabilities' overall ability to navigate postsecondary systems to obtain needed technology.

Positive trends that can mitigate many of the aforementioned institutional barriers include the increase of built-in accessibility features on "mainstream" technologies and the application of Universal Design for Learning (UDL) to course instruction and design. UDL principles are increasingly operationalized as interventions to redesign postsecondary curricula and often welcome the use of technology in the classroom (Fornauf & Dangora Erickson, 2020). In this context, UDL approaches are critical to actualizing self-determination principles because of the potential to counteract institutional barriers to AT use that are rooted in discriminatory and exclusionary beliefs. Universal design has expanded beyond physical structures to include approaches to instruction, design of materials, furniture arrangement, and classroom technology (Edyburn, 2010). Integrating technology use into course curricula may significant-

ly reduce stigma attributing AT devices to unfair advantage (Rose et al., 2005). The mainstream usage of information and communication and technology (ICT) devices such as phones and tablets also benefits students with disabilities as devices increasingly include accessibility features. Built-in accessibility features increase the utility of devices and reduce stigma of devices that have a medical aesthetic (Howard et al., 2020). Accessible ICT thus reduces the additional costs associated with AT. Furthermore, the UDL framework suggests the utilization of multimodal instructions techniques to provide different means of engaging and conveying information. The UDL approach increasingly suggests an interactive instructional approach that welcomes and invites technology use in the classroom setting.

There are a number of individual level factors that may impact the degree that students are able to navigate various barriers to effectively use technology. Individual level factors, including effective use of mainstreamed technology and AT use help to navigate or upend these barriers (McNicholl et al., 2019). Individual AT devices and software can also present barriers though if the AT requires specific skills to set up, operate, and/or maintain. If not trained appropriately, students can feel frustrated and may stop using or “abandon” technology. One part of addressing this barrier is ensuring that students’ needs and skills are aligned with the device. This means facilitating technological choices on a case-by-case basis to better one’s ability to operate the device as well as selecting the appropriate device size, structure, and appearance for the individual. For students with disabilities to be successful in postsecondary education, they need to be provided with the right AT to match their needs, preferences, and skills; training in how to use the equipment, device, or software; and a range of options to choose from.

Self-Determination in Assistive Technology Use

Individuals need to develop a strong sense of self-determination in order to address these barriers and obtain the technology that is most appropriate for their personal goals. Actualizing the self-determination framework suggests removing institutional barriers to full inclusion in postsecondary settings while also equipping individuals with the necessary knowledge, skills, and beliefs to achieve their personal goals (Wehmeyer, 2015). Self-determination can predict students’ academic performance, mental health, and achievement of post-transition goals (Field & Hoffman, 2012). There is a growing body of research about the importance of AT to support student self-determination in the transition to postsecondary

settings (Webb et al., 2008). Self-determination is particularly important for students transitioning from secondary to postsecondary institutions where students become more responsible for identifying their needs and requesting specific AT. Postsecondary students with a strong sense of self-determination have a good understanding of their disability, are able to seek support from their institution, and are able to convey their needs to the faculty and/or disability service staff (Goegan et al., 2019). Self-determination also means that students have a working knowledge of their rights should they encounter discriminatory beliefs or practices (Lindsay et al., 2018). There is increasing recognition that self-determination is vital to achieving postsecondary goals and outcomes of personal interest, and the reviewed research reflects a growing body of evidence-based suggestions to guide disability service professionals’ technical assistance efforts.

The specific process of developing self-determination in relation AT use is less understood. This knowledge gap may be connected to alarming findings about limited AT use and awareness in postsecondary settings. Around sixty percent of students with disabilities report having received little or no information about AT options in postsecondary settings. (Stumbo, et al., 2009). Furthermore, there is inconsistency among faculty in terms of their understanding of how to promote students’ sense of self-determination (Hong et al., 2011). Together, these gaps suggest a collective need for additional resources to enhance self-determination in relation to AT.

There has been some academic inquiry into how self-determination principles connect to an individual’s AT use. For example, disability service professionals tend to agree that students should be able to assert their preference of different types of AT based on what works best for them (Webb et al., 2008). Individuals must know the AT equipment that works best for them and their needs and be able to convey their needs to the faculty and/or disability service staff (Goegan et al., 2019). Knowledge of different devices and personal preferences allows students to acquire new AT, exchange or trade in AT devices, or request additional assistance with AT devices if they are not meeting students’ individual needs. Students must also know about their rights to access disability services and obtain AT within their educational institution (Lindsay et al., 2018). Some knowledge and skills are closely tied to students’ attitudes and self-perceptions. For example, knowing how to respond to peers, professionals, and others when encountering discrimination or stigma is thought to be an essential part of confidently and successfully using AT (Ripat & Woodgate, 2020). Furthermore, if

students do not believe that their AT will help them achieve their personal or academic goals, they are more likely to use the technology ineffectively or discontinue its use altogether (Geogan et al., 2019).

Collectively, the individual studies allude to different aspects of self-determination that may enable effective AT usage. There still is a need for summative analysis of the differing individual level factors associated with self-determination in AT use in postsecondary settings. As more students with disabilities enter postsecondary educational settings, there is a growing need to identify resources to support their self-determination in using and acquiring AT. Further exploring the links between self-determination and AT can benefit students, instructors, and disability support staff. This study set out to identify and collate aspects of AT use that are associated with student self-determination in order to better facilitate the equal access and overall participation of students with disabilities in postsecondary education.

Methods

The purpose of this study is to identify and collate a list of indicators of self-determination related to AT use and acquisition. The primary research question is: What are the individual level components of self-determination that may impact a student's ability to effectively use and obtain AT in postsecondary settings?

Design

We approached this question using a Delphi Panel. The Delphi process is a research technique that involves convening a panel of experts to discuss a topic or issue. The panel uses their individual expertise in research and professional knowledge to consolidate findings and seeks convergence on a topic of specific expertise (Vázquez-Ramos et al., 2007). The Delphi process has been used in disability services research in postsecondary education to create and update standards and performance indicators (Dukes, 2006; Lynch & Getzel, 2013). For this research, the process is conducted to generate a comprehensive list of items by individuals with specific expertise, or insider knowledge, about AT. The process entails soliciting feedback from a panel of experts across three stages or "rounds" of questionnaires.

Participants

Panelists were recruited based on a national reputation in this field and/or demonstrated expertise in assessing quality in AT services and supports for people with disabilities. We used a snowball sampling

technique to identify various experts who played a key role in the theory and practical development of the QIAT-PS collaborative (Waltz et al., 2015). A total of 12 participants were purposively recruited to participate on the panel. All of the participants are working professionals in the field of postsecondary education and AT with at least 10 years of experience. The panelists were specifically recruited because of their past experience using AT in postsecondary education or their close involvement with the delivery of services. The panel includes academic experts, educational administrators involved in the delivery of AT (i.e., representatives of disability resource centers), and people with disabilities who have specific insight about AT use and the delivery process in postsecondary settings.

Data Collection

An initial list of indicators was created via a review of the literature conducted in 2017, and the three panels of surveys were collected between February 2018 and April 2019. The research team received approval to conduct the research by the University's institutional review board, as exempt (non-human subject research) in July of 2017. Data were collected through a series of online surveys that contained open-ended questions and by panelists commenting directly on the items and returning the list to the principal investigator. Each of the panelist's input was collated by the research team, and then written feedback was returned to the individual members of the group to inform each round of analysis. This approach allowed the panelists to engage in a collaborative process while independently and anonymously reaching their own conclusions. There is no standard to ensure the reliability of the Delphi method as separate panels would likely yield differing results. Instead, qualitative criteria such as credibility and confirmability guide the removal or addition of items based on panel members' specific knowledge and expertise (Lincoln & Guba, 1985).

The process first involved generating a preliminary list of items that are hypothesized to impact students' performance based on a systematic review of existing literature. The items located through the literature were primarily related to knowledge about rights and campus resources, individual skills using technology, and behavioral aspects related to one's ability to self-advocate and locate appropriate resources or assistance. The research team collectively coded each of the individual items and grouped them into one of the domains based on Abery and Stancliffe's (2003) description of the different components of self-determination. Indicators included in the

list were only included if they were previously identified in literature. In the first round, the panel was asked to add in any items that they thought might be missing from the list based on their individual knowledge and expertise. They also began the process of grouping and regrouping related items. The research team created an updated list with additional items based on the panel feedback. In the second round, the panelists were asked to identify redundancies among the indicators, suggest how items may be interrelated, and to eliminate any non-relevant items. In the third and final round, panelists were provided an updated list, and were asked to assess how likely each item was to impact students' academic performance in relation to thinking and acting in self-determined ways (using a five-point Likert Scale). The purpose of the final round is to reach consensus about the items most likely to impact students' performance. Items were deleted from the final list if there were less than 80% agreement from the panel that the item was unlikely, or neither likely/unlikely to impact students' performance. The outcomes of each stage of the Delphi Processes are further described in Figure 1 with additional details regarding the process, response rate, and number of items identified through each round of the study.

Results

The initial literature review yielded 75 indicators across three strands of research salient to identifying potential indicators related to self-determination and AT use in postsecondary settings: (1) skills in using technology and navigating certain aspects of disability service delivery (2) knowledge, such as familiarity with key facets of disability rights laws, and (3) behaviors, including those related to self-efficacy and responding to others' attitudes. Across these strands, a list of individual indicators was created to reflect the multitude of practices and factors hypothesized to shape individuals' sense of self-determination.

Round 1

Panelists received the list of 75 indicators developed in the literature review phase. They were asked to add any items that were missing from the list and sort the items into three strands (knowledge, behavior, and skills). Researchers asked the panelists open-ended questions to generate additional items, categories, and subcategories, such as, "What additional knowledge, skills, or beliefs do students with disabilities require to use and obtain AT in postsecondary institutions?" Eight of the twelve (67%) expert panelists added additional items. The panel members added 30

indicators to the list, resulting in a combined total of 105 items from the literature review and first round.

Round 2

Panelists received an updated list of indicators that included the Round 1 additions.

They were asked to categorize items according to themes and identify items that were irrelevant or redundant. Items were removed from the list if at least two panelists agreed that they should be eliminated or combined. Panelists were asked to explain why they thought items should be eliminated or combined. Eleven of the twelve (92%) expert panelists responded to Round 2 and 61 items were deleted which condensed the list to 44 items.

Round 3

Nine out of the 12 (75%) completed the third panel questionnaire, ranking how likely each indicator is to impact students' academic performance. Results of the Round 3 questionnaire are summarized in Table 1. There was consensus among the panelists that the indicators represented factors that make an impact on student success, but not total consensus on the degree of likelihood. Of the 395 total responses from panelists, 320 were indications that they believe the item either likely (35%) or very likely (45%) to impact a student's self-determination. The only response with total consensus was question 12: "*student understands how their disability impacts their academic performance*," which all respondents agreed is "very likely." Several other indicators were frequently marked as "very likely;" some of the highest ranked indicators focused on knowledge of the basic practical features of their AT as applied to students' specific needs, such as question 14: "*student understands which AT devices, access features, or products work best for them*"; and question 15: "*student understands how AT enhances their performance on specific tasks*." Question 1, "*student understands how to access disability specific student services within their educational institution*," was also highly ranked by panelists, signaling the value of being able to navigate the service system.

Five items did not meet the inclusion threshold (at least 80% agreement among the panel). These items were ranked by at least two panelists as "unlikely" or "neither likely nor unlikely" to have an impact. The excluded indicators related to identity (item 13 in Table 1), understanding rights (items 7 and 8), and students' beliefs about responding to discrimination (items 36 and 39). Amongst the panelists, only five items were ranked as "unlikely" to impact a student's academic performance (less than 1% of the total re-

Figure 1

Visual Representation of the Delphi Process

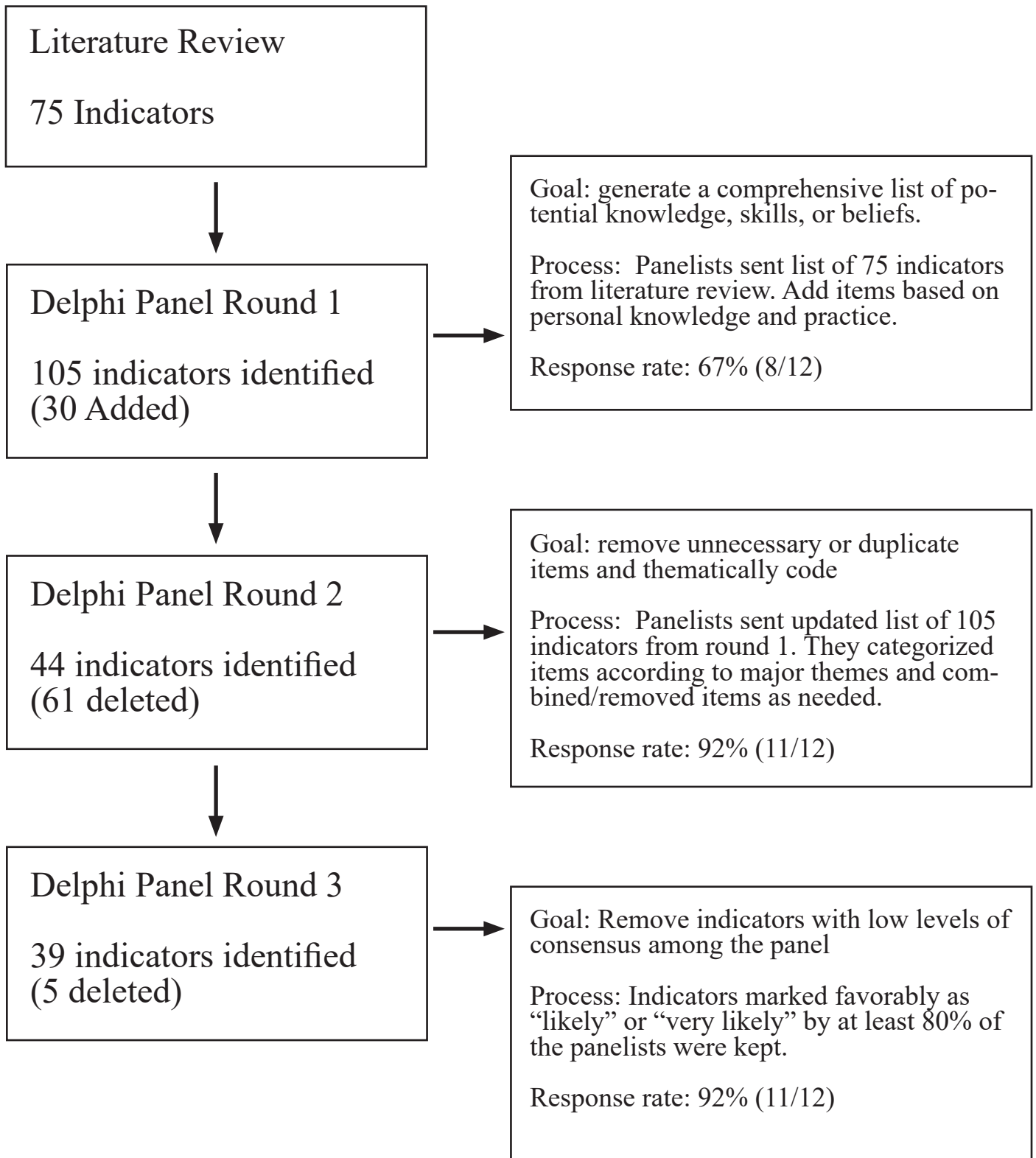


Table 1*QIATPS Delphi Generated Item List*

Question		Mean	Median	SD	Mode				
					1	2	3	4	5
Part One - Knowledge									
1.	Student understands how to access disability specific student services within their educational institution.	4.78	5	0.44	0	0	0	2	7
2.	Student understands how to use built-in accessibility features on different technology or devices that they routinely use.	4.22	4	0.83	0	0	2	3	4
3.	Student understands the process for requesting and acquiring assistive technology.	4.33	5	0.87	0	0	2	2	5
4.	Student understands where to find information or support about different types of AT devices or tools.	3.89	4	0.78	0	0	3	4	2
5.	Student understands documentation requirements for obtaining an accommodation, and/or using assistive technology in the classroom.	4.67	5	0.71	0	0	1	1	7
6.	Student understands where to find information or support about documentation requirements for obtaining a reasonable accommodation.	4.22	4	0.83	0	0	2	3	4
7.	Student understands how to exercise their legal rights to use or acquire AT.	4.22	4	0.83	0	0	2	3	4
8.	Student understands where to find information or support about their rights and responsibilities to use AT.	3.89	4	0.93	0	0	4	2	3
9.	Student understands where to go for help to obtain or use AT when access is denied.	4.56	5	0.73	0	0	1	2	6
10.	Student understands how their disability impacts their academic performance.	5.00	5	0.00	0	0	0	0	9
11.	Student understands which AT devices, access features, or products work best for them.	4.78	5	0.44	0	0	0	2	7
12.	Student understands how assistive technology enhances their performance on specific tasks.	4.78	5	0.44	0	0	0	2	7
13.	Student understands their strengths and weakness in regards to using assistive technology.	4.44	4	0.53	0	0	0	5	4
Part Two - Skills									
14.	Student is able to request additional assistance if AT devices are not meeting their individual needs.	3.89	5	0.53	0	0	0	4	5
15.	Student is able to provide feedback to service professionals about the effectiveness or usefulness of AT devices.	3.78	4	0.78	0	0	3	4	2
16.	Student is able to explain to peers, service providers, and instructors what AT helps the individual do.	4.22	4	0.67	0	0	3	5	1

17.	Student is able to articulate to classroom instructors how they can make instructional content more accessible to them.	4.33	4	0.83	0	0	2	3	4
18.	Student is able to identify different types of assistive technology that can be used to accommodate their disability.	4.56	4	0.71	0	0	1	4	4
19.	Student is able to identify how well their AT is working for them.	4.22	5	0.73	0	0	1	2	6
20.	Student is able to seek training for using assistive devices.	4.38	4	0.83	0	0	2	3	4
21.	Student is able to recognize when technology is not working properly.	4.67	5	0.92	0	0	2	1	5
22.	Student is able to problem solve solutions for when technology is not working properly.	4.33	5	0.50	0	0	0	3	6
23.	Student takes responsibility for interactions with the disability service office to acquire needed AT devices and services.	4.56	4	0.71	0	0	1	4	4
24.	Student takes responsibility to make sure that they have needed devices and services.	4.78	5	0.73	0	0	1	2	6
25.	Student uses assistive technology devices as independently as possible.	3.89	5	0.44	0	0	0	2	7
26.	Student is able to articulate a clear sense of goals and how they are affected by assistive technology usage	4.11	4	0.60	0	0	2	6	1
27.	Student is able to explain how assistive technology can be used to achieve their academic goals.	3.78	4	0.60	0	0	1	6	2
28.	Student is able to express their need for using or obtaining technology.	4.44	4	0.83	0	0	4	3	2
29.	Student is able to decide what technology to use.	4.00	5	0.73	0	0	1	3	5
30.	Student is able to assess the personal benefits of using or obtaining technology.	4.00	4	0.71	0	0	2	5	2
31.	Student is able to respond to discriminatory attitudes, such as questioning of their ability or need for devices.	4.33	4	0.71	0	0	2	5	2
32.	Student is able to respond to discriminatory practices, such as being denied the use of AT in the classroom.	4.11	4	0.71	0	0	1	4	4
Part Three - Beliefs									
33.	Student believes that if they are denied access to technology in a classroom setting, they can receive help from student services or other campus resources to remedy the situation.	3.89	4	0.67	0	0	1	5	3
34.	Student believes that if they encounter discriminatory attitudes about their AT use, they can effectively respond to them.	3.33	4	0.78	0	0	2	4	3
35.	Students believes that if they encounter discriminatory attitudes about their AT use, the attitudes can be changed.	3.78	3	1.00	0	2	3	3	1

36.	Student believes that that if technology is not working properly, they can identify steps to remedy the problem.	4.67	5	0.73	0	0	1	3	5
37.	Student believes that if they seek assistance in identifying appropriate technology, they will receive it.	4.44	4	0.83	0	0	4	3	2
38.	Student believes that the use of AT will help them to improve their school performance.	4.78	5	0.71	0	0	1	1	7
39.	Student believes that the use of AT will help them to achieve their educational goals.	4.22	5	0.88	0	0	2	1	6

Note. Items transposed to five-point scale. Five indicates strong agreement.

sponses). None of the items were ranked “very unlikely.” Only one item, which was related to responding to discriminatory attitudes (item 39), was rated as unlikely by multiple panelists. The other four excluded items were primarily thought to be “neither likely nor unlikely” to make an impact. Most of the panelists had a similar range of responses, with a majority of responses falling in the “likely” or “very likely” categories. One panelist was an outlier because they selected the neutral response (“neither likely nor unlikely”) for 65% of the indicators. Thirty-nine items are included in the final indicator list.

Discussion

Through the three-part Delphi process, the panel reached general consensus regarding the 39 AT indicators that may shape students’ sense of self-determination in postsecondary institutions. The items ranked most important by the panel represent essential aspects that may impact a student’s overall academic experience through their ability to effectively use and obtain AT. Each item on the list pertains to an aspect of student AT usage that is crucial to enable one’s sense of determination. These findings can inform educational training, supports, and interventions that target these specific skills, behaviors, and knowledge in order to fully enable a greater sense of self-determination in relation to AT. For example, each of these items will be used to develop a refined module for the QIAT-PS curriculum for individuals with disabilities transitioning to postsecondary institutions (QIAT-PS, 2021). Items relate to students knowing themselves, including how their disability impacts their academic performance, what features or devices work best, and how AT enhances performance of specific tasks. These foundational skills

are critical for students to achieve academic success, particularly in light of research showing that students cannot depend on professionals to take the time to get to know them and their needs without disregarding their experiences and input, and to know service and device options (Lenker et al., 2013). Thinking and acting in self-determined ways in relation to AT use requires a broad understanding and knowledge of how to navigate campus-wide services in addition to building specific skills related to using technologies.

Thinking and acting in a self-determined way in relation to navigating resources means that students have a working knowledge of where to go for help in addition to a strong belief that they will get the help they need when they seek it. Panelists indicated that it is equally important to understand how to access disability specific student services to obtain AT as it is to understand where to go for help AT if access is initially denied. McNicholl et al. (2019) find that students’ difficulty in communicating access needs to instructors, especially in relation to documentation requirements, is a key roadblock to an individual’s effective AT use. Campuses need to routinely clarify expectations with instructors and equip students with the skills they need to advocate for themselves. In campuses that situate disability services within compliance offices, the services and appeals process are interconnected and even handled by the same service professionals. At other campuses, accessing disability related student services that facilitate accommodations and AT use separately from compliance offices requires knowledge of multiple processes and services. Complicated processes for obtaining AT or exercising one’s right to use AT can create barriers to students’ self-determination when student’s lack information or agency in relation to the appeals process (Lindsay et al. 2018). Conversely, a bifurcated ap-

proach can alleviate concerns related to obtaining and appealing decisions related to AT use. Furthermore, creating an in-house grievance process with multiple levels of problem solving to facilitate student access may ultimately reduce risk of non-compliance with civil rights laws. Disability service professionals should consider the risks and benefits associated with different structures for delivering AT and ensuring institutional compliance.

Skill building in relation to self-determination means that students acquire knowledge about the range of technologies available and their utility for specific academic endeavors. One key indicator relates to students' need to understand the direct benefit of technology usage where "students understand how assistive technology enhances their performance on specific tasks." Other related indicators pertain to understanding how well AT is working, willingness to seek additional training related to devices or accessibility features, and recognizing when AT is not working properly. These skills take time to develop, and AT services may be abandoned if students cannot recognize an immediate benefit to their use (Malcolm & Roll, 2017). Service professionals need to allocate resources specifically to training and supporting student learning about their AT for different courses.

The need for intensive training in addition to the challenges of navigating various institutional barriers puts an additional burden on students with disabilities. Given the additional cost barriers to acquiring AT, a countermeasure may be that disability service professionals need to inform faculty and students about UDL and mainstreamed technology with embedded accessibility features. Given the surprisingly limited knowledge about choices for AT devices expressed by many students with disabilities (i.e., Stumbo et al., 2009), campus-wide education is a priority to empower individuals and inform instructors about the benefits of mainstreamed technology use. Mainstreamed accessibility features such as automatic captioning benefit students with and without disabilities. Given the recent dramatic shift to online learning in the context of the pandemic, captioning is now an integral and requisite part of effective instructional delivery and ensuring equal access to course materials. UDL principles are key to fostering the self-determination of students with disabilities and can improve general accessibility for many different learners.

Self-determination in relation to AT use also requires identifying specific devices—especially low cost options—that are appropriate for one's academic goals. Built-in accessibility features can significantly minimize the need for specialized or separate AT devices. Voice recognition, screen reading, and speech

synthesis software enhance the usability of existing technology and tend to be much less expensive than separate devices (Boot et al., 2018). Accessibility features such as voice recognition and screen readers are increasingly embedded within mainstreamed software. Mainstreamed accessibility features are improving but imperfect and do not meet the technology needs of all students. Some students with disabilities prefer or require separate AT rather mainstreamed technology. The heterogeneity of the study population with disabilities, instructors and students services professionals should be discouraged from a "blanket approach" to technology that uniformly favors UDL (Seale et al., 2020).

Better informing faculty and staff about UDL approaches can address some barriers to self-determination that individuals cannot address on their own. Campuses and disability service professionals in general can take a leadership role in informing individuals and instructors about mainstreamed technology options. Disability services professionals may consider advocating for the integration of training related to emergent accessible features into campus wide welcome events, orientation, and student services' trainings and resources outside of the disability service office. Some students who use or benefit from AT do not have a strong sense of their disability identity or how technology use relates to their specific impairment (Ripat et al., 2020). While the panelists uniformly agreed that understanding how one's disability impacts their self-determination in relation to AT use, there is also evidence that students struggle in developing this internal realization (Forber-Pratt et al., 2017). Recognizing one's individual needs and preferences for technology is a challenge for all students, and is unique for students with disabilities who shift from settings where parents and school services play a larger role in the process of advocating for, acquiring, and using AT.

Round 3 revealed a contrast between the conclusions drawn from the literature review and the expert panel indicator rankings in relation to the role of advocacy and legal rights. Studies included in the literature review strongly supported the importance of staff and students having knowledge of disability rights information (e.g., Lang et al., 2014; NCD, 2016), but the corresponding indicators were ranked lower on average, compared to other indicators by the expert panel in Round 3. In particular, the panel did not agree that having an understanding of how one's rights change as they transition from high school to postsecondary settings would impact academic performance. This disagreement could partially be explained by variation in postsecondary settings, ac-

ademic programs, and recent changes in suggested best practice for student accommodation and documentation requirements that are intended to make it easier to receive services. While some postsecondary settings require particularly rigorous medical documentation, there is growing recognition to use documentation and broader evidence from high school settings to inform postsecondary supports. This shift is in accordance with the 2008 ADA Amendments that expanded the legal definition of disability (Keenan et al., 2019). Together, these results speak to the need for strong institutional and campus wide supports to encourage the development of the self-determination of postsecondary students with disabilities.

The expert panel also ranked several indicators related to students' beliefs about discriminatory attitudes and practices relatively less likely to impact students' academic success. For example, more than half of the panelists did not think that an item presented to them in the final round, *"If a student believes that if they encounter discriminatory attitudes about their AT use, they will receive support from others if solicited,"* would impact students' performance. This may speak to the stigmatizing and lasting impact of discrimination. Even if a student encounters and identifies support regarding how to respond to the situation, the lasting impact may still be detrimental to one's academic performance (NCD, 2016). While student beliefs such as efficacy and confidence are vital components of achieving self-determination at the individual level, environmental factors and external beliefs can have a great impact on an individual's self-determination (Wehmeyer, 2015).

Based on the panel input, it seems that addressing stigma attached to service delivery continues to be an impediment to obtaining and using AT. Four items related to combatting discriminatory practice made it to the final round but were ultimately excluded from the item bank when panelists did not reach consensus. The implications of this discordance is that there is still disagreement, even amongst specialists in the field, about the best ways to address discrimination in postsecondary settings. Stigma reduction is a key part of operationalizing self-determination in postsecondary institutions (Getzel, 2014). Although these items were removed, it does not mean that this is not a central concern of actualizing self-determination in relation to AT use; it does mean that they may be beyond an individual's immediate control. There is persistent evidence that stigma is a continuing barrier to effective AT use and the delivery of AT services (Howard et al., 2020).

There is a growing optimism amongst researchers that better adaptation of UDL principles by postsec-

ondary instructors can counter the stigma attached to AT use. In the UDL framework, technology use becomes normalized as part of the educational process. This may be especially advantageous for students with highly stigmatized impairments, such as students with psychiatric disabilities, who do not feel comfortable disclosing to their peers or faculty members (Kain et al., 2019). The UDL approach alone will not counteract stigma though, and there is still an ongoing need for training and educators and peers to counteract discriminatory beliefs. This may be addressed by technical assistance to instructors related to the spirit of laws such as the ADA (i.e., the goals of equal opportunity and full participation) rather than the letter of the law (i.e., regulatory compliance). Recent research on technical assistance related to disability rights laws indicates that evidence on the law itself does not necessarily counter stigmatic beliefs about accommodations and specialized equipment as "special" treatment (Gould et al., 2015).

The 39 indicators represent a range of AT knowledge, skills, and behaviors that can help students with disabilities achieve their academic goals in postsecondary settings. The list is also a practical tool that can guide inquiry into student success and individual outcomes associated with AT use in academic settings. While the primary purpose of this research was to identify individual-level factors impacting student AT use, systematic and institutional barriers play a determining factor in the efficacy of individual level indicators of self-determination. For example, a number of items were eliminated from the preliminary review that related to obstacles students would not be able to mitigate with improved knowledge of disability rights information and enhanced self-advocacy skills, such as those that relate to economic resources and poverty. Such individual level factors are attributed to be beyond the immediate impact of self-determination and AT use, and require additional systematic transformational change (Goegan et al., 2019).

Limitations

As a preliminary assessment, findings from this study are indicative of items that are believed to impact postsecondary student performance and should not be interpreted as correlated or causal. The small sample, although typical of exploratory Delphi studies, limits generalizability. The purposive sample instead prioritizes deeper analysis of individual input. The items on the list of indicators should be read as an initial exploration of the range of knowledge, skills, and behaviors related to AT use that can enable one's sense of self-determination. Consensus was not reached amongst the panel regarding the degree of

likelihood amongst the indicators, and there was not full participation in every round of the process. Additional research is needed to more systematically and empirically analyze the potential impact of the documented items through a prospective study. It is pertinent, for example, to assess the relationship between the items in this list and student academic outcomes to further validate the item bank. Reflecting the principles of self-determination, outcome measures should reflect student interests and goals. Further rounds of Delphi studies may seek panelist responses to the ability of AT to help students meet the goals students themselves set in order to be more self-determined in postsecondary settings. Adhering to the key principles of self-determination means recognizing that students themselves are the best experts in identifying desirable AT outcomes and resources.

Conclusion

The 39 items identified through the Delphi process represent different areas of self-determination related to AT use. The items may in turn be a focus for individual learning, training, and/or educational support to enhance individuals' sense of self-determination in relation to AT use. Future research and practices may track the relationships between these indicators and academic outcomes related to an individual's personal goals. Furthermore, the development of this item bank adds a degree of rigor to the QIAT-PS program, as evidence-based findings will be incorporated into future training, TA efforts, and dissemination materials. This item bank may be useful to help track and understand student experiences and outcomes. Practitioners can utilize this item bank to develop training or research inquiries to better understand the relationship between AT use, self-determination, and academic outcomes.

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Academic Performance and Mobile Technology Use During the COVID-19 Pandemic: A Comparative Study

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Abstract

Most North American colleges and universities switched to online courses during the COVID-19 pandemic. Therefore, it is important to explore the impact of the newly remote courses on the academic lives of postsecondary students with and without disabilities and on technology use by students. It is also important to ascertain which newly used technologies are likely to be useful in the future. To do this, we surveyed 121 students with disabilities and 51 without disabilities and asked them about their academic performance and about the smartphone and tablet technologies they used to do schoolwork during the pandemic. Results indicate that most students were having a difficult time with learning and studying and that students with disabilities were experiencing more challenges, including the need to drop courses. The most common problems dealt with concentration, motivation, and discipline. The only positive impact reported relates to flexibility and time management. Approximately 70% of students used some form of mobile technology to do schoolwork, primarily Apple devices. The most common technologies reported by students were: Zoom, Google Docs, and Microsoft Word. Overall, most of these worked well, although over one third of both groups indicated that Zoom worked poorly. Where there were differences between the two groups, results show that the technologies were more problematic for students with disabilities. The variety of smartphone and tablet apps used by postsecondary students during the pandemic suggests that now that they have learned to use these, students will continue to use many of these once the pandemic is over.

Keywords: academic performance, smartphone, COVID-19 pandemic, mobile technologies, postsecondary students

Most North American colleges and universities cancelled in-person classes to prevent the propagation of the COVID-19 virus and switched to online courses. It is, therefore, important to explore the impact of such remote online courses on the academic lives of postsecondary students with and without disabilities, to explore their technology use and to ascertain which newly used technologies and practices are likely to be useful in the future. First, technologies that are seen by students as working well could be substituted for those that work poorly. Second, lessons learned during the COVID-19 period could be useful once the pandemic is over. In other words, it is crucial to understand student outcomes and technology use during

the pandemic because this can provide the foundation for sustainable practices in the future.

Remote online courses present the following challenges: Many faculty members are just learning to teach online, videoconferencing platforms and course management systems are frequently ill-suited to host such courses, and many students did not voluntarily register for online learning. Although all students are affected by the pandemic, students with disabilities, who may need technical as well as other types of accommodations, are likely to be even more adversely affected. Furthermore, it is important to find out how the pandemic affects the ways in which students use their technologies and how they feel the pandemic

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impacted their academic performance.

How remote learning affects students with disabilities is important because it is estimated that between 10% and 25% of North American postsecondary students have a disability. For example, studies by Fichten et al. (2018) and Snyder et al. (2019) showed that 17% to 19% of the American and Canadian undergraduate population have a disability. According to an extensive American study of freshmen enrolled in 184 different universities, 21.9% of students self-reported a disability (Eagan et al., 2017). Also, students with disabilities are more likely to attend two-year colleges rather than universities (McCloy & DeClou, 2013). Indeed, a recent study of two-year Canadian college social science students found that 26% self-reported a disability (Fichten et al., 2019).

There is extensive literature on the use of technology in online learning, as well as on the accessibility of online learning and distance education for students with disabilities (e.g., Almeida, 2020; Chmiliar & Anton, 2017, 2018; Thomson et al., 2015). We also know a great deal about access software that works on Windows and Mac computers (e.g., Fichten et al., 2020). However, these studies do not explore how various mobile technologies are used by students with and without disabilities to complete academic work and to access online platforms in the online remote teaching environment.

We found guidance for K-12 schools (e.g., Reich et al., 2020), conceptual papers (e.g., Williamson et al., 2020), pleas to meet ethical responsibilities to mitigate COVID-19 related risks for individuals with disabilities (Berger et al., 2020), practical tips on how to convert face-to-face classes to remote online learning (e.g., Taylor et al., 2020) and on technical challenges such as connectivity, power outages, assistive devices, technical support and technical training (Dianito et al., 2021; Khumalo et al., 2020; Ro'fah et al., 2020). However, we were able to find only two empirical studies that compared the experiences of postsecondary students with and without disabilities during the COVID-19 pandemic. A study by Zhang and colleagues (2020) showed that students with disabilities were more concerned than their peers without disabilities about classes going online and a large study by Soria et al. (2020) showed more negative outcomes for students with disabilities such as financial hardships during the pandemic due, in part, to increases in spending for technology. They also reported that students with disabilities were less likely to feel like they belonged on campus and that they felt less supported by their school.

All Students Struggle

The government-mandated quarantine and physical distancing measures (Government of Canada, 2020) during the pandemic are associated with mental health and anxiety-related issues (American Psychological Association, 2021; Best, 2020; Statistics Canada, 2021), which were already becoming more prevalent in postsecondary education before the pandemic. For example, a recent study involving 195 students at a large public university in the United States focused on identifying the long-term effects of the pandemic (Son et al., 2020). Results indicate that 71% of the participants reported increased stress and anxiety directly associated with the pandemic, and 82% of students expressed greater concerns about their academic performance. Eighty-six percent of the participants reported a decrease in social interaction due to physical distancing as a stressor. This is in line with findings of Statistics Canada (2020), which noted that participants from a crowdsourcing survey reported that their current health, both mental and overall, was substantially worse than before the pandemic and with a study comparing before and after COVID-19 student redactions to newly online learning (Besser et al., 2020). Numerous studies have documented the negative psychological outcomes of postsecondary students (e.g., Browning et al., 2021; Copeland et al., 2021).

During the beginning of the COVID-19 pandemic, family computers and laptops were less likely to be available to postsecondary students due to stay-at-home orders, which resulted in adults working from home and other children in the family also attending school online (Gillis & Krull, 2020). Issues in the home related to noise and distraction can present additional challenges (Top Hat, 2020). There can also be difficulties with Wi-Fi connectivity (Mupenzi et al., 2020). Given such concerns and possible difficulties with the availability of a computer during the COVID-19 pandemic, it is likely that students have turned to their mobile devices, such as tablets and smartphones. If so, it is important to know what apps and technologies they are using to do academic work during the pandemic.

Uses of Mobile Technologies to do Schoolwork

As early as 2016, Seilhamer et al. (2018) reported that 99% of university students owned a smartphone and 63% a tablet and that they were increasingly using these to do schoolwork. In a recent pilot study, Fichten et al. (2019) investigated the integration of smartphones and tablets into the learning process. The findings show that students with disabilities use their mobile devices for all the same reasons as stu-

dents without disabilities. In addition, students with disabilities use general purpose mobile device built-in features (e.g., font size, speech-to-text, word prediction) and apps as assistive aids. The growth and subsequent reliance on technology brought on by COVID-19 provides a unique opportunity to explore the dual role—general use and assistive technology—that mobile technologies such as smartphones and tablets can play in the learning environment.

Fichten et al.'s (2019) findings show that students, both those with and without disabilities, already use their mobile devices for doing schoolwork outside the classroom. For example, students can access the professor's teaching materials on their devices (e.g., review PowerPoint or Google Slides), listen to audio and video recordings of lectures, access online library services, check the course management system, read e-books, share course notes using WhatsApp, email and Facebook messenger, create digital notebooks/e-portfolios, provide visual proof that they had completed an assignment by taking a selfie or making a short video at a designated location, collaborate online to complete assignments, use their device while commuting to start written assignments, participate in course blogs, do online exams, and submit assignments online after these are run through Turnitin plagiarism software.

Uses of Mobile Technologies by Students with Disabilities

Most students experience barriers to their learning due to the pandemic, such as distractions, increased anxiety, and lack of motivation (Gillis & Krull, 2020; Schaffhauser 2020; Tasso et al., 2021). However, the pandemic may especially impede the academic success of students with disabilities, many of whom need accommodations, technical and otherwise, to a greater degree (Romero-Ivanova et al., 2020).

The goal of our study was to ask the students themselves which technologies they used, which of these worked well and poorly for them, how the pandemic affected the ways that students used their technologies and how they felt the pandemic affected their academic performance.

Method

Participants

Participants consisted of 172 college and university students: 121 with disabilities (75 females, 39 males and 7 who indicated a non-binary gender) and 51 without disabilities (32 females, 18 males, 1 who did not indicate). Participants attended 34 different colleges and universities, with 55 students attending

a university and 112 attending a junior/community college. As noted in the Procedure section, college students with disabilities are overrepresented in the sample because of the recruitment strategies used.

Among students with disabilities, 88 attended a college and 24 a university; among nondisabled students, 24 attended a college and 23 a university. This difference was significant, as a larger proportion of students with disabilities than without disabilities attended a college rather than a university, $\chi^2(1, 167) = 7.58, p = .01$. College students with disabilities were somewhat older ($M = 22.35$) than college students without disabilities, although this difference was not significant. ($M = 19.96$), $t(109) = 1.80, p = .074$. University students with disabilities ($M = 25.03$) were significantly older than students without disabilities ($M = 22.35$), $t(53) = 2.30, p = .025$. This is a typical finding (Fleming et al., 2017). The majority of university students were pursuing a Bachelor's degree. Participants were provided with a list of 14 disabilities/impairments and asked to indicate as many as applied to them (see Table 1). It should be noted that 50% of students had multiple disabilities.

Procedure

During August and September of 2020, we administered an accessible online survey (LimeSurvey, version 2) that had been approved by Dawson College's Research Ethics Board. Participant recruitment proceeded in a variety of ways. Email invitations were sent to Canadian postsecondary students with and without disabilities who had participated in our previous research and who had indicated that we may contact them for future studies. Announcements were emailed to discussion lists focusing on Canadian postsecondary education and to project partners (mainly student and campus disability service provider groups). In addition, there were notices put on the websites of groups of students with disabilities. We indicated that we were interested in participants who were currently enrolled in a college or a university. In addition, we also advertised for students at the Canadian college where the ethics certificate was issued. All students were participating in a larger investigation and all received a \$25 Amazon gift card. For the present study, students were asked a series of open-ended questions about mobile technologies and apps they used during the spring 2020 academic term when courses were taught remotely.

To ensure accessibility of the LimeSurvey (Version 2), we examined internet-based information on accessibility "fixes," and made sure that we asked questions where respondents had to use only checkboxes, radio buttons, clearly labeled pull-downs, and

Table 1*Disabilities/Impairments of Students*

Students' Disability/Impairment	Number of Students
Mental health difficulties / psychological disorder	79
Attention deficit hyperactivity disorder (ADHD)	39
Learning disability (LD)	32
Chronic medical / health problem	22
Neurological disorder	11
Visual impairment (NOT adequately corrected by wearing glasses or contact lenses)	7
Hard of hearing / hearing impairment	7
Speech / communication impairment	6
Limited mobility: use of a cane / crutch / walker	5
Limited use of hands / arms	4
Limited mobility: wheelchair / scooter user	3
Autism spectrum disorder	2
Totally blind	1
Deaf	0

Note. The 121 students indicated 218 different disabilities/impairments. 50% of students have 1 disability; the rest between 2 and 6.

text boxes. We pre-tested the survey with pilot participants who were blind (used Jaws), had low vision (used magnification), learning disabilities (used Kurzweil 3000), attention deficit hyperactivity disorder, and autism spectrum disorder.

Open-ended Survey Questions

The following questions were asked, and large text boxes were provided for students to provide their responses.

1. What smartphone/tablet technologies or apps did you use during the recent academic term (COVID-19 pandemic) to do schoolwork? (a) Which technologies or apps worked well? (b) Which technologies or apps did not work well?
2. How has the current COVID-19 pandemic changed the way you use your smartphone or tablet to do schoolwork?
3. What was the impact of the COVID-19 pandemic on how well you did in your courses?

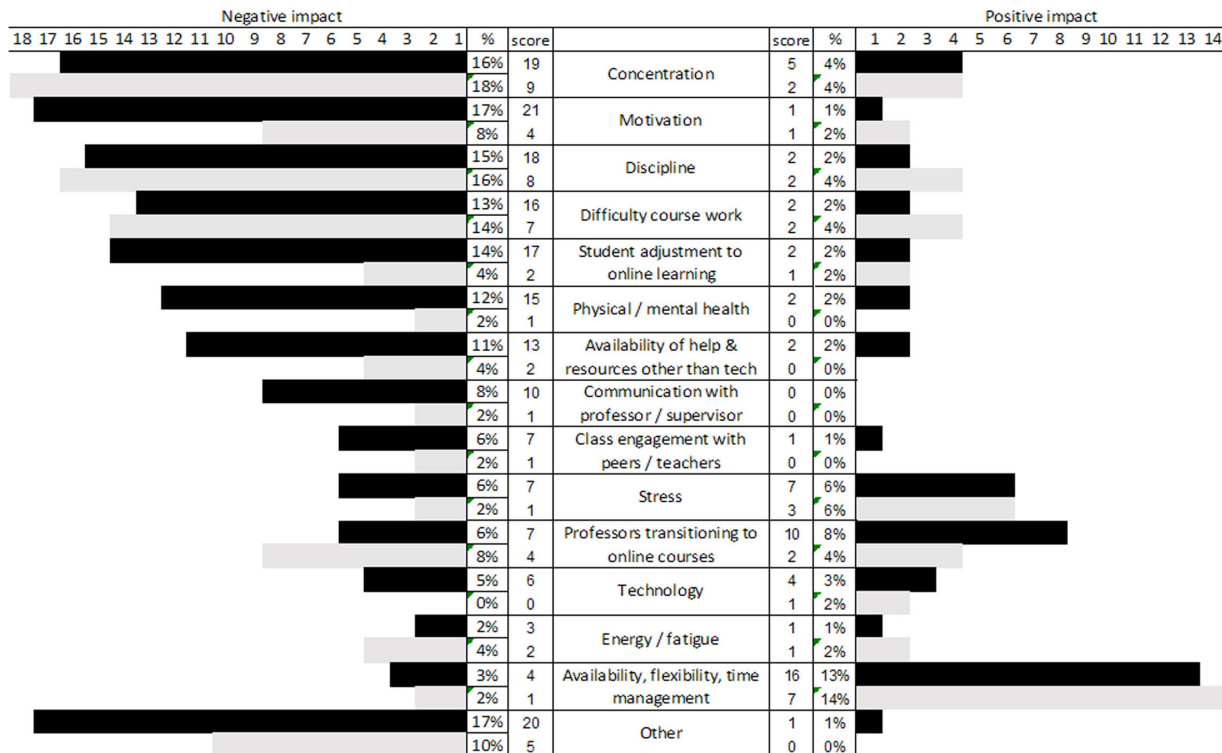
Categorization of Responses

Technologies mentioned by participants in response to Question 1 were grouped into 27 categories

by two coders: collaboration, discipline specific, e-books, e-mail, focus, hardware (e.g., smartphone, tablet, convertible 2-in-1 tablet/laptop), internet, messaging and video calls, music and video services, notes, online dictionaries/thesaurus, online storage, organization, other, PDFs, presentation, reading/writing toolkit, reference manager, scanning, speech-to-text, spreadsheet, office suites, time management, translation, university/college portal, videoconferencing, word processing. As seen in Table 4, these were subsequently divided into those that participants indicated worked well for them and those that worked poorly.

Question 2 responses were collapsed into three categories: relied more on mobile technologies, no impact on use of mobile technologies, relied less on mobile technologies. Coding reliability was 97%.

Question 3 responses were examined for impact of the Covid-19 pandemic on grades (improved, no change, deteriorated, and as a separate category: dropped courses). In addition, because students spontaneously wrote about the specifics of the impact of the pandemic we prepared a coding manual (Jorgensen et al., 2020) consisting of 15 categories (see Figure 1). Three coders were trained to a minimum

Figure 1*Impact of COVID-19 on Academic Work*

Note. Black bars refer to students with disabilities. The lighter bars refer to students without disabilities. Percentage calculated using 121 for students with disabilities and by 51 for students without disabilities.

70% percentage agreement criterion. Spot checks of 301 codes resulted in an average of 89% reliability.

Results

Question 1

To explore what mobile technologies students with and without disabilities used to do schoolwork during the pandemic, and which of these worked well and worked poorly, we carried out several descriptive frequency analyses. Because there were few participants with several disabilities, it is not possible to provide a breakdown of how well the technologies worked for students with different disabilities.

First, we evaluated what technologies students used. Table 2 shows that between 69% and 74% used some form of mobile technology to do schoolwork. Both groups were considerably more likely to use a smartphone (68% students with disabilities, 61% no disability) than a tablet (27%). Apple phones and tablets were more popular than Android devices for both groups. A few students used Windows tablets, mainly the 2-in-1 convertible hybrids that transform into ei-

ther a laptop or tablet. Between 20% of students with disabilities and 16% of students without disabilities used both devices.

We explored the frequency of specific, uncategorized technologies mentioned by the students. Those noted by at least five participants are presented in Table 3. The results show that, overall, most of these worked well for both groups of students. However, Zoom worked poorly for over 1/3 of both groups of students. In addition, half of the students with disabilities reported that Microsoft Teams did not work well for them; none of the students without disabilities reported this. As Table 3 shows, common specific technologies were less likely to work well for students with disabilities than for students without disabilities.

As Table 4 shows, the results indicate that most of the 27 technology categories (e.g., collaboration, e-books) worked well for students both with and without disabilities. However, videoconferencing, university/college portals, discipline specific apps, as well as messaging and video call apps posed problems for both groups. Overall, some categories of technologies such as videoconferencing, focus, notes,

Table 2*Mobile Technology Use for Schoolwork*

Group	Smartphone			Tablet				Any Mobile Technology
	Use	iPhone	Android	Use	iPad	Android	Other	
Students with a disability								
<i>n</i>	111	65	46	44	31	10	3	121
%	68	40	28	27	19	6	2	74
Students with no disability								
<i>n</i>	45	34	11	20	18	1	1	51
%	61	46	15	27	24	1	1	69

Table 3*Specific Technologies that Worked Well and Poorly During the COVID-19 Pandemic*

Technology	Group					
	No Disability			Disability		
	<i>N</i>	Worked Well (%)	Worked Poorly (%)	<i>N</i>	Worked Well (%)	Worked Poorly (%)
Zoom	14	64	36	53	66	34
Google Docs	10	100	0	24	96	4
Microsoft Word	3	100	0	29	79	21
Omnivox (Quebec university/college portal)	4	100	0	22	82	18
Calendar (excluding Google Calendar)	4	100	0	15	93	7
Microsoft Teams	6	100	0	8	50	50
Google Drive	5	100	0	7	100	0
Google Calendar	1	100	0	8	100	0
Quizlet	2	50	50	5	80	20
OneNote	0			5	80	20

Note. Worked well and worked poorly reflect the percentage of participants who mentioned the technology.

Table 4*Technology Categories*

Category	Technologies	Group					
		No Disability (<i>n</i> =51)			Disability (<i>n</i> =121)		
		Number	Worked Well (%)	Worked Poorly (%)	Number	Worked Well (%)	Worked Poorly (%)
Videoconferencing	Zoom, Microsoft Teams, Facetime, WebEx, BigBlueButton, Adobe Connect	19	79	26	59	63	39
Word Processing	Microsoft Word, Pages, google docs	15	73	0	51	86	10
Collaboration	Trello, Google Docs, Slack	12	83	0	32	81	3
Hardware	Samsung smartphone, tablet that converts into a laptop, iPhone, iPad, iPad air, iPad pro, Android smartphone, Samsung S9, Samsung a5, Android tablet	8	38	0	35	29	9
University/college portal	studUIM (University of Montreal), portal Ulaval, Omnivox, MyCourses, Moodle, cuLearn (Carleton's Learning Management Software powered by Moodle)	6	83	33	32	72	19
Organization	To Do list, built-in calendar app, Google Calendar, Calendar, Reminders, Apple Calendar, Todoist, Wunderlist, Google task list, myHomework, Reminders on iPhone, Calendrier, Google Agenda, Samsung Calendar, Clock, Tasks, My Exams	8	75	0	25	72	4
Notes	Evernote, Notability, Microsoft OneNote, Good notes, ColorNote, Samsung Notes, Notes	3	100	0	17	88	24
Online dictionaries / thesaurus	Oxford Dictionary, Merriam Webster, Online Dictionary, Online Thesaurus, Linguee	5	100	0	15	80	13
Other	Turnitin, Google Maps, Linguee, Quizlet, WebAssign, MindShift, "swipe" typing, Tide, Bixby, Google Assistant, Perusal, Duolingo, text-to-speech, Dictaphone for iPhone, Voice Dictation, Facebook to communicate with other students, calculator	5	40	40	15	87	0
Internet	Google, Google scholar, Safari, Google Chrome	6	67	0	8	75	0
Reading / writing toolkit	Grammarly, Antidote, Read and Write, Word Q, Spell Check, Kurzweil, Elevate English: Vocabulary, Grammar, and word search, keyboard word prediction	0	n/a	n/a	12	83	25
Presentation	Keynote (Apple), PowerPoint, Google Slides	3	67	33	9	56	11

(Table 4 Continues)

Discipline Specific	Photomath, Desmos, Wolfram/Alpha, Slader, AutoCAD, SketchUp, Stack Exchange, Webwork, Chegg Study, Solid Edge, Fusion 360, Calculator, MyStudies, Pulse, Eclipse	4	50	257	7	71	43
Messaging and video calls	Messenger, Skype, Hangout, WhatsApp, Discord, Facebook messenger, Facebook to connect	2	50	50	8	88	25
Focus	Stay on Task, Forest, Block Site, Engross, Brain Focus, Focus Keeper, Pomodoro, Pomodoro Timer, Be Focused	1	100	0	8	50	50
Suites	Wps, Office 365, Adobe creative cloud, Microsoft Office Suite	2	100	0	6	67	0
PDF	Xodo, Adobe PDF, Adobe PDF Reader, Adobe software, Microsoft PDF Viewer, PDF Reader	1	100	0	6	67	50
Email	Gmail, courriel, Mail, Microsoft Outlook, Gmail apps	1	100	0	5	100	0
Spreadsheet	Microsoft Excel, Google Spreadsheets, Numbers	2	100	0	4	50	25
Translation	Google translate, Deeply translate	2	100	0	4	75	0
Scanning	CamScanner, Tiny Scanner for mobile scanning of documents, PDF Scanner, Scan It, Microsoft Office Lens	1	100	0	4	50	0
E-books	Kindle app, iBook, Adobe digital editions (to read ebooks I couldn't take out of the library), Pearson e-text	1	100	0	4	100	0
Online storage	Google Drive, WeTransfer, One Drive, Dropbox, MEGA, Files	0	n/a	n/a	4	50	0
Time management	Interval Timer, Timer, Timer app on my Samsung device	0	n/a	n/a	2	50	0
Speech-to-text	Voice-to-text, dictation feature in Word, Dragon Naturally Speaking	1	100	0	1	100	0
Music and video services	Spotify, YouTube, Microsoft Stream	1	100	0	1	100	0
Reference manager	Spotify, YouTube, Microsoft Stream	0	n/a	n/a	2	100	0

Note. "Worked well" + "worked poorly" do not equal 100% because some students who indicated using a technology did not indicate how well it worked and because some indicated that it worked both well and poorly.

and discipline specific technologies worked poorly for a higher percentage of students with disabilities than those without disabilities. In addition, some categories (e.g., reading/writing toolkit, notes) were more likely to be used by students with disabilities than those without disabilities.

Question 2

To evaluate how the pandemic affected the ways students used their technologies we grouped responses into three categories: relied more on mobile technologies, no impact on use of mobile technologies, relied less on mobile technologies. Slightly over 50% of students, both those with and those without disabilities, relied more on mobile technologies and under 10% relied less on these. The rest indicated no change.

Question 3

To evaluate the impact of the pandemic on students' academic performance we conducted two analyses. First, we examined the impact on grades. Results show that approximately 20% of students in both groups felt that their grades improved. Among students without disabilities, 63% indicated no change and 21% indicated that their grades deteriorated. Among students with disabilities the picture was different. Only 34% of these students indicated no change, and 36% indicated that their grades got worse. Nine percent dropped courses.

When evaluating the specifics of the overall impact of the pandemic on their academic lives, students reported primarily negative outcomes. Figure 1 shows specifics about what impacts the pandemic had for both groups of students. The only category where students in both groups indicated a substantial number of positive comments involves the availability and flexibility of time management.

Discussion

Impact of the COVID-19 Pandemic on Students' Academic Performance

Our findings indicate that, consistent with the views of others (e.g., Gillis & Krull, 2020; Schaffhauser 2020; Serhan, 2020; Son et al., 2020), most students have had a difficult time with learning and studying during the COVID-19 pandemic, and that students with disabilities are experiencing more challenges. For example, slightly over 20% of nondisabled students indicated that their grades got worse, but none indicated dropping any courses. As for students with disabilities, 45% reported problems with grades: 36% indicated worse grades and 9% stated that they dropped courses.

Although we did not ask students about the causes of their difficulties, many spontaneously wrote about these. Three quarters of the comments were negative and those of students with and without disabilities did not differ. It should be noted that the most common problems dealt with concentration, motivation, discipline, coursework difficulty, adjusting to remote learning, physical and mental health and obtaining help and resources other than those dealing with technologies. The following quotations are typical of the negative responses:

- "It was easier for me to procrastinate when watching or going to a virtual class than a class in-person."
- "I was very overwhelmed."
- "I found it harder to concentrate because I couldn't go elsewhere to study due to the restrictions."
- "So many deadlines and tests were all clumped together."
- "It was harder to get answers to questions from teachers."
- "It was very hard to transition from in class learning to online, especially with my physics labs. However, after the first month it became easier to adapt."

As noted by others (e.g., Serhan, 2020; Shim & Lee, 2020), the main positive impact reported related to flexibility and time management.

- "I had more time to focus on my studies and work because I had less commute time (saving 3 hours)."
- "I had more time to work on my own schedule."

Smartphone and Tablet Technologies and Apps Used to do Schoolwork During the COVID-19 Pandemic

Approximately 70% of students used some form of mobile technology to do schoolwork. Consistent with the findings of other researchers, both groups of students were more likely to own a smartphone than a tablet and Apple devices were more popular than Android (Seilhamer et al., 2018).

The most common specific technologies reported by students, in descending order of popularity, are: apps related to videoconferencing, word processing, collaboration, and the use of college/university portals. Since both groups accessed their postsecondary institution's portal it is important to ensure that these are not only accessible but that they are also accessible and usable on mobile devices.

Overall, most popular technologies worked well for both groups of students, although over 1/3 of both groups indicated that Zoom worked poorly for them. This is consistent with findings of others, who also found that Zoom had a negative effect on students' learning experience and motivation (Serhan, 2020). Problems with Zoom included dropped signals, frozen screens, audio cutting out, difficulty finding the correct URL, and poor handling of Zoom by faculty who were not well versed in its use.

Where there were differences between the two groups of students, results show that the technologies worked more poorly for students with disabilities. For example, half of the responses of students with disabilities indicated that Microsoft Teams worked poorly for them. This is not surprising given that the literature, both that related to accessibility (Office of Information Technology, 2021) as well as to the functionality of Teams in general (Anderson, 2019) have been heavily criticized. It should be noted, however, that Microsoft has been making improvements (Microsoft Teams Team, 2021).

Fichten et al. (2010) found that students were often expected to employ software for home assignments that their professors had not taught them to use. In the present study too, there appears to be a need for professors to teach students how to use the various technologies associated with their course. This may be especially important for students with disabilities who often need to use these in conjunction with assistive technologies. For example, Microsoft Teams has numerous features and windows, but some of these are not intuitive for students using certain access technologies. It may also be that there are students, including those with learning disabilities, who need to be taught certain skills explicitly rather than relying on them acquiring these through reading instructions or experimentation. As well, high anxiety can prevent students from exploring the use of technology or learning its functions.

The following quotations are typical of students' responses about how they used their smartphone and tablet technologies and apps:

- "I was kind of disorganized during the pandemic and didn't use technologies as I would have wanted to, but I used Microsoft Word, OneNote, and the Timer app on my Samsung device."
- "I used Zoom, but mostly Microsoft Teams to talk with teachers, other students and to hand in homework. I also used Facebook a lot to communicate with other students, and Studium (a university/college portal app)."
- "I used Google Calendar for events. I used Word to write assignments. I used Zoom for online classes. I used Omnivox (a university/college portal app) to submit papers."
- "I used the Google Drive app on my tablet. This allowed me to work on my documents and share my documents with my classmates for group projects or presentations, as we were unable to meet in person."

To evaluate how the pandemic affected the extent to which students relied on their mobile technologies we grouped responses into three categories. Slightly over half of the students, both those with and those without disabilities, indicated that they relied more on their mobile technologies during the pandemic than before.

We grouped the specific technologies mentioned by students into 27 categories (e.g., collaboration, e-books). Again, while apps and technologies in most categories worked well for both groups of students, videoconferencing, university/college portals, discipline specific technologies, as well as messaging and video calls posed problems for both groups of students. In general, the apps in some categories worked poorly for a higher percentage of students with disabilities than those without disabilities. Some apps and technologies (e.g., reading/writing toolkit, notes, focus, scanning, ebooks) were more likely to be used by students with disabilities than those without disabilities. This may be because these technologies can at times serve as assistive technologies.

Because there were few participants within certain disability groupings, it is not possible to provide a breakdown of how well each technology worked for students with a specific disability. Yet, the diversity of the disabilities of students who indicated that specific apps worked well or poorly for them support the social model of disability (Barnes, 2007) in that it is not the diagnosis/disability that dictates the suitability of an app; rather it is the interaction of the functional limitation of the student and the task to be performed. Therefore, the same app, for example a text-to-speech app, may be used by students with a wide variety of disabilities, not all of them related to a visual impairment.

Limitations

Our sample consisted of volunteers. Thus, it is neither a random sample nor fully representative of the population studied. Volunteer effects, self-selection biases, and the recruitment methods set limitations on the generalizability of the results. In addition, the number of students with certain dis-

abilities was low. As well, most questions were open-ended. This technique has advantages, such as the ability to collect more detail and to benefit from unexpected insights (Survey Anyplace, n.d.). However, it also has limitations, such as relatively low frequencies of responses and the need for descriptive rather than inferential statistics. While we excluded responses of students who did not indicate that they used either a smartphone or tablet to do schoolwork from most analyses, it is possible that some students' responses reflected using laptops rather than only smartphone or tablet technologies.

Sustainability

Postsecondary faculty are interested in retaining aspects of online teaching once they return to face-to-face instruction (Lombardi, 2021; Top Hat, 2020) and it is clear that online learning has been increasing during the past decade (Allen & Seaman, 2017). Students, too, are likely to continue using some technologies that are popular during the pandemic. Our study brought to light the sustainability potential of certain mobile technologies and apps. The variety of smartphone and tablet apps used by postsecondary students during the pandemic suggests that now that they have learned to use these, they will continue to do so once the pandemic is over. Zoom, the most popular videoconferencing tool of the pandemic (Aiken, 2020; Aratani, 2020) is available on all platforms and devices and free versions can be downloaded without a university license. Students have learned to use Zoom to network among their peers and with their families, so without a doubt, this technology is here to stay.

During the COVID-19 pandemic, certain office suites have become especially popular. Many colleges and universities have provided students free access to Office365 (now called Microsoft 365; Microsoft, n.d.a) and most postsecondary institutions have a license for members of their academic community, making it the de facto university office suite. Google apps are also very popular, largely because these are also free, easy to use, and support collaboration. Both Google and Office365 suites are readily available on mobile devices. Because collaboration features and speech-to-text (i.e., dictation) are available for both Microsoft Word and Google Docs, word processing has become relatively easy even on small smartphones. The same is true for Office365 and Google presentation apps (i.e., PowerPoint and Google Slides). Of course, the larger size of tablets also makes it easy to type. Now that students have learned to use the various features of these office suites, especially the collaboration aspects, we expect these to remain in the future.

Students have also become familiar with free online storage apps such as OneDrive (part of the Office365 suite) and Dropbox. Both are freely available on mobile devices and were frequently mentioned by students in our study. These will probably continue to be used in the future and will result in files no longer being left on a college computer or on a lost USB key when students return to campus.

Using university and college portals is also an important feature of mobile devices. These, of course, give students access to learning resources, including course materials and the library from a distance. They also permit downloading and uploading assignments and collaborating with classmates. Because of the portability of mobile devices, students can check on course related activities any place any time. For example, King et al. (2020) explored the potential of using smartphones by faculty in face-to-face teaching. This feature will likely be used long after the pandemic is over.

Calendars of all sorts were also reported as popular to help students monitor deadlines and to provide reminders. Of course, calendars are a common built-in feature of mobile devices. Because of their portability, smartphones and tablets are especially well suited for this use. Google Calendar, with its collaboration features, is likely to stay with us because of the ease with which groups of students can get together to work on joint projects.

Among the variety of study apps, Quizlet stood out as the most popular. It makes online flashcards and can be used collaboratively. Also, Quizlet has pre-prepared flash cards for popular courses. This makes it perfect for mobile devices and for studying while commuting to the school once in person classes resume.

General Use Technologies as Assistive Aids

Students often do not think of the formidable power of the internet on their mobile device. Yet, Googling provides access to dictionaries, thesauruses, and research and information about most academic subjects (Richards, 2021). The same is true of the ability to dictate (speech-to-text) in mobile email, Word, Google Slides, calendar, and virtually all other apps (Imran, 2021). For example, the latest iPhones and iPads (e.g., iPhone versions 11 and 12) feature a microphone at the bottom of the keyboard, in a large row all by itself.

There is no longer a need to discuss many accessibility features as we all take them for granted (e.g., Apple, n.d.; TELUS, n.d.). Also, mobile apps and built-in features will read information (text-to-speech: e.g., "Siri read my email") (Kargathara et al.,

2021). Similarly, we no longer think of word prediction in our texts or of spelling or grammar checkers in our word processor (Bueno, 2020). Yet these are powerful literacy features and are used as assistive aids by students with different disabilities. Because of these built-in features of mobile devices there is less need for specialized assistive technologies (Kuo et al., 2021). In addition, there are a host of built-in accessibility features in most Apple and Android devices that can be of use to all postsecondary students. These features are described in the Adaptech Research Network free and inexpensive database (<http://adaptech.org/downloads/>).

Nevertheless, some mobile apps and technologies were more likely to be used by students with disabilities than those without disabilities. This includes reading/writing toolkit apps such as Read&Write and Kurzweil 3000. These are most likely to be useful for students with learning disabilities and other literacy challenges. Organization apps, such as calendars and reminders, as well as those that help students focus (e.g., Forest, Block Site), note taking apps such as Evernote and Notability, scanning apps such as Office Lens and CamScanner, and digital text and ebooks were also more likely to be used by students with disabilities.

Implications of the Findings

While there are many negative outcomes related to the COVID-19 pandemic, some positives have crept in and there are numerous lessons to be learned. Since online learning is an ongoing trend (Allen & Seaman, 2017), the results of the ongoing massive naturalistic experiment that is the pivot to remote learning will inform and change higher education permanently (Gurung et al., 2020; Lombardi, 2021; Kim, 2020; Young & Bruce, 2020;). However, all results of this experiment are not yet in.

Students are often unaware of the potential of assistive technologies for schoolwork

What we can conclude is that students, both those with and without disabilities, can benefit from the powerful apps and features of mobile devices. We can no longer view technology and apps as falling into one of two categories, either mainstream technology or assistive technology. Yes, there are a variety of mobile device features and apps that are intended for individuals with disabilities. For example, there are apps that assist students with low vision, such as screen reading (text-to-speech), scanning and optical character recognition. But there are also what are usually considered general use apps and built-in features of mobile devices that are, in fact, used

as assistive aids by students with certain disabilities (e.g., Chmiliar & Anton, 2018; Fichten et al., 2013). One example is the ability to dictate using mobile devices (speech-to-text) that can be used by students with a variety of neuromuscular impairments and some types of learning disabilities. In many cases students who could benefit from the use of mobile technologies are simply not aware that such tools are available. It is likely to be the campus assistive technologist to inform students.

Assistive technologists may need to teach students with disabilities about general use apps

Teaching students about helpful mobile apps that exist and how to effectively use them should be an important aspect of postsecondary education. If faculty do not do this then it will fall upon the assistive technologists who work in access offices to teach students with disabilities how to use mainstream technologies as assistive aids. The literature on accommodations for students with disabilities suggests that currently it is mainly the high-end expensive, multipurpose adaptive technologies that are used when providing accommodations and training (e.g., Malcolm & Roll, 2017). As suggested by McNicholl et al., (2019), “Future AT (assistive technology) practices should focus on harnessing the potential of mainstream devices as AT for all students, thus facilitating inclusion and reducing stigma” (p. 130).

The other major implication of this study is that of sustainability. Much of what postsecondary students have recently learned and integrated about the use of smartphone and tablet features and apps to do schoolwork has been in response to the COVID-19 pandemic and online remote learning. While students with and without disabilities have been enthusiastic users of mobile devices (Fichten et al., 2019), it is mainly during the pandemic that students have been forced to make extensive use of these devices to do schoolwork. It is also during this time that major schoolwork productivity tools (e.g., Microsoft 365 (formerly Office365), Google Docs, Adobe Acrobat) have enhanced their accessibility for both desktop and mobile use (Microsoft, n.d.b; Google, n.d.; Adobe, n.d.). However, it appears that now that students have learned to use these tools, they appreciate their benefits and are likely to continue employing them in the future. Once the pandemic is over and students return to campus and in person instruction, we expect that there will be a “new normal” throughout society. We believe it will touch on all aspects of education, including the use of mobile technology to do schoolwork for all students in postsecondary education, including those with disabilities. What we are

all learning during the pandemic will certainly outlast COVID-19.

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Promoting Student-Generated Applications of Universal Design to Address Accommodations (Practice Brief)

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Abstract

As colleges and universities increasingly focus on diversity and inclusion, it is essential to identify specific institutional practices that can evolve in support of embracing disability as a form of diversity. This article describes how disability resources staff, students, and faculty at a university collaborated to promote course policies and practices aimed at reducing the need for classroom accommodations and the dependence on students disclosing a disability. Faculty and staff embedded an action-based project in a course taken by undergraduate and graduate pre-service teachers. Students learned about multiple Universal Design frameworks and applied these frameworks by developing recommendations for policies and practices that promote universal access, in place of retrofitting instruction through accommodations. Students presented their recommendations to the university community at a series of campus events. Students' recommendations were also embedded into a training module for faculty and staff. The outcomes of this project demonstrate how leveraging student-generated ideas through collaboration across an institution can support a shift towards more inclusive practices.

Keywords: universal design, accommodations, action-based project, teacher education

Colleges and universities are increasingly prioritizing efforts to make postsecondary education more inclusive, including by recognizing disability as a form of diversity. Embracing disability as a form of diversity is reflected in efforts such as the establishment of divisions focused on diversity and inclusion, neurodiversity initiatives, training for faculty on inclusive pedagogy, and institutional statements of a commitment to an inclusive campus climate. These examples illustrate a shift in culture and practices to align with a social justice approach to disability in postsecondary education, which begins “with the assumption that people’s abilities and rights to contribute to and benefit from higher education are not dependent on their bodies or psyches conforming to dominant norms” (Evans et al., 2017, p. xii). A social justice perspective emphasizes working to reduce or eliminate structural, physical, and attitudinal barriers to the meaningful participation and success of

students with disabilities. Efforts aligned with social justice also reflect a shift toward understanding disability as a form of diversity that brings value to a community, rather than only as an individual characteristic or limitation. When disability is viewed as a form of diversity, the onus shifts to how colleges and universities plan for and respond to diversity (Kim & Aquino, 2017).

Disability accommodations are one area of postsecondary education in which the continued application of a social justice approach to disability is critical. Accommodations in the form of academic adjustments and related services can support students’ successful completion of coursework (McGregor et al., 2016) and increased rates of graduation (Salzer et al., 2008). However, many students eligible for accommodations either do not access or underutilize them. For example, McGregor et al. (2016) found that in a survey of approximately 4,000 university students at

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public universities, only 33% percent of those who self-reported a learning disability were also receiving accommodations. Further, Freedman and colleagues (2020a) found that students often downplay their need for accommodations when talking to professors, even volunteering not to use them before a professor raises a concern. The need for students to disclose a disability is a barrier to accessing accommodations. At the institutional level, the requirement to provide documentation of a disability, and pay for supporting medical or clinical evaluations, can deter students (Krebs, 2019). Further, students have identified experiences of stigma (Grimes et al., 2019) and concerns about how professors will perceive them (Freedman et al., 2020a) as reasons for not disclosing their disability.

This research points to the urgency of changing the culture of postsecondary education to make disclosing a disability less stigmatizing, but also to the need for instructional environments that reduce the need for accommodations to begin with. Universal Design is one promising overarching framework that aligns with inclusive and socially just approaches to disability. The tenets of Universal Design are intended to anticipate and eliminate barriers to individuals using products and environments. Universal Design has been applied in education through the development of frameworks such as Universal Design for Instruction and Universal Design for Learning (Table 1) that aim to promote inclusive instruction (Reardon et al., 2021). The principles of Universal Design for Instruction (McGuire & Scott, 2006) provide guidelines for developing postsecondary instructional environments that anticipate the diverse characteristics and needs of students. Another Universal Design framework, Universal Design for Learning, is built around providing multiple means of instruction under three guiding principles—engagement, representation, and action and expression (CAST, 2018). In their review of research on the application of Universal Design in postsecondary education, Reardon and colleagues (2021) found evidence to suggest that the use of Universal Design-related frameworks lead students to view faculty instruction more positively, and concluded that such frameworks are promising approaches to meeting the diverse needs of postsecondary students. In the area of disability-related accommodations, Universal Design-related frameworks also hold promise in designing inclusive instruction that proactively meets students' needs, thereby potentially reducing the need for accommodations and the burden on students to disclose a disability in order to receive support (Tobin & Behling, 2018).

Description of the Problem

Access to accommodations for postsecondary students with disabilities is largely dependent upon individuals requesting accommodations. This approach poses barriers to students' access to support and depends upon the allocation of significant resources to Disability Support Services in order to facilitate the delivery of accommodations. Shifting beyond the approach of supporting students' needs only after they request support, towards practices that are universally accessible to all students, remains challenging. Working to reduce or eliminate the need to "retrofit" (Dolmage, 2017, p. 67) supports via accommodations requires a collaborative effort among faculty and staff. Disability service providers cannot overhaul accommodation procedures without the willingness of faculty to adopt new classroom policies and practices. Meanwhile, faculty's changes to their pedagogy may be limited without the support of disability services providers, such as their knowledge of how to implement policies that are both inclusive and compliant with disability law. The focus of Universal Design-related frameworks on universal accessibility provides a starting point for collaboration towards developing more flexible and inclusive instructional policies and practices. This article describes an action-based project in which university staff, students, and faculty collaborated to develop and disseminate student-generated course policies and practices that were informed by Universal Design-related frameworks.

Participant Demographics and Institutional Partners/Resources

To promote inclusive approaches that could minimize the need for instructional accommodations, this project provided a structure for collaboration between 60 pre-service teachers (students), three disability resources staff, and three course instructors at a university. Faculty within the College of Education and staff from the Disability Resources Office have developed a collaborative relationship over several years, grounded in mutual interests in cultivating more inclusive postsecondary instructional environments. This collaboration has included developing presentations for students and faculty on inclusive pedagogy, consulting on supports for postsecondary transition, and sharing resources related to the use of emerging accessible and instructional technologies. A pivotal point in this relationship occurred when faculty and staff collaborated to investigate how students engage with professors in conversations about accommodations (Freedman et al., 2020b). Students' tendency to downplay their needs when in the position of asking

Table 1*Universal Design Frameworks*

Framework	Guiding Principles
Universal Design for Instruction (UDI) (Scott, McGuire, & Shaw, 2003)	<ul style="list-style-type: none"> • Equitable Use • Flexibility in Use • Simple and Intuitive Use • Perceptible Information • Tolerance for Error • Low Physical Effort • Size and Space for Approach and Use • Community of Learners • Instructional Climate
Universal Design for Learning (UDL) (CAST, 2018)	Providing Options for Multiple Means of: <ul style="list-style-type: none"> • Engagement • Representation • Action and Expression

for differential treatment from a professor led the faculty and staff to recognize the need for a shift towards more proactive approaches to supporting the needs of students, grounded in the notion of universal access.

Three faculty members from the College of Education met with three staff members from the University's Disability Resources Office prior to and during the semester to develop a plan for embedding a project focused on universal access and reducing the need for accommodations into a course taught by two of the faculty members. The group chose to implement the project in four sections of a teacher preparation course taken by senior and Master's level students studying to become middle and high school teachers. The course was chosen because of its focus on inclusive education and because two Universal Design frameworks—Universal Design for Learning and Universal Design for Instruction—were already embedded as part of the course curriculum. The College of Education faculty and Disability Resources staff also identified a venue to disseminate student-generated ideas and solicit feedback from the university community: "Access and Inclusion Week," an annual week-long series of sessions to promote an inclusive climate at the university.

Description of Practice

Introducing the Problem

Early in the semester, the instructors introduced

students to the landscape of disability-related accommodations. This topic was embedded within lessons focused on accommodations in schools and legal frameworks guiding disability services in K-12 and postsecondary education. The instructors introduced research studies, including those cited earlier in this paper, regarding disclosure and accommodations. The instructors highlighted direct quotes from university students who discussed their experiences with, or reluctance to use, accommodations. The class discussed reactions to this research in relation to their own experiences, including students who shared their own experiences disclosing (or choosing not to disclose) their eligibility for accommodations to instructors. Out of this conversation, the class articulated their understanding of the underlying problem: (1) many students with disabilities feel a sense of stigma about using accommodations in postsecondary education, and (2) students are discouraged from fully using the accommodations they are legally entitled to.

Laying the Foundation for Universal Design

Two Universal Design frameworks—Universal Design for Instruction (UDI) and Universal Design for Learning (UDL)—are embedded within a two-lesson unit in a course introducing pre-service teachers to methods of inclusive K-12 classroom teaching. During class, students examined the principles of both UDI and UDL and developed class resources in which they identified examples of teaching practices

consistent with each principle. The instructors added an additional lesson with a focus on the potential application of UDI and UDL in postsecondary education. This lesson centered on the aforementioned problem of students underutilizing accommodations and encountering stigma, and began to explore the applications of Universal Design frameworks to reform current approaches to accommodations.

A Community and Action-based Project

In this lesson, the instructors also introduced students to a community and action-based project entitled, “Universally Designed Course Policies.” This project asked students to apply knowledge of Universal Design-related frameworks by taking action to address barriers to students accessing supports within current approaches to delivering accommodations. The instructors emphasized the community-based context of the project; students were asked to address an issue that impacts students, staff, and faculty in their own university’s community. While the introduction to both UDI and UDL provided important foundational context for this project, the instructors asked students to focus their applications to UDI principles for consistency and clarity (Table 2). The instructors developed a template for the project to guide students in applying UDI in the area of classroom accommodations. In pairs, students selected one accommodation from a list provided by the Disability Resources Office. They were tasked with researching the accommodation and how it is commonly implemented in practice. The students then were asked to apply one or more of the nine principles of UDI as a rationale for developing new course policies and practices that would shift away from the need for individual accommodations toward embedding universally accessible support into a course. While UDL provides detailed guidelines for developing engaging and accessible instruction, UDI principles provide broader ideas that the instructors felt were more easily applicable for novice students in developing inclusive classroom policies and environments.

Peer Feedback and Cross-Sectional Collaboration

The instructor developed a structure for providing ongoing peer feedback throughout the project that occurred both within their own classroom and across course sections. Using an online discussion board, students brainstormed and responded to each other’s initial ideas about how principles of UDI could inform the development of course policies and practices that reduce the need for accommodations and emphasize universal access. Then, as students developed initial drafts of the assignment template, they were grouped

with another pair for feedback. The additional pair were students from another section of the course who had chosen to address the same accommodation, and were well positioned to provide informed feedback. Using web-based collaborative documents, students provided feedback to their peers, including assessing their application of UDI principles and pointing out potential limitations of their universally designed course policies and practices.

Student-Led Sessions

The instructors and Disability Resources staff arranged for students from each of the four sections of the course to present their Universal Design-informed policy recommendations. The student-led sessions occurred as a series of four roundtable events that were sponsored by the Disability Resources Office and open to the university community. In preparation for the events, students created flyers, a social media campaign (i.e., Twitter hashtag), and planned the format for their presentations. The students elected to present their recommendations in a roundtable format with the intention of generating discussion. Each pair developed a slide presentation that addressed the components of the project template, including the accommodation they selected, their recommendations for implementing UDI to reduce the need for the accommodation, and potential pitfalls of implementing their recommendation.

At the event, each pair of students presented at a roundtable, and audience members joined to discuss the group’s recommendations. All materials were shared virtually with the audience, which included staff from the Disability Resources Office, students, university staff, and faculty from across the university. Students were encouraged to invite peers and staff and faculty were invited via flyers and emails. While attendance varied throughout the sessions, many attendees had professional or self-disclosed personal connections to the disability community and/or education. Audience members rotated to each table over the course of the 90-minute session. Audience members were encouraged to provide feedback about the students’ recommendations. After the event, the instructors and students reflected on the experience, feedback that audience members provided, and next steps. Students incorporated feedback from university students, staff, and faculty into a revision of their policy recommendations, submitted at the end of the semester.

Table 2*The Principles of Universal Design for Instruction with Definitions Provided to Students*

Principle	Definition
1. Equitable Use	Useful and accessible to people with diverse abilities
2. Flexibility in Use	Accommodates a wide range of preferences and abilities
3. Simple and Intuitive Use	Easy to use, navigate understandably; predictable and free of unnecessary complexities
4. Perceptible Information	Communicates necessary information effectively to the user and accommodates a user's sensory abilities
5. Tolerance for Error	Accommodates for pacing and mastery, minimizes adverse consequences of unintended actions
6. Low Physical Effort	Can be used efficiently and comfortably and with a minimum of fatigue
7. Size and Space for Approach and Use	Can accommodate users of various sizes and with different mobility and communication needs
8. Community of Learners	Promoting interaction between learners and academics/teachers
9. Instructional Climate	Designing an instructional environment that is inclusive and welcoming

Evaluation of Observed Outcomes

Student-Generated Recommendations for Applying Universal Design for Instruction

Collectively, student projects provided recommendations for 14 different classroom accommodations that are approved by the Disability Resources Office and provided to students with disabilities. Table 3 includes examples of policy recommendations that students created in response to the accommodations that they addressed. For example, the group that addressed the accommodation of “Extended deadlines for out-of-class assignments” proposed that professors provide flexible deadlines to all students, rather than only to students with an accommodation. Students recommended faculty communicate this policy with a statement on their syllabus. Students also recognized the importance of accountability and communication and recommended that professors include in the policy that students should communicate with the professor about their need for flexibility with deadlines. These ideas were shared with staff from the Disability Resources Office, including the director, in roundtable discussions at the campus events.

Engaging Students in Social Justice Approaches to Disability in Postsecondary Education

In addition to creating tangible policy recommendations, the project facilitated students’ engagement with disability and Universal Design as issues of social justice. In the class discussion board, students considered the application of Universal Design-related frameworks to address classroom accommodations. Table 4 includes ideas for policies and practices that students brainstormed after choosing a specific accommodation. In their responses, students addressed the problem of stigma by emphasizing the need to move away from practices that depend on students disclosing a disability identity, or that single out a student for receiving differential treatment. Other students addressed a core idea of Universal Design—that building in accommodations through flexible policies and universal access to materials, rather than only retrofitting for individual students, can be beneficial for all students. Importantly, students’ responses also demonstrated how they directly applied principles of Universal Design for Instruction (e.g., “Equitable Use”) as a rationale for their ideas. These ideas demonstrate how students can learn and apply Universal Design-related frameworks, becoming informed partners of disability resources staff and fac-

Table 3*Sample Student Responses: Universal Design Accommodations*

Accommodation	Current Practice	UD Policy in Higher Education
Extended Time for Out-of-Class Assignments	To earn full credit, professors have deadlines for submitting assignments. Students can request an extension by contacting their professor and referring to their accommodations letter.	Flexible deadlines are allowed to all students, as needed. If an extension is needed, students should communicate with the professor ahead of time to discuss an alternative deadline.
Extended Time on Tests	Extended testing time is often completed at the university testing center, or the students might have discussed personal testing accommodations with their professor.	Online testing modules that permit extra time. Plan extra time within standard allotted time for the test.
Audio Recording Lectures	Students request to use audio recording devices by talking to their professors and referring to their accommodations letter.	Enable recorded lectures that are available for all students. Professors commit to record the lecture with an audio recording device and post it to the class website.

ulty, in efforts to develop policies aimed at promoting a social justice approach to disability.

Embedding Student Ideas into Faculty Development Module

Since students completed the course and submitted their final recommendations, faculty and Disability Resources staff have joined a university committee charged with developing faculty and staff professional development on inclusive practices. This committee was formed at the request of administrators who lead the Division of Diversity, Equity, and Inclusion. Faculty and staff have collaborated to develop these modules focused on Universal Design, including a module focused on accommodations. The student-generated policy recommendations are now embedded in the module as examples of a social justice approach to disability.

Implications and Portability

Promoting a social justice approach to disability can be enhanced through coordinated efforts aimed at shifting the culture and practices of an institution. While staff, students, and faculty occasionally have opportunities to collaborate (e.g., serving on task

forces, hosting campus-wide events), it is seldom that collaboration is embedded within course curricula. The integration of a Universal Design-focused action-based project yielded reciprocal benefits for those involved. Disability Resources staff members welcomed the opportunity for student-led sessions at the office's sponsored events. Staff also had the opportunity to provide feedback on students' recommendations and learn new approaches to implementing Universal Design frameworks, which they can share at future faculty trainings on the subject of classroom accommodations. Students learned the principles of Universal Design for Instruction and Universal Design for Learning and advocated for policies aimed at creating a more inclusive university for all. Faculty were able to provide students with an authentic opportunity to apply a key course concept.

Together, these outcomes can contribute to embracing disability as a form of diversity at a postsecondary institution. Inviting students with and without disabilities to address issues related to disclosure and traditional retrofit approaches to accommodations can send a clear message about the importance of "collective access" (Hamraie, 2013, para. 58). In other words, collaborating on projects that promote universal access emphasizes the mutual responsibil-

Table 4*Themes from Students' Discussion Board Posts about Universal Design and Accommodations*

Theme	Accommodation	Student Comments
Reducing Stigma and Need for Disclosure	Extended Deadlines on Assignments	<ul style="list-style-type: none"> Traditionally, students who provide documentation of a disability receive more time on out-of-school work...However, not everyone is comfortable with sharing this personal information with their teacher (a stranger). The policy I would suggest for a universal design for this accommodation is to allow everyone this option.
Benefits of Universal Access	Copy of slides or lecture notes	<ul style="list-style-type: none"> I think this is really helpful for students who struggle to keep up in class with taking notes, but I also think this could help the entire class. I know there were times in classes where I would struggle to keep up with writing notes and the notes I did write were barely legible because I was writing so fast. The way I look at it is the goal is for students to learn and be successful so it does not matter how they become successful in school, it just matters that they do.
	Use of laptop for notetaking	<ul style="list-style-type: none"> I think it is essential to give the students whether they are disabled or not to have the opportunity to take notes electronically if they believe it is beneficial. For example, I do not have a disability, but sure do prefer taking notes on my laptop rather than writing them by hand. I also think the use of technology will help to prepare students for future jobs in that they will be much-improved typing and more comfortable using technology.
Building on Principles of Universal Design	Request to present oral presentations one-on-one to the professor	<ul style="list-style-type: none"> This fits into the first principle of Universal Design, Equitable Use...any student can choose this alternate route, not just students with specific disabilities. Rather than retrofitting a new and sloppy assignment for a student who may ask for it, I am giving anyone that may benefit this opportunity. Like I mentioned, this would have benefitted me in school as I would turn into a ball of anxiety and not be able to eat for days before even a minor presentation.

ity all members of the campus community have in designing environments that embrace diversity and reduce the stigma of difference. The collaboration between students, staff and faculty in this project provides an example of the kind of reciprocal relationship that Reardon and colleagues (2021) argue is necessary for effectively advocating for inclusive instruction that may limit, albeit not completely eliminate, barriers to learning that require instructional accommodations.

There are a number of considerations for planning and implementing action-based projects, such as the project described in this paper. First, the representation of students who disclosed a disability in this project was limited to a few students. Partnering with more students with disabilities, including disability-related student groups, can help ensure that policies and practices are designed in true partnership with those who live the experience of disability in postsecondary education. Second, since postsecondary institutions vary in terms of their procedures and terminology related to accommodations, it is important to communicate nuances to students and faculty who become involved in efforts to promote policies and practices that emphasize universal access and attempt to reduce the need for accommodations. This will increase the likelihood that policies will be both specific and impactful in the local context. Finally, a sustained impact requires ongoing efforts that revisit policies and practices with creative problem-solving. Therefore, efforts to promote Universal Design can be enhanced by embedding projects in and across multiple courses.

Promoting the implementation of policies and practices informed by principles of Universal Design in postsecondary education can align with ongoing institutional goals (Tobin & Behling, 2018). For example, many postsecondary institutions are developing centers or divisions charged with developing initiatives related to fostering diversity and inclusion. Staff and faculty might collaborate to integrate a focus on Universal Design in such initiatives, as was the case in this project when the instructors and disability resources staff embedded student-generated ideas in a module that is being completed as part of an inclusive practice certificate for faculty and staff. This online certificate course, facilitated by two faculty or staff members who developed the course, consists of five modules, including an action-based project where faculty apply Universal Design-related frameworks to a perceived problem on campus. This professional development opportunity is advertised through the university Division of Equity and Inclusion website and via email. As of the Fall of 2021, 48 faculty members have completed the certificate

program in the first six months of its offering, with future sessions scheduled and fully enrolled for the 2021-2022 academic year.

Other opportunities for promoting flexible course policies and practices may include aligning with the institution's responses to crises such as the recent pandemic and the need for increased mental health support. Administrators may be more likely to support approaches to policies and practices that reduce the need for accommodations in light of the emerging reality that, in a crisis, students' needs shift on a daily basis, and environments that provide proactive support are a better way forward than depending on students to individually disclose a disability.

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***Reach Everyone, Teach Everyone* (Book Review)**

Tobin, T. J., & K. T. Behling. (2018). *Reach Everyone, Teach Everyone*. West Virginia University Press. pp. xi, 286. \$21.39 (softcover). ISBN-13: 978-1-946684-60-8.

Reviewed by Christa Miller¹

Reach Everyone, Teach Everyone by Thomas Tobin and Kirsten Behling is an important compilation of current literature on Universal Design for Learning (UDL) in Higher Education (HE). It is also a novel way to frame the usefulness of UDL to this generation of learners. The book's purpose is to redirect typical faculty perceptions that UDL is only for disabled students. The authors explain that research continues to find faculty perceptions of disability to be negative (Cook et. al., 2009; Hedrick et. al., 2010; Kranke et. al., 2013). The authors strive to reframe the usefulness and impact of UDL as a benefit to mobile learners. Their definition of mobile learners includes any student who uses a mobile device (phone, tablet, etc.) to connect to their course work. The examples represent the diversity of today's learners including students with full time jobs, busy parents, and students learning on-the-go. This review describes the general structure of the book followed by the limitations of the work and how well the book achieves its goal of re-framing UDL for higher education. It concludes with a summary of the overall contribution of this book and who would most benefit from reading it.

The UDL framework was developed through research in neuroscience, special education, and technology (Meyer et. al, 2013). It is universal in its applicability to all learners and learning environments. It has three principles, which are broken down into guidelines designed to remove common barriers to learning. The principles are multiple means of engagement, multiple means of representation, and multiple means of action and expression (CAST, 2018). In the more than two decades since UDL was proposed, much has been written about it. The literature

relevant to higher education is concerned with its efficacy as a method of proactively designing for learner variability (Fournaf et. al, 2020). Another prominent area of literature is framing UDL as part of a larger conversation about architectural Universal Design (UD) where UD is treated as an umbrella term that includes physical and digital design in public spaces as well as the classroom (Burgstahler, 2015).

Summary

The book has three parts: Where We Are Now, Re-framing UDL, and Adopt UDL on Your Campus. True to its theme, the book's structure is flexible, and the introduction contains a helpful reading guide based on the Readers university role. For example, campus leaders such as deans should read the history of UDL and its connection to current U.S. laws while a cover-to-cover read is recommended for faculty services staff because of their critical role. Disability services staff who are new to UDL may benefit from reading the whole book. Those who are already familiar with UDL and its position in law can skip Part One.

The heart of the book is best summarized with the phrase “Plus One”. This is where the authors shine. Having addressed the existing barriers in HE to adopting UDL, Tobin and Behling present an elegant and simple solution to the problem. “...give just one more way to engage than exists now” (p. 134). Using that as the foundation, they provide numerous examples of how to apply the approach to the representation of material, engagement of learners, and how learners act and express their learning. Even their way of guiding the reader's choice is an example of their “Plus One” strategy. When introducing the topic, they explain that an instructor should consider “where do learners always bring up the same questions every time the course is offered” (p. 109). Then use that to identify if the barrier relates to representation, engagement, or action and expression. Once faculty choose an area of focus, the authors recommend adding a one-step element of flexibility to help address that barrier.

For example, one of the common issues presented is when the assessment itself is problematic for a student's disability, such as a final written essay (CAST, 2016). They argue that allowing flexibility in distinct steps leading up to the final non-flexible assessment can bridge the performance gap for students. Ultimately, this will help instructors avoid designing

¹ Virginia Tech

assessments that test students on skills that are not fundamental to the learning objective. The strategies they present align with other evidence-based practices. They draw on scaffolding high stakes assessments to increase learner success, for example. Adding flexibility in the incremental steps leading up to the final assessment, they argue, is where UDL can reduce the psychosocial barriers so many learners face.

Throughout their discussion of the strategies for adding flexibility for a course, the authors also address what UDL is not. One common misconception the authors address is that UDL can happen accidentally, such as a professor who always provides captions. This can be helpful such as when tutorial videos are intentionally captioned. But it could also be a hindrance, as in the example of a professor who laboriously captioned many hours of videos without any evidence that students were actually using the videos.

After debunking many UDL fallacies and establishing the “Plus One” strategy on an individual level, the authors discuss how to expand to university-wide adoption. Part three is essentially a recommendation that UDL can implement UDL! In other words, the authors recommend a staged approach to adoption that uses the same “Plus One” paradigm. They recommend finding one way to add flexibility to a single program or curriculum. Then they suggest using UDL to add flexibility to course formats such as including new technologies or considering a fully online version. Once individual instructors and programs have found a way to leverage UDL, further adoption depends on connecting UDL to the university’s goals and developing strategic partnerships to sustain it.

Discussion

I found the premise that UDL in HE is best framed as a way to reach mobile learners interesting. Their examples and case studies certainly demonstrate the value of using UDL to reach learners whose phones and tablets provide them much needed flexibility. I concur and find this a praiseworthy way to frame UDL. However, many faculty still resist allowing technology in the classroom. Their justification relies on ableist norms and is tenuous legally. This is very troubling for disabled students whose disability status is revealed simply by using their approved assistive technology. Faculty often agree with Mueller and Oppenheimer's (2014) "The Pen Is Mightier Than the Keyboard: Advantages of Longhand Over Lap-

top Note Taking" and respond with technology bans. Because of this, I suspect that Tobin and Behling's argument in support of mobile learning is still likely to fall on infertile soil among many faculty.

As further justification for the reframing of UDL, the authors address the pervasive belief that UDL is only for disabled students. Their coverage of the history of UDL, its origins in special education, and its status within the law were informative and well described. They also shared that the research literature shows that faculty continue to have a negative association with supporting disabled students. This becomes the backbone of their reason for reframing UDL to make it more acceptable for those in HE. Unfortunately, they make little effort to address that the negative association is invalid. Furthermore, their argument does not address changing the negative association faculty have regarding disabled students. It relies on the idea that what is necessary for some is good for all. In doing so it panders to the ableist preference to continue to hide disability issues and sidestep honest discussions of disability.

Their premise favors the belief that if faculty won't swallow UDL to support disabled students, we should make it more palatable by talking about mobile learners. Redirection is a common and even valid approach to nudge faculty to do what is already in the best interest of their students. However, their reframing does not truly stray far from the UDL to achieve accessibility model. Even though the authors worked hard to provide a non-disability framing of UDL, the case studies frequently address specific barriers to disabled students and accessibility. On the whole, I believe this approach is more a reflection of the current reality of UDL in HE rather than a deficiency of the book itself. By the authors' own admission, staff who already support disabled students and digital accessibility are the most likely pioneers of institutional adoptions of UDL.

Conclusion

In summary, the book is a well narrated journey in how UDL in HE has come to its present state. It partially addresses a way to reframe the discussion to support institutional goals, though this framing has concerning tradeoffs for the disability community. The book provides specific strategies to move from individual to institutional commitment by reframing UDL in HE as a benefit to mobile learners. However,

it's more likely to be accepted at institutions without ingrained resistance to technology in the classroom. The guidance this book provides can benefit any HE professional from disability professionals, support staff, faculty, and administrators who want practical strategies for embedding UDL on their campuses. This book may be particularly useful as a reading group activity for disability professionals, instructional designers, or staff from centers of teaching and learning.

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JPED Author Guidelines

Purpose

The purpose of the *Journal of Postsecondary Education and Disability* (JPED) is to publish *research* and contemporary *best practices* related to disabled college students, college and university disability services offices, disability educators, and disability studies as a field within and lens for the study of higher education institutions. The sponsoring organization for the JPED is the Association on Higher Education and Disability (AHEAD, www.ahead.org), the primary source of disability related expertise on accessibility, legislation, rights, and any other disability-related information as it pertains to higher education. Consistent with the overall goals of AHEAD, each JPED article includes practical *implications for disability services educators* in colleges and universities.

Review Process

The JPED is peer-reviewed and uses a masked-in-both-directions review process. Although our reviewers take care to provide developmental feedback, it is essential that prospective authors follow the guidance and formatting instructions in this document carefully. The editorial process is not typically able to address major issues of conceptualization or craft in a way that leads to eventual publication.

Manuscript Topics and Types

Published manuscripts will advance JPED's purpose as detailed above (i.e., research, best practices, implications for disability services educators).

Research Articles

Manuscripts demonstrate scholarly excellence using one of the types of articles described in the *Publication Manual of the American Psychological Association* (7th edition, American Psychological Association [APA], 2020) sections 1.1-1.8. These include quantitative, qualitative, mixed methods, replication, meta-analyses, literature review, theoretical, and methodological articles. ***Inclusive of all manuscript elements (including title page, references, tables, and appendices) research articles cannot exceed 35 pages and typically are between 25-30 pages.***

Practice Briefs

Manuscripts describe innovative programs, services, or contemporary best practices that support disabled

college students or disability services, and are organized using the following first-heading levels (APA 2.27):

- **Summary of Relevant Literature:** provide a succinct summary of the most relevant and contemporary literature that provides context for what is already known about the practice/program.
- **Setting and/or Participants Demographics:** provide enough information about the implementation context for the practice described for the reader to make an informed assessment regarding similarity to their own practice environment--using a pseudonym or compositing as needed to provide anonymity for participants / institutions involved;
- **Depiction of the Problem:** provide a statement of the problem being addressed.
- **Description of Practice:** briefly describe the intended outcome for the innovative practice/program and how it has been implemented to date. Tables and figures may enhance specific details.
- **Evaluation of Observed Outcomes:** summarize formative and/or summative data used to evaluate the efficacy of your practice/program; support claims with evaluation data.
- **Implications and Transferability:** discuss what has been learned and how this practice/program could be enhanced. Be realistic about any challenges encountered and how others seeking to replicate the practice elsewhere might experience them. Offer suggestions about what could be done differently in the future to achieve better outcomes. Provide a clear description of how and why other disability service educators should consider adapting your practice/program.

Inclusive of all manuscript elements (including title page, references, tables, and appendices) practice briefs cannot exceed 15 pages and typically are between 8-12 pages.

Book Reviews

Prior to preparing a book review, please contact the JPED's Managing Editor (jped@ahead.org) to discuss the book you are considering reviewing. We typically have a queue of books for which we seek reviewers and also are typically awaiting reviews from several authors at a time. Doing so will increase the likelihood that we will be able to use the review you submit, which will follow the same submission process as other types, outlined below. Book

reviews provide:

- An overview of the book, identifying the book's stated purpose, the author's and his/her viewpoint, and a general summary of the content.
- An evaluation of the book's strengths, elaborating on the author's objectives and how well those objectives were achieved.
- Recommendations about the audiences that might find the book useful, why, and how you would suggest the book be used. Please be sure to address its potential contribution to the field. For any gaps in the book's content, rather than framing as weaknesses, consider offering suggestions about other works or perspectives that could be used in tandem with this book. In other words, of what conversations in our field could this book be an important part?

Inclusive of the text of the review itself, book reviews should typically be between 750-1250 words. Book review submissions should also be accompanied by a complete citation for the book reviewed as well as references for any additional citations in the text of the review.

Manuscript Preparation

All manuscripts must be prepared according to the standards of the APA publication manual (7th edition). Authors submitting manuscripts to the JPED will be well-served to thoroughly understand Section 12 of the APA manual where the publication process is described as preparing for publication, understanding the editorial publication process, manuscript preparation, copyright and permission guidelines, and during and after publication.

When submitting a manuscript to the JPED, follow these specific guidelines:

- Submit *one* complete Word document (.doc or .docx) that contains all manuscript components (i.e., title page, abstract, body, references, tables/figures).
- Provide a separate cover letter (APA 12.11) asking that the manuscript be considered for publication and stating that it has not been published, or is not being reviewed for publication, elsewhere.
- Manuscripts should have one-inch margins in 12-point Times New Roman font. Double space the abstract, body, and references; single space the title page and tables/figures.
- The title (APA 2.4) should not exceed 12 words.
- Place the abstract (maximum 250 words, APA 2.9) on page two (following the title page). Include three to five keywords (APA 2.10) below the abstract (does not apply to book reviews).
- Use APA Section 1, Scholarly Writing and Publishing Principles, related to types of articles and papers; ethical, legal, and professional standards in publishing; ensuring the accuracy of scientific findings; protecting the rights and welfare of research participants and subjects; and protecting intellectual property rights.
- Use APA Section 2, Paper Elements and Format, to align paper elements, format, and organization. Indent paragraphs (APA 2.24), and adhere to heading levels (APA 2.27) to organize the manuscript.
- Content and method are important. Use APA Section 3, Journal Article Reporting Standards, related to overview of reporting standards; common reporting standards across research designs; and reporting standards for quantitative, qualitative, and mixed methods research. Please refer to Madaus et al. (2020) for research guidelines for higher education and disability where instructions are provided for describing samples and study locations, and appropriately selecting and describing the methodologies employed.
- Writing is important, carefully edit and proofread the manuscript.. Use APA Section 4, Writing Style and Grammar, related to continuity and flow, conciseness and clarity, verbs, pronouns, and sentence construction. Use APA Section 6, Mechanics of Style, related to punctuation, spelling, capitalization, italics, abbreviations, numbers, statistical and mathematical copy, presentation of equations, and lists. Refer to APA 6.32-6.39 to properly report numbers expressed as numerals or in words.
- APA Section 5, Bias-Free Language and Guidelines provides guidance for writing about people, identity, and other topics wherein bias in writing is common. Although generally useful, this section's discussion of disability is reductive. Authors should follow their best judgment in this regard. Additional guidance is provided below.
- Regarding language related to disability, authors must determine the type of wording that is best for their given study - typically person-first or identity-first language. (See the "AHEAD Statement on Language" for details about these options and for additional resources on the topic.) We encourage authors to be explicit about their choices in the manuscript, informing

readers about the rationale for their choice of language. When research or program participants are disabled and it is possible to determine their preferences, the preferred language of those individuals should be prioritized ahead of researcher or practitioner decisions. Additionally, aligned with the AHEAD statement in terms of outdated language use, we discourage “the use of outmoded euphemisms such as ‘special needs,’ ‘physically or mentally challenged,’ differently- or alternatively-abled, etc.” unless there is an explicit reason, such as referring to past practices or terminology to learn something valuable from it for current practice.

- Use APA Section 8, Works Credited in Text, related to general guidelines for citation, works requiring special approaches to citation, in-text citations, and paraphrases and quotations. All citations must be referenced, and all references must be cited; avoid undercitation and overcitation (APA 8.1). Double-space and block quotations of 40 words or more (APA 8.27).
- Provide a complete reference list (APA 2.12) rather than a bibliography following the manuscript. References should be formatted consistently, following APA examples in sections 9-11. Please be sure to carefully edit references as manuscripts will not be sent out for review until they conform to APA guidelines and references represent the most common challenge point for submitted manuscripts.
- Mask any information that could reasonably reveal the identity of the authors to the reviewers. For example, citations that would identify an author should be replaced with “citation omitted” and the corresponding reference removed from the reference list (APA 8.3). This does not mean that all author citations must be removed, only those that are likely to reveal an author identity by being self-referential. Those which are “in press” or “under review” should also be removed as they are typically from an author. Mask institutional identities in manuscripts if they are likely to reveal the institution of an author. Please do not use a title that can be searched in order to find a previous iteration of the work (e.g., a conference presentation, a dissertation). We will ask you to unmask these elements of your manuscript subsequent to acceptance. These examples are not exhaustive, but it is the author’s job to minimize any information that can reveal author identity.
- Tables and/or figures, following references, are in black and white only, and must conform to

APA standards in APA Section 7. Follow examples related to table lines. Align numbers in tables to the single digit or the decimal. If tables and/or figures are submitted in image format (JPEG, PDF, etc.), an editable format must also be submitted along with a text description of the information depicted in the table/figure. This will be provided as an alternate format in the electronic version of the JPED, making tables/figures accessible for screen readers.

- In submitted manuscripts, all tables and figures should be placed at the end of the manuscript with a corresponding indication in the text, “<Place Table/Figure X approximately here>”. During layout editing, tables and/or figures should will be embedded in the text either as noted in the manuscript or after its first mention in text (APA 7.6)
- Do not include footnotes, instead, incorporate footnote narratives into the manuscript.
- Because of the importance of articles including practical implications for disability services educators in colleges and universities, authors will be well-served to include in the discussion a multiple paragraph subsection where practical implications for disability services educators are discussed.
- Before submission, ensure that the manuscript is ready by using strategies, examples, and checklists provided by APA:
 - Sample papers (end of Section 2, pp. 50-67).
 - Strategies to improve your writing (APA 4.25-4.30).
 - Tables checklist (APA 7.20).
 - Figure checklist (APA 7.35).
 - In-text citation styles (Table 8.1).
 - Examples of direct quotations in the text (Table 8.2).
 - Reference examples (section 10 and 11).
 - Manuscript preparation (APA 12.9-12.13).

Manuscript Submission

Before you decide to submit your manuscript, authors are encouraged to read past articles in the JPED (available at <https://www.ahead.org/professional-resources/publications/jped>) to better understand the types of submissions we print. **A manuscript must be submitted electronically as an attachment via email to jped@ahead.org, and must include the following:**

- Subject line: JPED manuscript submission.
- Include in the body of the email a statement

that you are submitting a manuscript for consideration for the JPED. Include the title of the manuscript and the full contact information for the corresponding author (APA 2.7).

- Attach to the email your complete manuscript, prepared as directed above, and a cover letter as outlined above.
- You will receive an email reply from Richard Allegra (Managing Editor of JPED) to confirm receipt of your submission within seven business days.
- Manuscript submissions by AHEAD members are especially welcome.

Upon Acceptance for Publication

For manuscripts that are accepted for publication, we will request additional information at two separate intervals:

- First, corresponding authors will be asked to respond to copyediting suggestions shortly after acceptance. As part of this process, Cassie Sanchez (Copyeditor) will contact you with a proposed copyedited draft of your submitted manuscript and/or specific questions requiring your response.
- Second, once your manuscript has been assigned to a future issue, Valerie Spears (JPED Editorial Assistant) will contact the corresponding author to request: 1) a 40-50 word bibliographic description for each author; 2) and a signed copyright transfer form (Valerie will send templates for both); and 3) approval of galley proofs of the article ready for publication.

Although JPED reserves the right to edit all material for space and style, corresponding authors will be notified of changes.

Special Issues

The JPED occasionally publishes special issues which feature a series of articles on a particular topic. The JPED welcomes ideas for special topic issues related to the field of postsecondary education and disability or disability studies. The issue can be formatted as a collection of articles related to a particular topic or as a central position paper followed by a series of commentaries (a modified point-counter point). If the issue has the potential to be valuable to the readership of the JPED, modification to the journal's content or format may be possible. Authors who wish to discuss a special issue should contact the editorial team at jped@ahead.org.

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JPED's acceptance rate is moderately selective, accepting approximately 20% of all submitted manuscripts during the last calendar year. JPED is indexed in EBSCO, ERIC and Emerging Sources Citation Index. At present, JPED does not have an impact factor but is working with Clarivate Analytics' Social Sciences Citation Index to obtain one.

Editorial and Review Teams

The editorial team is composed of Ezekiel Kimball, Ryan Wells, Valerie Spears, Richard Allegra, and Cassie Sanchez. The review board is composed of more than 70 international disability scholars and disability services educators with expertise on disabled college students, disability services, disability studies, and research methodologies.

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