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From the Editor

Reasonable Accommodations

Facilitating “reasonable accommodations,” including “academic adjustments” as outlined in Section 504 of the Rehabilitation Act of 1973, has inspired many creative and programmatic initiatives for students with disabilities by disability service educators. Diplomatically negotiating equitable accommodations with faculty members for students with disabilities is a top priority for disability service professionals. In the spirit of leveling the playing field, we strive to do what is best for the students with disabilities on our campuses, enabling high quality academic and student support systems (Tinto, 1993) so that students with disabilities have opportunities and success as they transition from high school and experience postsecondary education.

This second issue of volume 29 of the *Journal of Postsecondary Education and Disability* highlights some of the outstanding academic and student support services provided in our disability services offices. Academic advising, opportunity for extended-time on exams, classroom audio distribution systems, collaborative learning, and extracurricular activities are addressed in this issue. This issue also provides a thoughtful examination of what prevents students with disabilities from utilizing reasonable accommodations in postsecondary education, a practice brief on enhancing accessibility and improving the campus climate, and a book review on providing equal access for students with disabilities in the health sciences.

The authors of the first article discuss academic advising as an intervention for college students with attention deficit hyperactivity disorder (ADHD). **Kathleen D’Alessio and Manju Banerjee, from Landmark College**, propose an innovative approach to academic advising as an intervention for college students with ADHD. The advising model proposes using a student-centered developmental approach that includes specific elements of coaching, such as open-ended questioning, creating a safe space for students with challenges in self-regulation and executive function, and holding students accountable for their actions.

Michael Lyman, from San Juan Counseling, and Mark Beecher, Derek Griner, Michael Brooks, John Call, and Aaron Jackson, all from Brigham Young University, provide a qualitative review of what keeps students with disabilities from utilizing accommodations in postsecondary education. The authors identified six themes as barriers to accommodation use: desire for self-sufficiency, desire to

avoid negative social reactions, insufficient knowledge, quality and usefulness of disability student services and accommodations, negative experiences with professors, and fear of future ramifications.

The third article examines the extended time use of college students with disabilities, written by **Laura Spenceley and Starr Wheeler from the State University of New York at Oswego**. Among their findings was that more than half of the tests administered with extended time were completed within the time given to students taking the tests in the classroom. They discuss considerations for disability service providers when making decisions related to the provision of extended time.

Sara Schley and Michael Stinson, from the Rochester Institute of Technology, investigated the use of alternate methods of classroom interaction and communication to foster collaborative learning for deaf and hard of hearing students in diverse, graduate teacher education classrooms. They found that articulated speech and/or sign language interactions, and text-based chat interactions, can offer distinct advantages in increasing access to collaborative learning opportunities across a variety of student needs.

The fifth article presents a classroom audio distribution system (CADS) in a postsecondary setting as a story of universal design for learning (UDL). **Joan Flagg-Williams from Saint Joseph’s College and Wendy D. Bokhorst-Heng from Crandall University**, encourage a flexible approach toward teaching in order to include as many different types of students as possible in the learning process, including CADS as one way to support UDL in higher education settings.

Sarah Schoffstall, Stephanie Cawthon, Duncan Dickson, Mark Bond, Oscar Ocuto, and Jinjin Ge, from The University of Texas at Austin, discuss the impact of high school extracurricular involvement on postsecondary outcomes among deaf and hard-of-hearing youth. Their findings suggest that overall involvement in extracurricular activities significantly predicts independent living, and that breadth of involvement in more than one activity significantly predicts postsecondary attendance.

The practice brief in this issue is a discussion on campus climate and how to identify progress toward enhanced accessibility. **Allison Beyer, from Albany College of Pharmacy and Health Sciences, and Crystal Dea Moore and Jamin Totino, from Skid-**

more College, outline how the Assessment of Campus Climate to Enhance Student Success survey, and an external disability services audit, raised the level of awareness and attention to the needs of students with disabilities at departmental and institutional levels. The issue concludes with a book review by **Kate Link of the University of Wisconsin – Madison**, of *The Guide to Assisting Students with Disabilities: Equal Access in Health Science and Professional Education*, edited by Lisa Meeks and Neera Jain.

The editorial team and review boards hope that the information shared in this issue of the *Journal of Postsecondary Education and Disability* will inspire disability service educators and contribute to the high quality of reasonable accommodations provided in disability services offices. And, we hope to see you in July at the 39th conference of the Association on Higher Education and Disability in Indianapolis, Indiana, the Crossroads of America.

Roger D. Wessel, Ph.D.
Executive Editor

Reference

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Academic Advising as an Intervention for College Students with ADHD

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Abstract

An innovative approach to academic advising is being proposed as an intervention for college students with attention deficit hyperactivity disorder (ADHD). This is a student-centered developmental approach that includes specific elements of coaching, such as open-ended questioning, creating a safe space for students with challenges in self-regulation and executive function, and holding students accountable for their actions. Given the ubiquitous nature of academic advising on college campuses, this hybrid advising model can have a significant impact on the graduation and retention rates of students with ADHD who might otherwise drop out of college, despite having the competencies necessary for postsecondary success. Five students with ADHD were tracked at a small private college in the Northeast as they met with their advisors over 15 weeks. Their comments illustrate the five components of intervention advising for ADHD: the advisor-advisee relationship, postsecondary readiness, goal-setting, action steps/implementation, and accountability.

Keywords: *ADHD, advising, coaching*

For students with learning disabilities and/or attention deficit hyperactivity disorder (ADHD), enrolling in college is more achievable today than just a decade ago (Henderson, 2001; Raue & Lewis, 2011). In fact, students with ADHD are now a majority among those with disabilities on college campuses (Government Accountability Office, 2009). However, studies still suggest that these students do not fare as well as in higher education as their nondisabled peers; they often have higher rates of academic probation and lower rates of graduation and retention (Maitland, 2010).

Admission into college is only the first step in preparing for gainful employment; the ability to complete the postsecondary program is just as important. In fact, the need to earn a college degree for effective employment has never been greater (Pew Research Center, 2014). Moreover, an aborted college experience can put a serious economic and emotional burden on students and their families. Students with ADHD fail to acquire a college degree for a variety of reasons. Miller and Murray (2005) pointed out that

Factors such as personal autonomy, self-confidence, ability to deal with racism, study behaviors, or social competence have as much or more to do with grades, retention and graduation than how well a student writes or how competent a student is in mathematics. (para. 5)

The situation takes on critical significance as high-functioning college students with ADHD continue to drop out of college, which indicates that traditional student support services and accommodations may not be enough for this burgeoning population. The dearth of credible research on the efficacy of traditional interventions for ADHD (Green & Rabiner, 2012) underscores the need for novel ways to engage, support, and successfully graduate these students.

Academic advising is universally available at postsecondary institutions. In this article we propose a model of academic advising that adopts coaching-like elements, which could be just the intervention needed to increase the retention and graduation of

¹ Landmark College

students with ADHD. This approach has been successfully implemented at a small private college in the Northeast. Based on our understanding of the complex profile of young adults with ADHD, this paper discusses how an innovative model of academic advising accompanied by an advising curriculum specifically designed to address the needs of students who learn differently can foster retention of students with ADHD. This advising model can be readily adapted by other postsecondary institutions.

Profiles of College Students with ADHD

Current trends point to an increasingly complex profile of students with multiple and co-morbid symptomatology and many emotional and executive function challenges (Brown, 2009). According to the Government Accountability Office (GAO, 2009), students with ADHD and with psychiatric disabilities are the fastest growing disability populations on U.S. college campuses. The GAO report indicated that, between 2000 and 2008, U.S. college students who indicated having ADHD increased from 6.7% to 19.1%. Green and Rabiner (2012) noted a prevalence estimate between 2% and 8% of the college population, whereas DuPaul, Weyandt, O'Dell, and Verejao (2009) estimated that 25% of college students with disabilities have an ADHD diagnosis. New understanding of the complexities of ADHD, and the recognition that adult ADHD is different from childhood ADHD (American Psychiatric Association, 2013), underscores several elements that were previously ignored. For example, it is now acknowledged that ADHD symptoms can change over time and that an individual can present with different symptoms across their lifespan. Barkley (2011) pointed out that hyperactivity in childhood is often replaced in adulthood by anxiety and even depression. A primary diagnosis of ADHD is often accompanied by multiple co-occurring symptoms, such as perfectionistic behaviors, heightened panic reactions, and avoidance behaviors, which are at subthreshold levels for comorbid diagnoses but significantly debilitating for everyday functioning (Banerjee & Brinckerhoff, 2015). Furthermore, ADHD can be mild, moderate, and/or severe, and it can change over time.

The *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013) raised the threshold for the early identification of symptoms from age seven to age twelve, but many individuals with ADHD are first diagnosed in college. Some students display a developmental lag in social-emotional maturity, which may or may not correlate with academic competency. Negative self-perceptions

are common among these students, and many feel shame and guilt about their academic performance, which can lead to avoidance behaviors and procrastination (Stamp, Banerjee, & Brown, 2014). College students with ADHD have also reported being academically less confident than their peers about their ability to succeed (Lewandowski, Lovett, Coding, & Gordon, 2008; Shaw-Zirt, Popali-Lehane, Chaplin, & Bergman, 2005). Studies and self-reported evidence from students have suggested that these students have less academic success, experience greater psychological and emotional difficulties, and are on academic probation more often than their peers (Advokat, Lane, & Luo, 2012; Blase et al., 2009; Heiligenstein, Guenther, Levy, Savino, & Fulwiler, 1999).

No two individuals with ADHD are alike, but difficulty with executive function and self-regulation is the hallmark of an ADHD diagnosis (Brown, 2013). Deficits in executive function affect one's ability to set goals and take self-directed action to achieve these goals. Individuals with ADHD have difficulty with response control and with planning, organizing, and self-monitoring their behaviors to get the desired outcome (Barkley, 2012). Green and Rabiner's (2012) comprehensive review of college students with ADHD indicated that, despite a growing body of research on college students with ADHD, confirming findings are sparse, lack adequate rigor, and are not conclusive.

The current reality is that many college students with ADHD are high functioning and have all the necessary credentials to gain admission to competitive colleges, yet they fall apart when the rigors of postsecondary education start to escalate. Many enter college with little understanding of the demands of college-level work or college life and lack adequate strategies to cope with them (Miller, 2010). Interventions that acknowledge the behavioral reality of young adults with ADHD, both their strong academic potential and their self-sabotaging behaviors, are lacking.

Parallels between the experiences of first-year college students and students with ADHD are particularly revealing. First-year students often enter college with strong high school academic records, but once on campus they show a declining commitment to studying and doing homework (Liu, Sharkness, & Pryor, 2008; Sax, 2003). Miller and Murray (2005) cited McGillin (2003) in noting that a student's ability to cope and be resilient are the best barometers for college success. Students whose internal resilience was supported by "institutional experiences that strengthen their self-esteem and self-efficacy" (para. 7) were able to overcome the negative effects of at-risk factors.

In a study of first-generation college students, Fentress and Collopy (2011) identified four defining characteristics. The first is a lack of academic preparation. The authors noted that students' perception of their academic incompetence, rather than any actual academic insufficiency, has the greatest bearing on retention and college success. A recent study by Stamp et al. (2014) found that similar perceptions among college students with ADHD, particularly of shame and negative self-image, were a major barrier to college success.

The second characteristic is identity dissonance. First-generation college students often feel like outsiders and are isolated from the mainstream of college life. They are less involved in campus activities and less likely to work on campus. Many students with ADHD also experience identity dissonance because their academic and social engagements tend to differ from those of other students (Shaw-Zirt et al., 2005). First-generation college students also are vulnerable to stereotype threat, which can adversely affect working memory (Beilock, Rydell, & McConnell, 2007), an area of executive functioning that is impacted by ADHD, even when there is no stereotype threat.

The third characteristic is the financial strain many first-generation college students experience because of a lack of family resources. While financial strain may not be uniquely prevalent among students with ADHD, many have to provide updated disability documentation, which can be expensive. College is also more expensive for undergraduates with ADHD who take more than four years to complete their college degree. The fourth characteristic Fentress and Collopy identified is social capital, or awareness of the social networks of college life, including knowledge of campus resources, how to access them, students' rights, and general elements of academic community life. Once again, many students with ADHD are not as plugged in to the campus community as their peers, often due to difficulty initiating action and inhibiting impulse responses (Shaw-Zirt et al., 2005).

Common Interventions for ADHD

Traditional academic support for college students with ADHD includes accommodations such as rooms with reduced distractions for taking exams, extended time on tests, and single dorm room arrangements, to mention just a few. Many colleges also provide ADHD coaching on campus. The literature has identified three broad categories of interventions for ADHD: (a) pharmacological, (b) accommodations, and (c) psychosocial interventions, which includes ADHD coaching, cognitive behavior therapy (CBT), and counseling (Green & Rabiner, 2012). The following section briefly

describes each of these intervention categories and the challenges of implementing them on college campuses.

Pharmacological. Pharmacological interventions cover the vast range of medications, mostly stimulants, used to address symptoms of ADHD. These medications include methylphenidates such as Ritalin, Concerta, Daytrana, and Metadate, as well as dextroamphetamines and amphetamines such as Adderall and Dexedrine. Strattera (atomoxetine), a nonstimulant medication, is often prescribed for individuals who have ADHD and depression or anxiety. Vyvanse (lisdexamfetamine dimesylate), a long-acting stimulant, was studied with college students by DuPaul et al. (2012) over a five-week period and was found to be effective in reducing some of symptoms of ADHD, although the symptoms were still significant compared to the controls.

Research on the effectiveness of medication treatment for college students with ADHD is extremely sparse. It has been suggested that medication intervention may be less effective with this population because of the challenges young adults have in managing their medication (Rabiner et al., 2009), and of the need for medication that is effective over a much longer period than the previous six-hour school day. Moreover, it is unclear whether psycho-pharmacologists and physicians who prescribe medication for young adults in college are aware of the demands of college life, and disability services providers are not trained in how to accommodate the side-effects of medication. Managing and accommodating the side-effects of medication is clearly a challenge with this type of intervention, and the effects are individual specific.

Accommodations. Under the Americans with Disabilities Act (1990), college students with ADHD are entitled to reasonable accommodations that ensure equal access to academic and nonacademic campus life. Students with disabilities provide the required documentation to the disability services office on campus to receive accommodations, which are often negotiated between the student, disability services personnel, and the student's advisor or program faculty member (Banerjee & Brinckerhoff, 2015). There are several challenges in accommodating college students with ADHD. Most institutions have documentation and accommodation guidelines, but accommodation decisions can be subjective and the ADHD documentation needed to meet these guidelines can be expensive. For high-functioning students with ADHD, the traditional battery of diagnostic instruments lack the sensitivity to pick up on subtle markers of executive function disorders. Furthermore, students with ADHD may not seek services and accommodation because of the

stigma and shame attached (Stamp et al., 2014). Others feel uncomfortable about asking for accommodations because of the potential for disclosure among their peers, and/or a perception that they do not deserve accommodations and it is unfair when they do.

Psychosocial treatments. Psychosocial treatments, also known as behavior therapy and behavior modification, are often seen as an alternative to medication or are used in conjunction with medication to address symptoms of ADHD. Two common interventions that fall within this broad category are ADHD coaching and CBT.

ADHD coaching. Coaching has been widely recognized as an effective intervention for students with ADHD (Parker & Boutelle, 2009; Swartz, Prevatt, & Proctor, 2005). Coaching is different from study skills training and/or a learning strategy intervention. Learning strategies are tutor-directed activities that involve “teaching” students the skills and techniques they need to effectively navigate academic demands. Such interventions often include strategies for effective note-taking, active reading, test prep, and so on. Coaching, on the other hand, is an inquiry-based approach where student and coach are jointly engaged in the process of goal-setting and decision-making. Coaching helps students with ADHD achieve their academic goals in a self-determined manner and take ownership of their actions and the consequences. Coaches use open-ended questions to elicit a student’s own ideas and thoughts, and through such engagement help to shape students’ self-regulatory behaviors (Parker, Hoffman, Sawilowsky, & Rolands, 2011). They ask questions to make a student aware of their own ability to plan, set goals, demonstrate response control, and take deliberate action toward achieving their target goal(s). During the process, coaches identify and address elements that may facilitate or hinder goal attainment (Quinn, Ratey, & Maitland, 2000).

Even when available, many students with ADHD do not avail themselves of coaching services on campus for a host of reasons, including stereotype threat and perceptions of a stigma attached to receiving disability services (Mueller, Fuermaier, Koerts, & Tucha, 2012). ADHD coaching is not readily available on all college campuses, but various models of academic advising are an essential part of college life and are universally available at colleges and universities around the country. Interestingly, there is significant overlap between the elements of coaching and academic advising.

Cognitive behavior therapy. CBT is a type of mental health counseling that directly addresses self-critical thoughts that arise for ADHD students who experience difficulties in the college environment

(Ramsay & Rostain, 2006). CBT is a goal-oriented psychotherapeutic treatment where the therapist and the client work together to reorient the student’s thinking and thereby change behavior. According to Green and Rabiner (2012), no empirical studies testing the efficacy of these psychosocial treatments specifically for college students with ADHD have been published. CBT is not an intervention higher education institutions typically offer to their students. This private therapy can be expensive and often involves doing homework outside of the sessions, which may be difficult for a student to complete consistently.

Overview of the Literature on Academic Advising

Almost all higher education institutions provide their students with some form of academic advising, as it is acknowledged to be integral to the mission of teaching and learning. According to Light (2001), “good advising is the single most underestimated element of a successful college experience” (para. 5). Advising covers a broad spectrum of responsibilities, from imparting the ideals of higher education to the pragmatics of course enrollment to facilitating advisees’ academic and career goal development (O’Banion, 2012). According to the National Academic Advising Association (NACADA, 2006), “academic advising engages students beyond their own world views, while acknowledging their individual characteristics, values, and motivations as they enter, move through, and exit the institution” (para. 7). Students have identified academic advising as one of the most important aspects of their postsecondary education (Hillman, 2009). Heisserer and Parette (2002) stated that, “while faculty, administrators, and student affairs professionals all serve as student advocates and play an integral part in student retention and attrition, advisors are typically in the best positions to assist students in making quality academic decisions” (para. 2). Research also has pointed to the significant impact academic advising can have on student attrition and retention (McArthur, 2005).

There are multiple approaches to academic advising. Three models described by Heisserer and Parette (2002)—prescriptive, developmental, and integrated—broadly address the various approaches in the literature. The prescriptive model is a top-down approach where the advisor is directive and informs the student about course selection, degree requirements, and registration. The student simply follows the advice offered and takes no part in the decision-making. In the developmental model the student and the advisor share responsibility for making decisions. The advisor responds to the

student's queries and directs them to the appropriate campus resource, which fosters independent decision-making. The third model is an integrated approach, which is essentially a combination of the previous two models, where the student is both given advice and counseled to make independent decisions regarding academic, career, and life goals.

The advising literature also references an approach called intrusive or proactive advising, which is often cited as the preferred approach for students at risk of dropping out of college (Heisserer & Parette, 2002; NACADA, 2014). At-risk students include ethnic minorities, those who are academically disadvantaged, have disabilities, have low socioeconomic status, and/or are on academic probation. Intrusive advising presupposes deliberate interaction between advisor and advisee, often with mandatory requirements. Students are expected to follow the advisors' directives and are closely monitored. Intrusive advising is defined as an "intervention with an at-risk student that is designed to (a) facilitate informed, responsible decision-making, (b) increase student motivation toward activities in his/her social/academic community, and (c) ensure the probability of the student's academic success" (Heisserer & Parette, 2002; Intrusive Advising Model, para. 1, p. 74).

While intrusive advising may be good for at-risk students who may otherwise disengage, it is not particularly effective for students with ADHD. In fact, experience suggests that these students often ignore mandatory protocols such as attending advising meetings, which may be a warning sign of dropping out. Furthermore, many advisors are simply not aware of the specific challenges faced by ADHD students, such as difficulty regulating, and goal-setting, and they may react unsympathetically to missed sessions and the student's apparent lack of responsibility.

There is no doubt that increased contact with advisors, especially during freshman year, promotes students' sense of connectedness with the institution and affects their decision to stay in college (Miller, 2010). The advising approach for students with ADHD therefore needs to provide a calculated balance between encouraging frequent contact with the advisor while promoting independent decision-making and ownership of their decisions.

A Coaching Approach to Academic Advising

Integrating intrusive advising practices with components of ADHD coaching creates a hybrid approach that may be well-suited for some students with ADHD, especially if it can be adapted easily to existing advis-

ing models. This approach has been used successfully at one college in the Northeast, which is one of only two in the country that exclusively serves students with learning disabilities, ADHD, and autism spectrum disorder. The elements that define such a hybrid model of advising intervention for college students with ADHD are (a) the advisor-advisee relationship, (b) postsecondary readiness, (c) goal-setting, (d) action steps/implementation, and (e) accountability. These elements are further operationalized in detail through a student-centered developmental advising curriculum (see Appendix). During one semester, the authors of this paper monitored and recorded the comments and perceptions of five college students with ADHD who were engaged in this hybrid advising model. Their aim was to illustrate how well this approach serves as an intervention for ADHD.

Why Use Advising as an Intervention for ADHD

Advising is a forward-looking partnership between student and advisor. At its core is a focus on the future, in particular the student's life and career goals (Habley, Bloom, & Robbins, 2012). By contrast, student services such as tutoring, counseling, and disability services are perceived as supports for individual deficiencies. It is much easier for a student to tell a peer that he is going to an advising meeting rather than to the disability services office. Furthermore, most academic advising frameworks lend themselves to elements of interventions for at-risk populations, and by extension to students with ADHD.

The advisor-advisee relationship. The relationship between student and advisor is of particular significance to students with ADHD, and trust in that relationship is the bedrock of ADHD coaching. Highly qualified and well-trained coaches work in partnership with the student to address critical life skills, including motivation for academic achievement, readiness for college, interpersonal communication, self-advocacy, self-esteem, and individual perceptions (Edge Foundation). Coaches offer the student a safe, nonjudgmental environment and use open-ended questioning to encourage the student to articulate their academic and career goals, and to address their challenges. Trust between student and advisor is the cornerstone of this hybrid advising model, and the advisor actively nurtures it. They use various approaches to build trust, including being nonjudgmental and neutral while listening and providing a safe space for the students to express themselves emotionally. However, advisors do not serve as counselors, clinicians, therapists, or disability advocates. Advisors begin building trust by gauging a student's readiness and motivation to engage

in the advising process. One student who was tracked for this paper said to his advisor, “I don’t know why I am in college...I am not having fun.” Another student said, “I have no internal or external motivators...I just don’t want to do the work.” Talking to his advisor about not submitting work on time, another student said, “I know I am smart...my professors are lenient with me... I know I can get away with it.” Candid comments like this are only possible when students feel they can really trust their advisor to help them—as a professional and not as a friend.

Not every student is ready to participate fully in the advising process when he or she starts college. One student noted, “I wish everyone would back off and stop analyzing me,” and another said, “I don’t see any value in these advising meetings.” Knowing when to give the student space is equally important. There are several approaches to assessing students’ readiness and motivation to participate in this type of advising. It is not necessarily a formal process; advisors can assess readiness through open-ended dialogue and neutral listening, which encourages students to share where they are in their personal development. The key take-away is for advisors to recognize that each student with ADHD will be at a different start point when they engage with advising, and some may take more time to transition to the next developmental phase.

Postsecondary readiness. Many students with ADHD end up at a postsecondary institution that may not be the best fit for them. It may be a large institution or one where expectations are markedly different from the student’s past experiences. The transition to college is particularly difficult for many students with ADHD, and facilitating self-awareness and readiness to accept transitional changes is different for these students than for their non-ADHD peers. It can be challenging and time-consuming, and also rewarding. Many of these students have learned unproductive behaviors as a result of their past and current experiences with ADHD. Some overestimate their skills as a way to cover up deficiencies, and others develop negative stereotypical thinking that can lead to detrimental behaviors. The following student comments illustrate some unproductive coping strategies and poor self-awareness:

“I am unmotivated to do work because these courses are not useful to me.”

“Professor X is out to get me.”

“I did not complete the assignment so I did not go to class; and that continued for a few weeks.”

“I don’t want to be at this college. This is hard for me.”

In our hybrid advising model, advisors invite students to share personal insights on their strengths, weaknesses, values, and, most importantly, perceptions of the teaching-learning process. After following the advising curriculum for a semester, some of these same students noted that “it is OK to make mistakes” and that “the biggest lesson I learned was to take school seriously and take myself seriously, show up and be present and communicate.” Advisors do not provide therapy sessions, but they facilitate self-awareness by encouraging open communication between the student and themselves, and other members of various campus constituencies, including instructors, disability services providers, student affairs personnel, and so on. Advisors also connect students with resources that help them better understand the symptoms of ADHD, including new research on ADHD and how the brain learns.

Goal-setting. A central tenet of coaching is goal-setting, and advisors do help students identify their academic and career goals. For students with ADHD, longer-term goals need to be separated into smaller, more manageable steps. Distinguishing between a realistic goal and a “wish” is key, and students must feel ownership of their goals. Some of the students we tracked started with goals such as, “I will pass all my courses this term” and “I will get all A’s.” They worked with their advisor to identify action steps and ways to accomplish the goals they had set for themselves. The advisor was there to support the students and to redirect them when they failed to meet a specific goal. Advisors engaged the students not simply to set goals but to help them be aware of the context in which the goal would be executed. For example, students were asked to articulate how their goal would be accomplished in light of their other commitments, physical and mental health issues, and other distractions they would encounter. Students then took the lead in revising their goals and making decisions.

Action steps/implementation. Implementing the decisions made jointly by the advisee and advisor is at the heart of this hybrid model. Drawing from practices embedded in coaching, advisors help students accomplish their goals by reinforcing goal-directed actions and encouraging the advisee to question actions that are nonproductive. For example, an advisor might encourage a student to reflect on an unproductive rationale for missing class, such as, “About a year ago I slipped and fell on an icy hill and got a really bad concussion, which caused some minor memory loss and behavior change. So I’d rather have an absence and receive some scolding than slip and get another concussion.”

Advisors initially follow up closely with the student, but as the student develops independent skills,

this support is phased out. A plan to monitor the implementation of the student's action steps is set up as a collaborative exercise between the advisor and the advisee. Some students report on their progress frequently via digital communications or face-to-face—some advisors suggest a weekly meeting—but others do not. The meetings are not mandatory, but when mutually agreed upon parameters are established it is expected that they will be followed.

Accountability. Accountability is another central component of this advising model, and the advisors do hold students accountable for their actions and behavior. One key difference in this model, however, is that the advisors are knowledgeable about the difficulties associated with ADHD. Accountability is part of a contract between advisor and advisee, and the student is well aware of the consequences of breaking it, so while working toward goals, advisors and advisees identify elements that support or present obstacles to attaining them (Quinn et al., 2000). In addition to the meetings between students and their advisors, parents/caregivers may be invited to be part of the support system, depending on individual circumstances.

The students themselves define accountability, and the advisor integrates it into the advising protocol. Some students opt out of any agreement and agree instead to check in with their advisor via emails, whereas others agree to identify and articulate the consequences of their actions. For example, one student we were tracking noted, "Next semester, I will be less avoidant about small stuff and be more on top of work and be more disciplined." Her advisor immediately asked how she would accomplish this and what would happen if things did not go according to plan. Together they identified alternative ways to reach her goals, and consequences that were significant to the student if they did not succeed. A key element of accountability is that advisor and student become familiar with and acknowledge the behaviors that derail the student's goals, and then identify alternative ways to accomplish them. Traditional consequences such as poor grades often appear to have less value for students with ADHD than for their peers. Advisors working with this model understand such behavior and help motivate students to identify meaningful accountability measures.

A Curriculum for Advising

The academic advising curriculum for students who learn differently has been followed at this college for nearly a decade in its various iterations (see Appendix for details). This advising method specifically articulates two main goals: (1) to understand and reinforce student self-determination and interdependence,

and (2) to promote problem-solving and decision-making about educational and personal goals. Each goal is broken down into a set of student learning outcomes to be accomplished in three stages, loosely one semester each. The process of reinforcing students' self-determination helps to identify specific learning outcomes, which occur in three different stages of a student's time at college. During stage 1 the student is introduced to the departmental goals and is asked to acknowledge, consider, and reflect on how a particular program and associated learning outcomes can become part of their personal goals for postsecondary education. For example, under student learning outcome 1-1, the goal is for students to understand their learning strengths and challenges and to use this knowledge appropriately when making decisions. These learning outcomes can be broken down further into knowledge (understanding personal learning strengths and challenges), actions (asking for help when needed), and values (appreciating the unique strengths they bring to the learning environment). In stage 1, the advisor is working to build a trusting relationship while getting to know the student and discussing their learning strengths, challenges, and academic strategies for success. As the student progresses to stage 2, the goal is to use this understanding to develop personalized strategies for approaching academic work. By stage 3 the student is expected to consistently use strategies to refine and maintain their academic progress. Students are told what is expected of them and this creates a collegial and professional tone for the advising meetings, which are guided by a student-centered developmental approach. While it is recognized that students progress at their own rate, having curricular markers helps advisors create a productive advisor/advisee partnership from the outset. Advisors continually assess the advising sessions and give feedback to both their advisees and the advising department.

Discussion

Several themes define this hybrid model of advising for students with ADHD. One theme is assessing student readiness. This starts with the advisor actively determining "where the student is" at the start of the advising sessions in terms of his/her mental and emotional readiness to take full advantage of the current circumstances. The distinction between college-able and college-ready is key in students taking responsibility for their past actions and in seeing the current situation as a step in the right direction. One of the students we tracked did not want to be at the institution from the start and was there only because he had

been dismissed from his previous college. He directed all his effort toward getting back there, and his advisor helped him with this transition.

Another theme is addressing students' own perceptions of themselves and the educational environment. Perceptions can lead to habits that prevent students from achieving the desired outcomes. In this model the advisor works to create a safe haven where students learn to trust them and let go of perceptions that can derail rather than facilitate goal achievement. The advising sessions were indeed a safe place where students could start to rethink some of the negative perceptions associated with their disability. The advisors helped to reshape students' perceptions of themselves and of their engagement with others, particularly authority figures.

The advising sessions for ADHD students at this school are clearly not counseling or therapy, nor are they tutoring or academic support services. The tools of this hybrid advising model include open-ended questioning, sympathetic yet neutral listening, addressing perceptions through in-the-moment examples, creating self-awareness of strengths and challenges, and continual assessment of the advising sessions, all of which are grounded in the student's academic and career goals. Students are expected to meet with their advisors more frequently than in other advising models, the difference being that this is not a mandatory requirement and the advisors work hard to provide a place students can turn to when in need.

Many college personnel, including academic advisors, are not trained to address the needs of students with comorbid and multiple disabilities. At the institution where this hybrid advising approach is being used, the academic advising department is led by a Director of Advising and two Advising Supervisors. There also are 16 Academic Advisors who provide direct one-on-one advising and have a caseload of approximately 35 students. Eleven full-time faculty members contribute to the advising department by taking on additional advisees, and two administrators provide advising support when needed. The following section provides suggestions for the implementation of this advising model at other institutions.

Suggestions for Practice

We recommend that advisors have basic knowledge of some of the common disabilities, that they be aware of current research on neurodiversity, and that they understand the negative perceptions and behaviors that are common to individuals with ADHD. This advising model also recommends creating an environment of trust and neutrality and conducting advising

sessions in a nonjudgmental manner. They also make sure that students and their parents understand that the advisors are professionals hired by the college, and that they are not the students' personal disability advocates or their friends. For this type of advising to be successful, advisors must tailor their advising practices to the individual students' developmental readiness. Having regular and frequent meetings provides an additional structure that creates a natural intervention for students and helps to build trusting relationships.

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Appendix

Landmark College Advising Mission, Goals, and Outcomes

Mission: Advising promotes a student-centered, developmental approach to working with students in support of self-determination and interdependence. Advisors guide students in problem solving and making decisions with educational and personal goals. (Adopted Fall 2007)

Departmental Goal 1: Understand and reinforce student self-determination and interdependence.	Semester/Stage 1 Outcome	Stage 2 Outcome	Stage 3 Outcome
Student Learning Outcome 1-1: Understand learning strengths and challenges and use this knowledge appropriately when making decisions	<i>Student will review and discuss educational diagnosis (in general) as well as learning strengths, challenges, and academic strategies</i>	<i>Student will utilize understanding of their learning strengths and challenges to help identify strategies in approach to academic work</i>	<i>Student will consistently use strategies for academic success and refine according to their learning strengths and challenges</i>
Student Learning Outcome 1-2: Develop communication skills and become appropriately persistent through the use of self-advocacy	<i>Student will reflect upon and begin utilization of available communication avenues and protocols</i>	<i>Student will evaluate and adjust communication protocols in alignment with personal and educational goals and incorporate feedback from others involved</i>	<i>Student will understand and use effective communication with various audiences, in alignment with personal and educational goals</i>
Student Learning Outcome 1-3: Identify and utilize college resources appropriately	<i>Student will understand the scope of and access to resources including Drake Center for Academic Support, Coaching, Counseling, Health Services, ITS, and Transfer Services.</i>	<i>Student will exhibit willingness to utilize campus resources, as appropriate; evaluate successes/challenges; and make adjustments accordingly.</i>	<i>Student will evaluate use of campus resources in alignment with academic strategies, progress and personal and educational goals.</i>
Student Learning Outcome 1-4: Utilize advising and: a) Be willing to engage in discussion topics at all levels of difficulty; b) Seek feedback from advisor in timely manner	<i>Student will be introduced to the goals of advising, use advising regularly and participate in the advisor-advisee partnership</i>	<i>Student will understand the goals of advising, continue to use advising appropriately, and understand their roles and responsibilities in the advisor-advisee partnership</i>	<i>Student will integrate the advising process in continual identification, assessment and evaluation of personal and educational goals</i>

Student Learning Outcome 1-5: Initiate actions including communication (emails, phone calls) and resource use (DCAS, Office Hours, coaching, counseling, etc.)	<i>Student will understand how to initiate actions to access and utilize such resources</i>	<i>Student will initiate appropriate actions both with help of advisor and independently</i>	<i>Student will initiate actions and communicate independently to various parties when appropriate</i>
Student Learning Outcome 1-6: Demonstrate self-respect and respect for others	<i>Student will acknowledge learning profile, educational history, personal skills, and abilities in assessing self-knowledge</i>	<i>Student will use self-knowledge in making personal and educational decisions and in their interactions with others</i>	<i>Student will use self-reflection and the integration of the college experience into self-knowledge and interactions with others</i>
Student Learning Outcome 1-7: Listen to and consider others' points of view and deal with conflict and criticism appropriately	<i>Student will consider other points of view in discussions and in relation to educational and personal goals</i>	<i>Student will understand areas of conflict and the value of a variety of points of view in relation to personal and educational goals</i>	<i>Student will consider a variety of viewpoints and integrate where appropriate in making decisions toward educational and personal goals</i>
Department Goal 2: Promote student problem solving and decision making about educational and personal goals.	Semester/Stage 1 Outcomes	Stage 2 Outcomes	Stage 3 Outcomes
Student Learning Outcome 2-1: Understand Landmark policies, degree options, and degree plan options.	<i>Student will be introduced to college policies, graduation planning process and develop initial graduation plan</i>	<i>Student will review graduation plan, revise as necessary, and declare major</i>	<i>Student will understand impact of academic progress on graduation plan and adjust plan as needed</i>
Student Learning Outcome 2-2: Select appropriate courses	<i>Student will understand and select initial courses in alignment with placement, college requirements, and student interest</i>	<i>Student will understand resources available to select courses in context of past success, college requirements, degree declaration, and personal and educational goals</i>	<i>Student will evaluate and adjust course selection in alignment with personal and educational goals, Landmark College requirements, and post-Landmark considerations</i>

<p>Student Learning Outcome 2-3: Set educational and personal goals and monitor growth toward achievement of goals, including:</p> <ul style="list-style-type: none"> a) Consideration of different ways to achieve a goal; Anticipation of possible outcomes and consequences b) Working with an advisor, as appropriate c) Comparison of actual outcomes with expected outcomes, in order to realize steps of success d) Make necessary adjustments, working with advisor, as appropriate. 	<p><i>Student will establish initial goals with the help of the advisor and evaluate progress toward those goals at appropriate intervals during the semester</i></p>	<p><i>Student will review progress from previous semester; compare actual and expected outcomes, and adjust strategies accordingly throughout the semester</i></p>	<p><i>Student will continue to compare actual and expected outcomes, understand their progress toward goals, and consider adjustments and their impact throughout the semester</i></p>
<p>Student Learning Outcome 2-4: Develop a dynamic balance between academic and non-academic pursuits that fosters success.</p>	<p><i>Student will understand and consider non-academic offerings in alignment with their interests and personal and educational goals</i></p>	<p><i>Student will evaluate and adjust academic and co-curricular interests in balance and alignment with overall and academic and personal and educational goals</i></p>	<p><i>Student will assess progress toward personal and educational goals and the influence of the balance of academic and non-academic pursuits</i></p>

What Keeps Students with Disabilities from Using Accommodations in Postsecondary Education? A Qualitative Review

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Abstract

Past research has shown that students with disabilities (SWD) at the postsecondary level who use accommodations demonstrate greater academic achievement and higher graduation rates. Only limited research has been conducted to identify the barriers they face in using accommodations, and that research has not sampled a population specifically identified as having faced such barriers. Through interviews with SWD identified as having faced barriers to using accommodations, this study identified six themes; four were considered complex, as they contained subthemes. The four were a desire for self-sufficiency, a desire to avoid negative social reactions, insufficient knowledge, and the quality and usefulness of disability student services and accommodations. The two straightforward themes were negative experiences with professors and fear of future ramifications. It is hoped that these findings help disability student services providers and SWD make better and more informed decisions regarding the use of effective accommodations.

Keywords: *Students with disabilities, college students, accommodations, disability support services, barriers*

Research has shown that a postsecondary education increases earning potential over the course of an individual's life (Day & Newburger, 2002); this holds true for individuals with and without disabilities. Individuals with disabilities who have a college education are employed at a greater rate (Hennessey, Roessler, Cook, Unger, & Rumrill, 2006) and earn wages comparable to their peers without disabilities (Walters, 2000), but they enroll in college at half the rate of people without disabilities (Dowrick, Anderson, & Acosta, 2005) and graduate at a lower rate (Houtenville, 2003; National Center for Education Statistics, 1996). These low enrollment and graduation rates partly explain why individuals with disabilities often have less economic success. They also are often underemployed and paid lower wages (Hughes & Avoke, 2010), and 26% live below the poverty level, compared with only 9% of individuals without disabilities (National Organization on Disability, 2004).

In a more positive light, the number of postsecondary students with disabilities (SWD) is increasing (Horn, Peter, & Rooney, 2002). The National Center for Education Statistics (2006) estimated that in 2003-2004 11.3% of postsecondary students reported having a disability, which compares to only 2.6% in 1978 (Henderson, 1999). This significant increase in SWD's college attendance can be traced in part to key legislation that has been passed in support of individuals with disabilities (Yell, Rogers, & Rogers, 1998).

Section 504 of the Rehabilitation Act, which was passed in 1973, was the first piece of legislation that specifically provided protection for individuals with disabilities. It stated that any institution that receives federal funds must provide equal access for individuals with physical or mental impairments (Rehabilitation Act of 1973). Although the act did not specifically mention institutions of higher education, it applied to the many postsecondary institutions that received federal

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funds. One shortcoming of the Rehabilitation Act was that it did not provide civil or criminal penalties for colleges that did not comply, making it less effective than it could have been (Yell et al., 1998). The Americans with Disabilities Act (ADA) of 1990 corrected some of these shortcomings, specifically stating that it applied to postsecondary institutions, and it included penalties for noncompliance. The Rehabilitation Act and the ADA have played a large part in providing SWD with access to postsecondary education (Cope, 2005; Zuriff, 1996).

At the postsecondary level, a large portion of the responsibility to comply with disability legislation has been carried by disabled student services (DSS) offices (Szymanski, Hewitt, Watson, & Swett, 1999). Stodden (2001) reported that the majority of postsecondary institutions in the United States have a DSS. Once a SWD has disclosed and provided documentation of their disability, a disability services professional and the student identify the need for reasonable accommodations. This is done on a case-by-case basis (Frank & Wade 1993) in accordance with the student's functional limitations (Ofiesh, 2007). The primary means DSS professionals have to provide services to SWD are accommodations (Baker, 2006), which can be defined as "the provision of any educational support that is needed for the person with a disability to access, learn, and benefit from educational services alongside college peers without disability" (Upton, 2000, p. 10).

Even with disability legislation and accommodations provided by DSS, SWD are still graduating at a lower rate than their peers without disabilities. This trend has led researchers to question the effectiveness of DSS and the accommodations they provide (Mull, Sitlington, & Alper, 2001). They have approached this topic in a number of ways. Those who conducted experimental (Alster, 1997; Zuriff, 2000), quasi-experimental (Keim, McWhirter, & Bernstein, 1996; Vogel & Adelman, 1990), and self-report survey studies (Berry & Mellard, 2002; Sharpe, Johnson, Izzo, & Murray, 2005) suggested that accommodations are beneficial to SWD. Others (e.g., Salzer, Wick, & Rogers, 2008) came to a similar conclusion through a review of the literature, stating that "students with disabilities are as academically successful as students without disabilities when person-specific supports are provided" (p. 371).

Even though the literature suggests that DSS and the accommodations they provide are beneficial to SWD and boost graduation rates (Salzer et al., 2008; Vogel & Adelman, 1990), there is evidence that these services are not being fully utilized. Barnett and Li (1997) reported the results of a national survey of community colleges that found approximately 8 percent of

community college students report having a disability, but only about half of them register for accommodative services. Moreover, the National Longitudinal Transition Study 2 found that only 40% of postsecondary SWD who had used special education services in high school had informed their colleges of their disability (a necessary requirement to receive services), and that only 35% of all SWD received accommodations (Wagner, Newman, Cameto, Garza, & Levine, 2005).

The large percentage of postsecondary SWD who do not choose to seek eligibility for accommodations through a DSS office suggest that barriers may complicate some students' use of this campus resource. Barriers can be thought of as factors that prevent SWD from seeking or making regular use of the accommodations available to them (Marshak, Van Wieren, Ferrell, Swiss, & Dugan, 2010). Research on the barriers to using accommodations is limited, but what studies there are have identified the following: feelings of social disconnection, a discriminatory attitude from other students and faculty, subpar DSS practices, ineffective accommodations, unavailable accommodations, accommodations that reduce independence, a possible lack of assistance-seeking behaviors, a stigma attached to disabilities, and insufficient knowledge among SWD about their disability (Dowrick et al., 2005; Kurth & Mellard, 2006; Marshak et al., 2010; Trammell & Hathaway, 2007; West, Kregel, Getzel, & Zhu, 1993). Many of these studies did not directly study barriers specifically but identified them as part of a broader set of research questions. Moreover, many of the studies used methods such as surveys that did not allow the participants to fully explain or elaborate on their experiences.

Also of note in this research is the distinction between barriers as conceptualized in the "medical model" of disability, which focuses on the physical or mental impairment of the individual and how it can be "corrected" or accommodated, and a "social model" of disability that focuses on society's shortcomings in its approach to inclusiveness for individuals with disabilities. Barriers as conceptualized in the medical model focus on what the SWD can address in his/her own behavior to convince them to use accommodations, while barriers in the social model focus on more macro-level concerns in society's treatment of SWD that discourage autonomy (Shakespeare, 2013).

Marshak et al. (2010) interviewed 16 SWD who were registered with their school's DSS. The researchers focused on intra-individual traits and used semi-structured interviews to allow participants to explain their experiences with accommodation use in postsecondary education. From the interview data they identified five main themes: identity issues, a

desire to avoid negative social reactions, insufficient knowledge among SWD about disability issues, SWD's perceptions of the quality and usefulness of services, and negative experiences SWD had with professors.

This research (Marshak et al., 2010) provided valuable insights into SWD's experiences accessing and using accommodations, but it makes no mention of whether the participating students had actually encountered barriers to seeking or using accommodations. While most SWD have faced barriers of some kind, not all report facing barriers to postsecondary education (West et al., 1993). The data for Marshak et al.'s (2010) study was part of a larger body of data that examined more general issues related to SWD, thus it makes sense that the participants would all be SWD. A more ideal population for studying barriers to seeking or using accommodations would be SWD who have specifically encountered such barriers.

Statement of Purpose

Building on the work of Marshak et al. (2010), the current study was designed to examine the experiences of SWD more fully by specifically interviewing individuals who had faced barriers to their use of accommodations.

Method

The present study employed a hermeneutic qualitative research strategy based on semi-structured interviews of participants. Hermeneutic inquiry, which is based on a relational ontology, seeks to find greater meaning and understanding of people's lived experiences through an interpretation of their given account (Kvale & Brinkmann, 2009). This strategy addressed the research question by understanding participants' ideas, views, perceptions, reactions, attitudes, opinions, thoughts, and experiences (Jensen, 2006). As Denzin and Lincoln (1994) stated, "Qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them" (p. 3).

Qualitative research is ideal for studying people and experiences as they naturally occur (Johnson & Christensen, 2008). The current study investigated SWD's naturally occurring experiences in terms of barriers to access in college. The study used semi-structured interviews that were analyzed using a hermeneutic circle, as informed by Kvale and Brinkmann (2009). In this method, several broad and unfocused reviews of the transcripts are used to identify initial themes (Jackson & Patton, 1992). The text is then reviewed at increasingly deeper levels through succes-

sive readings. As themes are identified, the researcher circles back to the text looking for confirming and disconfirming evidence. This process is used to foster a deeper understanding of the meaning of the interviews.

The philosophical foundation of this study was relational ontology (Schwandt, 2000), which assumes that relationships are primary and necessary in understanding human experience (Jackson, Smith, & Hill, 2003). The epistemology of this study was hermeneutic and dialectic (Denzin & Lincoln, 2000). An important tenet of this epistemology is that "understanding is something that is *produced* in dialogue, not something *reproduced* by an interpreter through an analysis" (Schwandt, 2000, p. 195, italics in original). In keeping with these philosophical foundations, this study used an approach suggested by Kvale and Brinkmann (2009) that attempts to understand and interpret the meaning of the everyday "life world" of the interviewee with sensitivity and openness toward new and unexpected knowledge.

Participants

Sixteen interviews were conducted for this study. The participants were SWD who had registered with DSS at a large, private religious university whose students are predominantly White/Caucasian. They ranged in age from 20 to 43, with a mean of 25.7 and a median of 23. Nine were male and seven were female (see Table 1). Each participant was paid \$40 for their time and participation. The participants were identified through a DSS list of students who had been approved for accommodations but did not use some (or any) of them during the 2010-2011 school year. A total of 42 students were identified and contacted by e-mail. Participants' self-reported disabilities included depression, anxiety, severe mental health disorders, post-traumatic stress disorder, learning disabilities, attention deficit hyperactivity disorder, Asperger's syndrome, neurological disability, back injury, type 1 diabetes, endocrine disease, autoimmune disease, and visual impairment.

Kvale and Brinkmann (2009) suggest that the researcher should "interview as many subjects as necessary to find out what you need to know" (p. 113). The common qualitative interview design tends to use around 15 interviews, plus or minus 10 (Kvale & Brinkmann, 2009). Lastly, Kvale and Brinkmann (2009) warn against the commonly misunderstood presupposition that "the more interviews, the more scientific" (p. 113). The current study followed these guidelines in determining an appropriate number of participants. At around 12 interviews, the primary researcher noticed that the data being gathered seemed

redundant. A few more interviews were conducted, for a total of 16, to make sure that a point of saturation and redundancy had been reached.

All participants met the following criteria. Each had been enrolled in at least one semester or term during the 2010-2011 school year, and had been approved for one or more accommodations but had not used one or more of them. Those who did not use one or more of their approved accommodations were identified by their decision to not pick up their DSS letters that inform professors and the campus testing center of a student's eligibility for accommodations.

Procedures

After obtaining approval from the institutional review board, a DSS provider sent out e-mails to students who met the criteria mentioned previously. All interested participants were given further information, including the interview procedures, expected length of the interview, and the nature and purpose of the study. Those who agreed to participate were asked to provide their informed consent. All interviews were recorded and transcribed, and all identifying information was removed or changed. Once the research was completed and written up, all audio recordings were erased, leaving only the transcripts that had been stripped of all identifying information (i.e., participant names and towns, school names, etc.).

Data Collection

All interviews were conducted one-on-one. Fourteen interviews were conducted in person, and two were conducted over the phone with participants who were geographically distant from the researcher. Interviews ranged from 23 to 64 minutes, with a mean of 41.1 minutes. Each interview began by asking for demographic information, followed by a briefing that described the purpose of the interview, gave the interviewee a chance to consent to being recorded, and addressed any general questions about the interview. Following the interview, participants were debriefed, which provided an opportunity to discuss any questions the interviewee had, address issues or anxiety that came up during the interview, and receive feedback or clarification related to the interview (Kvale & Brinkmann, 2009).

This study utilized a semi-structured interview format, which "is defined as an interview with the purpose of obtaining description of the life world of the interviewee in order to interpret the meaning of the described phenomena" (Kvale & Brinkmann, 2009, p. 3). The researcher used a list of possible questions (see Appendix A) that informed the interview and helped

ensure that important topics and aspects of the intended research question were not neglected. It is also important to note that the list of questions was not simply read sequentially and verbatim in each interview. As Kvale and Brinkmann (2009) describe, "it is neither an open everyday conversation nor a closed questionnaire" (p. 27).

Data Analysis

The analysis of the transcribed interviews followed the same philosophical and theoretical assumptions that were used in conducting the interviews. The analysis was not a one-time event that happened solely at the end of the research process but was instead conducted throughout the research process. During the interviews, participants' responses were interpreted and further questions were formulated relative to the analysis or interpretation (Seidman, 1998).

For example, initially no questions were asked about fears associated with the impact using accommodations could have on a student's future. However, during several interviews the participants said they were anxious about the potential consequences of asking for and using their approved accommodations. These responses led us to develop the theme of "fear of future ramifications" and shaped subsequent interviews. Kvale and Brinkmann (2009) noted that "the ideal interview is already analyzed by the time the sound recorder is turned off" (p. 190).

Once all the interviews were transcribed, a post-transcription analysis was conducted using the hermeneutic circle methodology described above. The themes identified were continually taken back to the transcripts and reexamined for evidence that both confirmed and disconfirmed them. Themes that continued to be confirmed were retained, while themes that were not broadly supported were removed. An auditor then evaluated the analysis process and the themes that were retained. Only themes the principle researcher and the auditor agreed on were included.

For example, the theme of "Insufficient knowledge" initially had two subthemes, "Question of fairness of accommodations" and "Lack of awareness of DSS and available accommodations." While reexamining the transcripts to confirm/disconfirm the subtheme of fairness, several statements from students who were concerned that they were not disabled enough to warrant accommodations seemed significant. Subsequent reviews of the transcripts demonstrated that "Question of being disabled enough" was, indeed, a distinct subtheme.

As an additional validity check, the confirmed themes were e-mailed to all the original participants to get their feedback as to whether the interpretations

matched their experiences and intended meanings. Feedback from the participants was then taken back to the text to examine whether or not the feedback was broadly supported.

Results

Analysis of the interviews revealed six main themes related to barriers SWD face in accessing and using accommodations (see Figure 1 for an overview of all findings). Four of the identified themes contained subthemes and thus were considered complex, while the other two were more straightforward and contained no subthemes. The four complex themes were Desire for Self-Sufficiency, Desire to Avoid Negative Social Reactions, Insufficient Knowledge, and Quality and Usefulness of DSS and Accommodations. The two more straightforward themes were Negative Experiences with Professors and Fear of Future Ramifications.

Theme #1: Desire for Self-Sufficiency

Throughout the course of the interviews, many of the participants (all names are pseudonyms) commented on the importance of being self-sufficient, while others alluded to it as they discussed the great pains they had taken to maintain self-sufficiency.

Many participants reported working extraordinarily hard to achieve academically without having to use accommodations. However, Betty (a 27-year-old White female graduate student with attention and learning disabilities) explained that putting forth so much effort to be self-sufficient “sometimes...takes a toll.” The subthemes of this theme were the importance of being independent, being self-accommodating, and using accommodations as a backup.

Importance of being independent. Many of the participants talked at length about the value they placed on independence. In doing so, they explained how they intentionally did not use approved accommodations in an effort to be independent. A number of participants mentioned that this decision was due in part to a sense of pride, and that pride often stood in the way of asking for and receiving help. In general, independence seemed to be a large factor in deciding whether or not to use accommodations. Steve (a 25-year-old White male junior with an emotional disability) explained:

In a few classes I haven't used them at all. I really want to test myself to see if I can compete at the level of everyone else with the same standards as everyone else and I kind of do it as a test of my own abilities to see if I can do it...I mean eventu-

ally I would like to get to a place where I don't need such accommodations anymore; that's my ultimate goal.

Being self-accommodating. Several participants suggested that self-sufficiency was important to them as they discussed efforts to self-accommodate. One form of self-accommodating involved going directly to professors or classmates and asking for help instead of requesting accommodations through DSS. Other self-accommodation involved participants having insights on how to work with their disability more effectively and then using that insight to act in ways that leveled the playing field. Peter (a 23-year-old White male senior with learning, attention, and emotional disabilities) explained:

I just feel like the most important for me when obtaining a grade...is how to approach teachers, how to win teachers over, and have teachers really like you so you can share with them your goals and have them help you achieve those goals...I tend to talk to them first and then, and as time goes on I share with them some of my problems that I am facing and the things that are going wrong and the frustrations I have with being a disabled student and that seems to allow them to have more compassion my way... [It] really helped me... That's exactly why I think I haven't utilized [DSS] so much because I have figured out myself.

Joe (a 36-year-old White male senior with an emotional disability) also spoke about this approach:

I try to always do what's effective for me. I have to sit exactly where I need to sit and I get to class not too early but not too late. If I get there too early then I am just sitting there, and yeah that's bad for the social anxiety disorder...I do what I need to manage.

Using accommodations as a backup. Many of the participants wanted to address their needs on their own and only use accommodations as a backup. These participants emphasized that it was important to them to be as independent as possible, but at the same time they had the foresight that some circumstances required the use of accommodations. A few participants even talked about how having the accommodations as a safety net would lower their anxiety, thus minimizing their need for the accommodations. Amy (a 24-year-old White female senior with an emotional disability) illustrated this approach:

It actually helped decrease my anxiety and decrease my panic attacks, knowing that [accommodations] were available to me whether I used it or not and I did quite often...It helped me not need it as much actually.

Theme #2: Desire to Avoid Negative Social Reactions

The interviews revealed that many participants had a strong desire to avoid negative social reactions related to their disabilities and accommodations. The participants' comments made it clear that accommodations are not used in isolation, and many of them seemed keenly aware of how their use of accommodations affected others and influenced others' perceptions of them. This concern focused mostly on professors and peers. The subthemes that emerged were not wanting to be viewed or treated differently, fear of suspicion from others for receiving special treatment, and not wanting to be a burden.

Not wanting to be viewed or treated differently.

Many of the participants reported concerns about being viewed or treated differently. This included a strong desire to not be singled out or have attention drawn to them. Also of note was the desire to not be labeled or categorized as "the disabled student" and thus treated as less competent or fragile. In general, participants reported that they worried about being perceived and treated differently if peers or professors learned about their disability and accommodations. Carol (a 22-year-old White senior female who is blind) expressed her feelings:

It's not something I am ashamed of or anything but at the same time I don't want everyone to know me as the legally blind girl...And I really don't want people to feel sorrow for me because there is no need to feel sorry for me as far as I am concerned.

Peter expressed similar concerns:

I used the note taking at the start but it's kind of... humiliating. I was told to go tell the teacher like that I need a note taker and I thought he was going to just say, "Hey we need someone to help [Peter] take notes." I thought he would confidentially say that but he said, "Hey we need this guy to have his notes taken because he has a disability."

Fear of suspicion from others for receiving special treatment. A number of the participants focused on being aware that others might think they were taking advantage of the system or receiving special treatment that they did not deserve. A large concern

involved peers' potential jealousy or suspicion of the accommodations. Many participants also said they felt like some professors questioned the legitimacy of accommodations. Several reported being careful to not give professors any further reason to be suspicious of them. William (a 30-year-old White male senior with a physical disability) expressed his concerns about other students' perceptions:

The only thing I remember ever having was other students on more than one occasion I would, a student would see me, you know parking in a handicap spot or in a faculty spot or something like that and say, "Gee how did you get such a great parking spot." And at first I'd say, "Oh yeah, it was wonderful. First I fell 75 feet off a cliff and spent 4 months in traction." Eventually I decided that was a little, maybe a little bitter, so you know I stopped saying that, but it just struck me as a weird thing to say to someone who clearly has a handicap tag on their car...

Amy reported similar concerns about her teachers' perceptions of her use of accommodations:

I think when the students have the letters, if you don't mention it to the teacher or get it to them right off the bat it's kind of too little too late. If you bring it in later for a lot of teachers it seems like they might roll their eyes or they might not really take it seriously or you are just bringing it in as an excuse...If I haven't taken them in the beginning of the semester, I usually just count my losses and just deal with it and get a lower score.

Not wanting to be a burden. The accommodation process at college involves many individuals, including DSS providers, administrators, and professors. Many participants commented that they were concerned they were being too much of a burden on others. At times participants would simply choose not to use accommodations that would have helped, rather than put an extra burden on others. Jane (a 21-year-old White female junior with an emotional disability) expressed that she would never ask for extra help "because I feel like it's asking too much, asking too much of professors, asking too much of the university, trying to make my life easier."

Theme #3: Insufficient Knowledge

Many participants either did not know about available accommodations or did not use them because of incorrect or insufficient knowledge. Some of the participants' reported having insufficient knowledge related to their current situation, while others reported having insufficient knowledge earlier in their college

experience. The subthemes included questioning the fairness of accommodations, lacking awareness of DSS and available accommodations, and doubting whether one was “disabled enough.”

Questioning the fairness of accommodations.

Questioning the fairness of receiving accommodations was a common dilemma for many of the participants. This seemed to be an important moral dilemma that participants wrestled with again and again throughout their college experience. Many of the participants even struggled during the interview with whether accommodation use was fair or not. Questions of fairness often seemed to stem from participants’ lack of understanding about disability or the accommodations that are legally afforded them. Jane said, for example, “It just seems so unfair that...just because I am having a struggle in my life that I should get something that other people don’t get.” Many participants brought up this fairness issue in relation to their classmates. Jim (a 23-year-old White male graduate student with a chronic health disability) related the following:

There have been times when I have tests and I asked the teacher, Did the other guys finish? Because, if the other guys didn’t finish, I am going to feel bad if I took time and a half and could finish, and that’s been the same at law school and they dismissed it so now I don’t feel bad about taking the full time, but in the past it has been kind of a question because I don’t want an unfair advantage or unfair disadvantage.

Lacking awareness of DSS or available accommodations.

One of the guiding questions in the interview dealt with how the participants had learned about the services available to them due to their disabilities. Many of the answers included details about how at some point during college they had been unaware of DSS and accommodations. Some participants talked about how, even after registering with DSS and receiving accommodations, they still were not completely sure of what accommodations and services were available to them. A few of the interviewees also made suggestions about better advertising and visibility for DSS. Rachel (a 20-year-old White female senior with a chronic health disability) captured this lack of awareness: “I don’t think I’d heard of [DSS] at all...Maybe sending out e-mails to new students or something. Just maybe a mass e-mail. These are the services we can provide.”

Doubting whether one is “disabled enough.” A common belief or misconception among many of the participants was that they were not disabled enough

to use DSS or accommodations. The participants who endorsed this misconception often were students with emotional or learning disabilities. They frequently compared themselves to students with physical disabilities and deemed themselves not disabled enough. One participant even expressed concern about not being disabled enough to participate in this study. Amy related the following:

And at first with [DSS], I felt insecure going to them ’cause I was like, I don’t have a disability. I just have panic attacks. I’m not in a wheelchair. I don’t have a disease or anything like that, and that was really hard at first...helping them [students] understand that [DSS] is not just for physical disabilities would probably be helpful.

Theme #4: Quality and Usefulness of DSS and Accommodations

The quality and usefulness of DSS and the accommodations they provide were also mentioned as major barriers to the use of accommodations. This includes problems working with DSS and the process of setting up accommodations. Participants also talked about accommodations that might have helped them with their disabilities but were unavailable. Finally, a number of participants mentioned that some accommodations were not effective and in some instances were even detrimental to learning. The subthemes of this theme were the process of requesting and receiving accommodations, certain accommodations are not available, and accommodations are not effective.

Process of requesting and receiving accommodations.

The process of requesting and receiving accommodations included the participants’ experience first approaching DSS, meeting with a DSS provider, having ongoing contact with DSS, and implementing the accommodations. A few of the participants spoke about negative experiences with the DSS and its staff that discouraged them from using accommodation. Jane said, for example, “I saw [a DSS provider] and I kind of felt like he was working against me a little bit. I felt like I had to sit there and say no, really, I need help [and] like you are not listening to me...I just didn’t feel like he was going to do anything about it.”

Sometimes a student never received the requested accommodations, while at other times the inefficient process discouraged the participant from using accommodations later on. Jennifer (a 43-year-old White female senior with chronic health and emotional disabilities) and William noted the different ways the difficulty of the process discouraged their use of accommodations:

Jennifer: The same thing with the testing center...I can't walk very well and they said, well you need to go up there and get your test and then go down to the accessible rooms. And so then I walked here and here and then here and I walked down and then I went back up and went back down and then I went over to [a DSS provider] and said that was dumb. I can't walk that much.

William: I do remember that it was kind of hard to find, like hard to get on the schedule...After I met with her she had, kind of, to write up the accommodation letters and then wait for someone to print it, and then they had to wait for her to sign, so it was like a month between when I finally met with her and when I actually had the accommodation letters in my hands.

Certain accommodations are not available. All of the participants in this study had been approved for at least one accommodation through DSS, and many noted other accommodations that might have been helpful but were not available. Sometimes participants were not sure if certain accommodations were available, they just knew they were not currently available to them. A few students had attended other universities or community colleges and had used helpful accommodations that were not available at their current university. Dwayne (a 29-year-old White male senior with an emotional disability) reported, "I have trouble getting up in the morning because of my medications, and I tried to get support for going to school late but I didn't really get support for that."

Peter expressed feeling that he had more interaction and a more personal relationship with DSS providers at the community college level. He said, "So I just felt like the [DSS], it was lacking in a lot of the things I needed in comparison to [community college]... Whereas, [the local] community college they would sit you down and they'd even call you."

Accommodations are not effective or helpful. Participants described some accommodations as ineffective and often had stopped using those they did not find useful. In some cases, participants said they felt like some accommodations might even put them further behind in their classes. Joe expressed the following:

If I have to ask for something like exam due date extension then I do have to get a letter and a lot of the time I do feel like it's just a kind of a hopeless thing. There's a lot of hopelessness in being a disabled person. It's like if you ask for an extension on your exam due date you are just going to get

behind in your next exam,...you are starting old stuff while everyone is starting the new stuff and so it's kind of a self-defeating thing to ask for a letter.

Theme #5: Negative Experiences with Professors

Negative experiences with professors in relation to the use of accommodations seemed to be a major barrier. While many participants mentioned that most of their experiences with professors were positive, almost all of them could recount, often with great detail and passion, a negative experience. In many cases a professor simply did not honor the accommodations the participant had been approved for. While other professors did not necessarily deny accommodations outright, a negative experience often made a participant question whether to use accommodations in the future. Betty, for example, recounted the following experience:

I talked to [a DSS provider] and he said, "Yeah, I think it is legit, and so he talked to [another DSS provider] who also agreed, and so I called the professor back and at this point he was at a conference and he didn't seem very happy that I was continuing to pursue this, but he said he wasn't going to give me time and a half but he was going to give me time and a quarter instead of time and a half, and so I was like okay, but then when I hung up I felt upset that he wouldn't just give me that extra quarter.

Theme #6: Fear of Future Ramifications

Many participants worried about how accommodations might disadvantage them in the future. Potential disadvantages ranged from professors writing less positive letters of recommendation to fewer job opportunities. Joe related the following example:

I guess we're supposed to, as part of the academic process, develop relationships with professors, and a good way to destroy that is to always have to ask for accommodations...I didn't know if [having a disability] was going to go on my transcript.

Peter expressed fear that his current use of accommodations could affect his ability to obtain them in the future. He said, "I fear if I keep going into [DSS] and they see that I have good grades, they are going to take away some of the things they've given me."

Students expressed the more personal concern that accommodations might act as a crutch and limit the benefit and skills they otherwise might gain during their college education. Ralph (a 22-year-old White male freshman with a learning disability) related the following:

One of the accommodations that I qualified for is a microphone that you talk into that types for you...But if you are not a very good typist and you use that all the time, you will never be good at typing...I feel like using those accommodations could cripple me in a way.

Discussion

The current study builds on past research, especially Marshak et al. (2010), by contributing new perspectives from a population that has not been studied previously. The current study specifically identified a student population that had been approved for accommodations and then did not use at least one of those accommodations. This study also focused on the intra-personal experiences of students using accommodations. Since the study participants were specifically identified as having faced barriers to using accommodations, they provided new and unique insights about those barriers.

Through our analysis of the interviews, we found themes similar to those of Marshak et al. (2010), as well as some that differed (see Table 2 for more detailed information about these similarities and differences). Our results provide novel insights (i.e., subthemes) into previously reported reasons (i.e., themes) SWD may not use approved accommodations. The SWD in our sample reported having a strong need to feel independent, wanting to be self-accommodating, and wanting to use accommodations only as a “back-up.” They also shared strong feelings about not wanting to burden others because of their accommodation use and expressed fears that they were “not disabled enough.” Our findings also showed that students sometimes felt that “accommodations were not effective.”

Theme #6: Fear of Future Ramifications has not been identified previously in the literature. Some SWD reported fears that resulted from a lack of information, such as that their disability status may be indicated on their transcript or that accommodations would be taken away if they showed a positive academic performance. Other concerns were that professors would not write strong letters of recommendation and that accommodations might hinder their ability to develop skills (e.g., writing, reading, and typing). For many participants, the future ramifications were important considerations in deciding whether or not to use DSS and accommodations.

Theme 6 raises the question of whether SWD should always be encouraged to use accommodations. Previous research on barriers to accommodation use often approached the topic in a way that implied that

the ultimate goal should be to identify and eliminate barriers. Research has shown that when SWD use accommodations they are more successful academically (Salzer et al., 2008) and ultimately have higher graduation rates (Vogel & Adelman, 1990). While students in our study reported some significant benefits from using accommodations, they also identified multiple difficulties they experienced within themselves when using them (e.g., self-consciousness, a desire not to burden others, fear of retribution).

Implications

Our findings offer faculty, administrators, and DSS providers valuable insights into the barriers SWD face in accessing and using accommodations. The increased emphasis our participants put on self-sufficiency suggests that DSS providers should seriously consider SWD’s desire to be independent and understand the ways they strive to be so. Honest conversations between DSS providers and SWD about how the students’ needs can be met without sacrificing independence may encourage SWD to use beneficial accommodations.

The newly identified subtheme of not wanting to be a burden also has possible implications and applications. Many participants mentioned that, rather than burden professors and DSS providers, they sometimes did not use accommodations. An increased effort from professors and DSS providers to welcome and encourage SWD may help decrease the students’ concern about being a burden. One student mentioned that when she was working with a DSS provider he appeared to be extremely busy and overburdened. It may be useful to conduct further research to examine whether DSS providers are overworked/overburdened and whether this is creating a barrier to students seeking accommodations. If this is indeed the case, further discussion about increasing resources and personnel for DSS is warranted.

This study also identified the new subtheme of SWD questioning whether they are disabled enough, which suggests certain implications regarding disability type. This subtheme was primarily expressed by students with emotional and learning disabilities, who reported that they felt they should not receive accommodations because they were not as disabled as students with physical disabilities. DSS providers can play an important role in helping this group of students understand that they too deserve accommodations and equal access. As one student stated, “[a DSS provider] even made a comment like, even though your disability is not as visible, it’s still just as important as anyone else’s to take care of and so that helps.” Increased information about who is eligible to receive services at

DSS also may be helpful, as many participants reported that they used to think DSS was just for students with physical disabilities.

Another new subtheme identified in this study is that some accommodations are not effective. Some participants mentioned that the accommodations were not helpful or efficient and sometimes even put them further behind in their classes. It is important for DSS providers to make sure SWD are getting the most benefit out of the accommodations they are using. The interviews also indicated that when some accommodations were not effective the participants were less likely to use others. Conversely, if accommodations were beneficial their use was likely to increase. One student mentioned that it would be helpful if DSS providers monitored students' progress and the effectiveness of the accommodations they were using more closely. While this may be beyond the scope of what DSS providers are able to provide, a closer look at accommodations' effectiveness could prove valuable for SWD.

Other implications from this study stem from the newly identified theme, fear of future ramifications, which suggests that a new way of conceptualizing the non-use of accommodations may be in order. Instead of looking at this simply as another barrier that must be eliminated, it may be helpful to consider that, depending on context, use of accommodations sometimes may be detrimental. This suggests that DSS providers may be more effective if they take the student's contextual factors into account and involve the student more in the discussion of whether an accommodation may be helpful for their situation. This falls in line with previous researchers' recommendation that accommodations should be considered on a case-by-case basis (Frank & Wade, 1993; Salzer et al., 2008) rather than taking a one-size-fits-all approach.

In general, these findings have implications for educating college faculty, administrators, and students with and without disabilities more effectively. It seems that the high number of negative experiences participants reported having with faculty could be largely reduced by developing programs aimed at educating faculty about disability legislation, SWD, and accommodations. If faculty are made more aware of the ways they create barriers and what they can do to change that, SWD may be more likely to contact them about their needs and use the accommodations they are entitled to. Similar efforts could target college administrators and students without disabilities. In addition to making them more aware of and able to reduce barriers, the study findings may help all people in college settings be more curious about SWD's experiences and

encourage them to ask what barriers might be standing in the way of these students' college success. Finally, educating SWD about these findings may help them put language to their experiences and to advocate more effectively for useful accommodations, despite the barriers they face.

Further research is needed in several areas. The subtheme of not being disabled enough seemed to depend more on disability type than the other themes and subthemes identified, and to be expressed primarily by participants with emotional or learning disabilities rather than physical disabilities. This suggests that there may be other instances where barriers to accommodation use are a result of disability type.

Potentially rich information about barriers to accommodation use could be gained from studying a population of SWD who are not registered with DSS. Such research could reveal barriers that are simply not part of the experience of students who are aware of and have used DSS.

The results of this study also suggest that it could be beneficial to look at barriers to accommodation use with more complexity and specificity. Future research might focus on determining more specifically when accommodation use would be beneficial and when it truly is not needed or is even detrimental. Conducting such a study could prove difficult, as it would require a closer examination of numerous contextual variables (e.g., disability type, fluctuation of disability condition, choice of classes, accommodation effectiveness, students' future plans and aspirations, etc.). Nevertheless, it could provide DSS providers and SWD with invaluable information that would help them decide if and when to use accommodations.

Another area that should be investigated in future research is the degree to which the "medical model" of disability contributes to SWD's reluctance to use accommodations. While this study focused mostly on intra-personal factors in the decision to not use accommodations, additional research on systemic discrimination and barriers would help to paint a fuller picture of the situations SWD face in postsecondary settings and how negative cultural attitudes impact their decision-making relative to using supports.

Limitations

The students in our sample were attending a large, private, religion-oriented university; were older than the typical college-age undergraduate; and did not include any ethnic minorities, which may affect the generalizability of these results. An example of how the unique characteristics of our sample may have impacted our findings is that many expressed fears about

appearing to be asking for “too much.” While this may be generalizable to other SWD, it also could be attributable to our participants’ religious background. Again, while our participants’ responses may be representative of college students in general, older students may be more willing to ask for accommodations, having had more life experience in doing so. Given that our results come only from the experiences of White students, the unique barriers faced by students of diverse ethnic backgrounds are likely not represented. There is no way to know how much White privilege impacted our participants’ responses. Additional research is needed to better understand the experiences and needs of students from various backgrounds.

Another limitation is the lack of information obtained about our participants’ experiences using accommodations during high school. Without this information, it is difficult to know how much of their reported barriers to accommodation use result from the potentially difficult transition from high school (Section 504/IDEA; goal of success) to college (ADA; goal of access), which requires students to self-advocate.

Although the principle investigator involved professionals and researchers with a background in and knowledge of disability support issues in designing and conducting this study, SWD were not directly involved, which may have left out unique perspectives on students’ accommodation use. There may have been some limitations in the procedure for conducting and analyzing interviews. The primary investigator conducted all of the interviews, analyzed the interviews, and generated themes.

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Table 1

Participant Demographics

NAME (PSEUDONYM)	AGE	GENDER	RACE/ ETHNICITY	DISABILITY TYPE	YEAR IN SCHOOL
Jane	21	F	White/ Caucasian	Emotional (Depression)	Junior
Joe	36	M	White/ Caucasian	Emotional (Anxiety)	Senior
Steve	25	M	White/ Caucasian	Emotional (Depression, Anxiety)	Junior
William	30	M	White/ Caucasian	Physical (Back Injury, Pain, Mobility)	Senior
Rachel	20	F	White/ Caucasian	Chronic Health (Type I Diabetes, Addison's)	Senior
Richard	21	M	White/ Caucasian	Asperger's Syndrome	Senior
Peter	23	M	White/ Caucasian	Learning/Attention/ Emotional (ADHD, Reading, Anxiety)	Senior
Albert	22	M	White/ Caucasian	Emotional (Bipolar, Schizophrenia)	Sophomore
Jennifer	43	F	White/ Caucasian	Chronic Health/Emotional (Fibromyalgia, Anxiety, Depression)	Senior
Jim	23	M	White/ Caucasian	Chronic Health (Cerebral Palsy)	Graduate Student
Ralph	22	M	White/ Caucasian	Learning (Dyslexia)	Freshman
Amy	24	F	White/ Caucasian	Emotional (PTSD)	Senior
Betty	27	F	White/ Caucasian	Attention/Learning (ADHD, Processing Speed)	Graduate Student
Carol	22	F	White/ Caucasian	Physical (Blind)	Senior
Michelle	23	F	White/ Caucasian	Chronic Health (Liver Disease, Hepatitis)	Junior
Dwayne	29	M	White/ Caucasian	Emotional (Bipolar)	Senior

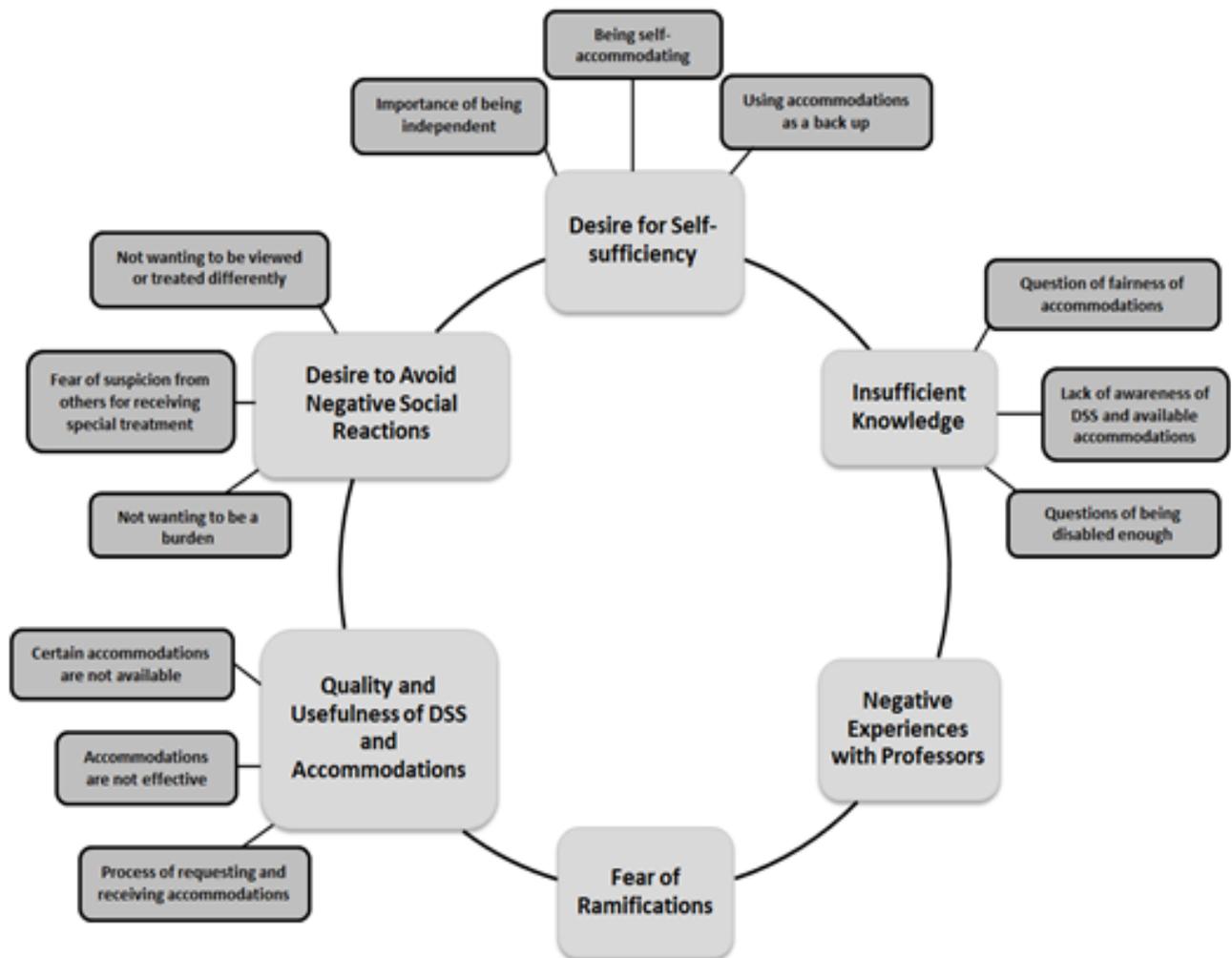
Note. PTSD=post-traumatic stress disorder; ADHD=attention deficit hyperactivity disorder

Table 2

Comparison of Marshak et al. (2010) to the Current Study

Marshak et al. (2010)	Current Study
1. Identity issues <ul style="list-style-type: none"> a. Desire to shed stigma of high school identity b. Desire to not integrate the presence of a disability into their identity c. Desire for self-sufficiency 	1. Desire for self-sufficiency <ul style="list-style-type: none"> a. Importance of being independent b. Being self-accommodating c. Using accommodations as a backup
2. Desire to avoid negative social reactions <ul style="list-style-type: none"> a. Fear of resentment of other students for special treatment b. Not wanting to be singled out 	2. Desire to avoid negative social reactions <ul style="list-style-type: none"> a. Not wanting to be viewed or treated differently b. Fear of suspicion from others for receiving special treatment c. Not wanting to be a burden
3. Insufficient knowledge <ul style="list-style-type: none"> a. Question of fairness of receiving accommodations b. Confusion about accessibility and DSS services c. Lack of training in how to explain their disability to others 	3. Insufficient knowledge <ul style="list-style-type: none"> a. Question of fairness of accommodations b. Lack of awareness of DSS and available accommodations c. Question of being disabled enough
4. Perceived quality and usefulness of services <ul style="list-style-type: none"> a. Expediency of service delivery b. Lack of compatibility with accommodations 	4. Perceived quality and usefulness of DSS and accommodations <ul style="list-style-type: none"> a. Process of requesting and receiving accommodations b. Certain accommodations are not available c. Accommodations are not effective
5. Negative experiences with professors	5. Negative experiences with professors 6. Fear of future ramifications

Figure 1. Accessing and utilizing accommodations themes and subthemes.



Appendix

Semi-Structured Guiding Questions

Will you please describe your overall experience at college?

How has your disability affected your experience at college?

Can you describe your experiences with contacting DSS and requesting accommodations?

What parts of this process were helpful or useful?

What parts of this process were not helpful or useful?

How have your experiences with faculty members been?

How have your experiences with other students been?

How have your experiences with DSS staff been?

Can you describe a specific experience where you felt like you didn't have access to services or accommodations that would have been helpful in your education?

I'm curious about your experience with getting approved for accommodations and then not using one or more of those accommodations. Can you describe this experience for me?

Why do you think other students might not seek out or use accommodations?

If you were in charge of DSS at the college, what would you do differently?

What would you do the same?

What advice would you give to a student with a similar disability, concerning accommodations and services at college?

What question should I have asked, but didn't?

What has this interview experience been like for you?

The Use of Extended Time by College Students with Disabilities

Laura M. Spenceley ¹
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Abstract

College students with disabilities represent approximately 11% of the general college population (U.S. Department of Education, 2013). These students are entitled to a variety of academic accommodations, including extended time to complete tests. Although extended time is frequently requested and granted, little empirical attention has been given to its use for exams taken by students with disabilities in a college classroom sample. The current study sampled records that were collected on all exams completed with extended time during two semesters at a midsize public university in the Northeast. The study explored two broad questions: What portion of typical time and extended time do students with disabilities use to complete exams? How does that use of time vary across common disabilities? Our findings indicated that more than half of the tests administered with extended time were completed within the time given to students in the sample classroom who took the tests. We also found, unexpectedly, that 12.9% of exams were completed in more than the extended time allotted. In this paper we discuss issues disability services providers could consider when making decisions about the provision of extended time and make recommendations for future research.

Keywords: *Extended time, students with disabilities, postsecondary education, test accommodations*

According to recent estimates, approximately 11% of students attending U.S. postsecondary institutions have a disability (U.S. Department of Education, 2013). Those with specific learning disabilities (LD), attention deficit hyperactivity disorder (ADHD), and/or psychological and psychiatric conditions account for the largest proportion of college students with disabilities (Raue & Lewis, 2011). These students are entitled to a variety of academic supports through Section 504 of the Rehabilitation and the Americans with Disabilities Act (ADA). Originally passed in 1990 (PL 101-336), ADA defined disability as a physical or mental impairment that has a substantial impact on a major life activity. The ADA Amendments Act of 2008 (ADAAA) provided a nonexhaustive list of those major life activities, including reading, concentrating, and thinking. Both the original law and the amendments further specify that individuals with disabilities must be

provided reasonable accommodations to access these major educational life activities, including academic accommodations.

Academic accommodations are meant to enable students with disabilities to access academic content and assessments (Goh, 2004). Accommodations can be provided in typical class settings, and under separate conditions. Lovett and Lewandowski (2015) defined test accommodations as modifications to the administration procedures that do not change the test content or the construct being evaluated. Test accommodations can include modifications to the timing and/or scheduling of a test, or to the response format, presentation, or setting (Thurlow, Elliott, & Ysseldyke, 2003). For example, a student with a visual impairment could be given an exam in large-text format to ameliorate the impact of their poor vision while retaining the original test items.

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Students with a variety of disabilities frequently request extended time to complete a test (Lazarus, Thompson, & Thurlow, 2006). Goh (2004) suggested that providing extended time can reasonably be applied in any situation where a student's disability causes them to process the test more slowly than is typical and thus impairs their ability to demonstrate their knowledge or skills. That is, students with LD or ADHD may have difficulty completing speeded tasks secondary to deficits in processing speed (Lewandowski, Cohen, & Lovett, 2013; Lewandowski, Lovett, Parolin, Gordon, & Coddling, 2007), while students with psychiatric impairments may require extended time to complete tests due to psychiatric symptoms or the use of psychotropic medication that impairs their processing speed (Eudaly, 2003).

Although extended time is frequently allowed in postsecondary settings (Bolt & Thurlow, 2004), its use has been debated in the literature. While a comprehensive review is beyond the scope of this discussion (see Lovett & Lewandowski, 2015; Phillips, 1994; Sireci, Scarpati, & Li, 2005), it should be noted that there is evidence to both support and contradict the fairness of extended time. For example, Gregg and Nelson (2010) found that, while extended time often improved the performance of students with and without disabilities, students without disabilities continued to outperform their disabled peers, even when those peers were given accommodations. Moreover, the results of Lewandowski and colleagues' empirical work (Lewandowski et al., 2013; Lewandowski, Lovett, & Rogers, 2008) has consistently shown that extended time improved nondisabled students' performance more than that of students with LD. In contrast, when Lewandowski et al. (2013) compared the results of students with LD who were given extended time to the results of their nondisabled peers given the typical time, students with LD showed a stronger performance than their nondisabled peers. These findings are certainly troubling, as they reveal that extended time may threaten the validity of test results by giving some students an unfair advantage.

Despite this spirited debate on the fairness of providing extended time in the college environment, the literature has given far less attention to the actual use of accommodations, and extended time specifically. In an experimental setting, Wadley and Liljequist (2013) found that, in a sample of college students with and without ADHD, both groups used less than the typical time and the extended time to complete a math task. Similarly, Cahalan-Laitusis, King, Cline, and Bridgman (2006) reported that individuals with LD and/or ADHD tended to use less than 25% of the

extended time allotted when taking the Scholastic Aptitude Test (SAT); however, the time used was noted to vary by task type. For example, students with disabilities used approximately 4% more time than their nondisabled peers to complete writing tasks but 14% more on mathematics tasks and 25% more on critical reading tasks. Although Lewandowski and colleagues (Lewandowski et al., 2007; Lewandowski et al., 2008; Lewandowski et al., 2013) shortened the standardized test administration time to eliminate ceiling effects, it cannot be assumed that the results from a standardized measure of reading administered in laboratory setting would generalize to content-rich tests administered in the classroom, with or without extended time. In fact, few studies have evaluated the extended time students with disabilities use to take tests in college courses. Stewart, Systma, Panahon, and Schreiber (2014) reviewed test logs provided by a university's office of disability services and found that, on average, students with disabilities used about the same amount of time to complete tests as their peers, regardless of how much extended time was allotted. Unfortunately, Stewart et al. aggregated data, thus limiting the opportunity for a specific exploration of the time used based on the type of disability and on the extended time allotted.

Despite concerns that the use of extended time on college campuses may give some students an unfair advantage and negatively influence the validity of test scores, few studies have explored how students with disabilities use extended time accommodations by disability type. Our primary goal in the current study was to expand the work of Stewart et al. (2014) to address two general research questions: What portion of typical time and extended time do students with disabilities use to complete exams? How does that use of time vary across disabilities common in the college population, such as LD, ADHD, and autism spectrum disorder? Given the lack of previous data to support empirical hypotheses, we sought to explore these questions descriptively to promote a more comprehensive understanding of the students who may be most likely to both under and over utilize the extended time accommodation.

Method

Prior to collecting data, all our procedures for the current study were approved through the campus institutional review board. We then gathered time data from the spring 2014 and fall 2014 semesters from archival records kept by the Office of Disability Support Services (DSS) at a midsize public university in the Northeast. These data were collected at the time

students with disabilities were presented to the DSS office to take a test with extended time. The records included the student name and the course name and number; the time the exam began and ended; support materials allowed, such as notes, calculators, and/or books; special notes from the instructor, such as whether the test-taker was given a 10-minute **extended** time limit rather than the entire class period. It was typical practice for the DSS office to collect these records in order to monitor exams completed under extended time conditions.

The authors then confirmed, through the archival records, the length of the class in which each test was taken with no specific time limit (as mentioned above). The accuracy of the time allotted and the time used to complete each test was verified prior to the data analysis through the following procedure. The two authors divided the time records between them and entered the total time allowed and utilized (in minutes) for each record. The authors then confirmed each other's data; when disagreements arose, the authors confirmed the time allotted and/or recalculated the time used, and agreed on the data before entering it. Time records that did not include a start time, end time, or course name/number were removed from the sample ($n = 52$).

Once we confirmed the data on time use, we calculated the proportion of time used (in minutes) out of the total class time allotted (in minutes) for each test administered. We then calculated the **percentage** of extended time allowed by multiplying the class time allowed by the extended time granted (either 1.5 [50% extended time] or 2.0 [100% extended time]) to obtain the total amount of time allowed for each test taken with extended time. We also created a categorical variable to reflect the proportion of class time used: up to 100% of class time, 101%-110% of class time, 111%-125% of class time, 126%-150% of class time, 151%-175% of class time, 176%-200% of class time, and >200% of class time. We selected these intervals because they align with the current standard of allotting either 50% or 100% more time than the class receives; they also provide more a more nuanced understanding of the patterns of time use.

The primary authors collected demographic information, including age, class standing, disabling condition, and amount of extended time allotted (1.5 or 2.0), from each participant's file and confirmed it using the same verification procedure as for time use data: The two authors divided the student records between them and noted each participant's age, class standing, disabling condition, and amount of extended time allotted. The authors then confirmed each other's information; when disagreements arose, the authors

verified the information by reviewing the student's record together.

The final sample included 1,093 unique exams completed by 187 individuals. The mean age of the sample was 22.01 years ($SD = 4.62$, range = 18-52 years). The sample included a nearly equal proportion of males (49.77%) and females (50.22%). Learning disabilities were the most frequent educational disability recorded (37.88%), followed by ADHD (23.88%) and multiple disabilities (13.36%). The greatest proportion of our sample were college juniors (33.76%), followed by seniors (28.27%), freshmen (21.41%), sophomores (16.38%), and graduate students (.18%). Of the sample, 605 exams (55.35%) were taken with 1.5 extended time and 488 (44.65%) were taken with 2.0 extended time.

Results

We utilized descriptive data analyses to answer our primary research questions. We began by exploring the general pattern of time use across the sample of tests taken with extended time by disability group, as presented in Table 1. We found that, on average, students who completed tests under extended time conditions used 103.18% of class time and 60.44% of the extended time allotted. Individuals with psychiatric disabilities used nearly 25% more than the class time allotted to complete their tests, while individuals with visual disabilities completed their tests in approximately 27% less than the time allotted in class. Individuals with LD and visual and medical disabilities on average completed the tests within the time allotted in the classroom. Across disability groups, we found individuals with physical (59.65%) and psychiatric (58.75%) disabilities used the greatest proportion of any extended time allotted to complete their tests, while individuals with medical (0%) and visual (21.88%) disabilities used the smallest portion of extended time allowed to complete their tests.

1.5 Extended Time

To further explore the amount of time used by individuals with disabilities to complete tests taken under extended time conditions, we split the dataset by tests taken with 1.5 and with 2.0 extended time (Table 1). For exams taken with 1.5 extended time ($n = 605$), the mean class time used was 96.11% ($SD = 55.73\%$), which indicates that, on average, exams were completed within the time allotted in the classroom. ; the mean extended time used was 64.03% ($SD = 37.13\%$). As displayed in Table 1, individuals with psychiatric disabilities on average used the highest percentage of class time (124.70%), while individuals with visual

disabilities on average used the lowest percentage of class time (73.36%).

Our analysis of the categorical variable of time used helps further explain patterns of time use by disability type (Table 2). Within the sample of exams taken with 1.5 extended time ($n = 605$), the majority ($n = 354$, 58.51%) were completed within the time given in the classroom. Of these 354 exams, LD ($n = 122$, 34.46%) and ADHD ($n = 101$, 28.53%) were most frequently represented. Of the sample of individuals with LD ($n = 185$) and ADHD ($n = 175$) given 1.5 extended time, the majority were able to complete the test within the time given in the classroom (65.95% and 57.71%, respectively). All individuals with medical disabilities were able to complete tests taken with 1.5 extended time within the time given in the classroom.

Of the individuals who used at least some of the extended time granted ($n = 251$), the largest proportion ($n = 89$, 35.46%) completed their tests within 126%-150% of class time, indicating that, when individuals with disabilities began to use their extended time to complete their test, approximately one-third completed it with 26%-50% more time than that given in the classroom. Across disability groups, individuals with ADHD most frequently used any portion of extended time (29.58%). Within specific disability groups, individuals with psychiatric diagnoses (60.71%) most frequently used any portion of extended time, while no individuals with medical diagnoses used any portion of extended time. We found that 16.53% ($n = 100$) of students who completed exams with 1.5 extended time used more than the time allotted. Of these, the most frequently represented disabilities were ADHD ($n = 27$, 35.06%) and psychiatric diagnoses ($n = 15$, 19.48%).

Extended Time 2.0

For the individuals who took exams with 2.0 extended time ($n = 488$), the average class time used was 111.96% ($SD = 62.83\%$), indicating that students given 2.0 extended time used more than the allotted class time, as presented in Table 1. On average, individuals with multiple disabilities used the most class time (140.99%) to complete exams, while individuals with visual disabilities used the least (97.00%).

As seen in Table 3, nearly a majority of the exams taken with 2.0 extended time were completed within the time allotted in the classroom ($n = 243$, 49.80%); LD was the most frequently represented disability ($n = 140$, 57.61%). Of these, the most frequently represented disabilities were ADHD ($n = 38$; 38.00%) and psychiatric diagnoses ($n = 21$; 21.00%).

For individuals who used at least a portion of the extended time allotted ($n = 245$), the largest portion (n

$= 61$, 12.50%) completed their tests within 126%-150% of the time allotted in the classroom. Across groups, individuals with LD ($n = 89$) represented the largest percentage of the sample (36.33%) that used any portion of extended time. Within disability groups, more than two-thirds (67.44%) of the individuals with multiple disabilities ($n = 29$) used more than the class time allotted, followed by individuals with ADHD, who used 63.95% ($n = 55$) of the extended time allotted. Forty-one (8.40%) completed their tests beyond the extended time allotted; the most frequently occurring disability among those individuals was LD ($n = 12$, 29.27%).

Discussion

The current study was designed to explore the extended time use patterns of college students with disabilities. We sought to expand the work of Stewart et al. (2014) to better understand the amount of students with disabilities use extended time to complete tests, and how these patterns vary across disabilities.

Our results revealed that a majority (54.62%) of students with disabilities who took tests under extended time conditions completed them in the time allotted in the classroom, irrespective of the amount of extended time allotted. These findings echo those of Cahalan-Laitusis et al. (2006) and Stewart et al. (2014), who found that when tests are administered with additional time, the majority of students with disabilities are able to complete the tests within the time given in the classroom. Across disability groups, we found that, on average, individuals with LD, visual disabilities, and medical disabilities were able to complete tests within the time allotted in the classroom, regardless of whether the tests were taken with 1.5 or 2.0 extended time. Furthermore, fewer than half of the individuals with LD, ADHD, visual disabilities, and medical disabilities used any extended time when taking tests.

Although these findings are noteworthy, some authors have suggested that providing extended time during testing reduces students' anxiety, frustration, and stress, in addition to allowing them sufficient time to access content and demonstrate their skills. For example, Elliott and Marquart (2004) found that middle school students with and without disabilities reported being more relaxed when taking a math test with extended time. Lang et al. (2005) found that students with and without disabilities reported being more comfortable taking tests under extended time conditions, and students with disabilities were more likely to report that taking tests was easier when given extended time. Another study found that high school and college students with and without disabilities perceived

that taking a test with 1.5 extended time would benefit their performance (Lewandowski, Lambert, Lovett, Panahon, & Sytsma, 2014). Given that anxiety, fatigue, motivation, and perceived likelihood of success may influence all student' test performance, providing an accommodation solely to reduce the impact of these factors could seriously threaten the validity of scores, especially in the absence of disability-related functional impairment (Ofiesh & Hughes, 2002).

Although the majority of individuals in the current study completed tests within the time given in the classroom, we found that nearly 17% who used 1.5 extended time and approximately 8% who used 2.0 extended time needed even more time than that allotted under the extended time conditions. We find these data concerning, given their potential impact on the validity and comparability of scores on tests taken under typical rather than extended time conditions. Scores on high-stakes exams like the SAT that were taken with extended time accommodations have been shown to have weaker predictive validity (Cahalan, Mandinach, & Camara, 2002) than those taken under typical conditions. Furthermore, Thornton, Reese, Pashley, and Dalessandro (2002) found that scores on the Law School Admission Test earned under extended time conditions tended to over-predict first-year law school performance for students with ADHD, LD, neurological impairment, and visual impairment. Although these findings indicate differential predictive validity in accommodated versus typically administered high-stakes tests, it is important to note that there is far less research on the impact extended time has on the validity of classroom test scores.

In a similar line of criticism, some have questioned whether test scores earned under extended time conditions are comparable to scores earned under typical time conditions. In a college sample, Lewandowski et al. (2013) found that, when students with LD were given doubletime to take tests, they were able to access more test items than nondisabled students taking the same test under typical time conditions. Practically speaking, this suggests that the scores of students who take tests under extended time may not be comparable to those who take the same test in the classroom. Given that approximately 12% of the students in the current study used even more than the extended time allotted, we emphasize the potential threat to the validity of test scores when students are given additional time to complete tests beyond the extended time accommodation.

In conjunction with the recommendations from Lewandowski et al. (2013) and other researchers (Ofiesh & Hughes, 2002; Ofiesh, Hughes, & Scott, 2004), our findings suggest that, when accommodating college stu-

dents with disabilities, we may need to provide smaller increments of extended time to balance their need for access to test content with the need to avoid creating an unfair advantage. In the current study, approximately 69% of tests administered with 1.5 extended time and 61.50% of tests administered with 2.0 extended time could have been completed with 25% extended time. While there is some research (see Ofiesh, 2000; Ofiesh, Mather, & Russell, 2005; Lovett & Leja, 2015) to suggest that measures of processing speed, retrieval fluency, and executive functioning may help identify individuals who will and will not benefit from extended time, the skills that best inform the allotment of extended time in a postsecondary setting, and the corresponding measures of these skills, have not been sufficiently explored. Absent additional research on the salient factors that can help inform the appropriate provision of extended time, such as processing speed or reading ability, we recommend that readers consider the relevant accommodation guidelines for each individual student, making sure to balance access with fairness.

While the current study is among the first to explore the use of extended time in an ecologically valid setting, it is important to consider the limitations of the data. We utilized archival data collected at the time each exam was given. We included all tests taken under extended time conditions, which ranged from brief quizzes to examinations. Given the diverse difficulty, content, and response formats of the tests, we cannot generalize our findings to a specific test or examination. Despite this limitation, our data support the findings of other studies (Stewart et al., 2014; Wadley & Liljequist, 2013) that a large portion of students who are given extended time do not use this accommodation to complete their tests. Although our sample included students with a variety of disabilities, we did not have equal representation across disability categories, which further limits the generalizability of our findings. Furthermore, we did not have access to the time use of nondisabled students enrolled in the same courses as our disabled sample who took tests under typical time conditions; thus it is impossible to determine the extent of the relationship between use of time, performance, and disabling condition. Finally, our findings were taken from exams completed during two semesters at one midsize public university. Differences in the admissions requirements and general academic standards across college campuses may prevent these data from being generalized to all schools.

Despite the limitations of the study, our findings are among the first to demonstrate the patterns of time use for college students with disabilities who were provided extended time accommodations to complete

classroom examinations. Our results provide evidence that students with disabilities may be able to access test content in less time than they are provided. Given the threats to the validity of scores on tests taken with accommodations, more research is needed to fully understand how extended time influences performance on classroom tests administered to students with and without disabilities both with and without this accommodation. Until then, we recommend that disability services providers continue to work to balance all students' right to access academic content without providing unnecessary accommodations that may produce an unfair advantage.

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Table 1

Mean and Standard Deviation of Percentage Time Utilized by Time Allotted and Disability

	1.5 Extended Time			2.0 Extended Time			Overall Sample		
	<i>n</i>	Class Time (<i>SD</i>)	Extended Time	<i>n</i>	Class Time (<i>SD</i>)	Extended Time (<i>SD</i>)	<i>N</i>	Class Time (<i>SD</i>)	Extended Time (<i>SD</i>)
LD	185	85.83 (50.50)	57.22 (33.67)	229	97.52 (56.24)	48.76 (28.12)	414	92.30 (54.00)	52.54 (30.97)
ADHD	175	100.61 (62.91)	67.07 (41.94)	86	123.69 (63.94)	61.84 (31.97)	261	108.21 (64.06)	65.35 (38.95)
ASD	28	107.30 (43.04)	71.53 (28.69)	40	119.60 (78.69)	59.80 (39.34)	68	114.53 (66.24)	64.63 (35.89)
PSY	56	124.70 (65.11)	83.13 (43.40)	53	124.67 (60.54)	62.33 (30.27)	109	124.68 (62.64)	73.02 (38.86)
Visual	22	73.36 (34.59)	48.91 (23.06)	10	97.00 (63.92)	48.50 (31.96)	32	80.75 (46.05)	48.78 (25.63)
Physical	30	113.93 (45.32)	75.12 (29.87)	27	120.09 (54.89)	60.05 (27.45)	57	116.85 (49.72)	67.98 (29.49)
Medical	6	73.60 (23.15)	49.07 (15.43)	0	--	--	6	73.60 (23.15)	49.07 (15.43)
Multiple	103	89.30 (49.17)	59.54 (32.78)	43	140.99 (68.22)	70.49 (34.11)	146	104.53 (60.06)	62.76 (33.43)
Total	605	96.11 (55.73)	64.03 (37.13)	488	111.96 (62.83)	55.98 (31.41)	1093	103.18 (59.50)	60.44 (34.91)

Note. LD=Learning Disability; ADHD=Attention Deficit Hyperactivity Disorder; ASD=Autism Spectrum Disorder; PSY=Psychiatric Disability

Table 2

Percentage of Tests Completed within Time Intervals by Disability for 1.5 Extended Time

Class Time	Disability								
	LD (n=185)	ADHD (n=175)	ASD (n=28)	PSY (n=56)	Visual (n=22)	Physical (n=30)	Medical (n=6)	Multiple (n=103)	Total (n=605)
Up to 100%	65.95 (n=122)	57.71 (n=101)	42.86 (n=12)	39.29 (n=22)	86.36 (n=19)	43.33 (n=13)	100 (n=6)	57.28 (n=59)	58.51 (n=354)
101-110%	6.49 (n=12)	4.00 (n=7)	10.71 (n=3)	1.79 (n=1)	0 (n=0)	10.00 (n=3)	0 (n=0)	5.82 (n=6)	5.29 (n=32)
111-125%	5.41 (n=10)	1.41 (n=2)	7.14 (n=2)	3.57 (n=2)	0 (n=0)	6.67 (n=2)	0 (n=0)	11.65 (n=12)	4.96 (n=30)
126-150%	13.51 (n=25)	15.43 (n=27)	17.86 (n=5)	17.86 (n=10)	13.63 (n=3)	16.67 (n=5)	0 (n=0)	13.59 (n=14)	14.71 (n=89)
151-175%	3.24 (n=6)	9.71 (n=17)	21.43 (n=6)	16.07 (n=9)	0 (n=0)	13.33 (n=4)	0 (n=0)	7.77 (n=8)	8.26 (n=50)
176-200%	2.70 (n=5)	5.71 (n=10)	0 (n=0)	10.71 (n=6)	0 (n=0)	6.67 (n=2)	0 (n=0)	3.88 (n=4)	4.46 (n=27)
>200%	2.70 (n=5)	6.29 (n=11)	0 (n=0)	10.71 (n=6)	0 (n=0)	3.33 (n=1)	0 (n=0)	0 (n=0)	3.80 (n=23)

Note. LD=Learning Disability; ADHD=Attention Deficit Hyperactivity Disorder; ASD=Autism Spectrum Disorder; PSY=Psychiatric Disability

Table 3

Percentage of Tests Completed within Time Intervals by Disability for 2.0 Extended Time

Class Time	Disability							
	LD (n=229)	ADHD (n=86)	ASD (n=40)	PSY (n=53)	Visual (n=10)	Physical (n=27)	Multiple (n=43)	Total (n=488)
Up to	61.14	36.05	47.50	43.40	60	37.04	32.56	49.78
100%	(n=140)	(n=31)	(n=19)	(n=23)	(n=6)	(n=10)	(n=14)	(n=243)
101-	5.68	2.33	5.00	5.66	0	0	2.33	4.30
110%	(n=13)	(n=2)	(n=2)	(n=3)	(n=0)	(n=0)	(n=1)	(n=21)
111-	7.42	9.30	2.50	5.66	10	14.81	4.65	7.38
125%	(n=17)	(n=8)	(n=1)	(n=3)	(n=1)	(n=4)	(n=2)	(n=36)
126-	8.73	22.09	2.50	15.09	10	18.52	16.28	12.50
150%	(n=20)	(n=19)	(n=1)	(n=8)	(n=1)	(n=5)	(n=7)	(n=61)
151-	4.37	6.98	10.00	5.66	0	14.81	4.65	5.94
175%	(n=10)	(n=6)	(n=4)	(n=3)	(n=0)	(n=4)	(n=2)	(n=29)
176-	7.42	13.95	12.50	16.98	20	7.41	23.26	11.68
200%	(n=17)	(n=12)	(n=5)	(n=9)	(n=2)	(n=2)	(n=10)	(n=57)
>200%	5.24	9.30	20.00	7.55	0	7.41	16.28	8.40
	(n=12)	(n=8)	(n=8)	(n=4)	(n=0)	(n=2)	(n=7)	(n=41)

Note. LD=Learning Disability; ADHD=Attention Deficit Hyperactivity Disorder; ASD=Autism Spectrum Disorder; PSY=Psychiatric Disability

Collaborative Writing in the Postsecondary Classroom: Online, In-Person, and Synchronous Group Work with Deaf, Hard-of-Hearing, and Hearing Students

Sara Schley¹

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Abstract

This project investigated the use of alternate methods of classroom interaction and communication to foster collaborative learning in diverse classrooms. Deaf, hard-of-hearing (DHH), and hearing students taking a graduate course in teacher education participated in lab sessions where interactions occurred via articulated speech and/or sign language and text-based chat interactions. The students interacted further using a collaborative tool to co-construct a group document. Results suggest that including this kind of tool in the classroom can significantly increase access to collaborative learning opportunities for students with a variety of special needs. While this study used DHH and hearing students who worked together in groups as the test case, the findings may be applicable to other groups with communication or language difficulties.

Keywords: Collaborative writing, cooperative learning, online technology, deaf, postsecondary education

Cooperative group learning is one of the most widely used and effective teaching strategies in the field of education (Felder & Brent, 2007; Johnson, Johnson, & Stanne, 2000; Smith, Sheppard, Johnson, & Johnson, 2005; Springer, Stanne, & Donovan, 1999; Terenzini, Cabrera, Colbeck, Parente, & Bjorklund, 2001). Unfortunately, many students with communication and learning disabilities, as well as students who are English language learners, often face barriers to full participation during group learning opportunities, which results in their being isolated and having lower levels of academic success. This project investigated the use of alternate methods of classroom interaction and communication to foster collaborative learning in diverse classrooms. Deaf, hard-of-hearing (DHH), and hearing students taking a graduate course in teacher education participated in lab sessions where classroom interactions occurred via articulated speech and/or sign language, and text-based chats. They interacted further using a collaborative tool to co-construct a group document. The results suggest that including this kind of

tool in the classroom can significantly increase access to collaborative learning opportunities for students with a variety of special needs. While this study used DHH and hearing students who worked together in groups as the test case, the findings may be applicable to other groups with communication or language difficulties.

Today's teachers are challenged by the need to instruct learners who have a variety of skills, languages, and cultural backgrounds. This variety is due in part to the increasing presence of students with disabilities in general education K-12 classrooms (Wolford, Heward, & Alber, 2001), including a large percentage of students who are DHH. For example, in fall 2011, 74% of all students classified as having a hearing impairment and receiving services through the Individuals with Disabilities Education Act (IDEA) spent at least 40% of their school day in a general (not special) class in a regular elementary or secondary school (National Center for Education Statistics, 2015). The proportion of DHH students in mainstream classes at the postsecondary level is even greater (Richardson, Marschark,

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Sarchet, & Sapere, 2010). This study addressed the following question: Does adding online opportunities for collaborative interaction help level the playing field for diverse learners? Findings for groups that included both DHH and hearing students may be applicable to other groups whose members have diverse communication characteristics, such as students with a learning disability.

The current supports available for DHH students are inadequate. These services include frequency-modulated systems, personal hearing devices/hearing aids, sign language interpreting, cued speech and/or oral interpreting, note-taking, and real-time speech-to-text classroom captioning (Hastings et al., 1997; Schick, 2008; Stinson, 2010). Despite this array of services, there is concern about whether DHH students are fully able to participate in classroom instruction and discussion, due to their communication challenges (Garrison, Long, & Stinson, 1994; Saur, Layne, Hurley, & Opton, 1986). DHH students in general education classes on average are able to progress and demonstrate greater academic proficiency than DHH students in other educational settings. However, these students still lag behind their hearing peers on a variety of academic measures (Antia, Jones, Luckner, Kreimeyer, & Reed, 2011; McCain & Antia, 2005; Thoutenhoofd, 2006).

In terms of class participation, DHH students were observed to participate in class less frequently than their hearing peers, and they reported difficulty participating in class (Garrison et al., 1994; Saur, Popp-Stone, & Hurley-Lawrence, 1987; Stinson, Liu, Saur, & Long, 1996). One factor in this difficulty is the rate at which information is presented in the classroom. Since interpreted communication lags behind the original communication, keeping up with the flow of conversation is challenging, and DHH students often respond to questions posed to the class later than expected, or inappropriately (Saur et al., 1986). Moreover, during classroom discussion there is rapid turn-taking and frequent interruptions, and whether a student relies only on oral speechreading or on a combination of that and sign language, it is challenging for them to follow these general classroom interactions (Stinson et al., 1996).

Ease of communication is arguably an important factor in academic success. If it is difficult to participate in the classroom (e.g., due to the speed of presentation and/or turn-taking during discussion), students may adopt a passive nonparticipatory approach, or at least may appear to be passive, which is associated with lower academic achievement (Braeges, Stinson, & Long, 1993). Long, Stinson, and Braeges (1991) found a strong positive relationship between self-reports of ease of communication, academic engagement, and

academic achievement, including language, mathematics, and science, as per standard achievement scores (see also Antia, Sabers, & Stinson, 2007).

Given the ongoing unsatisfactory state of education for these students, there is a critical need to find better ways to support them (Stinson & Antia, 1999; Stinson & Kluwin, 2011; Wagner, Newman, Cameto, & Levine, 2006). One particular classroom situation where these students need more effective support that has received little attention is engaging in collaborative activities, such as working in groups. Collaborative work occurs regularly at the elementary, middle school, and secondary levels and often at the postsecondary level as well, such as in a science laboratory (Antil, Jenkins, Wayne, & Vadasy, 1998; Cohen, 2002; Lunetta, Hofstein, & Clough, 2007; Puma, Jones, Rock, & Fernandez, 1993). In addition, learning in the 21st century requires students to collaborate more and more in order to deal with the explosion of digital information (American Management Association, 2013; Anderson-Inman, 2009; Association for Career and Technical Education, National Association of State Directors of Career Technical Education Consortium, & Partnership for 21st Century Skills, 2010).

Collaboration is a strategy that has proven effective in promoting deep, meaningful learning. One example is having an intense discussion while developing a strategy to solve a problem (Cohen, Brody, & Sapon-Shevin, 2012; Esmonde, 2009; Pintrich, Marx, & Boyle, 1993; Shuell, 1996). Successful instructional approaches that include substantial student collaboration include problem-based learning (Herreid, 1994; Markowitz, DuPré, Holt, Shaw-Ree, & Wischnowski, 2006) and process-oriented guided-inquiry learning. In problem-based learning, students work through materials to develop solutions (Herreid, 1994). When these students collaborate, they usually do so in small groups with two to seven members (Cohen, 2002). In process-oriented guided-inquiry learning, students work in self-managed teams of typically three to five learners while the instructor serves as a facilitator. The learning cycle within these groups consists of exploration, concept invention, and application (Hanson, 2006; Moog & Spencer, 2008; Moore, Black, Glackin, Ruppel, & Watson, 2015).

Collaboration is challenging for DHH students, for various reasons. Although these students can use a support service (e.g., an interpreter) to access the comments of hearing class members, issues such as the processing time between when a hearing student finishes talking and when the service provider finishes conveying the message frequently limit the DHH student's participation. Unfortunately, direct commu-

nication between DHH and hearing students is often difficult and makes participation by all members of the group a challenge. For example, observation of mixed groups of DHH and hearing members indicates that, in small groups, hearing members often communicate directly with each other instead of through a service provider (Stinson & Liu, 1999). This makes it difficult for the DHH member because they usually cannot understand all of the spoken communication, while the hearing members may not be able to understand the DHH member's speech and usually do not know the sign language DHH students often use to communicate. Furthermore, an interpreter is often not immediately available (Stinson & Liu, 1999). Therefore, it is important for educators to find better ways to support communication and learning when students with disabilities and other students collaborate.

Marchetti, Foster, Long, and Stinson (2012) have been exploring ways to increase the interaction and participation of groups that include DHH and hearing students in introductory statistics courses, such as requiring the use of whiteboards by small groups while solving statistics problems. They also tried using tablet computers, and thus compared a low-tech and a high-tech solution to promoting communication in the classroom between students with diverse abilities. Both solutions (whiteboards and tablets) ameliorated some of the communication challenges. Both hearing and DHH students said they liked using the whiteboards: "I was able to see others work and understand the concept better related to the topic" (p. 55) and "Using the whiteboard made working in the group a much more open experience, and people were more driven to pay attention and be involved with work" (p. 55).

Learning styles also impact classroom communication and collaboration (Lang, Stinson, Kavanagh, Liu, & Basile, 1999; Lynn, Connelly, Ross, & Schley, 2015). Strictly speaking, "learning styles" are students' preferences (rather than abilities per se) about the type of assignments a course requires, how information is presented, how they think about and process information, and how they prefer to relate to others (Grasha, 1990). The Grasha-Reichmann Student Learning Style Scales (Grasha, 1982; 1996; Reichmann & Grasha, 2010) is a 60-item survey about students' preferences regarding their motivation to think and learn (independent versus dependent), their interactions with peers and instructors (collaborative versus competitive), and their engagement with classroom activities and experiences (avoidant versus participant). Lang et al. (1999) and Lynn et al. (2015) compared postsecondary DHH students' learning styles to those of hearing students. There is some evidence to suggest that stu-

dents with a participative learning style (e.g., "I am interested in learning things in this course" versus "I study only enough to pass") fare better on measures of using class resources, interest in the course, and course grade (Lang et al., 1999). While learning styles were not the focus of the present study, these different styles of approaching the task of learning in class and in groups could arguably be a factor here. Given the impact communication challenges have on actual participation, DHH students could benefit from increased communicative and participative options.

Components of online and/or blended learning can extend options for interaction about course materials and topics. When comparing students in blended learning courses (i.e., that include both online and in-class components) who are DHH, hearing, and English language learners, Long, Vignare, Rappold, and Mallory (2007) found that DHH students in particular perceived that both the quality and quantity of their interactions with their peers and instructors were greatly improved by including an online component. By including online discussion boards and other online tools, the DHH students had another option for interacting with the course materials, their professor, and other students: using online text. This mitigated some of their classroom communication challenges: They could communicate directly (rather than via an interpreter, for example), and they had time to compose their contributions (rather than being "on the spot" in a classroom). In some important ways, this helped level the playing field in terms of ease of communication between DHH and hearing students.

This study examined collaboration in groups with DHH and hearing members from two perspectives: postsecondary education and teacher training. By working with students enrolled in a special education teacher-training program (i.e., future teachers of DHH students, in either a DHH school or program, or in a regular education program; although arguably this kind of pedagogy would benefit a wide range of students), we hoped to help them become skilled at using effective collaborative learning tools and techniques. We were specifically interested in adding synchronous communication to the classroom using print/text modalities as a medium of instruction in order to increase communication options and opportunities. We added three "lab assignments" to the syllabus, which required students to use in-person conversation, text conversation, and online collaborative documents to research a topic and develop a presentation.

Method

Participants

The participants included 55 students registered in two sections of a course in a DHH education teacher preparation program (for Year 1, 19 students were enrolled; for Year 2, 20 were enrolled in one section, 16 in another). The course, titled Psychology and Sociology of Deaf Students, examined psychological, sociological, and cultural issues in the context of the development of DHH students enrolled in kindergarten through 12th grade. Course objectives included examining the relationship between psychological and sociological theories and practices; generating appropriate applications of theory to practice, including applications regarding learning, cognitive development, and school socialization; identifying and analyzing educational issues and approaches that foster appropriate cognitive, affective, and behavioral development of DHH children; and understanding methodological issues that arise when doing research with DHH people.

Materials and Procedures

Assignments for the course included in-class quizzes on readings, K-12 classroom observations across a variety of DHH educational settings, a written observation report, a series of online assignments (interview summary, article review, presentation outline), class presentations, and three computer lab-based “mini projects,” which are the focus of this article. Each collaborative group had three to five students and required them to do a focused assignment using web resources, online collaboration (in print and in person), and a brief presentation to the class at the end of the lab session. While there are many ways to design cooperative learning within a classroom (see Slavin, 2010), we adopted a group investigation approach to develop inquiry, group discussion, shared planning, and shared presentation skills.

Google tools (Google Documents, Google Chat—a text-based chat system in Gmail¹) were the communication and collaboration forms selected for these assignments. Free Google accounts were available (most students already had one before these lab sessions started), and students for the most part were comfortable with the platform. When we first conducted these lab sessions, video chat was cumbersome on a wireless connection and Google Hangouts did not yet exist. Students were introduced to the collaborative document and text chat features, and they were required to use at least text chatting (Google Chat) and collaborative document construction (Google Documents). Groups could also use ASL signing and/or spoken English as they chose.

The collaborative groups included a mix of DHH and hearing students. Group members changed for each of the three lab assignments. Overall, 46% of the students were DHH (thus, 54% were hearing). About half of the DHH students preferred signing without voice, and about half preferred relying at least in part on the spoken channel. About half of the hearing students were fluent in ASL and about half were newer learners. While hearing status and communication preferences were not controlled within each group, students in each group had a variety of communication preferences and usually a variety of hearing statuses.

Lab sessions. The three lab sessions included the following details, directions, and sample sizes.

Lab 1: Deaf culture lesson. Students were asked to integrate materials and resources on Deaf culture. Each group was assigned a different topical area: famous deaf people, ASL poetry/theater, and deaf artists. Several websites for each topic were distributed to students. Students had to review the topic areas, identify resources to use in teaching, and present curricular ideas and resources with the entire class. This study examined Google Documents for six groups from Year 1 and five groups from Year 2 (an additional group from Year 1 declined informed consent; following IRB protocol we did not ask why). This study analyzed Google Chats from three groups for Year 1 and four groups for Year 2.

Lab 2: Learning, cognition, and teaching web resources. Students were divided into four groups. Each group was given a specific topic about learning, cognition, and teaching, along with a specific website (the four websites were: www.inspiration.com, <http://www.strategytools.org>, <http://readwritethink.org>, and <http://learnweb.harvard.edu/ALPS>; the latter website is no longer active). Each group was charged with reviewing the website, exploring the potential applications to the classroom, and sharing their analysis and review with the class. These websites were selected because they illustrated how principles of cognitive development and learning apply to instructional materials that are used to teach students, and because they provided tools for facilitating active visual learning. These sites are relevant to working with DHH students because they all involve visual approaches to learning, such as mapping ideas, and these students often respond positively to visual instructional materials (Power & Leigh, 2011). This study examined Google Documents for five groups from Year 1 and five groups from Year 2 (an additional group from Year 1 declined informed consent). This study analyzed Google Chats from five groups for Year 1 and four groups for Year 2.

Lab 3: Suggestions for parent resources. Four groups of students tackled a list of seven websites (<http://deafchildren.org>, <http://www.gallaudet.edu/clerc-center/our-resources/for-families.html>, <http://www.ncbegin.org/>, <http://www.handsandvoices.org>, <http://www.nichcy.org/FamiliesAndCommunity/Pages/Default.aspx>, <http://www.pacer.org/publications/taAlliance.asp>, <http://infoguides.rit.edu/dsa>), and developed a set of topics they deemed of interest to parents of DHH children along with suggestions for these parents. These sites were selected because they contained information that was relevant to issues that teachers of the deaf seemed likely to discuss with parents of DHH children, such as communication methods for DHH children and developing an individualized education program. This study included Google Documents for five groups from Year 1 and seven groups from Year 2 (an additional group from Year 1 declined informed consent). This study analyzed Google Chats from nine groups for Year 1 and two groups for Year 2.

Eight chat sessions that lasted less than five minutes were excluded from the analysis, as they were “mis-starts” and consisted of only a couple of lines, where multiple students in a group had initiated a chat session that was abandoned.

Data Collection

The Google Chat and Google Document sample sizes varied somewhat across the two study years and across the three labs in each year. The primary reason for this was because student groups sometimes started more than one chat session. This usually was due to multiple chats occurring between pairs of students within the groups. The authors made the analytic decision to include all chat sessions in the analyses, since the analytic goals were to see how students used these tools and how much text they created using Google Chat tools. Similarly, student groups occasionally produced more than one Google Document. When this happened, it was because students created one document that included notes for what they wanted to include in the presentation, and a second document was the presentation itself. In these cases, the documents were considered jointly while coding and counted as a “presentation.”

For each lab session, students were asked to explore websites on their own for approximately 20 minutes, then to meet as a group and brainstorm ideas, combine information into a presentation document, and present to the entire class. They were encouraged to converse using ASL and/or spoken English, Google Chat, and to use Google Documents to work collaboratively on the presentation document. They were al-

lowed to work with any Google Document format that they liked—word processing, presentation, etc.—thus documents came in different forms and had different formatting and content across all the groups.

All Google Chat sessions were saved by the instructor (by adding an instructor to each chat session, a full copy of the session is saved in Google’s mail system), who also saved all Google Documents.

Analyses

This research examined the text-based chat conversations and the shared documents produced by the students.

Google Chat analyses. Text chat sessions were analyzed for how much time students used the utility, how many conversational exchanges were made, the “density” of their sessions (proportion of exchanges divided by time using the utility), and what students discussed during these sessions. Three to four chat sessions occurred during each lab session (depending on how many groups we had designed for each lab: four groups in the first lab session for each section, three groups during the second lab session for each section, and four groups during the third lab session for each section). An example of what they looked like in progress appears in Figure 1 (a screen shot of the faculty member’s screen, with four chat groups occurring during the lab session).

Google Document analyses. Google Documents has a variety of options: text, spreadsheets, presentations, forms, and drawing documents. Students co-constructed a document, chose the format, and added elements themselves (text, videos, web links, etc.). For the three lab sessions, these co-constructed documents were analyzed for the following features:

- Whether students included content independent of the assigned websites
- Whether they integrated the different parts of their document
- The format they used
- Length of the documents
- Whether or not they included graphics, web links, and/or videos/video links

One group’s co-constructed document is reproduced in Figure 2.

In all cases, descriptive analyses were chosen as appropriate for this study. We also conducted inferential analyses of the amount of talk included in the chat sessions across the two years and the three labs. The data include 27 chat sessions and 33 co-constructed documents.

Results

Chat Sessions

The students and groups varied greatly on how much they used Google Chat. Across the three lab sessions and the two years, some groups used it copiously and some very little. A summary of descriptive statistics across both years and all three labs is included in Table 1.

Length and density of chat sessions. Chat sessions were measured for their length in two ways: the number of minutes students spent in the session and how many chat lines they produced. At one extreme, two groups used the chat function for only 5 to 10 minutes with approximately 10 interchanges (i.e., lines of chat). At the other extreme, four groups used it for over an hour (max: 1 hour 24 minutes) with 93 to 169 interchanges.

Students used the chat sessions for longer periods of time in Year 2 (mean: 55 minutes) than they did in Year 1 (mean: 43 minutes). However, they produced more lines of chat in Year 1 (67 on average) than in Year 2 (43 lines on average). Some groups used the Google Chat utility for quite a while, some only for a few minutes.

A better measure of how much interaction occurred during the chat sessions is to take the proportion of lines per minute across each session, a measure of the density of text in their sessions. The average density was 1.72 lines per minute in Year 1 and 0.8 in Year 2. Table 2 summarizes results across the two years of data collection and across the three labs conducted each year.

A two-way ANOVA with an interaction term was used to compare the means of the three labs across the two years in terms of density of talk in the chat sessions. Density was defined as the proportion of lines per chat session divided by the total number of minutes spent on the chat session. For example, one group spent 64 minutes using a chat session and wrote 169 lines of chat. This group's "density" was 2.64—or a little over two and a half lines of chat per minute during the session. The ANOVA showed no difference in density across the three lab sessions: Student groups wrote about as much per minute during the chat sessions in each of the three labs ($F=.02$, $df=2, 24$, $p<.98$). The average density in the lab sessions was 1.29 for Lab 1, 1.33 for Lab 2, and 1.36 for Lab 3. There was a main effect of Year ($F=7.33$, $df=1,25$, $p<.02$). The Year 1 density averaged 1.65 lines per minute during the chat session, and the Year 2 density averaged 0.8 lines per minute. We conclude that there was little difference in chat interactions between the three lab sessions, but there was a difference between Year 1 and Year 2, with Year 1 students using the tool more. The interaction effect

between Lab and Year was not significant ($F=3.07$, $df=1,25$, $p<.09$): The Year 1 students consistently used the chat tools more than the Year 2 students in each of the three labs.

Content of talk in chat sessions. The content of the text-based chats among students included conversation about assignment mechanics and about them sorting out their own "process," "meaty" conversation about content of the assignment, and sharing of links, videos, etc. The exchanges included a predictable variety: Some students were more "participatory" than others, some were less comfortable with the technology, and some were less "verbal" in the text chat mode. Table 3 includes examples of each type of chat interactions.

Collaborative Document Construction

The Google Documents results also included quite varied outcomes: Some students produced in-depth summaries and some were more "cursory." In and of itself, a cursory presentation document is not a problem, as the documents were supporting material for a class presentation; the document can be cursory as long as the presentation is sufficiently detailed.

The collaborative construction of a single document (with four-five simultaneous co-authors) seemed to be a useful process. The document texts included:

- Presentation notes (sequence of topics, bullet points on necessary facts and ideas)
- Summaries of assigned websites
- Information about additional material (beyond the assigned websites)
- Web links during presentation
- Video links during presentation

The documents demonstrated a variety of "quality" elements. We looked at whether students included content independent of the assigned website, whether they integrated different parts of their document, what format they used, the length of the documents, and whether or not they included graphics.

Overall, about half of the students included substantive content independent of the assigned websites (across the 33 documents, 17 included "above and beyond" information, five incorporated some additional substantive content but not completely). Similarly, about two-thirds of the documents had integrated information across the sections (14 documents had fully integrated information and nine had partially integrated information). Formatting choices varied across the groups: Eight groups chose to use narrative text and 25 used outline/bullet formats. The documents averaged

approximately four pages (range: one-half page to 14 pages/slides, standard deviation: 3.8 pages/slides). Finally, we looked at whether students incorporated graphics, videos/video links, or web links into their presentation documents: 12 included graphics (pictures, sketches, etc.), five included videos or video links, and 29 included links to other webpages.

Discussion

Our goals for these lab sessions were threefold: to provide students with additional opportunities and modalities for written self-expression, to provide an opportunity for collaboration while using Internet resources, and to encourage the development of ideas through discussion. The lab assignments met all three goals. The data analysis showed that, while students used these additional communication and collaboration tools to differing degrees, the modalities themselves (Google Chat and Google Documents) effectively fostered communication and collaboration in written formats among the students.

This itself is an important classroom outcome. The authors have several decades of experience between them of working with diverse groups of DHH, hearing, and other identified special needs postsecondary learners. Effective classroom communication is frequently a challenge, as some students are better signers than talkers, some are better at writing than signing, and there are the inevitable interpersonal differences, where some students are more comfortable talking in a class group format and some are more introverted.

Our prior attempts at smoothing out these communication challenges have involved setting up online course discussion boards, both faculty managed and student initiated, to give students an additional written outlet and to accommodate those who are less comfortable or able to communicate in class (Schley & Stinson, 2011). These helped to some degree but did not foster simultaneous synchronous collaboration.

While the data show differences between groups in their use of the chat and documents functions (with some groups using either to a greater or lesser degree), both tools clearly were effective in fostering simultaneous synchronous collaboration using oral/manual talk, written chat, and collaborative document construction. In short, with the help of the online collaboration tools, students were able to collaborate and complete their work in a manner that fulfilled the assignment requirements.

Implications for Postsecondary Disability Services Providers

For those representing disability issues on higher education campuses, these results suggest the need to advocate for the incorporation in college classrooms of multiple modes of communicative interaction (e.g., text chat and online collaborative tools, in addition to oral interaction and other modes of providing access for students with disabilities, such as note-taking and ASL/English interpreting). This instructional design detail dovetails nicely with principles of Universal Design for Learning (Izzo & Bauer, 2013; Jackson, 2005; Moon, Utschig, Todd, & Bozzorg, 2011). From an instructional design perspective, this addition is relatively simple. Campus representatives who work with faculty to improve the educational access of DHH students and students with other communication challenges can add this approach to their repertoire of effective teaching strategies.

Implications for Teaching

Implications for teaching include the pros and cons of using the technology-based collaboration tools. The pros are that the assignments capitalized on multimedia use of websites and presentations. Internet and technology resources are an increasingly rich area for teachers to incorporate in their classrooms, and we designed these assignments to give students practice at using these resources critically and analytically.

Cons include the fairly “heavy” technological requirements of this kind of classroom endeavor. The technology used in our classes required every student to have a laptop, as well as a classroom projection system and a stable, high-speed Internet connection. Technical support during the sessions is also crucial: There are numerous system breakdowns, which would be difficult for a faculty member to manage while also managing the students and the classroom session. However, certain collaborative technologies, such as Google Documents, are becoming increasingly familiar to students so less technology support may be needed in the future.

Implications for Further Research

Future research would benefit from collecting video data on these types of activities. What we could not analyze during these sessions was the extent and quality of students’ oral/manual talk during the lab assignments. We assume that those who chatted less in the online format probably had higher levels of oral/manual communication that enabled them to prepare for their group’s presentation at the end of the lab session, but we do not know if that is true. Additionally,

looking at their interactions across both oral/manual and text-based chat modalities would be of great value to the field of classroom collaboration research.

For this study, students were identified as DHH or hearing in a class registration list, and the students in groups knew whether a member was DHH or hearing. It seems that this approach may also be useful with other students who have difficulty communicating in groups, such as those with a learning disability or English language learners. It would be desirable to conduct future research with groups whose members have diverse communication characteristics other than being DHH or hearing. As mentioned above, this approach to collaborative group work increased students' communication options. While we have not evaluated whether the approach "works" for students with different temperaments (e.g., introverted versus extroverted), we suspect that such efforts level the communication playing field in a classroom of diverse learners. The tools certainly encourage complex thinking: The authors, who design and require these activities in the courses they teach, judged the "products" as being generally thorough, complete, and nicely done². And, finally, this type of assignment represented and encouraged active rather than passive learning.

In sum, this approach proved to be an effective way of encouraging online and in-person synchronous collaboration with a diverse group of postgraduate learners. While further research is necessary, it was a promising classroom exercise and we will continue to include such methods in our future teaching.

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Authors' Note

We thank the NTID Learning Center, National Technical Institute for the Deaf, and the Rochester Institute of Technology for technical support.

Footnotes

¹ Face-time video chat functions can be incorporated into Google's Chat function, but we did not use this feature during these lab sessions.

² While not analyzed or summarized in this paper, grades for these collaborative assignments were consistently high across both years of the course. At the time, grades at this college consisted of letter grades only, without +/- gradations. There was not enough variation in grades to include it in the analyses.

Table 1

Descriptive Statistics: Google Chat Summary Data

Measure	Year 1 (n=17)				Year 2 (n=10)			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Time	42.6	26.6	6	84	54.7	19.6	34	94
Lines	67.3	46.7	3	169	43.3	41.9	4	144
Density	1.72	0.9	0.3	3.18	0.80	0.70	0.11	2.08

Table 2

Descriptive Statistics for Google Chat Data by Lab Groups: Density of Chat Sessions (# lines/# minutes), N=27

Lab	Year 1		Year 2		Overall	
	Mean	SD	Mean	SD	Mean	SD
Lab 1	2.03	1.55	.73	.37	1.29	1.16
Lab 2	1.53	.61	1.09	1.03	1.33	.79
Lab 3	1.59	.73	.37	.36	1.36	.83
Overall	1.65	.83	.80	.70	1.34	.88

Table 3

Google Chat Analysis Examples

Type	Example
Assignment Mechanics	<p>student1: do we pick one website and indepth analze it or do we all pick different ones? analyze* it'd be nice if i could spell</p> <p>student2: i think we choose one in the end spelling blah</p>
Assignment Process	<p>student3: I say we each pick one and explore that way we can get more information that way the last page says combine information into a page with a list of topics two suggestions and one exaple of a website</p> <p>student2: right so lets look s and pick oe one</p> <p>student4: I can do Familieswith Deaf Children Resources</p> <p>student3: sounds good</p>
“Meaty” Conversation	<p>student1: i like mine it has a bunch of handouts for parents and a lot of them are translated into spanish or other possible home languages it seems like something realistic that i'd actually use</p> <p>student2: OOOOH how about technology for the home</p> <p>student3: my is mostly legal information so that kids the support needed in school. there is stuff about IDEA it has different organizations that they can join and schools that are affiliated with the website</p> <p>student3: here is a great thing if we can do younger. it is a program of how to read to deaf children</p> <p>student4: im gonna check out te hands and voices site</p>
Sharing Links/Videos	<p>student4: i found a site about deaf role models http://handsandvoices.org/articles/perfect/V12-1relevant.htm</p> <p>student3 http://www.ncbegin.org/index.php?option=com_content&view=article&id=100&Itemid=55</p> <p>that link is to ASL but you can search around the home page has a lot of other topics</p>

Note. All text is presented as it occurred during the Chat sessions (spelling errors were not corrected).

Figure 1. Screenshot of Google Chat Sessions in Progress.

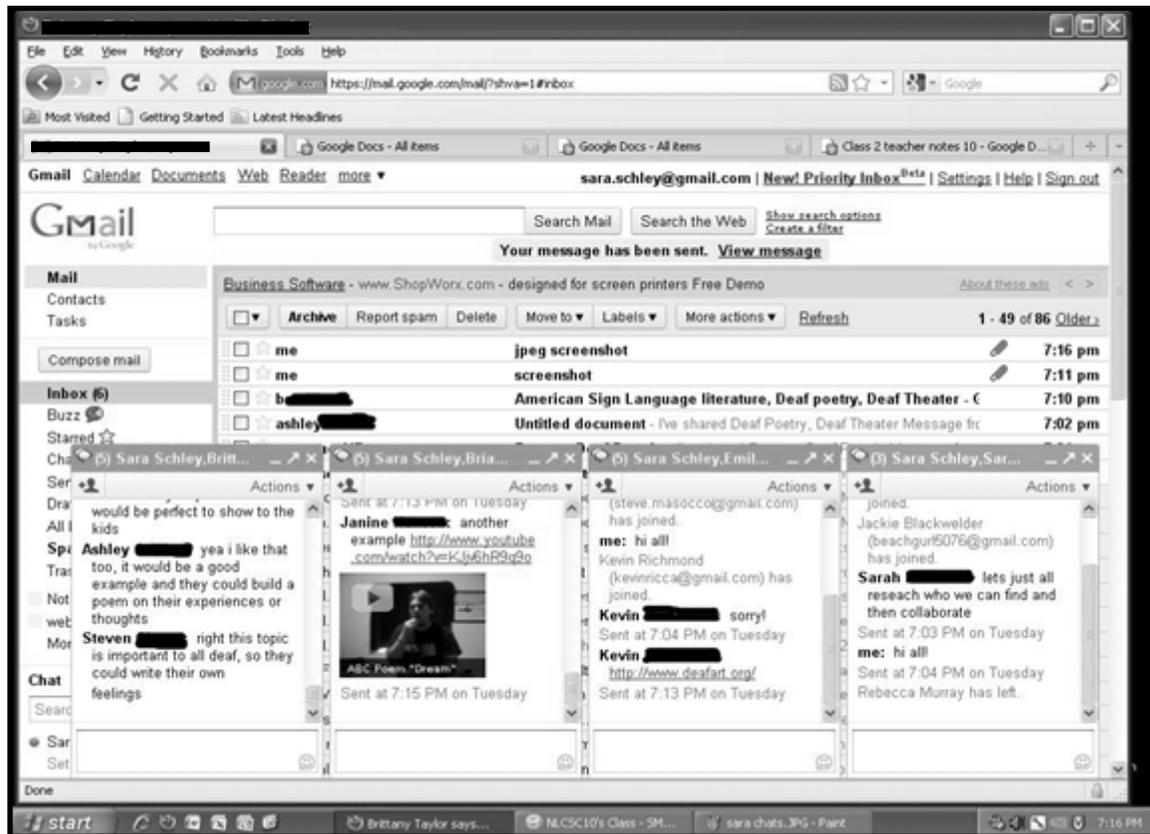


Figure 1. The figure displays a Gmail account window, with four chat windows next to each other along the bottom half of the screen. Each chat window has individual chat lines from 2-3 students, including text chat, web links, and a screen shot of a small embedded You Tube video.

Figure 2. Screenshot of Google Chat Sessions in Progress

Deaf Artists
(Names redacted)
References:
<http://www.rit.edu/ntid/dccs/dada/dada.htm>
<http://www.chuckbaird.com/bio.html>
<http://www.arthistory.sbc.edu/artartists/artartists.html>

Suggestions: Using Deaf Artists on Everyday Curriculum
When using an image or picture in the classroom, ask the students to have an open description/open discussion on what they look at. Discussion on paintings, sculptures, digital art, etc.

(name redacted)

What Is Art?
- Art is "the use of skill and imagination in the creation of aesthetic objects, environments, or experiences that can be shared with others" (Britannica Online)
-Deaf Artists use hands, ears and mouth in their art.
- "I am no longer interested in whether I am a Deaf artist or an artist who happens to be deaf. I have accepted being either cultured Deaf or hard of hearing; that's fine with me. But what makes me an artist, that really matters. The process is the power of creativity and all the gifts inside and from the surrounding environment. It is so much more fun that way. The brush becomes so free, and speaks or moves for itself."

Chuck Baird Biography
- Born in 1947 with moderate hearing loss but grew up culturally Deaf.
- Attended residential school in Kansas.
- Studied at both Gallaudet University and Rochester Institute of Technology.
- Through many artistic organizations he set up his own studio
- Traveled to many different workshops, schools, clubs and festivals to paint or teach painting.
- Involved in numerous murals and art exhibits.


Assignment
Use your creative writing skills to create a paragraph explaining what you see in the picture.
Explain how the picture makes you feel. What things are you most attracted to in the picture? What do you think the artist is trying to say?

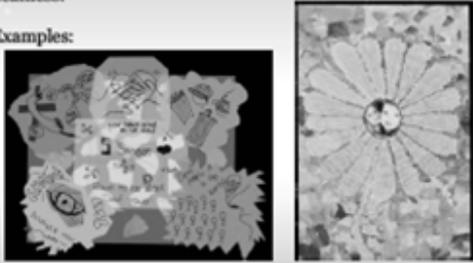
Assignment
Create your own self-portrait that shows who you are and your deafness.
Examples:


Figure 2. The first slide is a title slide, “Deaf Artists,” with three references to web pages of deaf artists. Slide 2 briefly summarizes “Suggestions for Artists in Everyday Curriculum” (for K-12 classroom teachers). Slide 3 summarizes what art is for Deaf artists: “The use and skill and imagination in the creation of aesthetic objects, environments, or experiences that can be shared with others.” Slide 4 gives biographical information of Chuck Baird, a prominent deaf artist. Slide 5 summarizes a classroom assignment (“Use creative writing skills to describe what you see in a Chuck Baird picture”). Slide 6 summarizes another possible assignment (“Create your own self-portrait that shows who you are and your deafness”).

Classroom Audio Distribution in the Postsecondary Setting: A Story of Universal Design for Learning

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Wendy D. Bokhorst-Heng²

Abstract

Classroom Audio Distribution Systems (CADS) consist of amplification technology that enhances the teacher's, or sometimes the student's, vocal signal above the background noise in a classroom. Much research has supported the benefits of CADS for student learning, but most of it has focused on elementary school classrooms. This study investigated the effects of CADS in the postsecondary setting. Surveys and focus groups were used to elicit the perspectives of both students and professors toward CADS in university classrooms, revealing many themes and multidimensional attitudes. Teachers' and students' perspectives are considered within the principles of Universal Design for Learning (UDL), which encourages a flexible approach toward teaching in order to include as many different types of students as possible in the learning process. CADS is seen as one way to support UDL in higher education settings.

Keywords: *Classroom audio distribution systems, Universal Design, higher education, voice amplification, student support*

Classroom audio distribution systems (CADS), also known as classroom sound field amplification, is a method for enhancing the teacher's, or sometimes the student's, vocal signal above the background noise in a room (Smaldino & Flexer, 2012). CADS consists of a transmitter, a receiver, and an amplifier, using infrared or FM radio technology. Ideally, the speaker's voice is spread uniformly to each listener in the room through one or more loudspeakers at a comfortable and consistent listening level (Whyte, 2010). Research confirms the positive effects on students' learning when the classroom listening environment is enhanced through teachers' amplification (Flagg-Williams, Rubin, & Aquino-Russell, 2009; Flexer, 2005; Massie & Dillon, 2006; Millett, 2008).

Flexer (2005) notes the following student populations that especially benefit from CADS: those with hearing impairments, auditory processing problems, cognitive disorders, learning disabilities, attention and behaviour problems, and articulation disorders. Those learning in a language that is not their primary language

also benefit, allowing them to hear every word clearly (Nelson, Kohnert, Sabur, & Shaw, 2005). In fact, all young children benefit since the ability to distinguish targeted speech sounds, especially within conditions of noise, does not fully develop until puberty (Flexer, 2005; Nelson & Soli, 2000). Bennett (1994) estimates "as many as one-third of the students in a typical classroom run the risk of academic difficulties because of the acoustical conditions present" (p. 45). Thus, there are myriad reasons why enhancing the acoustical quality of the classroom listening environment is critical. Improving the acoustics in the room is one part of the solution; enhancing voice volume and distribution, the focus of this study, is another.

Most of the research on CADS and its implications for learning has been with children in K-12 schools. In their reviews of the literature, Rosenberg (2005) identified only four studies specific to higher education and Millett (2008) identified only four additional ones. Our own search within the EBSCO database revealed few others. Yet, learning in postsecondary

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classrooms is similarly largely dependent on verbal communication and merits greater analysis of the listening environment.

The few studies that have examined higher education learning environments tend to focus on the inadequate acoustical quality of university classrooms with respect to background noise, reverberation, and distance between the speaker and the listener (Hodgson, 2002, 2004; Kennedy, Hodgson, Edgett, Lents, & Rempel, 2006; Larsen, Vega, & Ribera, 2008; Woodford, Prichard, & Jones, 1999). For example, Larsen et al. (2008) compared the speech recognition performance of students with normal hearing in two college classrooms, one of which met the American National Standards Institute ([ANSI]; 2002) acoustical standards required for elementary school classrooms. In both classrooms, they compared speech recognition with and without the use of CADS. Not only did they find that following the acoustical standards benefited learners in postsecondary classrooms, but also CADS improved speech recognition in all classroom environments. Woodford et al. (1999) examined the acoustics in seven different classrooms at a large university and found that noise levels exceeded the recommended maximum (as determined by Clabaugh, 1993). Seventy-five percent of students indicated they had experienced difficulty understanding the instructor, but with CADS, the students and instructors noted improved listening conditions.

Two studies looked at the benefits of CADS beyond general improvement of the listening environment. Smaldino, Green, and Nelson (1997) considered the effects on college students in a phonetics course, specifically chosen because the course content required fine auditory discrimination. The results indicated a positive benefit for using CADS in that course, but the implications focussed mainly on applying the information to K-12 classrooms. Valente (1998, as cited in Rosenberg, 2005) demonstrated improvement in the academic achievement of college students with the use of CADS, based on improved exam scores.

Our study thus fills a significant gap in the literature. Specifically, we examine the role of CADS for university students within the context of Universal Design (UD), a concept that is being increasingly applied to educational contexts across North America (Burgstahler & Cory, 2008; Higbee & Goff, 2008). UD began as an architectural and environmental concept, focusing on not just accommodating persons with disabilities but, rather, at the start designing products and environments that are more functional for everyone. Welch (1995) put it this way:

[Universal Design] emphasizes a creative approach that is more inclusive, one that asks at the outset of the design process how a product, graphic communication, building, or public space can be made both aesthetically pleasing and functional for the greatest number of users. (p. iii)

He refers to UD as a “value system” that embraces human diversity as the norm, suggesting a radical paradigmatic shift.

Within education, the principles of UD have been most commonly expressed in the terms of Universal Design for Learning (UDL) and Universal Design for Instruction (UDI) (see McGuire, Scott, & Shaw, 2006 for a full discussion of the distinction between these and other terms). The Center for Applied Special Technology (CAST) has led the development of principles and applications of UDL, particularly at the K-12 level. On their website (2015), CAST describes UDL as “a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn.” As a result of brain-based research, there is greater awareness in K-12 education about the variability in the way students learn. To that end, UDL promotes the development of best practices in all aspects of the learning environment and pedagogy in order to reach the widest possible range of learners (Rose, Harbour, Johnston, Daley, & Abarbanell, 2006; UDL, n.d.). The definition of UDL adopted by CAST (2011) is as follows:

The term UDL means a scientifically valid framework for guiding educational practice that:

- a. Provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged; and
- b. Reduces barriers in instruction, provides appropriate accommodations, supports, and challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient. (p. 6)

These objectives are met through flexible curricular designs, providing multiple means of representation (presenting information and content in different ways), multiple forms of action and expression (differentiating the ways that students can express what they know), and multiple means of engagement (stimulating interest and motivation in learning). At the postsecondary level, UD initiatives have been most typically expressed

through UDI. Similar to UDL, “UDI is an approach to teaching that consists of the proactive design and use of inclusive instructional strategies that benefit a broad range of learners, including students with disabilities” (McGuire et al., 2006, p. 169), without compromising academic standards. While UDL is largely a response to brain-based research, the impetus for UDI has come from the increasing diversity found in the postsecondary student body, particularly with respect to the increasing number of students with cognitive disabilities. According to Burgstahler (2008), “diversity has become a fact of life in higher education” (p. 4). A study in 2003 found that the average percentage of postsecondary students with disabilities (those registered to receive disability related services) varies from ½% to 6% and noted that these figures are dramatically increasing (Fichten et al., 2003). Furthermore, of the students who report having disabilities, the majority and fastest growing group are those who have “invisible disabilities” that affect learning (Burgstahler, 2008), including hearing, learning, attention, and communication differences, all of which relate to CADS. UDI is considered a tool for faculty to reflect on their practice and develop more inclusive instruction. Closely paralleling the seven well-established principles in UD (Connell et al., 1997), UDI contains nine principles (adapted from Scott, McGuire, & Shaw, 2001; Roberts, Park, Brown, & Cook, 2011):

1. Equitable use – accessing course information in a variety of formats;
2. Flexibility in use – varying instructional methods;
3. Simple and intuitive – clearly describing course expectations for grading, in different formats;
4. Perceptible information – necessary information is communicated effectively, regardless of ambient conditions, or the students’ sensory abilities, or language competency;
5. Tolerance for error – anticipating variation in the pace of learning, and providing ongoing feedback on coursework (rather than just final exams);
6. Low physical effort – instruction is designed to minimize nonessential physical effort;
7. Size and space for approach and use – allowing for use regardless of a student’s body size, posture, mobility, and communication needs;
8. A community of learners – the instructional environment promotes interaction and communication among students and between students and faculty; and

9. Instructional climate – instruction is designed to be welcoming and inclusive, while maintaining high expectations.

The fundamental premise of UDL and UDI is thus inclusive education, shifting our attention from a deficit model that accommodates individual students to one that seeks to reach the widest possible range of students. It is a proactive process rather than a reactive one (Burgstahler, 2008). UD, UDL, and UDI represent a value that assumes diversity to be the norm, and anticipates diversity in all aspects of educational planning and instruction. In this context, CADS needs to be given serious consideration as a support for learning by all students.

In our discussion, while UDI is the more common term used in higher education, we prefer to follow the practice of the recent symposium on Universal Design at the University of New Brunswick (Bokhorst-Heng & Flagg-Williams, 2014) by using the term UDL in our work. In using UDL, we place the emphasis on student learning, while at the same time acknowledging that it is the responsibility of the institution and the instructors to design their instructional and classroom practices with diversity in mind.

Context

The context of this study is a small private liberal arts university in Canada. At the time of the study, there were approximately 825 students and 50 faculty members at the university. In addition to a general liberal arts curriculum, the university also has a Bachelor of Education (B.Ed.) program and an Advanced Education Certificate program for in-service teachers. With the completion of new construction in October 2010, CADS was installed in all of the new classrooms (RedCat NXT integrated flat-panel speakers with Redmike VC infrared pendant-style microphones, by Lightspeed Technologies). Two classrooms in an older building also used the systems before the equipment was moved to the new facility. In addition, the lecture hall in an older building is equipped with a wireless beltpack transmitter and Peavey mixer and speaker system. The types of amplified classrooms throughout the university include small and medium-sized rooms, large lecture halls, and classes of both large and small numbers of students. When the new system was installed, a university technology specialist provided a brief orientation to all faculty members.

Methodology

Purpose

Our study examined the perspectives of both students and professors regarding their experiences and attitudes. We wanted to know:

1. What are the attitudes that this university's professors and students hold toward the use of CADS in their classrooms?
2. How are these attitudes and experiences interpreted with respect to higher education teaching and learning?
3. What are the implications of these attitudes and experiences for the effective implementation of CADS in higher education?

To answer these questions, we administered a university-wide survey for students and faculty, and conducted four focus group discussions: undergraduate students, B.Ed. students, Advanced Education Certificate students, and faculty.

Participants

All students and faculty members at the university were invited to participate in the study by completing a survey. Students were invited through the professors of core courses, thus ensuring access to the entire student body; faculty members were invited through email. A total of 324 students (39% of total sample size) completed the survey and, of these, 307 indicated they had experienced the use of CADS at some point in their education either as user or listener. Identifying information on the student surveys included only their year or program in the university. The 307 participants included in our analysis identified themselves as follows: 52 first year; 26 second year; 30 third year; 45 fourth year; 111 B.Ed; 38 Advanced Education Certificate (Graduate); and 5 'Other' (such as Part Time) students. Given the small size of the student population, our analysis grouped students according to undergraduate, B.Ed and Advanced Certificate (the latter being the only two postgraduate programs at the university). Undergraduate classes tend to be larger, and hence provided a distinct perspective; classes in the B.Ed program tend to be smaller, but also this group had a unique perspective as future educators who were already familiar with the broader ideas of inclusion and UDL; and the graduate students are professionals in the field of education and hence have K-12 experience in addition to experience as students in the university. Seventeen (34%) faculty members completed the survey. Sixteen indicated they had more than five years of teaching experience at the time of the survey.

There were four focus groups, each formed through a convenience sample (those who responded to an email invitation to participate, controlling only for gender – although in forming the undergraduate group, only male students were available at the times scheduled) and each comprised of four participants: Undergraduate students (four males), B.Ed. students (two male, two female), Graduate students (two male, two female), and Faculty (two male, two female; two were Education Faculty). All of the student group members had experience with CADS in at least one of the university's postsecondary classrooms and all of the faculty members had used the technology at some point in their teaching. All of the Advanced Education students and some of the B.Ed. students had additional experience using it when teaching in K-12 classrooms.

Instrumentation and Procedures

The study involved two survey questionnaires: one for the students and one for faculty. The student questionnaire was adapted from Cornwell and Evans (2001), changing the wording to suit the university context (for example, instead of school work, learning) and to reflect the system used at the university (instead of FM system, amplification system). It included the following questions:

1. Do you think amplification of the teacher's voice helped you in your learning? Please tell us how you think it has or has not helped your learning.
2. Would you like to see voice amplification used in more classrooms?
3. If you could change the amplification system in some way, what would you do?

To ensure anonymity, student surveys were distributed, administered, and collected during class by the instructor who then submitted the materials to an office administrator. Students were told participation was voluntary and would not influence their grades.

Faculty surveys were adapted from Cornwell and Evans similar to the student surveys, and we added an additional open-ended question to give faculty an opportunity to expand their ideas. Questions included:

1. Do you think that having the voice amplification system in your classroom benefits your students? Please tell us how you think it does or does not benefit your students.
2. Do you think using the voice amplification system is beneficial to you as a teacher?
3. If you could change the voice amplification system in some way, what would you do?

4. Is there any further information about voice amplification that would be beneficial to you in your use of this technology?

Surveys were completed voluntarily, in respondents' own time and anonymously submitted to an office administrator. Data collection through surveys was completed within a one-week time period in a winter semester.

Subsequent to the surveys, we conducted one faculty and three student focus groups. The discussions were semi-structured, and each ran for about 30-45 minutes. The questions were designed to elicit a more nuanced understanding of the issues raised in the survey responses. Prompts included questions such as:

1. Some respondents indicated that the use of voice amplification had a positive effect on student learning. Let's discuss this in greater depth: What might be the positive benefits you have experienced with respect to your learning? Perhaps you feel that the use of voice amplification has not had a positive effect on your learning – can you expand on this?
2. Have you used voice amplification in your role as a student? If so, did using it have any effect on you as a speaker?
3. Most research concerning voice amplification has been done in the context of elementary education. Do you think there is anything unique about its use with adults that might indicate different benefits or challenges?

Focus group discussions were recorded and transcribed for analysis.

Procedures of Analysis

The surveys elicited both quantitative and qualitative data. The quantitative data was related to respondent characteristics and used to determine respondent validity (e.g., if the respondent had no experience with CADS, their survey was not included). In analyzing the survey's qualitative data, we took each question separately and, following an inductive process outlined by Cresswell (2013), developed codes and themes as they emerged. To ensure inter-coder reliability (Cresswell, 2013), we first each took the same five surveys and independently coded them; we then met to discuss the codes we had developed and came to agreement on the definitions and applications of the codes. We each coded different sets of surveys and combined our findings. Responses to the survey questions were mostly one-sentence answers or short

phrases, which were tabulated to get a sense of the priority of the coded themes. The same process of determining inter-coder reliability was used in analyzing the focus group data. We also tabulated the number of speaker turns during focus group discussions that related to the different codes.

Results

While our survey questions were fairly broad, some very consistent themes emerged (see Table 1). Our first question was whether, and how, CADS improved student learning. Answers to this question in the student surveys mostly related to improved attention (15.6%), although often with the caveat that it depended on the classroom size and number of students in the class (14.2%). When students were asked what they would like to change about CADS, concerns about the quality of the technology (14.1%) and the need to provide better training and support for the users of the technology (4.3%) dominated their responses. Faculty also indicated the need for improved technology to enhance the effectiveness of amplification (17.2%); however, only 1.6% felt they needed any training in using the technology. Their bigger concern (26.6%) had to do with the voice factor: Technology was mostly seen as necessary to compensate for one's soft voice, or conversely not needed "because I have a loud voice."

We took the information generated by the survey responses to our focus groups to probe these issues more deeply. Subsequent analysis of our focus group conversations revealed seven main themes regarding their experiences with CADS: *impact on learning; classroom management; conditions of learning; usage; health and wellness; identity; and inclusion.*

Impact on Learning

Impact on learning was most commonly expressed in terms of how amplification enhances student attention, and its importance to students' own learning management. In the B.Ed., graduate, and faculty focus groups, respondents noted the importance of overcoming various sources of background noise: from building construction, road works, and traffic heard through open windows; noise polluting sounds coming from other classrooms such as moving furniture; and sounds within the classroom, such as typing. In the words of one participant, "You got 20 people on their laptops. They're taking notes... when you go home you can still hear the clicking sound! That's something you really hear." The effect of background noise was described by participants as "distracting," and most felt that amplifying the teacher's voice helped to mitigate that

distraction. A graduate student expressed this idea by saying, “I like to use my computer to take notes, but [CADS] would take away that sound.” Some faculty members found their students to be “more alert” and to “drift” less often when amplification was used. One gave the example, “If there are students talking in the last row... that’s a big distraction to the students in the last row who want to listen to the lecture and take down all the notes;” CADS would help.

In the faculty focus group a great deal of the conversation about students paying attention converged on the cognitive connections between learning and attending. They discussed the amount of information students naturally miss due to inattention as well as the limits of the human attention span. Some wondered if amplification could really help when these limitations on learning are always present, but the consensus was that it could. For example, one faculty respondent noted that “the amplification system clearly hits the auditory side,” referencing multiple pathways for learning. Another noted, regarding attention span limitations, “If we’re losing them through them not being able to hear, it’s going to be even shorter” without amplification.

The faculty, graduate, and B.Ed. focus groups all maintained that student attention has a major impact on learning even in the postsecondary classroom, and that CADS was a major player in enhancing that attention. One graduate student’s opinion was that, “We’re here paying for our courses, so most of us want to do well so we want to hear as much as possible.” This was true when students used CADS in their presentations as well, resulting in other students paying better attention. And, as one faculty member noted, “A lot of learning occurs as a result of what students [say] and if students can’t hear other students, you’re losing.”

The undergraduate students, however, had a different perspective about the impact of CADS on their learning. They acknowledged that when professors used CADS, it kept them “awake” and focused, but, unlike the other groups, they did not think this was a significant issue in higher education contexts. “We’re not from high school or anything like this, so, where, we can focus better...[the] lower level schools [are] not as attentive as we are,” they pointed out. “When it comes to middle school, you have kids who talk, you know, they pass notes and there’s a lot of noise going around. We’re more matured and so there’s not that roughhousing going on.” However, their perspective changed when they discussed the impact of CADS on the attention of the audience when they were the presenter:

For presentation as a student, you’re always worried about, ‘am I going to lose your attention’ or ‘am I going to gain their attention’ or ‘are they going to talk if I don’t’, or ‘are they going to drown me out’ [with distracting noises]. For me, I found that if you have the mic, they are going to hear no matter what they do.

This distinction between attitudes as learners and as presenters was not seen in the other focus groups.

Finally, a thought-provoking nuance of the *impact on learning* theme came from the B.Ed. focus group. They discussed how attention might vary from situation to situation. One respondent observed that it wasn’t necessarily just noise that was distracting, but also “where I’m at in my head space on a given day.” When students feel focused, the noise may have less effect than when they are feeling on the fringes. Also, some noise is expected and thus may not be as distracting: “Like the construction noise doesn’t bother me [because I’m used to it].” However, “when something is out of the ordinary, it’s harder to tune that out” – like the clicking of a pen, “and all I could do is not turn around [and say] ‘stop doing that!’” One student called it the “participation factor” and noted how “there’s times when you may be zoned out, but if you do have the amplification, you can still catch a part of it.”

Classroom Management

A second theme that emerged from our data was the role of amplification in classroom management. As with impact on learning, this theme was sometimes discussed in terms of the postsecondary setting and sometimes in reference to K-12 schools. All of the focus groups, except undergraduates, felt amplification enhanced teacher ‘presence’ throughout the classroom. For example, a B.Ed. student said:

[In university] we do a lot of group work. So, when it comes time to call us back together, there are times, especially at this time of the year when we all know each other, things are starting to go off the rails [and CADS helps to get the class back on track].

A faculty member who wished amplification was in the science labs said:

When they’re moving around [the lab], and you have to be different places... I would want to see [CADS installed]...you can see somebody doing something wrong three benches over and you’re over here, you can’t get to them because you’ve got rows and benches [in your way].

Some graduate students with experience using CADS in elementary school settings described teacher “presence” as the ability to maintain student attention all over the room, particularly when speakers are mounted in more than one location on the ceiling. Even in university classrooms with only one wall-mounted speaker, respondents felt amplification broadened the teacher’s presence in the room, a feeling referred to succinctly by one faculty member as “omnipresence,” or, as put by a B.Ed. student, “artificial proximity... because you feel that voice is behind you.”

Furthermore, all of the focus groups (again, except undergraduates) noted that students were less likely to miss important points and instructions did not have to be repeated as often by teachers when CADS was used. This was seen to be important because, as one B.Ed student described it, the issue even “compounds itself...you’re trying to think, what did I miss? And then you’re actually missing what she, what the person is saying right now.”

Enhanced voice clarity was mentioned in our survey responses, so we wanted to seek a deeper understanding of its meaning through the focus group responses. It seemed to be related to the previous idea about not missing important information. With the B.Ed participants, it meant “more projection from the microphone,” which meant “you are actually getting it quicker, clearer.” Another B. Ed. student described clarity as “audible,” and being able to “make out the voice,” while another thought of clarity as being “sharper sound;” that is, “I don’t have to stop and think and question, ‘what did he or she say.’” And within the faculty group there was agreement that a speaker with an accent could be heard and understood more clearly by using the microphone.

Faculty members also talked about how CADS had a role in “conditioning” the class to begin: “When you started adjusting [the microphone] around your neck, then they know the lecture is going to begin and, you know, they have to pay attention.” Faculty members also used descriptive terms such as a “sense of importance” or “a stronger measure of presence.” In the graduate student group, however, there was a debate about whether this same idea conveyed a negative message because it was too formal: “There is a level of separation... it doesn’t really radiate a conversational atmosphere; it is more of a listen-to-this type of thing.” In this regard, the group generally agreed that teachers need to be more “interactive to engage the students; step [engagement strategies] up.”

Conditions of Learning

By *conditions of learning*, we mean the learning environment: how amplification contributes to the classroom setting, such as helping to reduce anxiety or to create a calm atmosphere. One of the B.Ed. students who had a background in substitute teaching made the observation:

For some students, I think it’s a matter of even tone of voice. When you are in front of a class or in a class, you have to raise your voice in order to be heard. Some students don’t necessarily take that as just an increase in volume. They take, they feel an increased anxiety, and they react to that.

CADS allows the teacher to speak in a “normal voice” and hence does not “get that raised voice issue.” While most of this discussion was related to K-12 teaching, a faculty member spoke of this notion in the postsecondary classroom: “If students can hear you, that is going to speak well to the way they view you... like, I can hear them, they are caring about making sure that I’m listening.”

Classroom size emerged as another relevant aspect of the *conditions of learning* theme at the postsecondary level. All of the groups recognized that CADS is essential in large lecture halls. For example, an undergraduate noted, “If you have a class of two hundred, I think it will be worth it.” But some participants pointed out that amplification was not really needed in small rooms and/or classes with just a few students. Some also felt that professors with naturally loud voices became too loud when amplification was used in small settings. One B.Ed. student offered, “If it’s too loud, then that’s just as much a distraction.” A faculty member mentioned this, too: “I am used to projecting... I have a ‘stand in front of people’ voice...it was too hard on me mentally to dial that back [when using a microphone].”

Overall, though, there was more discussion about the advantages of CADS in the learning environment. A common thread was how it helped those with soft voices. Examples were: “I remember when one of my professors lost her voice and the mic did help with that;” and “even the small classrooms [without amplification], there were times, if you’re sitting on the outside, it is difficult to hear the prof because they are focused on the back of the room;” and [some professors] “stick to their notes; they are looking at their notes when they are talking to you and they really do need a little extra amplification.”

Usage (The Human Factor and the Technological Factor)

When our participants discussed issues related to using the equipment, two often-conflating aspects emerged: technical difficulties and operational difficulties. This topic especially pre-occupied the undergraduates, comprising almost half of their discussion. All groups recognized the importance of training on proper usage of the equipment.

One problem involving both usage and technology was static coming from the loudspeakers. The undergraduate participants described it as “constant humming” and distracting. One respondent said, “It’s just something that you have to get through to focus... As a college student, I have no problem focusing on the prof. It is just when you are in the classroom for three hours, it bothers you.” And a B.Ed. student described the static as being “nasty sometimes.” The problem had to do with setting the correct volume level on the microphone as well as on the display control module on the wall. One student noted some professors did not know how to use these controls, resulting in interference or inconsistent volume control. Another highlighted the disruption in the flow of the class when the professor had to adjust the volume control on the wall module. In contrast to the view presented (mostly) by the undergraduate participants, most faculty members felt they were competent in using the equipment, and only one felt the need for improved understanding of the equipment’s volume control. They did note other challenges related to the technology, but tended to minimize them by posing constructive solutions.

A second problem related to usage, or the “human factor” as one student put it, concerned issues specific to wearing the pendant microphone. For example, “It rubs against...button or chains or anything, it keeps making that [unwanted sound].” “[It would] pick up everything that’s close...like...ruffling every time it rubs against the shirt.” In all focus groups, respondents recognized that, as with any new technology, such issues could be avoided through practice and training. One graduate student put it like this: “You have to get used to it...it’s not natural, it’s not part of your body.” Another said, “It’s not just a matter of practice; it’s a matter of taking the time and explicitly telling someone, ‘you want to make sure to avoid doing this while the mic is on.’”

A third usage issue, raised by the undergraduate students, had to do with different input sources feeding into a single speaker system. They talked about the anxiety they felt when watching videos in class: “Everybody cringes and plugs their ears because...the volume just isn’t consistent with the prof speaking and

then the level of volume coming through the computer.” They also described how some professors would increase the volume on the display control module to adequately amplify their voices. But, if the volume on the computer was already on a high setting, the sound would, of course, be very loud, and as such, “there’s always that moment of dread” when the sound source switches from voice to audio-visual media. Given these experiences, some undergraduate students made it clear they preferred a professor’s natural voice to an amplified one, even though they recognized that informed users could manage the effect of the discrepant input sources. On the other hand, some undergraduates valued the improved sound quality of audio-visual media using the integrated system.

From the students’ perspectives, learning to use amplification competently was something they wanted for themselves as well as for their professors. As one undergraduate put it:

I think it will be beneficial for the student body to have microphones to use. Because there’s a nerve factor that comes behind using the microphone... At some point down the road [in life]...there is [likely to be] an expectation that you’ll stand behind the podium, and use the mic.

The B.Ed. students similarly felt the need for repeated practice with the microphone, indicating that, in the words of one, “The anxiety comes from just not being exposed to the technology.” Another student commented: “It is nerve-wracking at first [because] you hear yourself. You’re not used to hearing yourself and you are hearing yourself coming from the speaker at the other side of the room.” But, with repeated practice, one student found her anxiety lessened: “I know the last couple times I used it, I forgot I’ve got it on... I find I’m more relaxed now using it, and I can talk normal and everyone seems to hear me just fine.”

One more way the human factor plays a role is when users forget they are wearing a live microphone at times when it should be turned off. One B.Ed respondent observed that, “Working in the [K-12] school system, I think one of the biggest negative effects of these microphones is that teachers sometimes forget that they have them on,” especially when having a private conversation with someone or even talking to oneself. A faculty member recalled a similar situation: “I was playing a game with the class and I brought [one group] into a huddle [to whisper something to them] and [the rest of the class] all just started laughing because I still had it on.”

Health and Wellness

The importance of using CADS with respect to health and wellness featured prominently in the faculty discussions, together with the need to enhance the voices of soft-spoken people, taking up about half of their conversation. Their comments included ones like, “You don’t feel you need to force your voice. You talk in a more conversational manner;” and “For me, using it in a classroom, it’s an energy-saver,” and “I did have laryngitis once, and then that really helped.” But the primary focus of health and wellness for the graduate and B.Ed. participants (the undergraduate members were silent on this issue), and even some of the faculty, centred on the K-12 context, rather than higher education. A graduate student mentioned, “I know teachers that had to take time off because... the doctor told them that you have to rest [your voice] and they have to go to therapy or learn another way to talk.” Another recalled that, without amplification, “In September, when I finished the first days, I always had a sore throat because I’m always straining my voice.” Thinking about his future teaching context, a B.Ed. student felt amplification would be particularly helpful in a gym setting: “[Physical education teachers’] voices are raspy because they have to make it at such a high level for everybody to hear because it is such a big space.”

Identity

An interesting theme that emerged was the impact of CADS on the user’s identity, usually expressed as an increased sense of importance or confidence, although for some, a negative impact as well. This theme did not feature prominently, but it was an intriguing insight. Some of the undergraduate students talked about how access to microphones would be in keeping with the general ethos of the Business degree program. They observed that there is a sense of authority that comes with using the microphone:

When you have the mic, you are the one that is on the floor. So you feel like you are a star...the person with the mic will obviously be the one that everyone’s going to be directing their attention to; it highlights the person who’s talking.

Thus, attention is given to that person not just because their voice can be heard, but also “because they have a mic.” Another undergraduate said, “When you have the mic, you have the power. You have the authority in that classroom. That is your class. So it boosts confidence in the person speaking... [the microphone] changes the dynamic of the class.”

Interestingly, the opposite of this view appeared in some of the other discussions, ranging from discomfort to anxiety. One faculty member recalled, “I didn’t like it around my neck so I kept taking it off.” Shyness or anxiety was also discussed, as in a graduate student’s comment: “At first you’re shy because you’re not very used to it; being a shy person, maybe it would affect you a little bit.” Another said, about getting used to the microphone, “When I was [accidentally] hitting it, I was noticing that it was making a noise and I was afraid to make the people jump out of their seats, I guess.” Also, a faculty member gave an example of an undergraduate student who was uneasy giving presentations in class and was too nervous to use the microphone.

Both the faculty and the B.Ed. groups discussed the stigma that some people associate with using amplification. One B.Ed. participant put it like this: “People look at it too as, oh, my voice isn’t strong enough... it’s almost like an insult... as if it’s a reflection on the person themselves.” The faculty group also recalled instances of people who would not use it: “You go to conferences and the keynote speaker refuses the microphone...in a lecture hall with 300 people” and “I think there is a measure of embarrassment on the part of the adult” and “It is suggesting that you can’t do it by yourself; you require an aid.” In each of these conversations, participants agreed it is incumbent upon speakers to overcome their reluctance, and that increased access and training would not only diminish the anxiety but also the perceived stigma associated with using CADS.

Inclusion

One theme that emerged from the graduate student and faculty groups (but not the B.Ed. or undergraduate groups) was that CADS could make the higher education classroom more inclusive for students with hearing impairments. Respondents recalled university students they had known who benefitted greatly from the technology: “I’m just thinking of [a peer]; you can tell that it bothers her when she’s not able to hear because she wants to learn.” One faculty member observed that, while in K-12 classes a student’s hearing impairment is likely to be identified, an adult student might not share this type of personal information with a professor. As such, it was important to be proactive in the use of CADS, especially since, as both faculty and graduate students noted, all students in any classroom would benefit from this technology. For one student, it was a matter of respect: “In the classroom where, if somebody has some sort of hearing impairment...it is important to respect [that person].”

Discussion

While the postsecondary classroom becomes increasingly diverse, current thinking among those providing student support is grounded in UD. As its underpinning, UD has long embraced the view that diversity is the norm within the human population (Welch, 1995). The construct of UDL applies this thinking to the classroom through flexible teaching approaches and reduction of barriers to learning (CAST, 2011).

The results of this study indicate that the role of CADS within the UDL framework can be complex and multidimensional, permeating all aspects of learning. To sum up our results, its role may be seen as (1) providing flexibility in presenting and accessing information or providing appropriate accommodations and (2) a method for managing the learning environment in terms of acoustics and universal access to verbal communication.

In terms of providing flexibility and accommodations, disability service providers may find in CADS one more technological tool for helping make the higher education classroom environment more inclusive. From our data, it is apparent that CADS provides specific instructional flexibility. CADS can help faculty be more flexible in presenting information that is clearly understood within many types of learning activities. Students can demonstrate their knowledge and skills by making their own presentations with verbal clarity. Students' confidence can be built by frequent exposure to using a microphone themselves. While the present study did not identify any student disabilities, research from K-12 schools and extension of the comments from our participants indicate that CADS may be able to serve as an accommodation to reduce barriers to learning for those with disabilities related to hearing, auditory processing, and attention deficits (Flexer, 2005). Our study did not result in themes specifically related to English language learners, but according to research with younger students, the improved learning environment provided by CADS may also assist this student population (Nelson et al., 2005).

Our results highlighted other benefits of CADS in regard to voice enhancement for those instructors with naturally soft voices or temporarily strained voices from fatigue or from illness. It was also noted that CADS can provide universal support for learning by amplifying voices or media above temporary background noise or to manage the verbal lectures in large classrooms or with large groups of students. Our participants also noted that CADS affects both instructors and students who use it with respect to a feeling of confidence and identity in the classroom. The improved attention from the listeners not only

helps them individually, but also improves overall classroom engagement.

If disability service personnel are considering CADS as a pedagogical tool to enhance the learning environment of all students, there are a number of technical and educational factors that must be considered. To fully maximize the potential of CADS, faculty members must be educated on its use. Training should include the technical procedures, but also take into account the impact that CADS has on both the learner (such as focus as a listener and public speaking skills) and the educator (such as classroom presence and voice wellness). Users need to be involved in conversations about how CADS can enhance classroom management and engage all students in the learning experience.

Further, those planning to implement CADS need to recognize that the type and quality of technology selected, its installation, and its availability to instructors and students are all essential parts of providing an optimal listening environment. Whyte (2010), an educational audiologist, states: "It is important that soundfield systems are installed correctly, in appropriate places in the classroom and with consultation of the teachers who will be using them; training in the use of soundfield systems is essential" (p. 1). Jónsdóttir (2002) similarly points to the technical problems and teachers' lack of skill as being the main negative features of the use of CADS. Along these lines, our participants provided a great deal of input on the positives and negatives of the technical aspects of CADS as well as the need for and benefits of training its users. Our conclusion is that training should involve how the technology can be effectively fused with pedagogy leading to one more way to put UDL into practice in higher education.

Limitations and Further Research

The main limitation of this study is its focus on students' and faculty's perceptions, rather than on measurable factors such as grades, speech perception, or attention levels. Along the same lines, the study did not measure the hearing abilities of our students or the acoustical quality of the classrooms. Our participant groups were somewhat limited in that the sample size was small and some of the participants had prior knowledge about the use of CADS in K-12 schools. Nevertheless, the results of this investigation contribute to a deeper understanding of CADS in the postsecondary setting, a part of UDL.

In our study, awareness of the pedagogical significance of CADS was heightened and a number of significant issues were identified, but it is clear that research with CADS in higher education needs

a great deal more attention. Those working in post-secondary disability services may be well situated to focus attention on this topic. Those who assist with the professional development of faculty in UDL may investigate the feasibility of incorporating CADS technology into that training. The degree of benefit CADS could provide for specific student populations, such as those with hearing disabilities or attention deficits or those whose first language is not English, would be an important aspect to study at the postsecondary level as well. Future researchers may want to consider how learning is enhanced with CADS in classrooms where microphones and speaker systems already exist or where they may be retrofitted. Of course, the ideal setting for future research is one where a newly built facility includes CADS in its classrooms. In any future research with CADS, the goal is to obtain a deeper understanding of how universal design in architecture and technology can partner with universal design for learning in an effort to enhance the learning experiences of *all* students in broader inclusionary practices.

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Table 1

Survey Responses (% of total statements)

Code	Description	% of Total Statements (Students)	% of Total Statements (Faculty)
Access	Increased access to the technology	4.3%	9.4%
Attention	Use of technology improve attention, concentration, focus and enhances hearing	15.6%	7.8%
Calmer	Use of technology contributes to a more calm, positive classroom environment	0.4%	0%
Clarity	Improvement in specific aspects of verbal communication, such as clarity of the instructor's voice	8.1%	1.6%
ENG	Increased student engagement	0.4%	0%
ENV	Specific environments where the technology is the most or least effective (such as large classrooms)	14.2%	15.6%
INC	Improved inclusion of all participants in class	3.0%	1.6%
LRN	Positive hearing-learning connection explicitly stated	2.5%	9.4%
NEG-G	General negative comment, such as not worth the expense	6.4%	0%
NEG-S	Specific negative comments such as 'it gives me headaches'	2.1%	0%
NOD	The technology makes no difference	6.7%	0%
POS	General positive comments such as 'I like it' or 'don't change it'	6.6%	0%
SLF	A sense of self; more confidence	0%	6.3%
TEA	Teaching is enhanced, allows for mobility, improved teacher presence in the classroom	1.5%	1.6%
TEC	Specific technical difficulties related to the equipment such as static, feedback, speaker placement	14.1%	17.2%
USG	Users are unfamiliar with proper usage of the technology; more training/support is needed	4.3%	1.6%
VOI	Technology improves voice volume/ projection; reduces strain on the voice	8.8%	26.6%
		*99.00%	*100.2%

Note. * totals do not add up to 100 due to rounding

The Impact of High School Extracurricular Involvement on the Postsecondary Outcomes of Deaf and Hard-of-Hearing Youth

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Abstract

Involvement in extracurricular activities provides youth with opportunities to develop important personal skills, abilities, and preferences, and to build meaningful social support networks. Historically, students who are deaf or hard of hearing (SDHH) have had limited access to opportunities for both academic and occupational development, including extracurricular participation, although legal changes such as the Americans with Disabilities Act (1990) and the Individuals with Disabilities Education Improvement Act (2004) have shifted this landscape. Drawing from data available in the National Longitudinal Transition Survey 2 (NLTS2) and controlling for demographic covariates, we examine the predictive role overall extracurricular involvement and the breadth of that involvement play in postsecondary outcomes, including education, employment, independent living, and self-beliefs, for approximately 1,000 SDHH ages 14 to 18. We also describe the extracurricular activities in which SDHH are most often involved. Our findings suggest that overall involvement in extracurricular activities significantly predicted independent living, and that involvement in more than one activity significantly predicted postsecondary enrollment. We also discuss the limitations of the study design and implications for future research. It is clear that participation in extracurricular activities in high school benefits SDHH later in life.

Keywords: *Adolescent development, extracurricular involvement, deaf and hard of hearing, postsecondary outcomes*

There is growing recognition in educational research and practice of the important role extracurricular involvement plays in young people's positive development (Eccles, Barber, Stone, & Hunt, 2003; Fredricks & Eccles, 2006; Feldman-Farb & Matjasko, 2012; Feldman & Matjasko, 2005; Mahoney, Larson, & Eccles, 2005; Troutman & Dufur, 2007). Traditional definitions of *extracurricular activity* include a highly structured school- or community-sponsored collaborative activity that is guided by one or more adult supervisors. Examples of extracurricular activities within this definition include school and community athletics, performing arts, academic clubs, leadership clubs, and

Boy Scouts (Gilman, Meyers, & Perez, 2004; Mahoney & Stattin, 2000). Many U.S. high school students participate in extracurricular activities. In *Trends in the Well-Being of American Youth, the National Center for Education Statistics* Fox, Connolly, and Snyder, (2005) reported that, in 2001, 15.3% of high school seniors participated in an academic club, 38.6% in a sport, 25.3% in music or a performing art, 15.3% in an academic club, 10.8% in student council/government, and 10% in the newspaper or yearbook.

The purpose of this article is to explore the extracurricular involvement of students who are deaf or hard of hearing (SDHH), a low-incidence population with

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unique educational backgrounds, language modalities, and identification with cultural communities (Batten, Oakes, & Alexander, 2013; Luckner & Muir, 2001; Marschark & Spencer, 2010; Moeller, 2007). Historically, SDHH have had limited access to opportunities for academic and occupational development, including extracurricular activities. Recent legal changes, including the Americans with Disabilities Act (1990) and the Individuals with Disabilities Education Act (2004), have begun to open doors for SDHH both within and outside the classroom. For example, when the 1975 Education for All Handicapped Children Act was amended and signed into law in 1990 as the Individuals with Disabilities Education Act (IDEA), the term *handicap* was replaced by *disability* (Jacob & Hartshorne, 2003). Furthermore, according to Section 504 of the Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act (ADA) of 1990, any programs or services that receive federal money, including educational settings, are required to be accessible to individuals who are deaf and hard of hearing (DHH; DuBow & National Association of the Deaf, 2000). Thus, under ADA, institutions are required to provide accommodations for individuals with disabilities to ensure their equal access to educational opportunities, including extracurricular activities (Cawthon, Nichols, & Collier, 2009).

Previous research on extracurricular activities has explored the important role athletic participation plays in school, community, and cultural life for SDHH (Stewart, 1991; Stewart & Ellis, 1999). However, the impact of involvement in athletics and other extracurricular activities on postsecondary outcomes for DHH youth has yet to be fully examined. Only one study, by Antia, Jones, Luckner, Kreimeyer, and Reed (2011), has found that SDHH participation in school-sponsored extracurricular activities is significantly and positively correlated to both teachers' ratings of students' social skills and students' ratings of their own social skills. Participation in extracurricular activities was significantly and negatively correlated to teachers' problem behavior ratings.

In this article, we first define and discuss the salience of extracurricular involvement as an important context for the adolescent development of all youth. We then review and discuss outcomes specific to DHH youths' participation in extracurricular activities. In our analysis, we use data from the National Longitudinal Transition Study 2 (NLTS2) to investigate the relationship between SDHH extracurricular involvement in high school and their postacademic outcomes. We conclude this article with a discussion of the results and implications for individuals, practitioners, and researchers who work with DHH youth.

Extracurricular Involvement as a Context for Adolescent Development

The ecological systems theory of development provides the theoretical framework for much of the research on extracurricular involvement. It emphasizes a person-environment fit approach to understanding important factors of adolescent development (Bronfenbrenner, 1992; Gilman et al., 2004). This theory accounts for the integration of the individual, the family, and the school and community context, as well as the broader economic and sociological influences on extracurricular participation. This framework has inspired researchers to consider the direct and indirect effects participation in extracurricular activities has on positive youth development and adolescent well-being (Feldman & Matjasko, 2005; Mahoney, Larson, & Eccles, 2005).

Extracurricular activities put adolescents in important leisure environments that create opportunities for them to carry out developmental tasks (Darling, Caldwell, & Smith, 2005), such as exploring and expressing identity, discovering preferences, engaging in challenges outside of academics, building life skills and developing soft skills, social negotiation, and generating academic and social capital. Participating in extracurricular activities gives adolescents the opportunity to develop an extended support network of peers and of adults who serve as mentors (Darling et al., 2005; Eccles & Barber, 1999; Feldman & Matjasko, 2005). For students at risk for academic delay or who struggle with the academic demands of the classroom, extracurricular involvement may offer a place where they can develop important skills and be recognized for successes other than traditional academic achievement (Feldman & Matjasko, 2005).

The Impact of Extracurricular Involvement on Youth Development

Feldman and Matjasko (2005) and Feldman-Farb and Matjasko (2012) systematically examined 88 studies on extracurricular involvement, all published by 2012. Findings from these preeminent literature reviews suggest that extracurricular involvement during secondary school is indeed associated with enhanced academic and social functioning, which in some cases continues into the postsecondary setting. The studies primarily indicate that extracurricular involvement has a positive impact on educational attainment and academic success (Broh, 2002; Camp, 1990; Crosnoe, 2001; Eccles & Barber, 1999). Cooper, Valentine, Nye, and Lindsay (1999) found that extracurricular involvement accounted for 11% of the variance in high school students' GPA above and beyond what was predicted by demographic

information, such as age, race, and socioeconomic status (SES). Marsh (1992) used a large sample (N = 4,422) of nationally representative students and found a curvilinear relationship between extracurricular engagement and GPA. This indicated that stronger extracurricular engagement was associated with a higher GPA, but that the relationship may not be a simple “more is better” result at the upper end of the scale.

The literature also reveals that participation in extracurricular activities has a positive impact on psychological factors related to academic attitude and behavioral outcomes, such as academic persistence (Hanson & Kraus, 1998; Marsh & Kleitman, 2002). Several studies found that students who participated in athletics were almost twice as likely to remain in school as those who did not participate (Davalos, Chavez, & Guardiola, 1999; McNeal, 1995). Darling et al. (2005) reexamined data collected in 1995 from nine high schools in California and Wisconsin and found that extracurricular involvement positively predicted attitudes toward school, as well as the students’ academic aspirations. Eccles and Templeton (2002) proposed that participation in structured extracurricular activities fosters school engagement, interpersonal competence, educational aspirations, and college enrollment, which is similar to Tinto’s (1975) model of academic persistence. Tinto maintained that student persistence as opposed to withdrawal in postsecondary settings is a function of two major factors: a student’s interactions with (a) social systems and (b) academic systems operating within a given institution. Together these findings suggest that extracurricular activities are fundamental to a student’s development of academic motivation and achievement, and to their sense of engagement in school (Feldman-Farb & Matjasko, 2012). Participation in extracurricular activities may foster a sense of belonging and can strengthen social relationships, particularly among students from different ethnic groups or SES classes (Brown & Evans, 2002; Eccles & Barber, 1999; Feldman & Matjasko, 2005). It can also give academically challenged students a way to achieve a sense of community at school, thus reducing dropout rates and the negative impact of student attrition on community cohesiveness (Darling et al., 2005; Khmelkov & Hallinan, 1999; Reis & Díaz, 1999).

Researchers also have examined the impact of the breadth of involvement in extracurricular activities. This is an important concept because it distinguishes between an individual who spends all of their time and energy on one extracurricular activity, such as playing the piano, and one who is involved in multiple activities, such as music, student council, and a sport. Students with a broader range of activities theoretically

are exposed to a greater variety of peer groups, mentorship models, and social networks than those who participate in fewer activities. In the early research, it seemed that participating in more activities resulted in enhanced developmental outcomes. However, Feldman and Matjasko’s (2005) review suggested a curvilinear relationship that includes a point at which participation in too many extracurricular activities is detrimental to an individual’s well-being. This finding was corroborated by the Marsh (1992) analysis, which showed a similar curvilinear relationship between extracurricular engagement and GPA.

There is significant covariation in the literature that relates to various student characteristics and participation in extracurricular activities. In studies of the prevalence of extracurricular involvement and its impact on youth development, these factors often result in interaction effects. For example, early studies measuring participation trends found that adolescents engaged in extracurricular activities were more likely to be from higher SES backgrounds and of European American descent (Marsh, 1992; McNeal, 1998). More recently, Darling et al. (2005) found differences in the rates of youth participation: high school boys were more likely to participate in extracurricular activities than girls, and youth whose parents had less formal education were less likely to participate in extracurricular activities. These researchers also found that students of Hispanic descent were less likely to participate in extracurricular activities than students from any other ethnic demographic. Given the covariation in the literature related to various student characteristics, the analyses in the current study also include interactions for gender, SES, and academic achievement.

Extracurricular Involvement in the Lives of DHH Youth

Sports have been a strong influence in Deaf culture and DHH communities for decades, and they continue to play a role in the lives of DHH youth today (Arsic, Svetlana, & Jasmina, 2012; Stewart, 1991; Stewart & Ellis, 2005). In Deaf communities, athletics provide an important social context for meaningful interaction and facilitates opportunities for young people to strengthen their self-esteem and self-identity, and to contribute as a member of the community (Stewart, 1991; Stewart & Ellis, 2005). Schools for the Deaf also tend to emphasize the athletic tradition by holding competitions between state schools, which are widely supported by parents, alumni, and students. For DHH youth attending school in mainstream educational settings, involvement in extracurricular activities may be a major factor in their success (Luckner & Muir, 2002).

Participation in extracurricular activities also may facilitate the unique transition of DHH individuals who may not have full access to the linguistic modality of the postsecondary setting (Stewart, 1991). Recent research in Deaf education raises significant concerns about the adequacy of the preparation SDHH are given for life after high school (Luft, 2012). Using the Transition Competence Battery to measure the transition strengths and needs of 53 SDHH in middle and high school, Luft and Huff (2011) found that the majority of them were lacking the skills needed to be employed and to live independently. The authors suggested that school-based transition programming for deaf students in public schools should focus on their long-term needs and skill-building, rather than on the kinds of skills needed immediately after high school. Extracurricular sporting events, for example, provide both a buffer and the shared experiences inherent to group sports, which enables DHH athletes to build intimacy and social bonds with their peers (Stewart, 1991).

Outcomes Related to Participation in Extracurricular Involvement for DHH Youth

SDHH enroll in a variety of postsecondary educational institutions (Pepnet2, 2013). Some choose schools such as Gallaudet University or the National Technical Institute for the Deaf in the United States, which have programs specifically for SDHH. Some mainstream postsecondary institutions have a large DHH student population, but most serve fewer than 10 SDHH (Hochgesang, Dunning, Benaissa, De-Caro, & Karchmer, 2007). The most recent estimates, from the National Longitudinal Transition Study (NLTS2), are that only 53% of students identified as having a hearing impairment (including SDHH) completed their postsecondary degree, including diplomas, certificates, or licenses (Newman et al., 2011). Only 34% of students with disabilities completed a four-year college program, compared to 51% of nondisabled students (Newman et al., 2011).

Although some mainstreamed DHH college students who persist through their first year may be particularly resilient, not all choose to complete their degree. Stinson and Walter (1992) found that many SDHH who withdraw from mainstream colleges reported being dissatisfied with their social lives, having difficulty making friends with hearing peers, and lacking DHH peers to interact with. Stinson, Scherer, and Walter (1987) tested a path-analytic model of several factors on outcomes for 233 first-year SDHH at the National Technical Institute of the Deaf, which specifically serves SDHH, to determine whether such social interactions could be facilitated by involvement

in extracurricular activities. Their results suggested that increased college-sponsored extracurricular participation was negatively correlated with college retention after freshman year; in other words, students who participated in college-sponsored extracurricular activities were more likely to withdraw than those who did not. Stinson, Scherer, and Walter (1987) interpreted this finding to mean that students who over-emphasized social involvement in their first year of college may have not mastered self-management skills or developed deeply satisfying relationships. Their findings suggest that it is essential for first-year students to balance the time they devote to extracurricular and social activities with the time they give to their personal care-taking and academics.

Because SDHH are a low-incidence population, quantitative longitudinal studies on the impact community factors have on their higher education outcomes are few and far between. As part of a large five-year study of DHH youth in mainstream educational settings, Antia et al. (2011) examined the correlation between students' participation in school and community extracurricular activities and their social skills and problem behaviors. The study included 191 SDHH in grades two through eight from 125 elementary and middle schools in Arizona and Colorado. Participation in school and community activities were both significantly correlated with high social skills ratings and low problem behavior ratings. Antia et al. (2011) also conducted a principal factor analysis to account for possible collinearity among predictor variables and to obtain the best set of predictors for the social skills and problem behavior ratings. Participation in school and community activities was a consistent predictor under a broad family factor, which included families on the assumption that student participation in an activity is often influenced by their parents' willingness and ability to finance it and provide transportation. This study is the first to provide empirical evidence that extracurricular involvement has a direct effect on the social well-being of DHH students.

The Current Study

The purpose of this study was to investigate a predictive relationship between extracurricular involvement and postschool outcomes for DHH individuals, controlling for the following individual student characteristics: gender, socioeconomic status, Woodcock-Johnson III tests, grades, additional disability, and age. The NLTS2 database contains large samples that have the potential to capture variability within the DHH population, in terms of both individual characteristics

and the family and school contexts of extracurricular involvement. This study occurred in two phases. The first was a descriptive analysis of the number of DHH youth involved in six superordinate categories the researchers created to capture 17 extracurricular activities that NLTS2 reported during the first wave of data collection in the 10-year longitudinal study. The purpose of this first phase was to examine which extracurricular activities DHH youth were involved in. The second phase examined the predictive relationship between extracurricular involvement and the postschool outcomes of education, employment, and life satisfaction. The research questions for this second phase were as follows.

- Research Question 1a: What is the prevalence rate of high school participation in categories of extracurricular activities (athletics, religious, leadership/community, performing arts, knowledge-based, and disability support) for SDHH?
- Research Question 1b: Are there differences in the prevalence rates of participation in extracurricular activity (versus nonparticipation) by socioeconomic status (as measured by household income), gender, and achievement (as measured by scores on the Woodcock-Johnson subtests of achievement)?
- Research Question 2a: Does participation in any extracurricular activity (versus nonparticipation) predict postsecondary outcomes (education, employment, and life satisfaction), after controlling for other student characteristics (gender, family socioeconomic status, Woodcock-Johnson III, grades, additional disability, and age)?
- Research Question 2b: Does breadth of participation in extracurricular activities (as measured by the summed participation in any one of six researcher-categorized groups of activities: athletics, religious, leadership/community, performing arts, knowledge-based, and disability support) predict postsecondary outcomes (education, employment, and life satisfaction), after controlling for other student characteristics (gender, family socioeconomic status, Woodcock-Johnson III, grades, additional disability, and age)?
- Research Question 3a: If an interaction is found between socioeconomic status (as measured by household income) and extracurricular involvement (as a binary variable), does that interaction predict postsecondary outcomes?

- Research Question 3b: If there is an interaction between gender (male or female) and extracurricular involvement (as a binary variable), does that interaction predict postsecondary outcomes?
- Research Question 3c: If there is an interaction between academic achievement (as measured by scores on the Woodcock-Johnson subtests of achievement) and extracurricular involvement (as a binary variable), does that interaction predict postsecondary outcomes?

Methods

Dataset

The U.S. Department of Education funded the second National Longitudinal Transition Study to help scientists understand the achievements of disabled youth who are entering adult life (see <http://www.nlts2.org>). To be included in the study, students had to be between 13 and 16 years of age on December 1, 2000. Many different stakeholders participated, including the students themselves, their parents, teachers, and school staff. The surveyors contacted youth biannually from 2001 to 2009, and collected data via mail surveys, computer-assisted telephone interviews, and direct psychological assessments. This current analysis utilizes data from the first, second, and final waves that were collected in 2001, 2003, and 2009, respectively.

The NLTS2 was intended to be nationally representative for a wide variety of students with a wide variety of disabilities. A simple random sample would do a poor job of achieving this goal, therefore the NLTS2 surveyors used a stratified weighted sampling scheme, which improved the generalizability and precision of estimation. In the rest of this section, we discuss the sampling scheme in more detail.

Stratification occurred at both the local education agency (LEA) level and the disability level. The surveyors first stratified the LEAs by enrollment size, district wealth, and region. The enrollment size stratification was based on the number of students in grades seven through twelve, inclusive. LEAs with fewer than 1,600 students had a “small” enrollment; between 1,600 and 4,700 students had “medium” enrollment; between 4,700 and 15,000 students had “large” enrollment; and more than 15,000 students had a “very large” enrollment. Surveyors based the “district wealth” stratification on the Orshanky index, or the percentage of students living below the poverty line (Fisher, 1992). LEAs where 25% to 43% of its enrollment lived below the poverty line were coded as having “low” district wealth, whereas those where 14%

to 24% were below the poverty line had “medium” district wealth. Outside of this range, LEAs were coded as having either “very low” or “high” district wealth. The NLTS2 surveyors based the final stratification, region, on a grouping scheme that other federal organizations (the U.S. Department of Commerce, U.S. Bureau of Economic Analysis, and National Assessment of Educational Progress) used: Northeast, Southeast, Midwest, and West. This made NLTS2 consistent with other large-scale datasets related to American education and employment. After identifying these stratifications, the surveyors randomly sampled the LEAs and stratified students in the selected schools by disability category. The latter stratification helped ensure that NLTS2 had a nationally representative sample for every disability category sampled.

This study included roughly 950 students who are DHH. To be included, participants had to satisfy two criteria. First, the student’s parents had to verify that their child was deaf or hard of hearing (D/HH). Due to sparsity in the dataset, the surveyors collapsed the participants into the category DHH, despite the diversity of these two groups. Very little audiological information is available in this dataset, so we simply consider them as a whole. The second criterion was that the participant could have no missing data on the dependent variable for any particular analysis. Of the 950 students included in this study, 290 attended schools that specialize in serving students with disabilities. It is unclear what proportion of those students attended a residential school for the d/Deaf, as no variable in the dataset provided this information available. Only 10 of the 950 students participated in a 504 plan.

Variables

The independent variables in the current study included information about the youth’s extracurricular involvement and various interaction terms. Covariates and auxiliary variables for the missing data model involved both demographic and ability-related data. We took almost all of the independent variables, covariates, and auxiliary variables from the first wave of NLTS2. The only exception was the Woodcock-Johnson measure, which psychologists administered as part of the direct assessment across waves one and two. Sample size depended on the exact variable we looked at, not just the wave. For example, wave 1 of the dataset included data on 950 DHH students; Woodcock-Johnson assessment data from waves 1 and 2 were available for 680 DHH students; data on grades were available for 760 DHH students; and data from wave 5 were available for 540 students. More information on the study variables follows.

Independent variables. Independent variables may be grouped into three categories: participation, breadth of involvement, and interaction terms. The simplest variable, participation, recorded whether students participated in any organized extracurricular activities. We set this binary variable at one if parents reported that the youth participated in school activities outside of class, or if parents reported that the youth participated in out-of-school activities (variable names: np1F3 and np1F4). Otherwise the variable was set to zero.

The second variable, breadth of involvement, captured the wide variety of extracurricular activities the NLTS2 participants reported being involved in. They originally reported participating in at least 17 different extracurricular activities. We grouped these activities into six larger categories, each of which was binary. For instance, the athletic variable was set to one if parents reported that the youth belonged to a sports team or were in the Special Olympics. Variables were categorized by shared common qualitative features, such as the subject matter or nature of the activity. Otherwise it was set to zero. These larger categories consisted of religious youth groups, leadership and community-related groups, knowledge-based activities, disability support groups, athletic groups, and groups related to the performing arts. For more information on the coding of these six groups, see Appendix A.

The breadth of involvement variable was the sum of these six smaller binary variables. For instance, if students participated in both a sports team and a religious group, their score for this variable would be a two. Students who did not participate in any extracurricular activities would have a zero for this variable, and so on. Finally, a number of interaction terms were used in this analysis. SES status (measured by household income), gender, and academic achievement (measured by the Woodcock-Johnson tests) were hypothesized to interact with the participation variable.

Dependent variables. Our research lab has employed these seven dependent variables many times, from a variety of theoretical perspectives (e.g., removed for blind review) We group them into three larger categories: academic outcomes, employment-related outcomes, and general life outcomes. These variables were all collected from the fifth and final wave of NLTS2. The two academic outcomes were binary, one describing enrollment in a postsecondary institution and the other describing graduation from a postsecondary institution.

One employment outcome was binary, while two others were continuous. The binary variable described whether the youth had ever worked for pay outside the home. One continuous variable was the youth’s

hourly wage, the other described the youth's job satisfaction. The job satisfaction score was the sum of seven questions asked about the youth's satisfaction with the social aspects of the job, their compensation, and their career advancement potential. Four of the seven questions were binary, which we coded as zeros and ones. Three of the questions were on a continuous scale, which we rescaled so they varied between one-fourth and one. The individual questions can be found in Appendix B. Finally, we used one binary general life outcome and one continuous general life outcome. We added up five scaled questions to obtain the continuous outcome, which assessed aspects of the student's self-beliefs, in particular their self-esteem and self-efficacy. These questions can be found in Appendix C. The binary outcome described whether the student lived independently, with a spouse or roommate, or in any dormitory, including college housing.

Covariates and auxiliary variables. The covariates and auxiliary variables included demographic information and data related to achievement and aptitude. We took these data primarily from the first wave of NLTS2, which had the highest response rate. We used auxiliary variables only in the missing data model, not the research model. The demographic covariates included household income, gender, age, additional disabilities, and parental education level. NLTS2 surveyors created the cross-instrument dataset, which provided the gender and age variables. Parents reported the other variables in the first wave. We had two continuous variables to covary for achievement and ability level. The first covariate was the average of the six selected subtests of the Woodcock-Johnson III that psychologists administered in the first and second wave of NLTS2. The selected subtests included passage comprehension, the synonym-antonym subtest, calculation, applied problems, social studies, and science. The other covariate estimated the students' average grades, which NLTS2 surveyors reported in the cross-instrument dataset. Auxiliary variables helped correct for missingness but were not used in the primary analysis. The binary variables described whether a student's parent or guardian lived with a partner, and whether a student was ever expelled, suspended, or subject to other serious disciplinary action.

Missing Data Procedure

To make this study as representative as possible, we used multiple imputation to deal with missing data. This is consistent with our prior work (authors names removed for blind review). In multiple imputation, the software predicts missing values of the covariates and independent variables, using every other

variable in the dataset. This is done multiple times, which introduces some amount of randomness to the predicted values; the randomness helps to properly estimate standard errors.

This procedure is only appropriate if the data are missing at random. This assumption states that there is no response bias, conditioning on the other variables in the model. In most practical situations, it's not possible to directly evaluate the validity of this assumption. However, we may add variables to the missing data model to make the assumption more credible (Allison, 2001; Collins, Shafer, & Kam, 2001), which is why we added a few auxiliary variables to the missing data model. Table 1 displays the amount of missing data for independent variables, covariates, and auxiliary variables.

Overall, there was a tolerable amount of missing data for most of the independent variables and covariates, in particular the "participation" and "breadth of involvement" variables, which had 0% and 10% missing data, respectively. The one exception was the Woodcock-Johnson III measure and its interaction with the participation variable, which had 40% missing data. This was partly due to simple attrition; some percentage of students took the test in the second wave of NLTS2. However, part of the attrition was intentional. Trained psychologists had the option of deciding whether to administer the Woodcock-Johnson or an alternative assessment. Unfortunately, this decision-making process does not seem to be transparent to researchers. The NLTS2 documentation states that there was a routing questionnaire, but to our knowledge the routing test wasn't provided in the datasets. This uncertainty is one of the biggest reasons why we employed multiple imputation. Students could be included in this research whether or not they took the Woodcock-Johnson subtests. All the basic demographic covariates, like age, gender, additional disabilities, and parental education level, had no missing data. NLTS2 surveyors were not able to ascertain typical grades or household income for 20% of the sample. Finally, we had complete data on student disciplinary action for the auxiliary variables but lacked data on parent spousal status for 20% of the sample.

Data Analysis Strategy

To correct for the high degree of missingness in the Woodcock-Johnson III subtests, we created 20 imputations in R using the "mice" package (Buuren & Groothuis-Oudshoorn, 2011). Predictive mean matching imputed missing values for most of the dataset, while logistic regression imputed missing values for binary data. After R created the imputations, we used

the “survey” package (Lumley, 2004), which created a survey-corrected imputation list. The *glm* function fit the linear models and, finally, the “mitools” package combined the 20 models to give these statistics. Three sets of linear models were fit, each with four binary and three continuous dependent variables. Taylor linearization corrected for the stratified sampling design. The first set of linear models only included the participation IV. The second set included only the breadth of involvement IV. Finally, the last set of models included the participation IV and its associated interaction terms. Test-wise type I error rates are set at 0.01, and we report only statistically significant results.

Results

Descriptive Statistics

This section provides descriptive statistics for the independent variables, covariates, and auxiliary variables. We first discuss demographics and ability measurements. There seems to be a fair amount of demographic diversity in the sample. About half of the sample was female and about half of the sample had additional disabilities. Household income varied widely: 20% of households had an income greater than \$70,000 annually, and 20% had incomes less than \$20,000 annually. Other demographic data may be found in Table 2.

Descriptive statistics for ability and achievement covariates are also provided. About 40% of the students made mostly A's and B's or higher. On average, students scored 77.34 points on the Woodcock-Johnson subtests, with a standard deviation of 19.35 points. More information may be found in Table 3.

About 70% of students participated in some sort of extracurricular activity. Out of all those who did so, 30% participated in only one kind of activity, 20% participated in two different kinds of activities, and about 10% participated in three or more activities. Again, these numbers are rounded to the nearest ten in accordance with IES policy. Finally, we provide some descriptive information about which specific extracurricular activities the students participated in. Recall that we broadly categorized extracurricular activities into six groups; see appendix A for details. Of the roughly 950 students who participated in some type of extracurricular activity, 450 participated in athletics, 330 in a religious youth group, and 180 in a leadership or community group. About 110 students participated in the performing arts, 90 in a knowledge-based group, and 40 were in a disability support group.

Primary Analysis

Overall, none of the interaction terms was significant. We found no evidence to suggest that participating in extracurricular activities interacted with household income, gender, or achievement, as measured by the Woodcock-Johnson III subtests. As such, we discuss the other two sets of linear models. Participating in extracurricular activities significantly predicted independent living ($t[14270] = 3.02, p < 0.01$). Specifically, the odds of living independently were 9.50 times greater for students who participated in extracurricular activities, which is considered a strong effect (Ferguson, 2009; see Table 4 for more details). Table 5 is a contingency table for descriptive purposes. It uses independent living status as an outcome, which was drawn from wave 5 of the dataset, thus around 540 students are accounted for.

Finally, the breadth of involvement variable had a statistically significant impact on postsecondary education enrollment ($t[793] = 2.61, p < 0.01$). Being involved in more than one kind of activity improved the odds of attending postsecondary school by 2.41 times, a mild-to-moderate effect (Ferguson, 2009). More details may be found in Table 6.

Discussion

Predicting the outcomes (including academic success) of DHH students is challenging for several reasons, primarily because the low incidence of the population makes it difficult to locate participants for such studies (Convertino et al., 2009). Moreover, the linguistic, cultural, and educational heterogeneity within the population contribute to statistical variability, making it a challenge to generalize findings across the entire population. Given this, the use of a large-scale longitudinal database like the NLTS2 was promising because it contained representative sample sizes that had the potential to capture variability within the DHH population.

The purpose of this study was to identify which extracurricular activities DHH youth are involved in and further explore the potential predictive relationship between extracurricular involvement in high school and postsecondary outcomes for these youth. Our findings suggest that overall involvement in extracurricular activities significantly predicted only one of our postsecondary outcomes (independent living), but that involvement in more than one activity significantly predicted postsecondary enrollment. Limitations to the study design and implications for future research are discussed below.

Range of Activities in Which DHH Youth Are Involved

Roughly 950 students who are DHH were included in this study. Our descriptive analysis revealed that approximately 450 participated in athletics, 330 participated in a religious youth group, and 180 participated in a leadership or community group. About 110 students participated in the performing arts, 90 were in a knowledge-based group, and 40 were in a disability support group. As discussed earlier, it is not surprising that the largest percentage (slightly less than half) of students who are DHH participated in some form of athletic activity. The percentage of DHH students involved in athletic activities is fairly consistent with findings from Fox, Connolly, and Snyder (2005), who reported that 38.6% of high school seniors were involved in some form of interscholastic or intramural athletic activity. These descriptive findings highlight which activities DHH youth are most involved in and shed light on the activities of most interest to these youth.

Participation in Extracurricular Activities

Of all the outcomes measured in this study, only one was significantly predicted by DHH youth's involvement (participation versus nonparticipation) in any extracurricular activity. Our findings revealed that participation in any extracurricular activity significantly predicted independent living and was considered a strong effect. The value of this analysis is in understanding where extracurricular involvement contributes to the postschool experience of DHH individuals. Our findings may suggest that engaging in extracurricular activities gives DHH youth the opportunity to develop or strengthen important life skills that are transferable to living independently in postsecondary settings. Important life skills such as time management, decision-making, self-advocacy, self-determination, soft social skills, and social navigation are all examples of the transferable life skills DHH youth may develop through their participation in extracurricular activities (National Secondary Transition Technical Assistance Center, 2010). The lack of a significant relationship between overall involvement in extracurricular activities and postsecondary enrollment was a surprise, given the findings of previous studies indicating a significant and positive relationship between extracurricular involvement and academic aspiration and performance (Eccles & Barber, 1999; Eccles et al., 2003; Eccles & Templeton, 2002; Fredricks & Eccles, 2006; Mahoney, Cairns, & Farmer, 2003). Only a few studies found little or no correlation between general extracurricular involvement and any academically oriented outcome (Antshel & Anderman, 2000; Lisella & Serwatka,

1996). This particular finding from our study seems to add to this small collection.

The lack of significance in our findings is influenced to some degree by our choice of methodological designs. As Marsh (1992) comments, the use of regression analyses implicitly assumes that extracurricular involvement is linearly related to postsecondary outcomes. Although we found a lack of significance between overall extracurricular involvement and postsecondary education enrollment, it may be that extracurricular involvement has an indirect effect on these outcomes. In our study, a potential mediator may exist between extracurricular involvement and our outcomes of interest, such as student motivation. Fredericks and Eccles (2006) highlight an important concern in the field that was raised by researchers employing nonexperimental methods; there is likely some motivational construct underlying both involvement in extracurricular activities and outcomes related to academic achievement. It may be that we have failed to capture the true nature of the relationship between our variables of interest. Stinson and Walter (1997) insightfully argue that DHH students' motivation is a particularly important noncognitive predictor of college achievement. Future studies on the predictive ability of extracurricular involvement that account for the impact of student motivation on the postsecondary outcomes of DHH youth are recommended. Future studies would also do well to incorporate a path analytic approach to examine any indirect effects of extracurricular involvement on the postsecondary outcomes of DHH youth.

Breadth of Participation in Extracurricular Activities

In terms of the role breadth of involvement plays in postsecondary outcomes for DHH youth, our findings reveal that participation in more than one extracurricular activity significantly predicted postsecondary enrollment. While this effect was only mild to moderate, it validates the body of research that asserts that involvement in diverse activities is associated with better academic outcomes and enhanced psychosocial functioning (Bartko & Eccles, 2003; Fredericks & Eccles, 2006; Mahoney, Lord, & Carryl, 2005). As Fredericks and Eccles (2006) suggest, participating in a wide range of extracurricular activities gives youth additional opportunities to develop important competencies and exposes them to new experiences and peers. Our findings may also contribute to the body of research that suggests a curvilinear relationship between activity participation and student well-being (Feldman & Matjasko, 2005; Feldman-Farb & Matjasko, 2012; Marsh, 1992). Our findings primarily suggest that

increasing extracurricular participation benefits DHH youth and significantly predicts postsecondary enrollment. However, future studies would do well to include an interaction term to test for the curvilinearity in the relationship between extracurricular involvement and postsecondary outcomes for DHH youth, which would validate those findings more explicitly and extend them to DHH populations.

Limitations

There are several limitations to this study. The NLTS2 is primarily a research tool that provides data across a nationally representative sample of students, including those from low-incidence populations, such as DHH youth. This study is longitudinal, following individuals as they transition from high school to postsecondary opportunities and contexts. As such, this dataset, and this study in particular, is not experimental and is not designed to draw inferences between the experiences of individuals who are DHH and those who are hearing. It was not possible to distinguish which of the students in our sample attended a mainstream setting and which attended a d/Deaf school. This is a major limitation of the study, since no investigation of how this difference impacts extracurricular involvement or our selected outcomes was possible. There is also no appropriate control group within the NLTS2 dataset for DHH individuals that does not assume a disability as a function of their inclusion in the study. While this may be seen as a limitation of the analysis, it does provide discussion that moves away from a deficit perspective or expectation of a normative experience. Most of the current research on this topic is either cross-sectional or correlational and has been based on small-scale samples of convenience with very limited generalizability (Marsh, 1992). Future research is needed to directly address causal connections between extracurricular involvement and various outcome variables, using experimental designs to the greatest extent possible (Gilman et al., 2004). Experimental designs certainly would need to account for other methodological issues that are inherent to the topic of extracurricular involvement. However, the issue of student “self-selection” into extracurricular activities is the biggest methodological challenge all researchers face because of the difficulty in separating any real causal effects from preexisting differences among the study subjects (Marsh, 1992).

Implications for Individuals, Practitioners, and Researchers in the Field

Our study supports the current efforts of educational scholars and youth policy advocates who argue for the provision of extracurricular opportunities in schools and communities that will enable youth to engage in important developmental tasks. Participation in structured, organized, extracurricular activities such as athletics and academic and community clubs supports positive youth development and is a productive use of adolescents’ leisure time (Fredericks & Eccles, 2006). These findings can now be extended to DHH youth because, as our study shows, overall participation in extracurricular activities significantly predicts ability to live independently, while increased participation in extracurricular activities significantly predicts postsecondary enrollment. Policy-makers and educators, particularly those who work directly with DHH youth, should provide ample opportunities for their students to become involved in a variety of extracurricular activities and encourage them to do so.

Specific legal or policy implications of these findings may be found within strategies for improving transition planning for students who are DHH. IDEA requires that youth with individualized education programs begin planning for the transition to college by age 16, and in some cases the process starts as early as age 14. These findings thus encourage transition planners, parents, and teachers to consider the benefits of extracurricular activities for students who need to develop skills that lead to independent living outcomes. The transition planning could address these skills specifically and recommend both academic and extracurricular opportunities. These skills may be related to those used in academic settings, but they can also include those that add to an individual’s employability and to their agency in making decisions for themselves. For SDHH in both mainstream and self-contained settings, extracurricular activities may provide the social interaction and mentorship they can use to develop skills for successful life outcomes.

Conclusion

Our study found that participation in structured school or community extracurricular activities fosters one positive postsecondary outcome: independent living. Our study also found that breadth of participation increases the likelihood of enrollment in postsecondary education. Our study appears to validate other researchers’ findings that participation in extracurricular activities is beneficial to youth, especially DHH youth,

for the opportunities it affords (Eccles & Templeton, 2002). Youth who participate in extracurricular activities are given the chance to solve problems and overcome challenges; to develop skills in the social, academic, and physical domains; to belong to peer groups and establish positive and supportive mentoring networks; and to transfer the skills they acquire to a postsecondary setting. From a developmental perspective, all youth, DHH included, should be given the opportunity to engage in school and community activities, as they promote and foster important and positive adolescent growth.

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Footnote

¹ This was measured with a set of 17 Likert-scale items assessing frequency of participation in activities such as sports, fraternities/sororities, etc. Total scores were obtained by summing individual scores across the 17 items.

Table 1

Missing Data Percentages

Variable	Percentage Missing
Independent Variables	
Participation	0
Breadth of involvement	10
Interaction: Participation*Gender	10
Interaction: Participation*SES	20
Interaction: Participation*WJ	40
Covariates	
Age	0
Gender	0
Presence of additional disabilities	0
Household income	20
Woodcock-Johnson III measure	40
Typical grades	20
Parents highest education level	0
Auxiliary Variables	
Whether child was suspended	0
Whether parent lives with a partner	30

Note. Since these data are individually identifiable, these numbers are rounded to the nearest ten, in accordance with IES policy.

Table 2

Participant Demographics

Variable	Percentage
Covariates	
Youth is female	50
Age (as of 2002)	
14	20
15	20
16	20
17	30
18	10
Has additional disability	50
Yearly household income	
\$20,000 or less	20
\$20,001-\$30,000	20
\$30,001-\$40,000	10
\$40,001-\$50,000	10
\$50,001-\$60,000	10
\$60,000-\$70,000	10
\$70,001 or more	20
Parents highest education level	
No GED/High school diploma	20
GED/High school diploma only	30
Some postsecondary education	10
Vocational degree	<10
Associate's degree	10
Bachelor's degree	10
Some graduate work	<10
Graduate degree	10
Auxiliary variables	
Parent has a partner living in the home	90
Student subject to disciplinary action	30

Note. These numbers are rounded to the nearest ten, in accordance with IES policy.

Table 3

Ability Covariates

Students' Grades Are...	Percentage	
Mostly D's or below	<10	
Mostly C's and D's	10	
Mostly C's	10	
Mostly B's and C's	30	
Mostly B's	10	
Mostly A's and B's	30	
Mostly A's	10	
Woodcock-Johnson III subtests: Standard-score*	Average score	Std dev
Grand mean	77.34	19.35

Note. Because NLTS2 provides individually identifiable data, the percentages reported here are rounded to the nearest ten, in accordance with IES policy.

Table 4

Logistic Regression Results for Independent Living

Variable	Odds Ratio Estimate	<i>t</i> -statistic	<i>p</i> -value	Odds Ratio 95% Confidence Interval	
Extracurricular Participation	9.50	3.03	0.0025*	2.21	40.92
Parent education	1.01	0.04	0.9681	0.75	1.35
Household income	0.95	-0.63	0.5312	0.82	1.11
Presence of additional disabilities	0.46	-1.47	0.1400	0.16	1.29
Woodcock-Johnson III score (standardized)	1.05	1.75	0.0824	0.99	1.10
Typical grades	0.86	-0.76	0.4460	0.58	1.27
Youth is female	0.89	0.66	0.8297	0.30	2.63
Youth's age	0.90	0.42	0.7356	0.49	1.65

Note. * $p < .01$

Table 5

Contingency Table: Student Extracurricular Participation and Independent Living Status

Independent Living	Extracurricular Participation	
	Did not participate	Participated
No	110	30
Yes	240	200

Table 6

Logistic Regression Results for Postsecondary Enrollment

Variable	Odds Ratio Estimate	<i>t</i> -statistic	<i>p</i> -value	Odds Ratio 95% Confidence interval	
Breadth of involvement	2.41	2.61	0.0094*	1.24	4.69
Parent education	1.40	1.74	0.0818	0.96	2.05
Household income	1.01	0.11	0.9117	0.85	1.20
Presence of additional disabilities	0.22	1.97	0.0500	0.05	1.00
Woodcock-Johnson III score (standardized)	1.10	3.23	0.0016*	1.04	1.17
Typical grades	1.41	2.03	0.0426	1.01	1.98
Youth is female	2.04	1.09	0.2755	0.57	7.33
Youth's age		1.42	0.1574	0.84	

Note. * $p < .01$

Appendix A**Categorizing Extracurricular Activities**

Category	Category includes...	Variable names
Leadership & community groups	Scouting groups YMCA/YWCA/JCC/Boys-Girls club 4-H club Student Government Volunteer service Group Cultural Affinity Group Leadership/Group Development club	np1F5_01 np1F5_03 np1F5_06 np1F5_09 np1F5_11 np1F5_13 np1F5_15
Knowledge-based groups	Special interest clubs School subject matter club Homework club Vocational club	np1F5_07 np1F5_10 np1F5_14 np1F5_16
Religious youth groups	Religious youth groups	np1F5_02
Disability-related groups	Disability-oriented support group	np1F5_12
Athletics	Sports team Special Olympics	np1F5_04 np1F5_05
Performing arts	Performing group	np1F5_08

Appendix B**The Job Satisfaction Score**

Prompt	Scale
Youth thinks he/she has opportunities to work his/or her way up	Binary
Youth thinks he/she is paid pretty well for his or her work	Binary
Youth thinks he/she is treated pretty well by others at work	Binary
Youth thinks his or her education is being put to good use	Binary
How well youth gets/got along with co-workers at current or most recent job	Likert 1-4
How well youth gets/got along with boss at current or most recent job	Likert 1-4
How well youth usually likes/liked his/her current or most recent job	Likert 1-4

Appendix C

The Self-Beliefs Score

Prompt	Scale
Youth identification with statement: you know how to get the information you need	Likert 1-3
Youth identification with: you can handle most things that come your way	Likert 1-3
Youth identification with statement: you are proud of who you are	Likert 1-3
Youth identification with statement: you feel useful and important	Likert 1-3
Youth identification with: You feel your life is full of interesting things to do	Likert 1-3

From Assessment to Action: Identifying Progress Toward Enhanced Accessibility and Campus Climate (Practice Brief)

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Abstract

In 2013, a focus group of administrators, faculty, staff, and students at Skidmore College was held to discuss cross-campus changes implemented following the Assessment of Campus Climate to Enhance Student Success survey and an external disability services audit, which were conducted during the 2008-2009 academic year. The focus group gave these campus constituents an opportunity to both gauge progress and identify areas of continuing need in serving the college's students with disabilities. The participants identified changes in policies, procedures, and services, and in the level of awareness and attention given to the needs of students with disabilities at the departmental and institutional levels. This practice brief describes the implementation of this focus group and reviews cross-campus initiatives implemented between 2009 and 2013, as identified by the respondents. Three themes emerged from the focus group responses: enhanced communication and coordination, increased awareness and receptivity, and areas needing further development.

Keywords: *Campus climate, disability services, focus group, college students with disabilities*

Literature Review

As of 2009, approximately 11% of all students enrolled at U.S. postsecondary education institutions reported having a disability (Korbel, Lucia, Wenzel, & Anderson, 2011; Snyder & Dillow, 2013). While legal mandates such as Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act have increased access to postsecondary education for individuals with disabilities, access alone cannot guarantee that these students will be afforded full participation or inclusion in the campus environment (Belch, 2011; Meade, 2006). As the need for individualized support continues to increase beyond accommodations in the classroom, providing support for students with disabilities has become an imperative responsibility for departments other than college disability services offices (Huger, 2011). Thus it is essential to coordinate institutional efforts to establish

effective support services. This requires faculty, administrators, and staff to go beyond mere compliance with legal mandates to foster a welcoming campus climate (Korbel et al., 2011; Simon, 2011). Campus climate refers to individuals with disabilities' attitudes toward and perceptions of the campus environment, including their evaluation of the institution's support systems and resources, educational and social practices, and the physical environment (Cress, 2008; Huger, 2011).

To establish a welcoming campus climate for students with both documented and undocumented disabilities, university leaders must evaluate the accessibility of their institution's physical, social, organizational, and technological systems and structures (Strange, 2000). Campus climate assessments are one way to evaluate an institution's current effectiveness in meeting the needs of the entire campus population, and the results may provide a catalyst for developing more informed practices and new student support ini-

¹ Albany College of Pharmacy and Health Sciences; ² Skidmore College

tiatives (Stodden, Brown, & Roberts, 2011). However, while it is common practice among higher education institutions to conduct campus climate assessments, there is limited evidence on how the data from these assessments have been used to implement changes in services, policies, and procedures for students with disabilities. This practice brief provides an overview of the progress Skidmore College has made in implementing the recommendations that emerged from disability services and campus climate assessments, specifically those identified and discussed by campus constituencies in a focus group.

Background of Campus Climate and Disability Services Assessment Implementation

With the support of senior administrative leadership, Skidmore College, a small, highly selective liberal arts college in Upstate New York, contracted with the Association on Higher Education and Disability in fall 2008 to conduct the Assessment of Campus Climate to Enhance Student Success (ACCESS) in order to gain a better understanding of the campus climate (see Eilola et al., 2011, for a complete discussion of this process). Recommendations resulting from the ACCESS survey included a need for greater awareness across the campus about the needs of students with disabilities and the accommodations process, stronger relationships between faculty and the school's Office of Disability Services, and the establishment of an Americans with Disabilities Act (ADA) advisory board to implement accessibility initiatives (Eilola et al., 2011). Skidmore College concurrently contracted with an external consultant to audit its disability services program, which was done from October 2008 to March 2009. The audit recommendations included creating an ADA advisory group to implement accessibility and educational initiatives, adopting a formal disability services model, and identifying methods to increase the accessibility of programs and services by making information about the accommodations process more available to the public. These concurrent initiatives prompted conversations across campus departments and facilitated plans to create an enhanced campus experience for students with disabilities.

Discussion of the Problem

In spring 2013, members of the ADA advisory group decided to assess progress made toward satisfying the recommendations from the 2008-2009 audit and survey in terms of policies, procedures, services, and overall awareness within individual departments

and across the campus. The purpose in gathering data more than four years after implementing the two initial initiatives was to formally recognize progress made in implementing the recommendations, promote conversation across constituencies about disability and accessibility, and detect areas of continued need in serving the college's students with disabilities. If the school failed to assess progress and plan future initiatives, the needs of its students with disabilities could go unmet, an issue the ADA advisory group continually works to eradicate.

Strategy for Enrolling Students with Disabilities

Since 2008, the number of students with disabilities enrolled at Skidmore College who registered to receive academic accommodations has steadily increased (Table 1). For example, the number of students who took exams with extended time allowed or in the college's testing room with reduced distractions more than tripled from fall 2009 to fall 2012 (Table 2). The majority of students who registered as having documented disabilities identified themselves as having a learning disability, ADD, or ADHD.

In 2013, members of the college's ADA advisory group decided to conduct a focus group to elicit feedback from school administrators, faculty, staff, and students on progress made toward creating a more inclusive environment for students with disabilities since the 2008-2009 assessments. The administrators selected this over alternative data-collection methods as it enabled campus constituencies to have thoughtful conversations around disability and accessibility issues on campus, in accordance with the ADA advisory group's mission. Administrators from academic advising, academic affairs, residential life, special programs, campus life, the counseling center, student academic services, institutional technology, and library services were invited via e-mail to participate. Those invited to participate were selected based on their involvement in campus services related to ADA concerns. Current students with and without disabilities who had been attending Skidmore College since 2009 were also contacted via e-mail and invited to participate in individual interviews, which asked the same focus group questions but within a confidential environment.

Before starting, participants were given a verbal and written overview of the background, procedures, risks and benefits, confidentiality, and voluntary nature of the focus group. All participants signed an informed consent form to acknowledge their understanding and agreement with the procedures. Each question was then posed (see Appendix), and participants were given time

for open discussion on each topic. The focus group process was documented using an audio-recording device. When the focus group ended, the recording was reviewed and analyzed to identify unique areas of progress and overarching themes in the participants' responses. This involved examining the data in each domain of inquiry (i.e., each interview question) to identify emergent themes across the individual responses. These themes were then reviewed to ensure that they appropriately represented what the interviewees expressed in each domain of inquiry.

Observed Outcomes

Ten individuals representing the areas of academic advising, academic affairs, residential life, special programs, campus life, the counseling center, student academic services, institutional technology, and library services, and one student, participated in the focus group. Three students (two with disabilities and one without) and two administrators (one from academic affairs and one from human resources) who were unable to attend the focus group participated in individual interviews, which were conducted using the focus group questions, as explained above. Three themes emerged from the focus groups and interviews (see Table 3 for quotes corresponding with each theme). These themes included enhanced communication and coordination between and within campus constituencies; increased awareness and receptivity to inclusion and the accommodations process; and the need for more development to create a fully inclusive, accessible campus environment.

Enhanced Communication and Coordination

The ADA advisory group established in 2011 was comprised of administrators, faculty, staff, and students, upon the recommendation of both the ACCESS survey implementation team and the external auditor. The committee's aim was to improve cross-campus communication, address issues of access and ADA compliance, and plan and execute initiatives to improve inclusion and access across the campus. The group chose a shared model of disability services provision, in which responsibility for providing services is distributed among faculty, administrators, and staff. Communication between the Coordinator of Student Access Services (formerly titled coordinator for students with disabilities), the offices of admissions, special programs, and residential life, and the counseling center became more intentional, which resulted in seamless student referrals to the appropriate departments. Anna,* an administrator participant,

noted that the student housing accommodations process had been streamlined when this task was reassigned to the Coordinator of Student Access Services.

The curriculum committee instituted a requirement for faculty to include an academic accommodations statement on all course syllabi. When they registered with the Coordinator of Student Access Services, these statements informed students what course-related accommodations were available. The Office of Academic Advising and the Coordinator of Student Access Services jointly implemented faculty training on how student academic services operated, with an emphasis on serving students with disabilities. They also implemented a training session for new faculty hires on coordinating the delivery of accommodations. New student employees also received training through the Office of Residential Life about the inclusive programming offered in the residence halls. This training was given by administrator respondent Anna and included an explanation of the accommodations statements provided on program flyers. Application materials for special programs and study abroad opportunities were also updated to include information about what accommodation supports were available and the process for requesting them. Student respondent Jane* stated that adding accommodation information to the study abroad application had made coordinating and receiving academic accommodations at an institution abroad a straightforward process.

Physical enhancements to the campus had also been undertaken following the assessments conducted in 2009. A testing room was established by student academic services in 2009, which improved the college's ability to provide appropriate testing accommodations. Faculty respondent Mark* noted that the Office of Student Academic Services saw a steady increase in the number of students who took exams with extended time and/or reduced distractions after the testing room was established, although a relationship between the testing room and the increase in test accommodations used cannot be confirmed without further evaluation (Table 1). Walkways, doorways, and bathroom facilities across the campus were also renovated to improve physical accessibility.

Increased Awareness and Receptivity to Inclusion and the Accommodations Process

The focus group participants noted that an increase in deliberate coordination and communication among the college departments generated greater awareness and receptivity to the need for inclusive practices across the campus. They also said they sensed that the administration had more fully embraced an ethos of

ADA compliance. While additional evaluation would have to be conducted to confirm their responses, the respondents all said they felt a shift on campus toward increased awareness and receptivity relative to the increased coordination of services since the college had started to implement the various initiatives in 2009.

The respondents perceived that employees and students had become better self-advocates and were able to articulate their needs early in the employment process or when registering with the Coordinator of Student Access Services, respectively. According to administrator respondents Mark* and Alyssa,* external factors contributing to the positive changes may have included the evolution of the ADA, high schools' preparation of students with disabilities for the college experience, and more students coming from regions where protection under ADA standards is strictly enforced. Administrators also mentioned recognizing changes in their own attitudes when making accommodation requests on behalf of students, in particular a shift away from an apologetic tone to one of ease.

Need for Future Development for an Inclusive, Accessible Campus Environment

The respondents recognized that all campus constituencies needed additional training. Increased staff training and continued faculty development were considered crucial, as administrator respondent Alyssa noted, especially in methods for effectively meeting the needs of students with particular disabilities. Alyssa also suggested that faculty, administration, staff, and students could benefit from knowing which disabilities were represented on campus in order to provide support for those individuals' unique needs. The Office of Residential Life is currently contemplating offering student leader trainings on using inclusive and "person-first" language. Student respondent Mary* recommended offering more opportunities for all campus community members to participate in dialogues on disability. The student respondents also felt that creating a group specifically for students with disabilities and their allies to discuss needs, challenges, and avenues for social change could be a powerful and supportive resource.

Plans to continue plant renovations are in progress, such as hiring a consultant to evaluate the campus and recommend improvements. The Institutional Technology Office discussed plans to provide a campus accessibility map on the college website, which would enable individuals to identify accessible pathways before visiting the campus, and Academic Affairs expressed interest in providing a resource guide of best practices on the website to support students with disabilities.

Increased coordination and visibility have created workload issues for the Office of Student Access Services located within Student Academic Services. The responsibilities of the Office of Student Access Services have grown considerably in recent years, and additional growth is expected as the needs and number of students with disabilities continue to increase. Additional staffing may be needed to support the Office of Student Access Services. The work of the ADA advisory group will continue to be crucial for planning and effecting change, and the respondents agreed that making the committee better known across campus would benefit its mission and vision.

Implications

The focus group and individual interview participants identified campuswide changes that not only were concrete (e.g., physical and procedural changes) but also could be sensed in the institution's climate. The ACCESS survey and external audit were productive steps that helped campus constituents solidify plans to create greater awareness and enhance accessibility. Ultimately, efforts to change the campus climate since conducting the ACCESS survey and audit were made possible by the attention and efforts of the institution's dedicated faculty, administrators, and staff. Employees of Skidmore College collectively implemented several of the recommendations identified by the assessment and audit, such as establishing an ADA advisory group, holding faculty and student trainings to increase awareness of the needs of students with disabilities and the accommodations process, including an accommodations statement on course syllabi and application documents, adopting a formal disability services model in the selection of a shared model, and increasing cooperation between the Coordinator of Student Access Services and various other departments.

The limitations of this brief include potential personal bias in the participants' responses and possible inhibition about disclosing their observations in a public forum. Participants' responses can only be considered representative of a subset of individuals, not of the entire campus community. The focus group process could be improved by holding multiple sessions to increase the number of respondents and concurrently implementing a quantitative assessment to offer campus constituents multiple ways to report their observations. Moreover, inviting all individuals on campus to participate, rather than targeting select departments, would allow for a wider range of perspectives and greater representation of the entire campus. Despite their limitations, focus groups are a valuable

way of allowing campus constituents who have an interest and stake in meeting the needs of students with disabilities to collectively recognize progress and identify areas where future development is needed. Focus groups can also be reproduced at other institutions, given adequate backing from campus leaders.

Looking ahead, it will be important to provide more training for faculty, staff, and administrators on the principles and implementation of universal design. As “flipped” classrooms (i.e., those where faculty give students class time to apply active learning techniques rather than relying completely on lecturing) become more common, helping faculty adapt their materials to meet universal design standards will become even more necessary. Having a better understanding of faculty needs in this area will inform this work. Finally, assessment of the campus climate using both qualitative and quantitative measures should continue, and those outcomes should be used to improve services and enhance inclusion as part of the ADA advisory group’s charge.

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Authors' Note

The authors would like to thank Sue Layden and Pat Oles from Skidmore College for their comments on previous drafts of this manuscript. Please note that pseudonyms have been used to protect the respondents' identities (indicated by * on first appearance).

Table 1

Number of Students Registered with Student Access Services

Year	Number of Students
2005-2006	126
2006-2007	131
2007-2008	145
2008-2009	173
2009-2010	197
2010-2011	210
2011-2012	231
2012-2013	234

Table 2

Testing Room Use Since Established

Academic Term	Number of Exams Given
2009-2010	124
2010-2011	208
2011-2012	317
2012-2013	350
2013-2014	590

Table 3

Themes and Illustrative Quotes

Theme	Response	Respondent
1. Enhanced Communication and Coordination	<p>“This past June, we shifted the chair of the [housing accommodations] process to the [Coordinator of Student Access Services position]... Streamlining that process has made it easier for students to engage with the person who is the expert in that area. I think for family, many students who are seeking housing accommodations are also seeking classroom accommodations, so having that in one place has really helped.”</p>	Administrator, Anna*
	<p>“Overall I feel the shift from 2008 or prior...We really feel like we have an advocate and someone we could go to with questions that we previously didn’t have.”</p>	Administrator, Rita*
	<p>“Ever since I was a freshman, they had the [testing] room in Student Academic Services...I like the fact that there is a physical location for support.”</p>	Student, Jane*
	<p>“At the beginning of class, professors will bring up if you have any disability needs or concerns, please come talk to me, and they put it on the syllabus.”</p>	Student, Mary*
	<p>“Students used to come up to faculty the day of the exam... but because of the work you are doing with students early on, that is being reduced. With the statement in the syllabi and students being aware and understanding their responsibilities, that has changed a lot.”</p>	Faculty, Leslie*
2. Increased Awareness and Receptivity to Inclusion and the Accommodations Process	<p>“The other [change] in the area of Academic Affairs along with faculty has been the increase in the ADA statement on syllabi, and the work that has been done by the Curriculum Committee to encourage all faculty to include that on all of their syllabi.”</p>	Faculty, Mark*
	<p>“I’m not apologizing when I come with requests... We have a lot of students in the summer with diet restrictions. If we do need an accommodation, it’s not a problem...Everybody’s attitude really seems more supportive.”</p>	Administrator, Anna*
	<p>“I definitely think there is a change from freshman year...Going to professors, I didn’t feel really stigmatized at all for it...it’s something I need and I felt like they understood.”</p>	Student, Jane*
	<p>“Once the testing room was established, we saw slow but steady increase in the use of that testing room from students and faculty.”</p>	Administrator, Mark*

(Table 3, continued)

3. Needs for Future Development for an Inclusive, Accessible Campus Environment	“If there was some outlet...for people who would like to talk about their experiences...if they want to share. I feel like that would have been helpful for me early on.”	Student, Mary*
	“I still think there is some confusion around how to work with students with particular disabilities...Some targeted work with faculty and staff around those issues would be really important.”	Administrator, Alyssa*
	“One concern that I have...there is only one person in this position [of Coordinator for Student Access Services]...and we need to continue to look at staffing and support in this area.”	Faculty, Marla*
	“I don’t think that the campus community is fully aware the ADA committee exists and what it’s working on...As a part of the awareness effort, it could include the committee itself.”	Administrator, Mark*

Appendix

Focus Group and Interview Discussion Questions

1. In what ways have policy, procedures, and/or services in your department/area changed relative to the inclusion of students with disabilities or sensitivity to ADA compliance standards since the Assessment of Campus Climate to Enhance Student Success (ACCESS) survey that was conducted in fall 2008?
2. If applicable, in what ways have you recognized an increase in overall awareness of students with disabilities and access issues among administration, staff, faculty, and students since ACCESS was conducted?
3. In what way(s) do you feel your area and the overall campus need to further progress in regard to inclusiveness and accessibility?

The Guide to Assisting Students with Disabilities: Equal Access in Health Science and Professional Education (Book Review)

Lisa M. Meeks & Neera R. Jain
New York: Springer, 2015
240 pages, \$65 (Paperback).

Reviewed by Kate Link ¹

As a disability services educator, I can say with some certainty that many in my field have felt stressed when addressing a situation that a student with a disability felt was an emergency. Disability services educators must consider numerous layers before suggesting a reasonable accommodation—patient safety, technical standards, confidentiality, and assistive technology available—which makes it highly challenging to accommodate students with disabilities who are studying the health sciences. Emergencies can take on a new meaning for these students, since they may occur inside or outside the classroom setting. This also can make accommodating their needs more complex. *The Guide to Assisting Students with Disabilities: Equal Access in Health Science and Professional Education*, edited by Lisa Meeks and Neera Jain, offers a lifeline to disability services educators who are navigating the health sciences. This well-written and thorough approach to determining reasonable accommodations for students with disabilities who are studying in this field offers ideas on what accommodations are appropriate and how to implement them in the classroom and in clinical settings.

Because college campuses differ, Meeks and Jain begin the book with an in-depth analysis of what resources are available on which college campuses to help guide students with disabilities and the professionals who work with them. It helps readers learn, for example, that Title IX complaints go to one campus office and disability discrimination cases to another. By providing such an overview, the editors help fill gaps in the reader's professional knowledge, rather than overwhelming them with unnecessary information. The editors then discuss disability law, a disability services

provider's bread and butter, and how those laws are applied in determining which academic and clinical accommodations are reasonable and appropriate.

As a person with an adverse reaction to all things science and math, I avoided taking chemistry, biology, and any other laboratory courses while in college. Because of my lack of knowledge and experience in these areas, I am sometimes at a loss when interacting with students with disabilities who are studying the health sciences. Reading chapter 4 of *The Guide* gave me a better understanding of how accommodations operate in these classrooms and clinical settings, and also helped me realize that each student needs to be assessed individually.

All health sciences students have some required clinical rotations and therefore may need additional accommodations to progress through their degree program. While most disability services providers have a firm grasp on the classroom portion of a program or course, they often have no clinical experience because many academic programs do not require it. Therefore, the real-life cases presented throughout chapter 4 were of particular interest to this reader. These tidbits address "what ifs" and special considerations a disability services provider is likely to encounter in the field.

A topic of conversation with many advancing students, regardless of degree program, is certification or licensure exams. Another topic may be how to critically and effectively serve students in need of assistive technology within the health care arena. In an age where technology reigns supreme, there is always something to learn and explore. This book provides an intelligent analysis of both of these topics, which will enable disability services educators to serve health sciences students more efficiently and personally.

Another interesting chapter addresses professionalism in the health fields and how to communicate about one's disability. When, how, or whether to disclose a disability is an important consideration for many students with disabilities: Do I discuss my disability before a flare-up affects my ability to go to work or wait until it is necessary? What language do I use when disclosing my disability? Should I disclose my disability at all? These real-life questions require serious, individualized discussion. Chapter 7 provides individual cases and tips to finding solutions, as well as a highly informative appendix, all of which will help disability services educators support their students' self-advocacy skills development.

¹ University of Wisconsin-Madison

There are not many disability services providers working on college campuses, and many of us are “one-person shops.” Sometimes we need a little extra advice. *The Guide* provides this by addressing some less obvious subjects related to providing disability services in the health sciences. The last few chapters offer help in troubleshooting accommodation concerns, developing critical thinking skills, and debunking myths, and also provide general tips for best practices.

A major strength of this book is the transferability of its ideas across fields of study. While its central focus is to support professionals who are working with students with disabilities who are studying the health sciences, the critical thinking skills this book helps one develop can easily be applied to other college programs and majors. Most disability services providers will tell you that providing accommodations is not a one-person job and that teamwork with campus colleagues is of the utmost importance. After all, every student needs to discuss professionalism in communications to prepare for the workforce or further education, not to mention developing strong self-advocacy skills. Moreover, every faculty member working for an institution of higher learning needs to know the laws applying to reasonable academic accommodations and how those laws maintain the essential nature of a particular program or course.

As a relatively new disability services educator, I found this book reassuring. Most of the best practices suggested throughout the work confirm what I have learned at various conferences, from webinars, and through other professional development opportunities, as well as in conversations with my coworkers, while also providing me with new and helpful information. One of the best things about working in disability services is the wealth of knowledge and expertise shared among colleagues. When we can celebrate that knowledge while using it to improve our work and the lives of our students, we have done our jobs well. By creating *The Guide to Assisting Students with Disabilities: Equal Access in Health Science and Professional Education*, Lisa Meeks and Neera Jain are helping disability service educators do just that. I suggest that all disability services educators read it, not just because it is a good read but because you never know when a student emergency may arise, and it is always best to be prepared when one does.

About the Reviewer

Kate Link received her B.S. from the University of Wisconsin-Madison and M.A. from Ball State University. Her experience includes working as a student affairs professional at Ball State University and a disability service provider at the University of Wisconsin-Platteville. She is currently an Accommodation Specialist with the McBurney Disability Resource Center at the University of Wisconsin-Madison. She can be reached by email at: kate.link@wisc.edu.

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- **References:** Use the current APA guidelines to format and proofread your paper prior to submitting it. This includes the proper use of spelling, punctuation and grammar, appropriate use of headers, correct formatting in listing references, and formatting any tables or figures appropriately.

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From the Editor

Reasonable Accommodations

Facilitating “reasonable accommodations,” including “academic adjustments” as outlined in Section 504 of the Rehabilitation Act of 1973, has inspired many creative and programmatic initiatives for students with disabilities by disability service educators. Diplomatically negotiating equitable accommodations with faculty members for students with disabilities is a top priority for disability service professionals. In the spirit of leveling the playing field, we strive to do what is best for the students with disabilities on our campuses, enabling high quality academic and student support systems (Tinto, 1993) so that students with disabilities have opportunities and success as they transition from high school and experience postsecondary education.

This second issue of volume 29 of the *Journal of Postsecondary Education and Disability* highlights some of the outstanding academic and student support services provided in our disability services offices. Academic advising, opportunity for extended-time on exams, classroom audio distribution systems, collaborative learning, and extracurricular activities are addressed in this issue. This issue also provides a thoughtful examination of what prevents students with disabilities from utilizing reasonable accommodations in postsecondary education, a practice brief on enhancing accessibility and improving the campus climate, and a book review on providing equal access for students with disabilities in the health sciences.

The authors of the first article discuss academic advising as an intervention for college students with attention deficit hyperactivity disorder (ADHD). **Kathleen D’Alessio and Manju Banerjee, from Landmark College**, propose an innovative approach to academic advising as an intervention for college students with ADHD. The advising model proposes using a student-centered developmental approach that includes specific elements of coaching, such as open-ended questioning, creating a safe space for students with challenges in self-regulation and executive function, and holding students accountable for their actions.

Michael Lyman, from San Juan Counseling, and Mark Beecher, Derek Griner, Michael Brooks, John Call, and Aaron Jackson, all from Brigham Young University, provide a qualitative review of what keeps students with disabilities from utilizing accommodations in postsecondary education. The authors identified six themes as barriers to accommodation use: desire for self-sufficiency, desire to

avoid negative social reactions, insufficient knowledge, quality and usefulness of disability student services and accommodations, negative experiences with professors, and fear of future ramifications.

The third article examines the extended time use of college students with disabilities, written by **Laura Spenceley and Starr Wheeler from the State University of New York at Oswego**. Among their findings was that more than half of the tests administered with extended time were completed within the time given to students taking the tests in the classroom. They discuss considerations for disability service providers when making decisions related to the provision of extended time.

Sara Schley and Michael Stinson, from the Rochester Institute of Technology, investigated the use of alternate methods of classroom interaction and communication to foster collaborative learning for deaf and hard of hearing students in diverse, graduate teacher education classrooms. They found that articulated speech and/or sign language interactions, and text-based chat interactions, can offer distinct advantages in increasing access to collaborative learning opportunities across a variety of student needs.

The fifth article presents a classroom audio distribution system (CADS) in a postsecondary setting as a story of universal design for learning (UDL). **Joan Flagg-Williams from Saint Joseph’s College and Wendy D. Bokhorst-Heng from Crandall University**, encourage a flexible approach toward teaching in order to include as many different types of students as possible in the learning process, including CADS as one way to support UDL in higher education settings.

Sarah Schoffstall, Stephanie Cawthon, Duncan Dickson, Mark Bond, Oscar Ocuto, and Jinjin Ge, from The University of Texas at Austin, discuss the impact of high school extracurricular involvement on postsecondary outcomes among deaf and hard-of-hearing youth. Their findings suggest that overall involvement in extracurricular activities significantly predicts independent living, and that breadth of involvement in more than one activity significantly predicts postsecondary attendance.

The practice brief in this issue is a discussion on campus climate and how to identify progress toward enhanced accessibility. **Allison Beyer, from Albany College of Pharmacy and Health Sciences, and Crystal Dea Moore and Jamin Totino, from Skid-**

more College, outline how the Assessment of Campus Climate to Enhance Student Success survey, and an external disability services audit, raised the level of awareness and attention to the needs of students with disabilities at departmental and institutional levels. The issue concludes with a book review by **Kate Link of the University of Wisconsin – Madison**, of *The Guide to Assisting Students with Disabilities: Equal Access in Health Science and Professional Education*, edited by Lisa Meeks and Neera Jain.

The editorial team and review boards hope that the information shared in this issue of the *Journal of Postsecondary Education and Disability* will inspire disability service educators and contribute to the high quality of reasonable accommodations provided in disability services offices. And, we hope to see you in July at the 39th conference of the Association on Higher Education and Disability in Indianapolis, Indiana, the Crossroads of America.

Roger D. Wessel, Ph.D.
Executive Editor

Reference

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Academic Advising as an Intervention for College Students with ADHD

Kathleen A. D'Alessio ¹
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Abstract

An innovative approach to academic advising is being proposed as an intervention for college students with attention deficit hyperactivity disorder (ADHD). This is a student-centered developmental approach that includes specific elements of coaching, such as open-ended questioning, creating a safe space for students with challenges in self-regulation and executive function, and holding students accountable for their actions. Given the ubiquitous nature of academic advising on college campuses, this hybrid advising model can have a significant impact on the graduation and retention rates of students with ADHD who might otherwise drop out of college, despite having the competencies necessary for postsecondary success. Five students with ADHD were tracked at a small private college in the Northeast as they met with their advisors over 15 weeks. Their comments illustrate the five components of intervention advising for ADHD: the advisor-advisee relationship, postsecondary readiness, goal-setting, action steps/implementation, and accountability.

Keywords: *ADHD, advising, coaching*

For students with learning disabilities and/or attention deficit hyperactivity disorder (ADHD), enrolling in college is more achievable today than just a decade ago (Henderson, 2001; Raue & Lewis, 2011). In fact, students with ADHD are now a majority among those with disabilities on college campuses (Government Accountability Office, 2009). However, studies still suggest that these students do not fare as well as in higher education as their nondisabled peers; they often have higher rates of academic probation and lower rates of graduation and retention (Maitland, 2010).

Admission into college is only the first step in preparing for gainful employment; the ability to complete the postsecondary program is just as important. In fact, the need to earn a college degree for effective employment has never been greater (Pew Research Center, 2014). Moreover, an aborted college experience can put a serious economic and emotional burden on students and their families. Students with ADHD fail to acquire a college degree for a variety of reasons. Miller and Murray (2005) pointed out that

Factors such as personal autonomy, self-confidence, ability to deal with racism, study behaviors, or social competence have as much or more to do with grades, retention and graduation than how well a student writes or how competent a student is in mathematics. (para. 5)

The situation takes on critical significance as high-functioning college students with ADHD continue to drop out of college, which indicates that traditional student support services and accommodations may not be enough for this burgeoning population. The dearth of credible research on the efficacy of traditional interventions for ADHD (Green & Rabiner, 2012) underscores the need for novel ways to engage, support, and successfully graduate these students.

Academic advising is universally available at postsecondary institutions. In this article we propose a model of academic advising that adopts coaching-like elements, which could be just the intervention needed to increase the retention and graduation of

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students with ADHD. This approach has been successfully implemented at a small private college in the Northeast. Based on our understanding of the complex profile of young adults with ADHD, this paper discusses how an innovative model of academic advising accompanied by an advising curriculum specifically designed to address the needs of students who learn differently can foster retention of students with ADHD. This advising model can be readily adapted by other postsecondary institutions.

Profiles of College Students with ADHD

Current trends point to an increasingly complex profile of students with multiple and co-morbid symptomatology and many emotional and executive function challenges (Brown, 2009). According to the Government Accountability Office (GAO, 2009), students with ADHD and with psychiatric disabilities are the fastest growing disability populations on U.S. college campuses. The GAO report indicated that, between 2000 and 2008, U.S. college students who indicated having ADHD increased from 6.7% to 19.1%. Green and Rabiner (2012) noted a prevalence estimate between 2% and 8% of the college population, whereas DuPaul, Weyandt, O'Dell, and Verejao (2009) estimated that 25% of college students with disabilities have an ADHD diagnosis. New understanding of the complexities of ADHD, and the recognition that adult ADHD is different from childhood ADHD (American Psychiatric Association, 2013), underscores several elements that were previously ignored. For example, it is now acknowledged that ADHD symptoms can change over time and that an individual can present with different symptoms across their lifespan. Barkley (2011) pointed out that hyperactivity in childhood is often replaced in adulthood by anxiety and even depression. A primary diagnosis of ADHD is often accompanied by multiple co-occurring symptoms, such as perfectionistic behaviors, heightened panic reactions, and avoidance behaviors, which are at subthreshold levels for comorbid diagnoses but significantly debilitating for everyday functioning (Banerjee & Brinckerhoff, 2015). Furthermore, ADHD can be mild, moderate, and/or severe, and it can change over time.

The *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2013) raised the threshold for the early identification of symptoms from age seven to age twelve, but many individuals with ADHD are first diagnosed in college. Some students display a developmental lag in social-emotional maturity, which may or may not correlate with academic competency. Negative self-perceptions

are common among these students, and many feel shame and guilt about their academic performance, which can lead to avoidance behaviors and procrastination (Stamp, Banerjee, & Brown, 2014). College students with ADHD have also reported being academically less confident than their peers about their ability to succeed (Lewandowski, Lovett, Coding, & Gordon, 2008; Shaw-Zirt, Popali-Lehane, Chaplin, & Bergman, 2005). Studies and self-reported evidence from students have suggested that these students have less academic success, experience greater psychological and emotional difficulties, and are on academic probation more often than their peers (Advokat, Lane, & Luo, 2012; Blase et al., 2009; Heiligenstein, Guenther, Levy, Savino, & Fulwiler, 1999).

No two individuals with ADHD are alike, but difficulty with executive function and self-regulation is the hallmark of an ADHD diagnosis (Brown, 2013). Deficits in executive function affect one's ability to set goals and take self-directed action to achieve these goals. Individuals with ADHD have difficulty with response control and with planning, organizing, and self-monitoring their behaviors to get the desired outcome (Barkley, 2012). Green and Rabiner's (2012) comprehensive review of college students with ADHD indicated that, despite a growing body of research on college students with ADHD, confirming findings are sparse, lack adequate rigor, and are not conclusive.

The current reality is that many college students with ADHD are high functioning and have all the necessary credentials to gain admission to competitive colleges, yet they fall apart when the rigors of postsecondary education start to escalate. Many enter college with little understanding of the demands of college-level work or college life and lack adequate strategies to cope with them (Miller, 2010). Interventions that acknowledge the behavioral reality of young adults with ADHD, both their strong academic potential and their self-sabotaging behaviors, are lacking.

Parallels between the experiences of first-year college students and students with ADHD are particularly revealing. First-year students often enter college with strong high school academic records, but once on campus they show a declining commitment to studying and doing homework (Liu, Sharkness, & Pryor, 2008; Sax, 2003). Miller and Murray (2005) cited McGillin (2003) in noting that a student's ability to cope and be resilient are the best barometers for college success. Students whose internal resilience was supported by "institutional experiences that strengthen their self-esteem and self-efficacy" (para. 7) were able to overcome the negative effects of at-risk factors.

In a study of first-generation college students, Fentress and Collopy (2011) identified four defining characteristics. The first is a lack of academic preparation. The authors noted that students' perception of their academic incompetence, rather than any actual academic insufficiency, has the greatest bearing on retention and college success. A recent study by Stamp et al. (2014) found that similar perceptions among college students with ADHD, particularly of shame and negative self-image, were a major barrier to college success.

The second characteristic is identity dissonance. First-generation college students often feel like outsiders and are isolated from the mainstream of college life. They are less involved in campus activities and less likely to work on campus. Many students with ADHD also experience identity dissonance because their academic and social engagements tend to differ from those of other students (Shaw-Zirt et al., 2005). First-generation college students also are vulnerable to stereotype threat, which can adversely affect working memory (Beilock, Rydell, & McConnell, 2007), an area of executive functioning that is impacted by ADHD, even when there is no stereotype threat.

The third characteristic is the financial strain many first-generation college students experience because of a lack of family resources. While financial strain may not be uniquely prevalent among students with ADHD, many have to provide updated disability documentation, which can be expensive. College is also more expensive for undergraduates with ADHD who take more than four years to complete their college degree. The fourth characteristic Fentress and Collopy identified is social capital, or awareness of the social networks of college life, including knowledge of campus resources, how to access them, students' rights, and general elements of academic community life. Once again, many students with ADHD are not as plugged in to the campus community as their peers, often due to difficulty initiating action and inhibiting impulse responses (Shaw-Zirt et al., 2005).

Common Interventions for ADHD

Traditional academic support for college students with ADHD includes accommodations such as rooms with reduced distractions for taking exams, extended time on tests, and single dorm room arrangements, to mention just a few. Many colleges also provide ADHD coaching on campus. The literature has identified three broad categories of interventions for ADHD: (a) pharmacological, (b) accommodations, and (c) psychosocial interventions, which includes ADHD coaching, cognitive behavior therapy (CBT), and counseling (Green & Rabiner, 2012). The following section briefly

describes each of these intervention categories and the challenges of implementing them on college campuses.

Pharmacological. Pharmacological interventions cover the vast range of medications, mostly stimulants, used to address symptoms of ADHD. These medications include methylphenidates such as Ritalin, Concerta, Daytrana, and Metadate, as well as dextroamphetamines and amphetamines such as Adderall and Dexedrine. Strattera (atomoxetine), a nonstimulant medication, is often prescribed for individuals who have ADHD and depression or anxiety. Vyvanse (lisdexamfetamine dimesylate), a long-acting stimulant, was studied with college students by DuPaul et al. (2012) over a five-week period and was found to be effective in reducing some of symptoms of ADHD, although the symptoms were still significant compared to the controls.

Research on the effectiveness of medication treatment for college students with ADHD is extremely sparse. It has been suggested that medication intervention may be less effective with this population because of the challenges young adults have in managing their medication (Rabiner et al., 2009), and of the need for medication that is effective over a much longer period than the previous six-hour school day. Moreover, it is unclear whether psycho-pharmacologists and physicians who prescribe medication for young adults in college are aware of the demands of college life, and disability services providers are not trained in how to accommodate the side-effects of medication. Managing and accommodating the side-effects of medication is clearly a challenge with this type of intervention, and the effects are individual specific.

Accommodations. Under the Americans with Disabilities Act (1990), college students with ADHD are entitled to reasonable accommodations that ensure equal access to academic and nonacademic campus life. Students with disabilities provide the required documentation to the disability services office on campus to receive accommodations, which are often negotiated between the student, disability services personnel, and the student's advisor or program faculty member (Banerjee & Brinckerhoff, 2015). There are several challenges in accommodating college students with ADHD. Most institutions have documentation and accommodation guidelines, but accommodation decisions can be subjective and the ADHD documentation needed to meet these guidelines can be expensive. For high-functioning students with ADHD, the traditional battery of diagnostic instruments lack the sensitivity to pick up on subtle markers of executive function disorders. Furthermore, students with ADHD may not seek services and accommodation because of the

stigma and shame attached (Stamp et al., 2014). Others feel uncomfortable about asking for accommodations because of the potential for disclosure among their peers, and/or a perception that they do not deserve accommodations and it is unfair when they do.

Psychosocial treatments. Psychosocial treatments, also known as behavior therapy and behavior modification, are often seen as an alternative to medication or are used in conjunction with medication to address symptoms of ADHD. Two common interventions that fall within this broad category are ADHD coaching and CBT.

ADHD coaching. Coaching has been widely recognized as an effective intervention for students with ADHD (Parker & Boutelle, 2009; Swartz, Prevatt, & Proctor, 2005). Coaching is different from study skills training and/or a learning strategy intervention. Learning strategies are tutor-directed activities that involve “teaching” students the skills and techniques they need to effectively navigate academic demands. Such interventions often include strategies for effective note-taking, active reading, test prep, and so on. Coaching, on the other hand, is an inquiry-based approach where student and coach are jointly engaged in the process of goal-setting and decision-making. Coaching helps students with ADHD achieve their academic goals in a self-determined manner and take ownership of their actions and the consequences. Coaches use open-ended questions to elicit a student’s own ideas and thoughts, and through such engagement help to shape students’ self-regulatory behaviors (Parker, Hoffman, Sawilowsky, & Rolands, 2011). They ask questions to make a student aware of their own ability to plan, set goals, demonstrate response control, and take deliberate action toward achieving their target goal(s). During the process, coaches identify and address elements that may facilitate or hinder goal attainment (Quinn, Ratey, & Maitland, 2000).

Even when available, many students with ADHD do not avail themselves of coaching services on campus for a host of reasons, including stereotype threat and perceptions of a stigma attached to receiving disability services (Mueller, Fuermaier, Koerts, & Tucha, 2012). ADHD coaching is not readily available on all college campuses, but various models of academic advising are an essential part of college life and are universally available at colleges and universities around the country. Interestingly, there is significant overlap between the elements of coaching and academic advising.

Cognitive behavior therapy. CBT is a type of mental health counseling that directly addresses self-critical thoughts that arise for ADHD students who experience difficulties in the college environment

(Ramsay & Rostain, 2006). CBT is a goal-oriented psychotherapeutic treatment where the therapist and the client work together to reorient the student’s thinking and thereby change behavior. According to Green and Rabiner (2012), no empirical studies testing the efficacy of these psychosocial treatments specifically for college students with ADHD have been published. CBT is not an intervention higher education institutions typically offer to their students. This private therapy can be expensive and often involves doing homework outside of the sessions, which may be difficult for a student to complete consistently.

Overview of the Literature on Academic Advising

Almost all higher education institutions provide their students with some form of academic advising, as it is acknowledged to be integral to the mission of teaching and learning. According to Light (2001), “good advising is the single most underestimated element of a successful college experience” (para. 5). Advising covers a broad spectrum of responsibilities, from imparting the ideals of higher education to the pragmatics of course enrollment to facilitating advisees’ academic and career goal development (O’Banion, 2012). According to the National Academic Advising Association (NACADA, 2006), “academic advising engages students beyond their own world views, while acknowledging their individual characteristics, values, and motivations as they enter, move through, and exit the institution” (para. 7). Students have identified academic advising as one of the most important aspects of their postsecondary education (Hillman, 2009). Heisserer and Parette (2002) stated that, “while faculty, administrators, and student affairs professionals all serve as student advocates and play an integral part in student retention and attrition, advisors are typically in the best positions to assist students in making quality academic decisions” (para. 2). Research also has pointed to the significant impact academic advising can have on student attrition and retention (McArthur, 2005).

There are multiple approaches to academic advising. Three models described by Heisserer and Parette (2002)—prescriptive, developmental, and integrated—broadly address the various approaches in the literature. The prescriptive model is a top-down approach where the advisor is directive and informs the student about course selection, degree requirements, and registration. The student simply follows the advice offered and takes no part in the decision-making. In the developmental model the student and the advisor share responsibility for making decisions. The advisor responds to the

student's queries and directs them to the appropriate campus resource, which fosters independent decision-making. The third model is an integrated approach, which is essentially a combination of the previous two models, where the student is both given advice and counseled to make independent decisions regarding academic, career, and life goals.

The advising literature also references an approach called intrusive or proactive advising, which is often cited as the preferred approach for students at risk of dropping out of college (Heisserer & Parette, 2002; NACADA, 2014). At-risk students include ethnic minorities, those who are academically disadvantaged, have disabilities, have low socioeconomic status, and/or are on academic probation. Intrusive advising presupposes deliberate interaction between advisor and advisee, often with mandatory requirements. Students are expected to follow the advisors' directives and are closely monitored. Intrusive advising is defined as an "intervention with an at-risk student that is designed to (a) facilitate informed, responsible decision-making, (b) increase student motivation toward activities in his/her social/academic community, and (c) ensure the probability of the student's academic success" (Heisserer & Parette, 2002; Intrusive Advising Model, para. 1, p. 74).

While intrusive advising may be good for at-risk students who may otherwise disengage, it is not particularly effective for students with ADHD. In fact, experience suggests that these students often ignore mandatory protocols such as attending advising meetings, which may be a warning sign of dropping out. Furthermore, many advisors are simply not aware of the specific challenges faced by ADHD students, such as difficulty regulating, and goal-setting, and they may react unsympathetically to missed sessions and the student's apparent lack of responsibility.

There is no doubt that increased contact with advisors, especially during freshman year, promotes students' sense of connectedness with the institution and affects their decision to stay in college (Miller, 2010). The advising approach for students with ADHD therefore needs to provide a calculated balance between encouraging frequent contact with the advisor while promoting independent decision-making and ownership of their decisions.

A Coaching Approach to Academic Advising

Integrating intrusive advising practices with components of ADHD coaching creates a hybrid approach that may be well-suited for some students with ADHD, especially if it can be adapted easily to existing advis-

ing models. This approach has been used successfully at one college in the Northeast, which is one of only two in the country that exclusively serves students with learning disabilities, ADHD, and autism spectrum disorder. The elements that define such a hybrid model of advising intervention for college students with ADHD are (a) the advisor-advisee relationship, (b) postsecondary readiness, (c) goal-setting, (d) action steps/implementation, and (e) accountability. These elements are further operationalized in detail through a student-centered developmental advising curriculum (see Appendix). During one semester, the authors of this paper monitored and recorded the comments and perceptions of five college students with ADHD who were engaged in this hybrid advising model. Their aim was to illustrate how well this approach serves as an intervention for ADHD.

Why Use Advising as an Intervention for ADHD

Advising is a forward-looking partnership between student and advisor. At its core is a focus on the future, in particular the student's life and career goals (Habley, Bloom, & Robbins, 2012). By contrast, student services such as tutoring, counseling, and disability services are perceived as supports for individual deficiencies. It is much easier for a student to tell a peer that he is going to an advising meeting rather than to the disability services office. Furthermore, most academic advising frameworks lend themselves to elements of interventions for at-risk populations, and by extension to students with ADHD.

The advisor-advisee relationship. The relationship between student and advisor is of particular significance to students with ADHD, and trust in that relationship is the bedrock of ADHD coaching. Highly qualified and well-trained coaches work in partnership with the student to address critical life skills, including motivation for academic achievement, readiness for college, interpersonal communication, self-advocacy, self-esteem, and individual perceptions (Edge Foundation). Coaches offer the student a safe, nonjudgmental environment and use open-ended questioning to encourage the student to articulate their academic and career goals, and to address their challenges. Trust between student and advisor is the cornerstone of this hybrid advising model, and the advisor actively nurtures it. They use various approaches to build trust, including being nonjudgmental and neutral while listening and providing a safe space for the students to express themselves emotionally. However, advisors do not serve as counselors, clinicians, therapists, or disability advocates. Advisors begin building trust by gauging a student's readiness and motivation to engage

in the advising process. One student who was tracked for this paper said to his advisor, “I don’t know why I am in college...I am not having fun.” Another student said, “I have no internal or external motivators...I just don’t want to do the work.” Talking to his advisor about not submitting work on time, another student said, “I know I am smart...my professors are lenient with me... I know I can get away with it.” Candid comments like this are only possible when students feel they can really trust their advisor to help them—as a professional and not as a friend.

Not every student is ready to participate fully in the advising process when he or she starts college. One student noted, “I wish everyone would back off and stop analyzing me,” and another said, “I don’t see any value in these advising meetings.” Knowing when to give the student space is equally important. There are several approaches to assessing students’ readiness and motivation to participate in this type of advising. It is not necessarily a formal process; advisors can assess readiness through open-ended dialogue and neutral listening, which encourages students to share where they are in their personal development. The key take-away is for advisors to recognize that each student with ADHD will be at a different start point when they engage with advising, and some may take more time to transition to the next developmental phase.

Postsecondary readiness. Many students with ADHD end up at a postsecondary institution that may not be the best fit for them. It may be a large institution or one where expectations are markedly different from the student’s past experiences. The transition to college is particularly difficult for many students with ADHD, and facilitating self-awareness and readiness to accept transitional changes is different for these students than for their non-ADHD peers. It can be challenging and time-consuming, and also rewarding. Many of these students have learned unproductive behaviors as a result of their past and current experiences with ADHD. Some overestimate their skills as a way to cover up deficiencies, and others develop negative stereotypical thinking that can lead to detrimental behaviors. The following student comments illustrate some unproductive coping strategies and poor self-awareness:

“I am unmotivated to do work because these courses are not useful to me.”

“Professor X is out to get me.”

“I did not complete the assignment so I did not go to class; and that continued for a few weeks.”

“I don’t want to be at this college. This is hard for me.”

In our hybrid advising model, advisors invite students to share personal insights on their strengths, weaknesses, values, and, most importantly, perceptions of the teaching-learning process. After following the advising curriculum for a semester, some of these same students noted that “it is OK to make mistakes” and that “the biggest lesson I learned was to take school seriously and take myself seriously, show up and be present and communicate.” Advisors do not provide therapy sessions, but they facilitate self-awareness by encouraging open communication between the student and themselves, and other members of various campus constituencies, including instructors, disability services providers, student affairs personnel, and so on. Advisors also connect students with resources that help them better understand the symptoms of ADHD, including new research on ADHD and how the brain learns.

Goal-setting. A central tenet of coaching is goal-setting, and advisors do help students identify their academic and career goals. For students with ADHD, longer-term goals need to be separated into smaller, more manageable steps. Distinguishing between a realistic goal and a “wish” is key, and students must feel ownership of their goals. Some of the students we tracked started with goals such as, “I will pass all my courses this term” and “I will get all A’s.” They worked with their advisor to identify action steps and ways to accomplish the goals they had set for themselves. The advisor was there to support the students and to redirect them when they failed to meet a specific goal. Advisors engaged the students not simply to set goals but to help them be aware of the context in which the goal would be executed. For example, students were asked to articulate how their goal would be accomplished in light of their other commitments, physical and mental health issues, and other distractions they would encounter. Students then took the lead in revising their goals and making decisions.

Action steps/implementation. Implementing the decisions made jointly by the advisee and advisor is at the heart of this hybrid model. Drawing from practices embedded in coaching, advisors help students accomplish their goals by reinforcing goal-directed actions and encouraging the advisee to question actions that are nonproductive. For example, an advisor might encourage a student to reflect on an unproductive rationale for missing class, such as, “About a year ago I slipped and fell on an icy hill and got a really bad concussion, which caused some minor memory loss and behavior change. So I’d rather have an absence and receive some scolding than slip and get another concussion.”

Advisors initially follow up closely with the student, but as the student develops independent skills,

this support is phased out. A plan to monitor the implementation of the student's action steps is set up as a collaborative exercise between the advisor and the advisee. Some students report on their progress frequently via digital communications or face-to-face—some advisors suggest a weekly meeting—but others do not. The meetings are not mandatory, but when mutually agreed upon parameters are established it is expected that they will be followed.

Accountability. Accountability is another central component of this advising model, and the advisors do hold students accountable for their actions and behavior. One key difference in this model, however, is that the advisors are knowledgeable about the difficulties associated with ADHD. Accountability is part of a contract between advisor and advisee, and the student is well aware of the consequences of breaking it, so while working toward goals, advisors and advisees identify elements that support or present obstacles to attaining them (Quinn et al., 2000). In addition to the meetings between students and their advisors, parents/caregivers may be invited to be part of the support system, depending on individual circumstances.

The students themselves define accountability, and the advisor integrates it into the advising protocol. Some students opt out of any agreement and agree instead to check in with their advisor via emails, whereas others agree to identify and articulate the consequences of their actions. For example, one student we were tracking noted, "Next semester, I will be less avoidant about small stuff and be more on top of work and be more disciplined." Her advisor immediately asked how she would accomplish this and what would happen if things did not go according to plan. Together they identified alternative ways to reach her goals, and consequences that were significant to the student if they did not succeed. A key element of accountability is that advisor and student become familiar with and acknowledge the behaviors that derail the student's goals, and then identify alternative ways to accomplish them. Traditional consequences such as poor grades often appear to have less value for students with ADHD than for their peers. Advisors working with this model understand such behavior and help motivate students to identify meaningful accountability measures.

A Curriculum for Advising

The academic advising curriculum for students who learn differently has been followed at this college for nearly a decade in its various iterations (see Appendix for details). This advising method specifically articulates two main goals: (1) to understand and reinforce student self-determination and interdependence,

and (2) to promote problem-solving and decision-making about educational and personal goals. Each goal is broken down into a set of student learning outcomes to be accomplished in three stages, loosely one semester each. The process of reinforcing students' self-determination helps to identify specific learning outcomes, which occur in three different stages of a student's time at college. During stage 1 the student is introduced to the departmental goals and is asked to acknowledge, consider, and reflect on how a particular program and associated learning outcomes can become part of their personal goals for postsecondary education. For example, under student learning outcome 1-1, the goal is for students to understand their learning strengths and challenges and to use this knowledge appropriately when making decisions. These learning outcomes can be broken down further into knowledge (understanding personal learning strengths and challenges), actions (asking for help when needed), and values (appreciating the unique strengths they bring to the learning environment). In stage 1, the advisor is working to build a trusting relationship while getting to know the student and discussing their learning strengths, challenges, and academic strategies for success. As the student progresses to stage 2, the goal is to use this understanding to develop personalized strategies for approaching academic work. By stage 3 the student is expected to consistently use strategies to refine and maintain their academic progress. Students are told what is expected of them and this creates a collegial and professional tone for the advising meetings, which are guided by a student-centered developmental approach. While it is recognized that students progress at their own rate, having curricular markers helps advisors create a productive advisor/advisee partnership from the outset. Advisors continually assess the advising sessions and give feedback to both their advisees and the advising department.

Discussion

Several themes define this hybrid model of advising for students with ADHD. One theme is assessing student readiness. This starts with the advisor actively determining "where the student is" at the start of the advising sessions in terms of his/her mental and emotional readiness to take full advantage of the current circumstances. The distinction between college-able and college-ready is key in students taking responsibility for their past actions and in seeing the current situation as a step in the right direction. One of the students we tracked did not want to be at the institution from the start and was there only because he had

been dismissed from his previous college. He directed all his effort toward getting back there, and his advisor helped him with this transition.

Another theme is addressing students' own perceptions of themselves and the educational environment. Perceptions can lead to habits that prevent students from achieving the desired outcomes. In this model the advisor works to create a safe haven where students learn to trust them and let go of perceptions that can derail rather than facilitate goal achievement. The advising sessions were indeed a safe place where students could start to rethink some of the negative perceptions associated with their disability. The advisors helped to reshape students' perceptions of themselves and of their engagement with others, particularly authority figures.

The advising sessions for ADHD students at this school are clearly not counseling or therapy, nor are they tutoring or academic support services. The tools of this hybrid advising model include open-ended questioning, sympathetic yet neutral listening, addressing perceptions through in-the-moment examples, creating self-awareness of strengths and challenges, and continual assessment of the advising sessions, all of which are grounded in the student's academic and career goals. Students are expected to meet with their advisors more frequently than in other advising models, the difference being that this is not a mandatory requirement and the advisors work hard to provide a place students can turn to when in need.

Many college personnel, including academic advisors, are not trained to address the needs of students with comorbid and multiple disabilities. At the institution where this hybrid advising approach is being used, the academic advising department is led by a Director of Advising and two Advising Supervisors. There also are 16 Academic Advisors who provide direct one-on-one advising and have a caseload of approximately 35 students. Eleven full-time faculty members contribute to the advising department by taking on additional advisees, and two administrators provide advising support when needed. The following section provides suggestions for the implementation of this advising model at other institutions.

Suggestions for Practice

We recommend that advisors have basic knowledge of some of the common disabilities, that they be aware of current research on neurodiversity, and that they understand the negative perceptions and behaviors that are common to individuals with ADHD. This advising model also recommends creating an environment of trust and neutrality and conducting advising

sessions in a nonjudgmental manner. They also make sure that students and their parents understand that the advisors are professionals hired by the college, and that they are not the students' personal disability advocates or their friends. For this type of advising to be successful, advisors must tailor their advising practices to the individual students' developmental readiness. Having regular and frequent meetings provides an additional structure that creates a natural intervention for students and helps to build trusting relationships.

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Appendix

Landmark College Advising Mission, Goals, and Outcomes

Mission: Advising promotes a student-centered, developmental approach to working with students in support of self-determination and interdependence. Advisors guide students in problem solving and making decisions with educational and personal goals. (Adopted Fall 2007)

Departmental Goal 1: Understand and reinforce student self-determination and interdependence.	Semester/Stage 1 Outcome	Stage 2 Outcome	Stage 3 Outcome
Student Learning Outcome 1-1: Understand learning strengths and challenges and use this knowledge appropriately when making decisions	<i>Student will review and discuss educational diagnosis (in general) as well as learning strengths, challenges, and academic strategies</i>	<i>Student will utilize understanding of their learning strengths and challenges to help identify strategies in approach to academic work</i>	<i>Student will consistently use strategies for academic success and refine according to their learning strengths and challenges</i>
Student Learning Outcome 1-2: Develop communication skills and become appropriately persistent through the use of self-advocacy	<i>Student will reflect upon and begin utilization of available communication avenues and protocols</i>	<i>Student will evaluate and adjust communication protocols in alignment with personal and educational goals and incorporate feedback from others involved</i>	<i>Student will understand and use effective communication with various audiences, in alignment with personal and educational goals</i>
Student Learning Outcome 1-3: Identify and utilize college resources appropriately	<i>Student will understand the scope of and access to resources including Drake Center for Academic Support, Coaching, Counseling, Health Services, ITS, and Transfer Services.</i>	<i>Student will exhibit willingness to utilize campus resources, as appropriate; evaluate successes/challenges; and make adjustments accordingly.</i>	<i>Student will evaluate use of campus resources in alignment with academic strategies, progress and personal and educational goals.</i>
Student Learning Outcome 1-4: Utilize advising and: a) Be willing to engage in discussion topics at all levels of difficulty; b) Seek feedback from advisor in timely manner	<i>Student will be introduced to the goals of advising, use advising regularly and participate in the advisor-advisee partnership</i>	<i>Student will understand the goals of advising, continue to use advising appropriately, and understand their roles and responsibilities in the advisor-advisee partnership</i>	<i>Student will integrate the advising process in continual identification, assessment and evaluation of personal and educational goals</i>

Student Learning Outcome 1-5: Initiate actions including communication (emails, phone calls) and resource use (DCAS, Office Hours, coaching, counseling, etc.)	<i>Student will understand how to initiate actions to access and utilize such resources</i>	<i>Student will initiate appropriate actions both with help of advisor and independently</i>	<i>Student will initiate actions and communicate independently to various parties when appropriate</i>
Student Learning Outcome 1-6: Demonstrate self-respect and respect for others	<i>Student will acknowledge learning profile, educational history, personal skills, and abilities in assessing self-knowledge</i>	<i>Student will use self-knowledge in making personal and educational decisions and in their interactions with others</i>	<i>Student will use self-reflection and the integration of the college experience into self-knowledge and interactions with others</i>
Student Learning Outcome 1-7: Listen to and consider others' points of view and deal with conflict and criticism appropriately	<i>Student will consider other points of view in discussions and in relation to educational and personal goals</i>	<i>Student will understand areas of conflict and the value of a variety of points of view in relation to personal and educational goals</i>	<i>Student will consider a variety of viewpoints and integrate where appropriate in making decisions toward educational and personal goals</i>
Department Goal 2: Promote student problem solving and decision making about educational and personal goals.	Semester/Stage 1 Outcomes	Stage 2 Outcomes	Stage 3 Outcomes
Student Learning Outcome 2-1: Understand Landmark policies, degree options, and degree plan options.	<i>Student will be introduced to college policies, graduation planning process and develop initial graduation plan</i>	<i>Student will review graduation plan, revise as necessary, and declare major</i>	<i>Student will understand impact of academic progress on graduation plan and adjust plan as needed</i>
Student Learning Outcome 2-2: Select appropriate courses	<i>Student will understand and select initial courses in alignment with placement, college requirements, and student interest</i>	<i>Student will understand resources available to select courses in context of past success, college requirements, degree declaration, and personal and educational goals</i>	<i>Student will evaluate and adjust course selection in alignment with personal and educational goals, Landmark College requirements, and post-Landmark considerations</i>

<p>Student Learning Outcome 2-3: Set educational and personal goals and monitor growth toward achievement of goals, including:</p> <ul style="list-style-type: none"> a) Consideration of different ways to achieve a goal; Anticipation of possible outcomes and consequences b) Working with an advisor, as appropriate c) Comparison of actual outcomes with expected outcomes, in order to realize steps of success d) Make necessary adjustments, working with advisor, as appropriate. 	<p><i>Student will establish initial goals with the help of the advisor and evaluate progress toward those goals at appropriate intervals during the semester</i></p>	<p><i>Student will review progress from previous semester; compare actual and expected outcomes, and adjust strategies accordingly throughout the semester</i></p>	<p><i>Student will continue to compare actual and expected outcomes, understand their progress toward goals, and consider adjustments and their impact throughout the semester</i></p>
<p>Student Learning Outcome 2-4: Develop a dynamic balance between academic and non-academic pursuits that fosters success.</p>	<p><i>Student will understand and consider non-academic offerings in alignment with their interests and personal and educational goals</i></p>	<p><i>Student will evaluate and adjust academic and co-curricular interests in balance and alignment with overall and academic and personal and educational goals</i></p>	<p><i>Student will assess progress toward personal and educational goals and the influence of the balance of academic and non-academic pursuits</i></p>

What Keeps Students with Disabilities from Using Accommodations in Postsecondary Education? A Qualitative Review

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Abstract

Past research has shown that students with disabilities (SWD) at the postsecondary level who use accommodations demonstrate greater academic achievement and higher graduation rates. Only limited research has been conducted to identify the barriers they face in using accommodations, and that research has not sampled a population specifically identified as having faced such barriers. Through interviews with SWD identified as having faced barriers to using accommodations, this study identified six themes; four were considered complex, as they contained subthemes. The four were a desire for self-sufficiency, a desire to avoid negative social reactions, insufficient knowledge, and the quality and usefulness of disability student services and accommodations. The two straightforward themes were negative experiences with professors and fear of future ramifications. It is hoped that these findings help disability student services providers and SWD make better and more informed decisions regarding the use of effective accommodations.

Keywords: *Students with disabilities, college students, accommodations, disability support services, barriers*

Research has shown that a postsecondary education increases earning potential over the course of an individual's life (Day & Newburger, 2002); this holds true for individuals with and without disabilities. Individuals with disabilities who have a college education are employed at a greater rate (Hennessey, Roessler, Cook, Unger, & Rumrill, 2006) and earn wages comparable to their peers without disabilities (Walters, 2000), but they enroll in college at half the rate of people without disabilities (Dowrick, Anderson, & Acosta, 2005) and graduate at a lower rate (Houtenville, 2003; National Center for Education Statistics, 1996). These low enrollment and graduation rates partly explain why individuals with disabilities often have less economic success. They also are often underemployed and paid lower wages (Hughes & Avoke, 2010), and 26% live below the poverty level, compared with only 9% of individuals without disabilities (National Organization on Disability, 2004).

In a more positive light, the number of postsecondary students with disabilities (SWD) is increasing (Horn, Peter, & Rooney, 2002). The National Center for Education Statistics (2006) estimated that in 2003-2004 11.3% of postsecondary students reported having a disability, which compares to only 2.6% in 1978 (Henderson, 1999). This significant increase in SWD's college attendance can be traced in part to key legislation that has been passed in support of individuals with disabilities (Yell, Rogers, & Rogers, 1998).

Section 504 of the Rehabilitation Act, which was passed in 1973, was the first piece of legislation that specifically provided protection for individuals with disabilities. It stated that any institution that receives federal funds must provide equal access for individuals with physical or mental impairments (Rehabilitation Act of 1973). Although the act did not specifically mention institutions of higher education, it applied to the many postsecondary institutions that received federal

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funds. One shortcoming of the Rehabilitation Act was that it did not provide civil or criminal penalties for colleges that did not comply, making it less effective than it could have been (Yell et al., 1998). The Americans with Disabilities Act (ADA) of 1990 corrected some of these shortcomings, specifically stating that it applied to postsecondary institutions, and it included penalties for noncompliance. The Rehabilitation Act and the ADA have played a large part in providing SWD with access to postsecondary education (Cope, 2005; Zuriff, 1996).

At the postsecondary level, a large portion of the responsibility to comply with disability legislation has been carried by disabled student services (DSS) offices (Szymanski, Hewitt, Watson, & Swett, 1999). Stodden (2001) reported that the majority of postsecondary institutions in the United States have a DSS. Once a SWD has disclosed and provided documentation of their disability, a disability services professional and the student identify the need for reasonable accommodations. This is done on a case-by-case basis (Frank & Wade 1993) in accordance with the student's functional limitations (Ofiesh, 2007). The primary means DSS professionals have to provide services to SWD are accommodations (Baker, 2006), which can be defined as "the provision of any educational support that is needed for the person with a disability to access, learn, and benefit from educational services alongside college peers without disability" (Upton, 2000, p. 10).

Even with disability legislation and accommodations provided by DSS, SWD are still graduating at a lower rate than their peers without disabilities. This trend has led researchers to question the effectiveness of DSS and the accommodations they provide (Mull, Sitlington, & Alper, 2001). They have approached this topic in a number of ways. Those who conducted experimental (Alster, 1997; Zuriff, 2000), quasi-experimental (Keim, McWhirter, & Bernstein, 1996; Vogel & Adelman, 1990), and self-report survey studies (Berry & Mellard, 2002; Sharpe, Johnson, Izzo, & Murray, 2005) suggested that accommodations are beneficial to SWD. Others (e.g., Salzer, Wick, & Rogers, 2008) came to a similar conclusion through a review of the literature, stating that "students with disabilities are as academically successful as students without disabilities when person-specific supports are provided" (p. 371).

Even though the literature suggests that DSS and the accommodations they provide are beneficial to SWD and boost graduation rates (Salzer et al., 2008; Vogel & Adelman, 1990), there is evidence that these services are not being fully utilized. Barnett and Li (1997) reported the results of a national survey of community colleges that found approximately 8 percent of

community college students report having a disability, but only about half of them register for accommodative services. Moreover, the National Longitudinal Transition Study 2 found that only 40% of postsecondary SWD who had used special education services in high school had informed their colleges of their disability (a necessary requirement to receive services), and that only 35% of all SWD received accommodations (Wagner, Newman, Cameto, Garza, & Levine, 2005).

The large percentage of postsecondary SWD who do not choose to seek eligibility for accommodations through a DSS office suggest that barriers may complicate some students' use of this campus resource. Barriers can be thought of as factors that prevent SWD from seeking or making regular use of the accommodations available to them (Marshak, Van Wieren, Ferrell, Swiss, & Dugan, 2010). Research on the barriers to using accommodations is limited, but what studies there are have identified the following: feelings of social disconnection, a discriminatory attitude from other students and faculty, subpar DSS practices, ineffective accommodations, unavailable accommodations, accommodations that reduce independence, a possible lack of assistance-seeking behaviors, a stigma attached to disabilities, and insufficient knowledge among SWD about their disability (Dowrick et al., 2005; Kurth & Mellard, 2006; Marshak et al., 2010; Trammell & Hathaway, 2007; West, Kregel, Getzel, & Zhu, 1993). Many of these studies did not directly study barriers specifically but identified them as part of a broader set of research questions. Moreover, many of the studies used methods such as surveys that did not allow the participants to fully explain or elaborate on their experiences.

Also of note in this research is the distinction between barriers as conceptualized in the "medical model" of disability, which focuses on the physical or mental impairment of the individual and how it can be "corrected" or accommodated, and a "social model" of disability that focuses on society's shortcomings in its approach to inclusiveness for individuals with disabilities. Barriers as conceptualized in the medical model focus on what the SWD can address in his/her own behavior to convince them to use accommodations, while barriers in the social model focus on more macro-level concerns in society's treatment of SWD that discourage autonomy (Shakespeare, 2013).

Marshak et al. (2010) interviewed 16 SWD who were registered with their school's DSS. The researchers focused on intra-individual traits and used semi-structured interviews to allow participants to explain their experiences with accommodation use in postsecondary education. From the interview data they identified five main themes: identity issues, a

desire to avoid negative social reactions, insufficient knowledge among SWD about disability issues, SWD's perceptions of the quality and usefulness of services, and negative experiences SWD had with professors.

This research (Marshak et al., 2010) provided valuable insights into SWD's experiences accessing and using accommodations, but it makes no mention of whether the participating students had actually encountered barriers to seeking or using accommodations. While most SWD have faced barriers of some kind, not all report facing barriers to postsecondary education (West et al., 1993). The data for Marshak et al.'s (2010) study was part of a larger body of data that examined more general issues related to SWD, thus it makes sense that the participants would all be SWD. A more ideal population for studying barriers to seeking or using accommodations would be SWD who have specifically encountered such barriers.

Statement of Purpose

Building on the work of Marshak et al. (2010), the current study was designed to examine the experiences of SWD more fully by specifically interviewing individuals who had faced barriers to their use of accommodations.

Method

The present study employed a hermeneutic qualitative research strategy based on semi-structured interviews of participants. Hermeneutic inquiry, which is based on a relational ontology, seeks to find greater meaning and understanding of people's lived experiences through an interpretation of their given account (Kvale & Brinkmann, 2009). This strategy addressed the research question by understanding participants' ideas, views, perceptions, reactions, attitudes, opinions, thoughts, and experiences (Jensen, 2006). As Denzin and Lincoln (1994) stated, "Qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them" (p. 3).

Qualitative research is ideal for studying people and experiences as they naturally occur (Johnson & Christensen, 2008). The current study investigated SWD's naturally occurring experiences in terms of barriers to access in college. The study used semi-structured interviews that were analyzed using a hermeneutic circle, as informed by Kvale and Brinkmann (2009). In this method, several broad and unfocused reviews of the transcripts are used to identify initial themes (Jackson & Patton, 1992). The text is then reviewed at increasingly deeper levels through succes-

sive readings. As themes are identified, the researcher circles back to the text looking for confirming and disconfirming evidence. This process is used to foster a deeper understanding of the meaning of the interviews.

The philosophical foundation of this study was relational ontology (Schwandt, 2000), which assumes that relationships are primary and necessary in understanding human experience (Jackson, Smith, & Hill, 2003). The epistemology of this study was hermeneutic and dialectic (Denzin & Lincoln, 2000). An important tenet of this epistemology is that "understanding is something that is *produced* in dialogue, not something *reproduced* by an interpreter through an analysis" (Schwandt, 2000, p. 195, italics in original). In keeping with these philosophical foundations, this study used an approach suggested by Kvale and Brinkmann (2009) that attempts to understand and interpret the meaning of the everyday "life world" of the interviewee with sensitivity and openness toward new and unexpected knowledge.

Participants

Sixteen interviews were conducted for this study. The participants were SWD who had registered with DSS at a large, private religious university whose students are predominantly White/Caucasian. They ranged in age from 20 to 43, with a mean of 25.7 and a median of 23. Nine were male and seven were female (see Table 1). Each participant was paid \$40 for their time and participation. The participants were identified through a DSS list of students who had been approved for accommodations but did not use some (or any) of them during the 2010-2011 school year. A total of 42 students were identified and contacted by e-mail. Participants' self-reported disabilities included depression, anxiety, severe mental health disorders, post-traumatic stress disorder, learning disabilities, attention deficit hyperactivity disorder, Asperger's syndrome, neurological disability, back injury, type 1 diabetes, endocrine disease, autoimmune disease, and visual impairment.

Kvale and Brinkmann (2009) suggest that the researcher should "interview as many subjects as necessary to find out what you need to know" (p. 113). The common qualitative interview design tends to use around 15 interviews, plus or minus 10 (Kvale & Brinkmann, 2009). Lastly, Kvale and Brinkmann (2009) warn against the commonly misunderstood presupposition that "the more interviews, the more scientific" (p. 113). The current study followed these guidelines in determining an appropriate number of participants. At around 12 interviews, the primary researcher noticed that the data being gathered seemed

redundant. A few more interviews were conducted, for a total of 16, to make sure that a point of saturation and redundancy had been reached.

All participants met the following criteria. Each had been enrolled in at least one semester or term during the 2010-2011 school year, and had been approved for one or more accommodations but had not used one or more of them. Those who did not use one or more of their approved accommodations were identified by their decision to not pick up their DSS letters that inform professors and the campus testing center of a student's eligibility for accommodations.

Procedures

After obtaining approval from the institutional review board, a DSS provider sent out e-mails to students who met the criteria mentioned previously. All interested participants were given further information, including the interview procedures, expected length of the interview, and the nature and purpose of the study. Those who agreed to participate were asked to provide their informed consent. All interviews were recorded and transcribed, and all identifying information was removed or changed. Once the research was completed and written up, all audio recordings were erased, leaving only the transcripts that had been stripped of all identifying information (i.e., participant names and towns, school names, etc.).

Data Collection

All interviews were conducted one-on-one. Fourteen interviews were conducted in person, and two were conducted over the phone with participants who were geographically distant from the researcher. Interviews ranged from 23 to 64 minutes, with a mean of 41.1 minutes. Each interview began by asking for demographic information, followed by a briefing that described the purpose of the interview, gave the interviewee a chance to consent to being recorded, and addressed any general questions about the interview. Following the interview, participants were debriefed, which provided an opportunity to discuss any questions the interviewee had, address issues or anxiety that came up during the interview, and receive feedback or clarification related to the interview (Kvale & Brinkmann, 2009).

This study utilized a semi-structured interview format, which "is defined as an interview with the purpose of obtaining description of the life world of the interviewee in order to interpret the meaning of the described phenomena" (Kvale & Brinkmann, 2009, p. 3). The researcher used a list of possible questions (see Appendix A) that informed the interview and helped

ensure that important topics and aspects of the intended research question were not neglected. It is also important to note that the list of questions was not simply read sequentially and verbatim in each interview. As Kvale and Brinkmann (2009) describe, "it is neither an open everyday conversation nor a closed questionnaire" (p. 27).

Data Analysis

The analysis of the transcribed interviews followed the same philosophical and theoretical assumptions that were used in conducting the interviews. The analysis was not a one-time event that happened solely at the end of the research process but was instead conducted throughout the research process. During the interviews, participants' responses were interpreted and further questions were formulated relative to the analysis or interpretation (Seidman, 1998).

For example, initially no questions were asked about fears associated with the impact using accommodations could have on a student's future. However, during several interviews the participants said they were anxious about the potential consequences of asking for and using their approved accommodations. These responses led us to develop the theme of "fear of future ramifications" and shaped subsequent interviews. Kvale and Brinkmann (2009) noted that "the ideal interview is already analyzed by the time the sound recorder is turned off" (p. 190).

Once all the interviews were transcribed, a post-transcription analysis was conducted using the hermeneutic circle methodology described above. The themes identified were continually taken back to the transcripts and reexamined for evidence that both confirmed and disconfirmed them. Themes that continued to be confirmed were retained, while themes that were not broadly supported were removed. An auditor then evaluated the analysis process and the themes that were retained. Only themes the principle researcher and the auditor agreed on were included.

For example, the theme of "Insufficient knowledge" initially had two subthemes, "Question of fairness of accommodations" and "Lack of awareness of DSS and available accommodations." While reexamining the transcripts to confirm/disconfirm the subtheme of fairness, several statements from students who were concerned that they were not disabled enough to warrant accommodations seemed significant. Subsequent reviews of the transcripts demonstrated that "Question of being disabled enough" was, indeed, a distinct subtheme.

As an additional validity check, the confirmed themes were e-mailed to all the original participants to get their feedback as to whether the interpretations

matched their experiences and intended meanings. Feedback from the participants was then taken back to the text to examine whether or not the feedback was broadly supported.

Results

Analysis of the interviews revealed six main themes related to barriers SWD face in accessing and using accommodations (see Figure 1 for an overview of all findings). Four of the identified themes contained subthemes and thus were considered complex, while the other two were more straightforward and contained no subthemes. The four complex themes were Desire for Self-Sufficiency, Desire to Avoid Negative Social Reactions, Insufficient Knowledge, and Quality and Usefulness of DSS and Accommodations. The two more straightforward themes were Negative Experiences with Professors and Fear of Future Ramifications.

Theme #1: Desire for Self-Sufficiency

Throughout the course of the interviews, many of the participants (all names are pseudonyms) commented on the importance of being self-sufficient, while others alluded to it as they discussed the great pains they had taken to maintain self-sufficiency.

Many participants reported working extraordinarily hard to achieve academically without having to use accommodations. However, Betty (a 27-year-old White female graduate student with attention and learning disabilities) explained that putting forth so much effort to be self-sufficient “sometimes...takes a toll.” The subthemes of this theme were the importance of being independent, being self-accommodating, and using accommodations as a backup.

Importance of being independent. Many of the participants talked at length about the value they placed on independence. In doing so, they explained how they intentionally did not use approved accommodations in an effort to be independent. A number of participants mentioned that this decision was due in part to a sense of pride, and that pride often stood in the way of asking for and receiving help. In general, independence seemed to be a large factor in deciding whether or not to use accommodations. Steve (a 25-year-old White male junior with an emotional disability) explained:

In a few classes I haven't used them at all. I really want to test myself to see if I can compete at the level of everyone else with the same standards as everyone else and I kind of do it as a test of my own abilities to see if I can do it...I mean eventu-

ally I would like to get to a place where I don't need such accommodations anymore; that's my ultimate goal.

Being self-accommodating. Several participants suggested that self-sufficiency was important to them as they discussed efforts to self-accommodate. One form of self-accommodating involved going directly to professors or classmates and asking for help instead of requesting accommodations through DSS. Other self-accommodation involved participants having insights on how to work with their disability more effectively and then using that insight to act in ways that leveled the playing field. Peter (a 23-year-old White male senior with learning, attention, and emotional disabilities) explained:

I just feel like the most important for me when obtaining a grade...is how to approach teachers, how to win teachers over, and have teachers really like you so you can share with them your goals and have them help you achieve those goals...I tend to talk to them first and then, and as time goes on I share with them some of my problems that I am facing and the things that are going wrong and the frustrations I have with being a disabled student and that seems to allow them to have more compassion my way... [It] really helped me... That's exactly why I think I haven't utilized [DSS] so much because I have figured out myself.

Joe (a 36-year-old White male senior with an emotional disability) also spoke about this approach:

I try to always do what's effective for me. I have to sit exactly where I need to sit and I get to class not too early but not too late. If I get there too early then I am just sitting there, and yeah that's bad for the social anxiety disorder...I do what I need to manage.

Using accommodations as a backup. Many of the participants wanted to address their needs on their own and only use accommodations as a backup. These participants emphasized that it was important to them to be as independent as possible, but at the same time they had the foresight that some circumstances required the use of accommodations. A few participants even talked about how having the accommodations as a safety net would lower their anxiety, thus minimizing their need for the accommodations. Amy (a 24-year-old White female senior with an emotional disability) illustrated this approach:

It actually helped decrease my anxiety and decrease my panic attacks, knowing that [accommodations] were available to me whether I used it or not and I did quite often...It helped me not need it as much actually.

Theme #2: Desire to Avoid Negative Social Reactions

The interviews revealed that many participants had a strong desire to avoid negative social reactions related to their disabilities and accommodations. The participants' comments made it clear that accommodations are not used in isolation, and many of them seemed keenly aware of how their use of accommodations affected others and influenced others' perceptions of them. This concern focused mostly on professors and peers. The subthemes that emerged were not wanting to be viewed or treated differently, fear of suspicion from others for receiving special treatment, and not wanting to be a burden.

Not wanting to be viewed or treated differently.

Many of the participants reported concerns about being viewed or treated differently. This included a strong desire to not be singled out or have attention drawn to them. Also of note was the desire to not be labeled or categorized as "the disabled student" and thus treated as less competent or fragile. In general, participants reported that they worried about being perceived and treated differently if peers or professors learned about their disability and accommodations. Carol (a 22-year-old White senior female who is blind) expressed her feelings:

It's not something I am ashamed of or anything but at the same time I don't want everyone to know me as the legally blind girl...And I really don't want people to feel sorrow for me because there is no need to feel sorry for me as far as I am concerned.

Peter expressed similar concerns:

I used the note taking at the start but it's kind of... humiliating. I was told to go tell the teacher like that I need a note taker and I thought he was going to just say, "Hey we need someone to help [Peter] take notes." I thought he would confidentially say that but he said, "Hey we need this guy to have his notes taken because he has a disability."

Fear of suspicion from others for receiving special treatment. A number of the participants focused on being aware that others might think they were taking advantage of the system or receiving special treatment that they did not deserve. A large concern

involved peers' potential jealousy or suspicion of the accommodations. Many participants also said they felt like some professors questioned the legitimacy of accommodations. Several reported being careful to not give professors any further reason to be suspicious of them. William (a 30-year-old White male senior with a physical disability) expressed his concerns about other students' perceptions:

The only thing I remember ever having was other students on more than one occasion I would, a student would see me, you know parking in a handicap spot or in a faculty spot or something like that and say, "Gee how did you get such a great parking spot." And at first I'd say, "Oh yeah, it was wonderful. First I fell 75 feet off a cliff and spent 4 months in traction." Eventually I decided that was a little, maybe a little bitter, so you know I stopped saying that, but it just struck me as a weird thing to say to someone who clearly has a handicap tag on their car...

Amy reported similar concerns about her teachers' perceptions of her use of accommodations:

I think when the students have the letters, if you don't mention it to the teacher or get it to them right off the bat it's kind of too little too late. If you bring it in later for a lot of teachers it seems like they might roll their eyes or they might not really take it seriously or you are just bringing it in as an excuse...If I haven't taken them in the beginning of the semester, I usually just count my losses and just deal with it and get a lower score.

Not wanting to be a burden. The accommodation process at college involves many individuals, including DSS providers, administrators, and professors. Many participants commented that they were concerned they were being too much of a burden on others. At times participants would simply choose not to use accommodations that would have helped, rather than put an extra burden on others. Jane (a 21-year-old White female junior with an emotional disability) expressed that she would never ask for extra help "because I feel like it's asking too much, asking too much of professors, asking too much of the university, trying to make my life easier."

Theme #3: Insufficient Knowledge

Many participants either did not know about available accommodations or did not use them because of incorrect or insufficient knowledge. Some of the participants' reported having insufficient knowledge related to their current situation, while others reported having insufficient knowledge earlier in their college

experience. The subthemes included questioning the fairness of accommodations, lacking awareness of DSS and available accommodations, and doubting whether one was “disabled enough.”

Questioning the fairness of accommodations.

Questioning the fairness of receiving accommodations was a common dilemma for many of the participants. This seemed to be an important moral dilemma that participants wrestled with again and again throughout their college experience. Many of the participants even struggled during the interview with whether accommodation use was fair or not. Questions of fairness often seemed to stem from participants’ lack of understanding about disability or the accommodations that are legally afforded them. Jane said, for example, “It just seems so unfair that...just because I am having a struggle in my life that I should get something that other people don’t get.” Many participants brought up this fairness issue in relation to their classmates. Jim (a 23-year-old White male graduate student with a chronic health disability) related the following:

There have been times when I have tests and I asked the teacher, Did the other guys finish? Because, if the other guys didn’t finish, I am going to feel bad if I took time and a half and could finish, and that’s been the same at law school and they dismissed it so now I don’t feel bad about taking the full time, but in the past it has been kind of a question because I don’t want an unfair advantage or unfair disadvantage.

Lacking awareness of DSS or available accommodations.

One of the guiding questions in the interview dealt with how the participants had learned about the services available to them due to their disabilities. Many of the answers included details about how at some point during college they had been unaware of DSS and accommodations. Some participants talked about how, even after registering with DSS and receiving accommodations, they still were not completely sure of what accommodations and services were available to them. A few of the interviewees also made suggestions about better advertising and visibility for DSS. Rachel (a 20-year-old White female senior with a chronic health disability) captured this lack of awareness: “I don’t think I’d heard of [DSS] at all...Maybe sending out e-mails to new students or something. Just maybe a mass e-mail. These are the services we can provide.”

Doubting whether one is “disabled enough.” A common belief or misconception among many of the participants was that they were not disabled enough

to use DSS or accommodations. The participants who endorsed this misconception often were students with emotional or learning disabilities. They frequently compared themselves to students with physical disabilities and deemed themselves not disabled enough. One participant even expressed concern about not being disabled enough to participate in this study. Amy related the following:

And at first with [DSS], I felt insecure going to them ’cause I was like, I don’t have a disability. I just have panic attacks. I’m not in a wheelchair. I don’t have a disease or anything like that, and that was really hard at first...helping them [students] understand that [DSS] is not just for physical disabilities would probably be helpful.

Theme #4: Quality and Usefulness of DSS and Accommodations

The quality and usefulness of DSS and the accommodations they provide were also mentioned as major barriers to the use of accommodations. This includes problems working with DSS and the process of setting up accommodations. Participants also talked about accommodations that might have helped them with their disabilities but were unavailable. Finally, a number of participants mentioned that some accommodations were not effective and in some instances were even detrimental to learning. The subthemes of this theme were the process of requesting and receiving accommodations, certain accommodations are not available, and accommodations are not effective.

Process of requesting and receiving accommodations.

The process of requesting and receiving accommodations included the participants’ experience first approaching DSS, meeting with a DSS provider, having ongoing contact with DSS, and implementing the accommodations. A few of the participants spoke about negative experiences with the DSS and its staff that discouraged them from using accommodation. Jane said, for example, “I saw [a DSS provider] and I kind of felt like he was working against me a little bit. I felt like I had to sit there and say no, really, I need help [and] like you are not listening to me...I just didn’t feel like he was going to do anything about it.”

Sometimes a student never received the requested accommodations, while at other times the inefficient process discouraged the participant from using accommodations later on. Jennifer (a 43-year-old White female senior with chronic health and emotional disabilities) and William noted the different ways the difficulty of the process discouraged their use of accommodations:

Jennifer: The same thing with the testing center...I can't walk very well and they said, well you need to go up there and get your test and then go down to the accessible rooms. And so then I walked here and here and then here and I walked down and then I went back up and went back down and then I went over to [a DSS provider] and said that was dumb. I can't walk that much.

William: I do remember that it was kind of hard to find, like hard to get on the schedule...After I met with her she had, kind of, to write up the accommodation letters and then wait for someone to print it, and then they had to wait for her to sign, so it was like a month between when I finally met with her and when I actually had the accommodation letters in my hands.

Certain accommodations are not available. All of the participants in this study had been approved for at least one accommodation through DSS, and many noted other accommodations that might have been helpful but were not available. Sometimes participants were not sure if certain accommodations were available, they just knew they were not currently available to them. A few students had attended other universities or community colleges and had used helpful accommodations that were not available at their current university. Dwayne (a 29-year-old White male senior with an emotional disability) reported, "I have trouble getting up in the morning because of my medications, and I tried to get support for going to school late but I didn't really get support for that."

Peter expressed feeling that he had more interaction and a more personal relationship with DSS providers at the community college level. He said, "So I just felt like the [DSS], it was lacking in a lot of the things I needed in comparison to [community college]... Whereas, [the local] community college they would sit you down and they'd even call you."

Accommodations are not effective or helpful. Participants described some accommodations as ineffective and often had stopped using those they did not find useful. In some cases, participants said they felt like some accommodations might even put them further behind in their classes. Joe expressed the following:

If I have to ask for something like exam due date extension then I do have to get a letter and a lot of the time I do feel like it's just a kind of a hopeless thing. There's a lot of hopelessness in being a disabled person. It's like if you ask for an extension on your exam due date you are just going to get

behind in your next exam,...you are starting old stuff while everyone is starting the new stuff and so it's kind of a self-defeating thing to ask for a letter.

Theme #5: Negative Experiences with Professors

Negative experiences with professors in relation to the use of accommodations seemed to be a major barrier. While many participants mentioned that most of their experiences with professors were positive, almost all of them could recount, often with great detail and passion, a negative experience. In many cases a professor simply did not honor the accommodations the participant had been approved for. While other professors did not necessarily deny accommodations outright, a negative experience often made a participant question whether to use accommodations in the future. Betty, for example, recounted the following experience:

I talked to [a DSS provider] and he said, "Yeah, I think it is legit, and so he talked to [another DSS provider] who also agreed, and so I called the professor back and at this point he was at a conference and he didn't seem very happy that I was continuing to pursue this, but he said he wasn't going to give me time and a half but he was going to give me time and a quarter instead of time and a half, and so I was like okay, but then when I hung up I felt upset that he wouldn't just give me that extra quarter.

Theme #6: Fear of Future Ramifications

Many participants worried about how accommodations might disadvantage them in the future. Potential disadvantages ranged from professors writing less positive letters of recommendation to fewer job opportunities. Joe related the following example:

I guess we're supposed to, as part of the academic process, develop relationships with professors, and a good way to destroy that is to always have to ask for accommodations...I didn't know if [having a disability] was going to go on my transcript.

Peter expressed fear that his current use of accommodations could affect his ability to obtain them in the future. He said, "I fear if I keep going into [DSS] and they see that I have good grades, they are going to take away some of the things they've given me."

Students expressed the more personal concern that accommodations might act as a crutch and limit the benefit and skills they otherwise might gain during their college education. Ralph (a 22-year-old White male freshman with a learning disability) related the following:

One of the accommodations that I qualified for is a microphone that you talk into that types for you...But if you are not a very good typist and you use that all the time, you will never be good at typing...I feel like using those accommodations could cripple me in a way.

Discussion

The current study builds on past research, especially Marshak et al. (2010), by contributing new perspectives from a population that has not been studied previously. The current study specifically identified a student population that had been approved for accommodations and then did not use at least one of those accommodations. This study also focused on the intra-personal experiences of students using accommodations. Since the study participants were specifically identified as having faced barriers to using accommodations, they provided new and unique insights about those barriers.

Through our analysis of the interviews, we found themes similar to those of Marshak et al. (2010), as well as some that differed (see Table 2 for more detailed information about these similarities and differences). Our results provide novel insights (i.e., subthemes) into previously reported reasons (i.e., themes) SWD may not use approved accommodations. The SWD in our sample reported having a strong need to feel independent, wanting to be self-accommodating, and wanting to use accommodations only as a “back-up.” They also shared strong feelings about not wanting to burden others because of their accommodation use and expressed fears that they were “not disabled enough.” Our findings also showed that students sometimes felt that “accommodations were not effective.”

Theme #6: Fear of Future Ramifications has not been identified previously in the literature. Some SWD reported fears that resulted from a lack of information, such as that their disability status may be indicated on their transcript or that accommodations would be taken away if they showed a positive academic performance. Other concerns were that professors would not write strong letters of recommendation and that accommodations might hinder their ability to develop skills (e.g., writing, reading, and typing). For many participants, the future ramifications were important considerations in deciding whether or not to use DSS and accommodations.

Theme 6 raises the question of whether SWD should always be encouraged to use accommodations. Previous research on barriers to accommodation use often approached the topic in a way that implied that

the ultimate goal should be to identify and eliminate barriers. Research has shown that when SWD use accommodations they are more successful academically (Salzer et al., 2008) and ultimately have higher graduation rates (Vogel & Adelman, 1990). While students in our study reported some significant benefits from using accommodations, they also identified multiple difficulties they experienced within themselves when using them (e.g., self-consciousness, a desire not to burden others, fear of retribution).

Implications

Our findings offer faculty, administrators, and DSS providers valuable insights into the barriers SWD face in accessing and using accommodations. The increased emphasis our participants put on self-sufficiency suggests that DSS providers should seriously consider SWD’s desire to be independent and understand the ways they strive to be so. Honest conversations between DSS providers and SWD about how the students’ needs can be met without sacrificing independence may encourage SWD to use beneficial accommodations.

The newly identified subtheme of not wanting to be a burden also has possible implications and applications. Many participants mentioned that, rather than burden professors and DSS providers, they sometimes did not use accommodations. An increased effort from professors and DSS providers to welcome and encourage SWD may help decrease the students’ concern about being a burden. One student mentioned that when she was working with a DSS provider he appeared to be extremely busy and overburdened. It may be useful to conduct further research to examine whether DSS providers are overworked/overburdened and whether this is creating a barrier to students seeking accommodations. If this is indeed the case, further discussion about increasing resources and personnel for DSS is warranted.

This study also identified the new subtheme of SWD questioning whether they are disabled enough, which suggests certain implications regarding disability type. This subtheme was primarily expressed by students with emotional and learning disabilities, who reported that they felt they should not receive accommodations because they were not as disabled as students with physical disabilities. DSS providers can play an important role in helping this group of students understand that they too deserve accommodations and equal access. As one student stated, “[a DSS provider] even made a comment like, even though your disability is not as visible, it’s still just as important as anyone else’s to take care of and so that helps.” Increased information about who is eligible to receive services at

DSS also may be helpful, as many participants reported that they used to think DSS was just for students with physical disabilities.

Another new subtheme identified in this study is that some accommodations are not effective. Some participants mentioned that the accommodations were not helpful or efficient and sometimes even put them further behind in their classes. It is important for DSS providers to make sure SWD are getting the most benefit out of the accommodations they are using. The interviews also indicated that when some accommodations were not effective the participants were less likely to use others. Conversely, if accommodations were beneficial their use was likely to increase. One student mentioned that it would be helpful if DSS providers monitored students' progress and the effectiveness of the accommodations they were using more closely. While this may be beyond the scope of what DSS providers are able to provide, a closer look at accommodations' effectiveness could prove valuable for SWD.

Other implications from this study stem from the newly identified theme, fear of future ramifications, which suggests that a new way of conceptualizing the non-use of accommodations may be in order. Instead of looking at this simply as another barrier that must be eliminated, it may be helpful to consider that, depending on context, use of accommodations sometimes may be detrimental. This suggests that DSS providers may be more effective if they take the student's contextual factors into account and involve the student more in the discussion of whether an accommodation may be helpful for their situation. This falls in line with previous researchers' recommendation that accommodations should be considered on a case-by-case basis (Frank & Wade, 1993; Salzer et al., 2008) rather than taking a one-size-fits-all approach.

In general, these findings have implications for educating college faculty, administrators, and students with and without disabilities more effectively. It seems that the high number of negative experiences participants reported having with faculty could be largely reduced by developing programs aimed at educating faculty about disability legislation, SWD, and accommodations. If faculty are made more aware of the ways they create barriers and what they can do to change that, SWD may be more likely to contact them about their needs and use the accommodations they are entitled to. Similar efforts could target college administrators and students without disabilities. In addition to making them more aware of and able to reduce barriers, the study findings may help all people in college settings be more curious about SWD's experiences and

encourage them to ask what barriers might be standing in the way of these students' college success. Finally, educating SWD about these findings may help them put language to their experiences and to advocate more effectively for useful accommodations, despite the barriers they face.

Further research is needed in several areas. The subtheme of not being disabled enough seemed to depend more on disability type than the other themes and subthemes identified, and to be expressed primarily by participants with emotional or learning disabilities rather than physical disabilities. This suggests that there may be other instances where barriers to accommodation use are a result of disability type.

Potentially rich information about barriers to accommodation use could be gained from studying a population of SWD who are not registered with DSS. Such research could reveal barriers that are simply not part of the experience of students who are aware of and have used DSS.

The results of this study also suggest that it could be beneficial to look at barriers to accommodation use with more complexity and specificity. Future research might focus on determining more specifically when accommodation use would be beneficial and when it truly is not needed or is even detrimental. Conducting such a study could prove difficult, as it would require a closer examination of numerous contextual variables (e.g., disability type, fluctuation of disability condition, choice of classes, accommodation effectiveness, students' future plans and aspirations, etc.). Nevertheless, it could provide DSS providers and SWD with invaluable information that would help them decide if and when to use accommodations.

Another area that should be investigated in future research is the degree to which the "medical model" of disability contributes to SWD's reluctance to use accommodations. While this study focused mostly on intra-personal factors in the decision to not use accommodations, additional research on systemic discrimination and barriers would help to paint a fuller picture of the situations SWD face in postsecondary settings and how negative cultural attitudes impact their decision-making relative to using supports.

Limitations

The students in our sample were attending a large, private, religion-oriented university; were older than the typical college-age undergraduate; and did not include any ethnic minorities, which may affect the generalizability of these results. An example of how the unique characteristics of our sample may have impacted our findings is that many expressed fears about

appearing to be asking for “too much.” While this may be generalizable to other SWD, it also could be attributable to our participants’ religious background. Again, while our participants’ responses may be representative of college students in general, older students may be more willing to ask for accommodations, having had more life experience in doing so. Given that our results come only from the experiences of White students, the unique barriers faced by students of diverse ethnic backgrounds are likely not represented. There is no way to know how much White privilege impacted our participants’ responses. Additional research is needed to better understand the experiences and needs of students from various backgrounds.

Another limitation is the lack of information obtained about our participants’ experiences using accommodations during high school. Without this information, it is difficult to know how much of their reported barriers to accommodation use result from the potentially difficult transition from high school (Section 504/IDEA; goal of success) to college (ADA; goal of access), which requires students to self-advocate.

Although the principle investigator involved professionals and researchers with a background in and knowledge of disability support issues in designing and conducting this study, SWD were not directly involved, which may have left out unique perspectives on students’ accommodation use. There may have been some limitations in the procedure for conducting and analyzing interviews. The primary investigator conducted all of the interviews, analyzed the interviews, and generated themes.

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Table 1

Participant Demographics

NAME (PSEUDONYM)	AGE	GENDER	RACE/ ETHNICITY	DISABILITY TYPE	YEAR IN SCHOOL
Jane	21	F	White/ Caucasian	Emotional (Depression)	Junior
Joe	36	M	White/ Caucasian	Emotional (Anxiety)	Senior
Steve	25	M	White/ Caucasian	Emotional (Depression, Anxiety)	Junior
William	30	M	White/ Caucasian	Physical (Back Injury, Pain, Mobility)	Senior
Rachel	20	F	White/ Caucasian	Chronic Health (Type I Diabetes, Addison's)	Senior
Richard	21	M	White/ Caucasian	Asperger's Syndrome	Senior
Peter	23	M	White/ Caucasian	Learning/Attention/ Emotional (ADHD, Reading, Anxiety)	Senior
Albert	22	M	White/ Caucasian	Emotional (Bipolar, Schizophrenia)	Sophomore
Jennifer	43	F	White/ Caucasian	Chronic Health/Emotional (Fibromyalgia, Anxiety, Depression)	Senior
Jim	23	M	White/ Caucasian	Chronic Health (Cerebral Palsy)	Graduate Student
Ralph	22	M	White/ Caucasian	Learning (Dyslexia)	Freshman
Amy	24	F	White/ Caucasian	Emotional (PTSD)	Senior
Betty	27	F	White/ Caucasian	Attention/Learning (ADHD, Processing Speed)	Graduate Student
Carol	22	F	White/ Caucasian	Physical (Blind)	Senior
Michelle	23	F	White/ Caucasian	Chronic Health (Liver Disease, Hepatitis)	Junior
Dwayne	29	M	White/ Caucasian	Emotional (Bipolar)	Senior

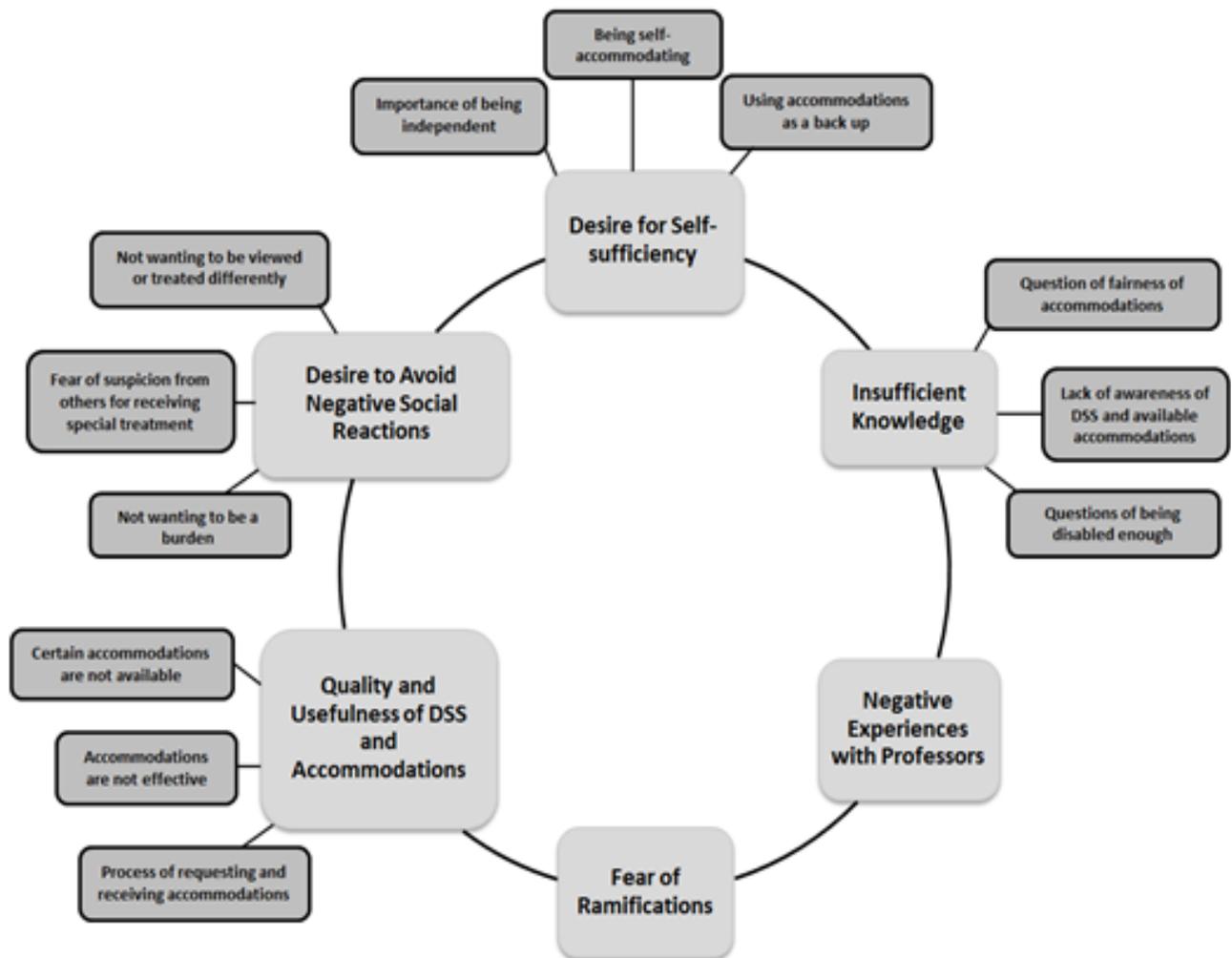
Note. PTSD=post-traumatic stress disorder; ADHD=attention deficit hyperactivity disorder

Table 2

Comparison of Marshak et al. (2010) to the Current Study

Marshak et al. (2010)	Current Study
1. Identity issues <ol style="list-style-type: none"> a. Desire to shed stigma of high school identity b. Desire to not integrate the presence of a disability into their identity c. Desire for self-sufficiency 	1. Desire for self-sufficiency <ol style="list-style-type: none"> a. Importance of being independent b. Being self-accommodating c. Using accommodations as a backup
2. Desire to avoid negative social reactions <ol style="list-style-type: none"> a. Fear of resentment of other students for special treatment b. Not wanting to be singled out 	2. Desire to avoid negative social reactions <ol style="list-style-type: none"> a. Not wanting to be viewed or treated differently b. Fear of suspicion from others for receiving special treatment c. Not wanting to be a burden
3. Insufficient knowledge <ol style="list-style-type: none"> a. Question of fairness of receiving accommodations b. Confusion about accessibility and DSS services c. Lack of training in how to explain their disability to others 	3. Insufficient knowledge <ol style="list-style-type: none"> a. Question of fairness of accommodations b. Lack of awareness of DSS and available accommodations c. Question of being disabled enough
4. Perceived quality and usefulness of services <ol style="list-style-type: none"> a. Expediency of service delivery b. Lack of compatibility with accommodations 	4. Perceived quality and usefulness of DSS and accommodations <ol style="list-style-type: none"> a. Process of requesting and receiving accommodations b. Certain accommodations are not available c. Accommodations are not effective
5. Negative experiences with professors	5. Negative experiences with professors 6. Fear of future ramifications

Figure 1. Accessing and utilizing accommodations themes and subthemes.



Appendix

Semi-Structured Guiding Questions

Will you please describe your overall experience at college?

How has your disability affected your experience at college?

Can you describe your experiences with contacting DSS and requesting accommodations?

What parts of this process were helpful or useful?

What parts of this process were not helpful or useful?

How have your experiences with faculty members been?

How have your experiences with other students been?

How have your experiences with DSS staff been?

Can you describe a specific experience where you felt like you didn't have access to services or accommodations that would have been helpful in your education?

I'm curious about your experience with getting approved for accommodations and then not using one or more of those accommodations. Can you describe this experience for me?

Why do you think other students might not seek out or use accommodations?

If you were in charge of DSS at the college, what would you do differently?

What would you do the same?

What advice would you give to a student with a similar disability, concerning accommodations and services at college?

What question should I have asked, but didn't?

What has this interview experience been like for you?

The Use of Extended Time by College Students with Disabilities

Laura M. Spenceley ¹
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Abstract

College students with disabilities represent approximately 11% of the general college population (U.S. Department of Education, 2013). These students are entitled to a variety of academic accommodations, including extended time to complete tests. Although extended time is frequently requested and granted, little empirical attention has been given to its use for exams taken by students with disabilities in a college classroom sample. The current study sampled records that were collected on all exams completed with extended time during two semesters at a midsize public university in the Northeast. The study explored two broad questions: What portion of typical time and extended time do students with disabilities use to complete exams? How does that use of time vary across common disabilities? Our findings indicated that more than half of the tests administered with extended time were completed within the time given to students in the sample classroom who took the tests. We also found, unexpectedly, that 12.9% of exams were completed in more than the extended time allotted. In this paper we discuss issues disability services providers could consider when making decisions about the provision of extended time and make recommendations for future research.

Keywords: *Extended time, students with disabilities, postsecondary education, test accommodations*

According to recent estimates, approximately 11% of students attending U.S. postsecondary institutions have a disability (U.S. Department of Education, 2013). Those with specific learning disabilities (LD), attention deficit hyperactivity disorder (ADHD), and/or psychological and psychiatric conditions account for the largest proportion of college students with disabilities (Raue & Lewis, 2011). These students are entitled to a variety of academic supports through Section 504 of the Rehabilitation and the Americans with Disabilities Act (ADA). Originally passed in 1990 (PL 101-336), ADA defined disability as a physical or mental impairment that has a substantial impact on a major life activity. The ADA Amendments Act of 2008 (ADAAA) provided a nonexhaustive list of those major life activities, including reading, concentrating, and thinking. Both the original law and the amendments further specify that individuals with disabilities must be

provided reasonable accommodations to access these major educational life activities, including academic accommodations.

Academic accommodations are meant to enable students with disabilities to access academic content and assessments (Goh, 2004). Accommodations can be provided in typical class settings, and under separate conditions. Lovett and Lewandowski (2015) defined test accommodations as modifications to the administration procedures that do not change the test content or the construct being evaluated. Test accommodations can include modifications to the timing and/or scheduling of a test, or to the response format, presentation, or setting (Thurlow, Elliott, & Ysseldyke, 2003). For example, a student with a visual impairment could be given an exam in large-text format to ameliorate the impact of their poor vision while retaining the original test items.

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Students with a variety of disabilities frequently request extended time to complete a test (Lazarus, Thompson, & Thurlow, 2006). Goh (2004) suggested that providing extended time can reasonably be applied in any situation where a student's disability causes them to process the test more slowly than is typical and thus impairs their ability to demonstrate their knowledge or skills. That is, students with LD or ADHD may have difficulty completing speeded tasks secondary to deficits in processing speed (Lewandowski, Cohen, & Lovett, 2013; Lewandowski, Lovett, Parolin, Gordon, & Coddling, 2007), while students with psychiatric impairments may require extended time to complete tests due to psychiatric symptoms or the use of psychotropic medication that impairs their processing speed (Eudaly, 2003).

Although extended time is frequently allowed in postsecondary settings (Bolt & Thurlow, 2004), its use has been debated in the literature. While a comprehensive review is beyond the scope of this discussion (see Lovett & Lewandowski, 2015; Phillips, 1994; Sireci, Scarpati, & Li, 2005), it should be noted that there is evidence to both support and contradict the fairness of extended time. For example, Gregg and Nelson (2010) found that, while extended time often improved the performance of students with and without disabilities, students without disabilities continued to outperform their disabled peers, even when those peers were given accommodations. Moreover, the results of Lewandowski and colleagues' empirical work (Lewandowski et al., 2013; Lewandowski, Lovett, & Rogers, 2008) has consistently shown that extended time improved nondisabled students' performance more than that of students with LD. In contrast, when Lewandowski et al. (2013) compared the results of students with LD who were given extended time to the results of their nondisabled peers given the typical time, students with LD showed a stronger performance than their nondisabled peers. These findings are certainly troubling, as they reveal that extended time may threaten the validity of test results by giving some students an unfair advantage.

Despite this spirited debate on the fairness of providing extended time in the college environment, the literature has given far less attention to the actual use of accommodations, and extended time specifically. In an experimental setting, Wadley and Liljequist (2013) found that, in a sample of college students with and without ADHD, both groups used less than the typical time and the extended time to complete a math task. Similarly, Cahalan-Laitusis, King, Cline, and Bridgman (2006) reported that individuals with LD and/or ADHD tended to use less than 25% of the

extended time allotted when taking the Scholastic Aptitude Test (SAT); however, the time used was noted to vary by task type. For example, students with disabilities used approximately 4% more time than their nondisabled peers to complete writing tasks but 14% more on mathematics tasks and 25% more on critical reading tasks. Although Lewandowski and colleagues (Lewandowski et al., 2007; Lewandowski et al., 2008; Lewandowski et al., 2013) shortened the standardized test administration time to eliminate ceiling effects, it cannot be assumed that the results from a standardized measure of reading administered in laboratory setting would generalize to content-rich tests administered in the classroom, with or without extended time. In fact, few studies have evaluated the extended time students with disabilities use to take tests in college courses. Stewart, Systma, Panahon, and Schreiber (2014) reviewed test logs provided by a university's office of disability services and found that, on average, students with disabilities used about the same amount of time to complete tests as their peers, regardless of how much extended time was allotted. Unfortunately, Stewart et al. aggregated data, thus limiting the opportunity for a specific exploration of the time used based on the type of disability and on the extended time allotted.

Despite concerns that the use of extended time on college campuses may give some students an unfair advantage and negatively influence the validity of test scores, few studies have explored how students with disabilities use extended time accommodations by disability type. Our primary goal in the current study was to expand the work of Stewart et al. (2014) to address two general research questions: What portion of typical time and extended time do students with disabilities use to complete exams? How does that use of time vary across disabilities common in the college population, such as LD, ADHD, and autism spectrum disorder? Given the lack of previous data to support empirical hypotheses, we sought to explore these questions descriptively to promote a more comprehensive understanding of the students who may be most likely to both under and over utilize the extended time accommodation.

Method

Prior to collecting data, all our procedures for the current study were approved through the campus institutional review board. We then gathered time data from the spring 2014 and fall 2014 semesters from archival records kept by the Office of Disability Support Services (DSS) at a midsize public university in the Northeast. These data were collected at the time

students with disabilities were presented to the DSS office to take a test with extended time. The records included the student name and the course name and number; the time the exam began and ended; support materials allowed, such as notes, calculators, and/or books; special notes from the instructor, such as whether the test-taker was given a 10-minute **extended** time limit rather than the entire class period. It was typical practice for the DSS office to collect these records in order to monitor exams completed under extended time conditions.

The authors then confirmed, through the archival records, the length of the class in which each test was taken with no specific time limit (as mentioned above). The accuracy of the time allotted and the time used to complete each test was verified prior to the data analysis through the following procedure. The two authors divided the time records between them and entered the total time allowed and utilized (in minutes) for each record. The authors then confirmed each other's data; when disagreements arose, the authors confirmed the time allotted and/or recalculated the time used, and agreed on the data before entering it. Time records that did not include a start time, end time, or course name/number were removed from the sample ($n = 52$).

Once we confirmed the data on time use, we calculated the proportion of time used (in minutes) out of the total class time allotted (in minutes) for each test administered. We then calculated the **percentage** of extended time allowed by multiplying the class time allowed by the extended time granted (either 1.5 [50% extended time] or 2.0 [100% extended time]) to obtain the total amount of time allowed for each test taken with extended time. We also created a categorical variable to reflect the proportion of class time used: up to 100% of class time, 101%-110% of class time, 111%-125% of class time, 126%-150% of class time, 151%-175% of class time, 176%-200% of class time, and >200% of class time. We selected these intervals because they align with the current standard of allotting either 50% or 100% more time than the class receives; they also provide more a more nuanced understanding of the patterns of time use.

The primary authors collected demographic information, including age, class standing, disabling condition, and amount of extended time allotted (1.5 or 2.0), from each participant's file and confirmed it using the same verification procedure as for time use data: The two authors divided the student records between them and noted each participant's age, class standing, disabling condition, and amount of extended time allotted. The authors then confirmed each other's information; when disagreements arose, the authors

verified the information by reviewing the student's record together.

The final sample included 1,093 unique exams completed by 187 individuals. The mean age of the sample was 22.01 years ($SD = 4.62$, range = 18-52 years). The sample included a nearly equal proportion of males (49.77%) and females (50.22%). Learning disabilities were the most frequent educational disability recorded (37.88%), followed by ADHD (23.88%) and multiple disabilities (13.36%). The greatest proportion of our sample were college juniors (33.76%), followed by seniors (28.27%), freshmen (21.41%), sophomores (16.38%), and graduate students (.18%). Of the sample, 605 exams (55.35%) were taken with 1.5 extended time and 488 (44.65%) were taken with 2.0 extended time.

Results

We utilized descriptive data analyses to answer our primary research questions. We began by exploring the general pattern of time use across the sample of tests taken with extended time by disability group, as presented in Table 1. We found that, on average, students who completed tests under extended time conditions used 103.18% of class time and 60.44% of the extended time allotted. Individuals with psychiatric disabilities used nearly 25% more than the class time allotted to complete their tests, while individuals with visual disabilities completed their tests in approximately 27% less than the time allotted in class. Individuals with LD and visual and medical disabilities on average completed the tests within the time allotted in the classroom. Across disability groups, we found individuals with physical (59.65%) and psychiatric (58.75%) disabilities used the greatest proportion of any extended time allotted to complete their tests, while individuals with medical (0%) and visual (21.88%) disabilities used the smallest portion of extended time allowed to complete their tests.

1.5 Extended Time

To further explore the amount of time used by individuals with disabilities to complete tests taken under extended time conditions, we split the dataset by tests taken with 1.5 and with 2.0 extended time (Table 1). For exams taken with 1.5 extended time ($n = 605$), the mean class time used was 96.11% ($SD = 55.73\%$), which indicates that, on average, exams were completed within the time allotted in the classroom. ; the mean extended time used was 64.03% ($SD = 37.13\%$). As displayed in Table 1, individuals with psychiatric disabilities on average used the highest percentage of class time (124.70%), while individuals with visual

disabilities on average used the lowest percentage of class time (73.36%).

Our analysis of the categorical variable of time used helps further explain patterns of time use by disability type (Table 2). Within the sample of exams taken with 1.5 extended time ($n = 605$), the majority ($n = 354$, 58.51%) were completed within the time given in the classroom. Of these 354 exams, LD ($n = 122$, 34.46%) and ADHD ($n = 101$, 28.53%) were most frequently represented. Of the sample of individuals with LD ($n = 185$) and ADHD ($n = 175$) given 1.5 extended time, the majority were able to complete the test within the time given in the classroom (65.95% and 57.71%, respectively). All individuals with medical disabilities were able to complete tests taken with 1.5 extended time within the time given in the classroom.

Of the individuals who used at least some of the extended time granted ($n = 251$), the largest proportion ($n = 89$, 35.46%) completed their tests within 126%-150% of class time, indicating that, when individuals with disabilities began to use their extended time to complete their test, approximately one-third completed it with 26%-50% more time than that given in the classroom. Across disability groups, individuals with ADHD most frequently used any portion of extended time (29.58%). Within specific disability groups, individuals with psychiatric diagnoses (60.71%) most frequently used any portion of extended time, while no individuals with medical diagnoses used any portion of extended time. We found that 16.53% ($n = 100$) of students who completed exams with 1.5 extended time used more than the time allotted. Of these, the most frequently represented disabilities were ADHD ($n = 27$, 35.06%) and psychiatric diagnoses ($n = 15$, 19.48%).

Extended Time 2.0

For the individuals who took exams with 2.0 extended time ($n = 488$), the average class time used was 111.96% ($SD = 62.83\%$), indicating that students given 2.0 extended time used more than the allotted class time, as presented in Table 1. On average, individuals with multiple disabilities used the most class time (140.99%) to complete exams, while individuals with visual disabilities used the least (97.00%).

As seen in Table 3, nearly a majority of the exams taken with 2.0 extended time were completed within the time allotted in the classroom ($n = 243$, 49.80%); LD was the most frequently represented disability ($n = 140$, 57.61%). Of these, the most frequently represented disabilities were ADHD ($n = 38$; 38.00%) and psychiatric diagnoses ($n = 21$; 21.00%).

For individuals who used at least a portion of the extended time allotted ($n = 245$), the largest portion (n

$= 61$, 12.50%) completed their tests within 126%-150% of the time allotted in the classroom. Across groups, individuals with LD ($n = 89$) represented the largest percentage of the sample (36.33%) that used any portion of extended time. Within disability groups, more than two-thirds (67.44%) of the individuals with multiple disabilities ($n = 29$) used more than the class time allotted, followed by individuals with ADHD, who used 63.95% ($n = 55$) of the extended time allotted. Forty-one (8.40%) completed their tests beyond the extended time allotted; the most frequently occurring disability among those individuals was LD ($n = 12$, 29.27%).

Discussion

The current study was designed to explore the extended time use patterns of college students with disabilities. We sought to expand the work of Stewart et al. (2014) to better understand the amount of students with disabilities use extended time to complete tests, and how these patterns vary across disabilities.

Our results revealed that a majority (54.62%) of students with disabilities who took tests under extended time conditions completed them in the time allotted in the classroom, irrespective of the amount of extended time allotted. These findings echo those of Cahalan-Laitusis et al. (2006) and Stewart et al. (2014), who found that when tests are administered with additional time, the majority of students with disabilities are able to complete the tests within the time given in the classroom. Across disability groups, we found that, on average, individuals with LD, visual disabilities, and medical disabilities were able to complete tests within the time allotted in the classroom, regardless of whether the tests were taken with 1.5 or 2.0 extended time. Furthermore, fewer than half of the individuals with LD, ADHD, visual disabilities, and medical disabilities used any extended time when taking tests.

Although these findings are noteworthy, some authors have suggested that providing extended time during testing reduces students' anxiety, frustration, and stress, in addition to allowing them sufficient time to access content and demonstrate their skills. For example, Elliott and Marquart (2004) found that middle school students with and without disabilities reported being more relaxed when taking a math test with extended time. Lang et al. (2005) found that students with and without disabilities reported being more comfortable taking tests under extended time conditions, and students with disabilities were more likely to report that taking tests was easier when given extended time. Another study found that high school and college students with and without disabilities perceived

that taking a test with 1.5 extended time would benefit their performance (Lewandowski, Lambert, Lovett, Panahon, & Sytsma, 2014). Given that anxiety, fatigue, motivation, and perceived likelihood of success may influence all student' test performance, providing an accommodation solely to reduce the impact of these factors could seriously threaten the validity of scores, especially in the absence of disability-related functional impairment (Ofiesh & Hughes, 2002).

Although the majority of individuals in the current study completed tests within the time given in the classroom, we found that nearly 17% who used 1.5 extended time and approximately 8% who used 2.0 extended time needed even more time than that allotted under the extended time conditions. We find these data concerning, given their potential impact on the validity and comparability of scores on tests taken under typical rather than extended time conditions. Scores on high-stakes exams like the SAT that were taken with extended time accommodations have been shown to have weaker predictive validity (Cahalan, Mandinach, & Camara, 2002) than those taken under typical conditions. Furthermore, Thornton, Reese, Pashley, and Dalessandro (2002) found that scores on the Law School Admission Test earned under extended time conditions tended to over-predict first-year law school performance for students with ADHD, LD, neurological impairment, and visual impairment. Although these findings indicate differential predictive validity in accommodated versus typically administered high-stakes tests, it is important to note that there is far less research on the impact extended time has on the validity of classroom test scores.

In a similar line of criticism, some have questioned whether test scores earned under extended time conditions are comparable to scores earned under typical time conditions. In a college sample, Lewandowski et al. (2013) found that, when students with LD were given doubletime to take tests, they were able to access more test items than nondisabled students taking the same test under typical time conditions. Practically speaking, this suggests that the scores of students who take tests under extended time may not be comparable to those who take the same test in the classroom. Given that approximately 12% of the students in the current study used even more than the extended time allotted, we emphasize the potential threat to the validity of test scores when students are given additional time to complete tests beyond the extended time accommodation.

In conjunction with the recommendations from Lewandowski et al. (2013) and other researchers (Ofiesh & Hughes, 2002; Ofiesh, Hughes, & Scott, 2004), our findings suggest that, when accommodating college stu-

dents with disabilities, we may need to provide smaller increments of extended time to balance their need for access to test content with the need to avoid creating an unfair advantage. In the current study, approximately 69% of tests administered with 1.5 extended time and 61.50% of tests administered with 2.0 extended time could have been completed with 25% extended time. While there is some research (see Ofiesh, 2000; Ofiesh, Mather, & Russell, 2005; Lovett & Leja, 2015) to suggest that measures of processing speed, retrieval fluency, and executive functioning may help identify individuals who will and will not benefit from extended time, the skills that best inform the allotment of extended time in a postsecondary setting, and the corresponding measures of these skills, have not been sufficiently explored. Absent additional research on the salient factors that can help inform the appropriate provision of extended time, such as processing speed or reading ability, we recommend that readers consider the relevant accommodation guidelines for each individual student, making sure to balance access with fairness.

While the current study is among the first to explore the use of extended time in an ecologically valid setting, it is important to consider the limitations of the data. We utilized archival data collected at the time each exam was given. We included all tests taken under extended time conditions, which ranged from brief quizzes to examinations. Given the diverse difficulty, content, and response formats of the tests, we cannot generalize our findings to a specific test or examination. Despite this limitation, our data support the findings of other studies (Stewart et al., 2014; Wadley & Liljequist, 2013) that a large portion of students who are given extended time do not use this accommodation to complete their tests. Although our sample included students with a variety of disabilities, we did not have equal representation across disability categories, which further limits the generalizability of our findings. Furthermore, we did not have access to the time use of nondisabled students enrolled in the same courses as our disabled sample who took tests under typical time conditions; thus it is impossible to determine the extent of the relationship between use of time, performance, and disabling condition. Finally, our findings were taken from exams completed during two semesters at one midsize public university. Differences in the admissions requirements and general academic standards across college campuses may prevent these data from being generalized to all schools.

Despite the limitations of the study, our findings are among the first to demonstrate the patterns of time use for college students with disabilities who were provided extended time accommodations to complete

classroom examinations. Our results provide evidence that students with disabilities may be able to access test content in less time than they are provided. Given the threats to the validity of scores on tests taken with accommodations, more research is needed to fully understand how extended time influences performance on classroom tests administered to students with and without disabilities both with and without this accommodation. Until then, we recommend that disability services providers continue to work to balance all students' right to access academic content without providing unnecessary accommodations that may produce an unfair advantage.

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Table 1

Mean and Standard Deviation of Percentage Time Utilized by Time Allotted and Disability

	1.5 Extended Time			2.0 Extended Time			Overall Sample		
	<i>n</i>	Class Time (<i>SD</i>)	Extended Time	<i>n</i>	Class Time (<i>SD</i>)	Extended Time (<i>SD</i>)	<i>N</i>	Class Time (<i>SD</i>)	Extended Time (<i>SD</i>)
LD	185	85.83 (50.50)	57.22 (33.67)	229	97.52 (56.24)	48.76 (28.12)	414	92.30 (54.00)	52.54 (30.97)
ADHD	175	100.61 (62.91)	67.07 (41.94)	86	123.69 (63.94)	61.84 (31.97)	261	108.21 (64.06)	65.35 (38.95)
ASD	28	107.30 (43.04)	71.53 (28.69)	40	119.60 (78.69)	59.80 (39.34)	68	114.53 (66.24)	64.63 (35.89)
PSY	56	124.70 (65.11)	83.13 (43.40)	53	124.67 (60.54)	62.33 (30.27)	109	124.68 (62.64)	73.02 (38.86)
Visual	22	73.36 (34.59)	48.91 (23.06)	10	97.00 (63.92)	48.50 (31.96)	32	80.75 (46.05)	48.78 (25.63)
Physical	30	113.93 (45.32)	75.12 (29.87)	27	120.09 (54.89)	60.05 (27.45)	57	116.85 (49.72)	67.98 (29.49)
Medical	6	73.60 (23.15)	49.07 (15.43)	0	--	--	6	73.60 (23.15)	49.07 (15.43)
Multiple	103	89.30 (49.17)	59.54 (32.78)	43	140.99 (68.22)	70.49 (34.11)	146	104.53 (60.06)	62.76 (33.43)
Total	605	96.11 (55.73)	64.03 (37.13)	488	111.96 (62.83)	55.98 (31.41)	1093	103.18 (59.50)	60.44 (34.91)

Note. LD=Learning Disability; ADHD=Attention Deficit Hyperactivity Disorder; ASD=Autism Spectrum Disorder; PSY=Psychiatric Disability

Table 2

Percentage of Tests Completed within Time Intervals by Disability for 1.5 Extended Time

Class Time	Disability								
	LD (n=185)	ADHD (n=175)	ASD (n=28)	PSY (n=56)	Visual (n=22)	Physical (n=30)	Medical (n=6)	Multiple (n=103)	Total (n=605)
Up to 100%	65.95 (n=122)	57.71 (n=101)	42.86 (n=12)	39.29 (n=22)	86.36 (n=19)	43.33 (n=13)	100 (n=6)	57.28 (n=59)	58.51 (n=354)
101-110%	6.49 (n=12)	4.00 (n=7)	10.71 (n=3)	1.79 (n=1)	0 (n=0)	10.00 (n=3)	0 (n=0)	5.82 (n=6)	5.29 (n=32)
111-125%	5.41 (n=10)	1.41 (n=2)	7.14 (n=2)	3.57 (n=2)	0 (n=0)	6.67 (n=2)	0 (n=0)	11.65 (n=12)	4.96 (n=30)
126-150%	13.51 (n=25)	15.43 (n=27)	17.86 (n=5)	17.86 (n=10)	13.63 (n=3)	16.67 (n=5)	0 (n=0)	13.59 (n=14)	14.71 (n=89)
151-175%	3.24 (n=6)	9.71 (n=17)	21.43 (n=6)	16.07 (n=9)	0 (n=0)	13.33 (n=4)	0 (n=0)	7.77 (n=8)	8.26 (n=50)
176-200%	2.70 (n=5)	5.71 (n=10)	0 (n=0)	10.71 (n=6)	0 (n=0)	6.67 (n=2)	0 (n=0)	3.88 (n=4)	4.46 (n=27)
>200%	2.70 (n=5)	6.29 (n=11)	0 (n=0)	10.71 (n=6)	0 (n=0)	3.33 (n=1)	0 (n=0)	0 (n=0)	3.80 (n=23)

Note. LD=Learning Disability; ADHD=Attention Deficit Hyperactivity Disorder; ASD=Autism Spectrum Disorder; PSY=Psychiatric Disability

Table 3

Percentage of Tests Completed within Time Intervals by Disability for 2.0 Extended Time

Class Time	Disability							
	LD (n=229)	ADHD (n=86)	ASD (n=40)	PSY (n=53)	Visual (n=10)	Physical (n=27)	Multiple (n=43)	Total (n=488)
Up to	61.14	36.05	47.50	43.40	60	37.04	32.56	49.78
100%	(n=140)	(n=31)	(n=19)	(n=23)	(n=6)	(n=10)	(n=14)	(n=243)
101-	5.68	2.33	5.00	5.66	0	0	2.33	4.30
110%	(n=13)	(n=2)	(n=2)	(n=3)	(n=0)	(n=0)	(n=1)	(n=21)
111-	7.42	9.30	2.50	5.66	10	14.81	4.65	7.38
125%	(n=17)	(n=8)	(n=1)	(n=3)	(n=1)	(n=4)	(n=2)	(n=36)
126-	8.73	22.09	2.50	15.09	10	18.52	16.28	12.50
150%	(n=20)	(n=19)	(n=1)	(n=8)	(n=1)	(n=5)	(n=7)	(n=61)
151-	4.37	6.98	10.00	5.66	0	14.81	4.65	5.94
175%	(n=10)	(n=6)	(n=4)	(n=3)	(n=0)	(n=4)	(n=2)	(n=29)
176-	7.42	13.95	12.50	16.98	20	7.41	23.26	11.68
200%	(n=17)	(n=12)	(n=5)	(n=9)	(n=2)	(n=2)	(n=10)	(n=57)
>200%	5.24	9.30	20.00	7.55	0	7.41	16.28	8.40
	(n=12)	(n=8)	(n=8)	(n=4)	(n=0)	(n=2)	(n=7)	(n=41)

Note. LD=Learning Disability; ADHD=Attention Deficit Hyperactivity Disorder; ASD=Autism Spectrum Disorder; PSY=Psychiatric Disability

Collaborative Writing in the Postsecondary Classroom: Online, In-Person, and Synchronous Group Work with Deaf, Hard-of-Hearing, and Hearing Students

Sara Schley¹

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Abstract

This project investigated the use of alternate methods of classroom interaction and communication to foster collaborative learning in diverse classrooms. Deaf, hard-of-hearing (DHH), and hearing students taking a graduate course in teacher education participated in lab sessions where interactions occurred via articulated speech and/or sign language and text-based chat interactions. The students interacted further using a collaborative tool to co-construct a group document. Results suggest that including this kind of tool in the classroom can significantly increase access to collaborative learning opportunities for students with a variety of special needs. While this study used DHH and hearing students who worked together in groups as the test case, the findings may be applicable to other groups with communication or language difficulties.

Keywords: Collaborative writing, cooperative learning, online technology, deaf, postsecondary education

Cooperative group learning is one of the most widely used and effective teaching strategies in the field of education (Felder & Brent, 2007; Johnson, Johnson, & Stanne, 2000; Smith, Sheppard, Johnson, & Johnson, 2005; Springer, Stanne, & Donovan, 1999; Terenzini, Cabrera, Colbeck, Parente, & Bjorklund, 2001). Unfortunately, many students with communication and learning disabilities, as well as students who are English language learners, often face barriers to full participation during group learning opportunities, which results in their being isolated and having lower levels of academic success. This project investigated the use of alternate methods of classroom interaction and communication to foster collaborative learning in diverse classrooms. Deaf, hard-of-hearing (DHH), and hearing students taking a graduate course in teacher education participated in lab sessions where classroom interactions occurred via articulated speech and/or sign language, and text-based chats. They interacted further using a collaborative tool to co-construct a group document. The results suggest that including this kind of

tool in the classroom can significantly increase access to collaborative learning opportunities for students with a variety of special needs. While this study used DHH and hearing students who worked together in groups as the test case, the findings may be applicable to other groups with communication or language difficulties.

Today's teachers are challenged by the need to instruct learners who have a variety of skills, languages, and cultural backgrounds. This variety is due in part to the increasing presence of students with disabilities in general education K-12 classrooms (Wolford, Heward, & Alber, 2001), including a large percentage of students who are DHH. For example, in fall 2011, 74% of all students classified as having a hearing impairment and receiving services through the Individuals with Disabilities Education Act (IDEA) spent at least 40% of their school day in a general (not special) class in a regular elementary or secondary school (National Center for Education Statistics, 2015). The proportion of DHH students in mainstream classes at the postsecondary level is even greater (Richardson, Marschark,

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Sarchet, & Sapere, 2010). This study addressed the following question: Does adding online opportunities for collaborative interaction help level the playing field for diverse learners? Findings for groups that included both DHH and hearing students may be applicable to other groups whose members have diverse communication characteristics, such as students with a learning disability.

The current supports available for DHH students are inadequate. These services include frequency-modulated systems, personal hearing devices/hearing aids, sign language interpreting, cued speech and/or oral interpreting, note-taking, and real-time speech-to-text classroom captioning (Hastings et al., 1997; Schick, 2008; Stinson, 2010). Despite this array of services, there is concern about whether DHH students are fully able to participate in classroom instruction and discussion, due to their communication challenges (Garrison, Long, & Stinson, 1994; Saur, Layne, Hurley, & Opton, 1986). DHH students in general education classes on average are able to progress and demonstrate greater academic proficiency than DHH students in other educational settings. However, these students still lag behind their hearing peers on a variety of academic measures (Antia, Jones, Luckner, Kreimeyer, & Reed, 2011; McCain & Antia, 2005; Thoutenhoofd, 2006).

In terms of class participation, DHH students were observed to participate in class less frequently than their hearing peers, and they reported difficulty participating in class (Garrison et al., 1994; Saur, Popp-Stone, & Hurley-Lawrence, 1987; Stinson, Liu, Saur, & Long, 1996). One factor in this difficulty is the rate at which information is presented in the classroom. Since interpreted communication lags behind the original communication, keeping up with the flow of conversation is challenging, and DHH students often respond to questions posed to the class later than expected, or inappropriately (Saur et al., 1986). Moreover, during classroom discussion there is rapid turn-taking and frequent interruptions, and whether a student relies only on oral speechreading or on a combination of that and sign language, it is challenging for them to follow these general classroom interactions (Stinson et al., 1996).

Ease of communication is arguably an important factor in academic success. If it is difficult to participate in the classroom (e.g., due to the speed of presentation and/or turn-taking during discussion), students may adopt a passive nonparticipatory approach, or at least may appear to be passive, which is associated with lower academic achievement (Braeges, Stinson, & Long, 1993). Long, Stinson, and Braeges (1991) found a strong positive relationship between self-reports of ease of communication, academic engagement, and

academic achievement, including language, mathematics, and science, as per standard achievement scores (see also Antia, Sabers, & Stinson, 2007).

Given the ongoing unsatisfactory state of education for these students, there is a critical need to find better ways to support them (Stinson & Antia, 1999; Stinson & Kluwin, 2011; Wagner, Newman, Cameto, & Levine, 2006). One particular classroom situation where these students need more effective support that has received little attention is engaging in collaborative activities, such as working in groups. Collaborative work occurs regularly at the elementary, middle school, and secondary levels and often at the postsecondary level as well, such as in a science laboratory (Antil, Jenkins, Wayne, & Vadasy, 1998; Cohen, 2002; Lunetta, Hofstein, & Clough, 2007; Puma, Jones, Rock, & Fernandez, 1993). In addition, learning in the 21st century requires students to collaborate more and more in order to deal with the explosion of digital information (American Management Association, 2013; Anderson-Inman, 2009; Association for Career and Technical Education, National Association of State Directors of Career Technical Education Consortium, & Partnership for 21st Century Skills, 2010).

Collaboration is a strategy that has proven effective in promoting deep, meaningful learning. One example is having an intense discussion while developing a strategy to solve a problem (Cohen, Brody, & Sapon-Shevin, 2012; Esmonde, 2009; Pintrich, Marx, & Boyle, 1993; Shuell, 1996). Successful instructional approaches that include substantial student collaboration include problem-based learning (Herreid, 1994; Markowitz, DuPré, Holt, Shaw-Ree, & Wischnowski, 2006) and process-oriented guided-inquiry learning. In problem-based learning, students work through materials to develop solutions (Herreid, 1994). When these students collaborate, they usually do so in small groups with two to seven members (Cohen, 2002). In process-oriented guided-inquiry learning, students work in self-managed teams of typically three to five learners while the instructor serves as a facilitator. The learning cycle within these groups consists of exploration, concept invention, and application (Hanson, 2006; Moog & Spencer, 2008; Moore, Black, Glackin, Ruppel, & Watson, 2015).

Collaboration is challenging for DHH students, for various reasons. Although these students can use a support service (e.g., an interpreter) to access the comments of hearing class members, issues such as the processing time between when a hearing student finishes talking and when the service provider finishes conveying the message frequently limit the DHH student's participation. Unfortunately, direct commu-

nication between DHH and hearing students is often difficult and makes participation by all members of the group a challenge. For example, observation of mixed groups of DHH and hearing members indicates that, in small groups, hearing members often communicate directly with each other instead of through a service provider (Stinson & Liu, 1999). This makes it difficult for the DHH member because they usually cannot understand all of the spoken communication, while the hearing members may not be able to understand the DHH member's speech and usually do not know the sign language DHH students often use to communicate. Furthermore, an interpreter is often not immediately available (Stinson & Liu, 1999). Therefore, it is important for educators to find better ways to support communication and learning when students with disabilities and other students collaborate.

Marchetti, Foster, Long, and Stinson (2012) have been exploring ways to increase the interaction and participation of groups that include DHH and hearing students in introductory statistics courses, such as requiring the use of whiteboards by small groups while solving statistics problems. They also tried using tablet computers, and thus compared a low-tech and a high-tech solution to promoting communication in the classroom between students with diverse abilities. Both solutions (whiteboards and tablets) ameliorated some of the communication challenges. Both hearing and DHH students said they liked using the whiteboards: "I was able to see others work and understand the concept better related to the topic" (p. 55) and "Using the whiteboard made working in the group a much more open experience, and people were more driven to pay attention and be involved with work" (p. 55).

Learning styles also impact classroom communication and collaboration (Lang, Stinson, Kavanagh, Liu, & Basile, 1999; Lynn, Connelly, Ross, & Schley, 2015). Strictly speaking, "learning styles" are students' preferences (rather than abilities per se) about the type of assignments a course requires, how information is presented, how they think about and process information, and how they prefer to relate to others (Grasha, 1990). The Grasha-Reichmann Student Learning Style Scales (Grasha, 1982; 1996; Reichmann & Grasha, 2010) is a 60-item survey about students' preferences regarding their motivation to think and learn (independent versus dependent), their interactions with peers and instructors (collaborative versus competitive), and their engagement with classroom activities and experiences (avoidant versus participant). Lang et al. (1999) and Lynn et al. (2015) compared postsecondary DHH students' learning styles to those of hearing students. There is some evidence to suggest that stu-

dents with a participative learning style (e.g., "I am interested in learning things in this course" versus "I study only enough to pass") fare better on measures of using class resources, interest in the course, and course grade (Lang et al., 1999). While learning styles were not the focus of the present study, these different styles of approaching the task of learning in class and in groups could arguably be a factor here. Given the impact communication challenges have on actual participation, DHH students could benefit from increased communicative and participative options.

Components of online and/or blended learning can extend options for interaction about course materials and topics. When comparing students in blended learning courses (i.e., that include both online and in-class components) who are DHH, hearing, and English language learners, Long, Vignare, Rappold, and Mallory (2007) found that DHH students in particular perceived that both the quality and quantity of their interactions with their peers and instructors were greatly improved by including an online component. By including online discussion boards and other online tools, the DHH students had another option for interacting with the course materials, their professor, and other students: using online text. This mitigated some of their classroom communication challenges: They could communicate directly (rather than via an interpreter, for example), and they had time to compose their contributions (rather than being "on the spot" in a classroom). In some important ways, this helped level the playing field in terms of ease of communication between DHH and hearing students.

This study examined collaboration in groups with DHH and hearing members from two perspectives: postsecondary education and teacher training. By working with students enrolled in a special education teacher-training program (i.e., future teachers of DHH students, in either a DHH school or program, or in a regular education program; although arguably this kind of pedagogy would benefit a wide range of students), we hoped to help them become skilled at using effective collaborative learning tools and techniques. We were specifically interested in adding synchronous communication to the classroom using print/text modalities as a medium of instruction in order to increase communication options and opportunities. We added three "lab assignments" to the syllabus, which required students to use in-person conversation, text conversation, and online collaborative documents to research a topic and develop a presentation.

Method

Participants

The participants included 55 students registered in two sections of a course in a DHH education teacher preparation program (for Year 1, 19 students were enrolled; for Year 2, 20 were enrolled in one section, 16 in another). The course, titled Psychology and Sociology of Deaf Students, examined psychological, sociological, and cultural issues in the context of the development of DHH students enrolled in kindergarten through 12th grade. Course objectives included examining the relationship between psychological and sociological theories and practices; generating appropriate applications of theory to practice, including applications regarding learning, cognitive development, and school socialization; identifying and analyzing educational issues and approaches that foster appropriate cognitive, affective, and behavioral development of DHH children; and understanding methodological issues that arise when doing research with DHH people.

Materials and Procedures

Assignments for the course included in-class quizzes on readings, K-12 classroom observations across a variety of DHH educational settings, a written observation report, a series of online assignments (interview summary, article review, presentation outline), class presentations, and three computer lab-based “mini projects,” which are the focus of this article. Each collaborative group had three to five students and required them to do a focused assignment using web resources, online collaboration (in print and in person), and a brief presentation to the class at the end of the lab session. While there are many ways to design cooperative learning within a classroom (see Slavin, 2010), we adopted a group investigation approach to develop inquiry, group discussion, shared planning, and shared presentation skills.

Google tools (Google Documents, Google Chat—a text-based chat system in Gmail¹) were the communication and collaboration forms selected for these assignments. Free Google accounts were available (most students already had one before these lab sessions started), and students for the most part were comfortable with the platform. When we first conducted these lab sessions, video chat was cumbersome on a wireless connection and Google Hangouts did not yet exist. Students were introduced to the collaborative document and text chat features, and they were required to use at least text chatting (Google Chat) and collaborative document construction (Google Documents). Groups could also use ASL signing and/or spoken English as they chose.

The collaborative groups included a mix of DHH and hearing students. Group members changed for each of the three lab assignments. Overall, 46% of the students were DHH (thus, 54% were hearing). About half of the DHH students preferred signing without voice, and about half preferred relying at least in part on the spoken channel. About half of the hearing students were fluent in ASL and about half were newer learners. While hearing status and communication preferences were not controlled within each group, students in each group had a variety of communication preferences and usually a variety of hearing statuses.

Lab sessions. The three lab sessions included the following details, directions, and sample sizes.

Lab 1: Deaf culture lesson. Students were asked to integrate materials and resources on Deaf culture. Each group was assigned a different topical area: famous deaf people, ASL poetry/theater, and deaf artists. Several websites for each topic were distributed to students. Students had to review the topic areas, identify resources to use in teaching, and present curricular ideas and resources with the entire class. This study examined Google Documents for six groups from Year 1 and five groups from Year 2 (an additional group from Year 1 declined informed consent; following IRB protocol we did not ask why). This study analyzed Google Chats from three groups for Year 1 and four groups for Year 2.

Lab 2: Learning, cognition, and teaching web resources. Students were divided into four groups. Each group was given a specific topic about learning, cognition, and teaching, along with a specific website (the four websites were: www.inspiration.com, <http://www.strategytools.org>, <http://readwritethink.org>, and <http://learnweb.harvard.edu/ALPS>; the latter website is no longer active). Each group was charged with reviewing the website, exploring the potential applications to the classroom, and sharing their analysis and review with the class. These websites were selected because they illustrated how principles of cognitive development and learning apply to instructional materials that are used to teach students, and because they provided tools for facilitating active visual learning. These sites are relevant to working with DHH students because they all involve visual approaches to learning, such as mapping ideas, and these students often respond positively to visual instructional materials (Power & Leigh, 2011). This study examined Google Documents for five groups from Year 1 and five groups from Year 2 (an additional group from Year 1 declined informed consent). This study analyzed Google Chats from five groups for Year 1 and four groups for Year 2.

Lab 3: Suggestions for parent resources. Four groups of students tackled a list of seven websites (<http://deafchildren.org>, <http://www.gallaudet.edu/clerc-center/our-resources/for-families.html>, <http://www.ncbegin.org/>, <http://www.handsandvoices.org>, <http://www.nichcy.org/FamiliesAndCommunity/Pages/Default.aspx>, <http://www.pacer.org/publications/taAlliance.asp>, <http://infoguides.rit.edu/dsa>), and developed a set of topics they deemed of interest to parents of DHH children along with suggestions for these parents. These sites were selected because they contained information that was relevant to issues that teachers of the deaf seemed likely to discuss with parents of DHH children, such as communication methods for DHH children and developing an individualized education program. This study included Google Documents for five groups from Year 1 and seven groups from Year 2 (an additional group from Year 1 declined informed consent). This study analyzed Google Chats from nine groups for Year 1 and two groups for Year 2.

Eight chat sessions that lasted less than five minutes were excluded from the analysis, as they were “mis-starts” and consisted of only a couple of lines, where multiple students in a group had initiated a chat session that was abandoned.

Data Collection

The Google Chat and Google Document sample sizes varied somewhat across the two study years and across the three labs in each year. The primary reason for this was because student groups sometimes started more than one chat session. This usually was due to multiple chats occurring between pairs of students within the groups. The authors made the analytic decision to include all chat sessions in the analyses, since the analytic goals were to see how students used these tools and how much text they created using Google Chat tools. Similarly, student groups occasionally produced more than one Google Document. When this happened, it was because students created one document that included notes for what they wanted to include in the presentation, and a second document was the presentation itself. In these cases, the documents were considered jointly while coding and counted as a “presentation.”

For each lab session, students were asked to explore websites on their own for approximately 20 minutes, then to meet as a group and brainstorm ideas, combine information into a presentation document, and present to the entire class. They were encouraged to converse using ASL and/or spoken English, Google Chat, and to use Google Documents to work collaboratively on the presentation document. They were al-

lowed to work with any Google Document format that they liked—word processing, presentation, etc.—thus documents came in different forms and had different formatting and content across all the groups.

All Google Chat sessions were saved by the instructor (by adding an instructor to each chat session, a full copy of the session is saved in Google’s mail system), who also saved all Google Documents.

Analyses

This research examined the text-based chat conversations and the shared documents produced by the students.

Google Chat analyses. Text chat sessions were analyzed for how much time students used the utility, how many conversational exchanges were made, the “density” of their sessions (proportion of exchanges divided by time using the utility), and what students discussed during these sessions. Three to four chat sessions occurred during each lab session (depending on how many groups we had designed for each lab: four groups in the first lab session for each section, three groups during the second lab session for each section, and four groups during the third lab session for each section). An example of what they looked like in progress appears in Figure 1 (a screen shot of the faculty member’s screen, with four chat groups occurring during the lab session).

Google Document analyses. Google Documents has a variety of options: text, spreadsheets, presentations, forms, and drawing documents. Students co-constructed a document, chose the format, and added elements themselves (text, videos, web links, etc.). For the three lab sessions, these co-constructed documents were analyzed for the following features:

- Whether students included content independent of the assigned websites
- Whether they integrated the different parts of their document
- The format they used
- Length of the documents
- Whether or not they included graphics, web links, and/or videos/video links

One group’s co-constructed document is reproduced in Figure 2.

In all cases, descriptive analyses were chosen as appropriate for this study. We also conducted inferential analyses of the amount of talk included in the chat sessions across the two years and the three labs. The data include 27 chat sessions and 33 co-constructed documents.

Results

Chat Sessions

The students and groups varied greatly on how much they used Google Chat. Across the three lab sessions and the two years, some groups used it copiously and some very little. A summary of descriptive statistics across both years and all three labs is included in Table 1.

Length and density of chat sessions. Chat sessions were measured for their length in two ways: the number of minutes students spent in the session and how many chat lines they produced. At one extreme, two groups used the chat function for only 5 to 10 minutes with approximately 10 interchanges (i.e., lines of chat). At the other extreme, four groups used it for over an hour (max: 1 hour 24 minutes) with 93 to 169 interchanges.

Students used the chat sessions for longer periods of time in Year 2 (mean: 55 minutes) than they did in Year 1 (mean: 43 minutes). However, they produced more lines of chat in Year 1 (67 on average) than in Year 2 (43 lines on average). Some groups used the Google Chat utility for quite a while, some only for a few minutes.

A better measure of how much interaction occurred during the chat sessions is to take the proportion of lines per minute across each session, a measure of the density of text in their sessions. The average density was 1.72 lines per minute in Year 1 and 0.8 in Year 2. Table 2 summarizes results across the two years of data collection and across the three labs conducted each year.

A two-way ANOVA with an interaction term was used to compare the means of the three labs across the two years in terms of density of talk in the chat sessions. Density was defined as the proportion of lines per chat session divided by the total number of minutes spent on the chat session. For example, one group spent 64 minutes using a chat session and wrote 169 lines of chat. This group's "density" was 2.64—or a little over two and a half lines of chat per minute during the session. The ANOVA showed no difference in density across the three lab sessions: Student groups wrote about as much per minute during the chat sessions in each of the three labs ($F=.02$, $df=2, 24$, $p<.98$). The average density in the lab sessions was 1.29 for Lab 1, 1.33 for Lab 2, and 1.36 for Lab 3. There was a main effect of Year ($F=7.33$, $df=1,25$, $p<.02$). The Year 1 density averaged 1.65 lines per minute during the chat session, and the Year 2 density averaged 0.8 lines per minute. We conclude that there was little difference in chat interactions between the three lab sessions, but there was a difference between Year 1 and Year 2, with Year 1 students using the tool more. The interaction effect

between Lab and Year was not significant ($F=3.07$, $df=1,25$, $p<.09$): The Year 1 students consistently used the chat tools more than the Year 2 students in each of the three labs.

Content of talk in chat sessions. The content of the text-based chats among students included conversation about assignment mechanics and about them sorting out their own "process," "meaty" conversation about content of the assignment, and sharing of links, videos, etc. The exchanges included a predictable variety: Some students were more "participatory" than others, some were less comfortable with the technology, and some were less "verbal" in the text chat mode. Table 3 includes examples of each type of chat interactions.

Collaborative Document Construction

The Google Documents results also included quite varied outcomes: Some students produced in-depth summaries and some were more "cursory." In and of itself, a cursory presentation document is not a problem, as the documents were supporting material for a class presentation; the document can be cursory as long as the presentation is sufficiently detailed.

The collaborative construction of a single document (with four-five simultaneous co-authors) seemed to be a useful process. The document texts included:

- Presentation notes (sequence of topics, bullet points on necessary facts and ideas)
- Summaries of assigned websites
- Information about additional material (beyond the assigned websites)
- Web links during presentation
- Video links during presentation

The documents demonstrated a variety of "quality" elements. We looked at whether students included content independent of the assigned website, whether they integrated different parts of their document, what format they used, the length of the documents, and whether or not they included graphics.

Overall, about half of the students included substantive content independent of the assigned websites (across the 33 documents, 17 included "above and beyond" information, five incorporated some additional substantive content but not completely). Similarly, about two-thirds of the documents had integrated information across the sections (14 documents had fully integrated information and nine had partially integrated information). Formatting choices varied across the groups: Eight groups chose to use narrative text and 25 used outline/bullet formats. The documents averaged

approximately four pages (range: one-half page to 14 pages/slides, standard deviation: 3.8 pages/slides). Finally, we looked at whether students incorporated graphics, videos/video links, or web links into their presentation documents: 12 included graphics (pictures, sketches, etc.), five included videos or video links, and 29 included links to other webpages.

Discussion

Our goals for these lab sessions were threefold: to provide students with additional opportunities and modalities for written self-expression, to provide an opportunity for collaboration while using Internet resources, and to encourage the development of ideas through discussion. The lab assignments met all three goals. The data analysis showed that, while students used these additional communication and collaboration tools to differing degrees, the modalities themselves (Google Chat and Google Documents) effectively fostered communication and collaboration in written formats among the students.

This itself is an important classroom outcome. The authors have several decades of experience between them of working with diverse groups of DHH, hearing, and other identified special needs postsecondary learners. Effective classroom communication is frequently a challenge, as some students are better signers than talkers, some are better at writing than signing, and there are the inevitable interpersonal differences, where some students are more comfortable talking in a class group format and some are more introverted.

Our prior attempts at smoothing out these communication challenges have involved setting up online course discussion boards, both faculty managed and student initiated, to give students an additional written outlet and to accommodate those who are less comfortable or able to communicate in class (Schley & Stinson, 2011). These helped to some degree but did not foster simultaneous synchronous collaboration.

While the data show differences between groups in their use of the chat and documents functions (with some groups using either to a greater or lesser degree), both tools clearly were effective in fostering simultaneous synchronous collaboration using oral/manual talk, written chat, and collaborative document construction. In short, with the help of the online collaboration tools, students were able to collaborate and complete their work in a manner that fulfilled the assignment requirements.

Implications for Postsecondary Disability Services Providers

For those representing disability issues on higher education campuses, these results suggest the need to advocate for the incorporation in college classrooms of multiple modes of communicative interaction (e.g., text chat and online collaborative tools, in addition to oral interaction and other modes of providing access for students with disabilities, such as note-taking and ASL/English interpreting). This instructional design detail dovetails nicely with principles of Universal Design for Learning (Izzo & Bauer, 2013; Jackson, 2005; Moon, Utschig, Todd, & Bozzorg, 2011). From an instructional design perspective, this addition is relatively simple. Campus representatives who work with faculty to improve the educational access of DHH students and students with other communication challenges can add this approach to their repertoire of effective teaching strategies.

Implications for Teaching

Implications for teaching include the pros and cons of using the technology-based collaboration tools. The pros are that the assignments capitalized on multimedia use of websites and presentations. Internet and technology resources are an increasingly rich area for teachers to incorporate in their classrooms, and we designed these assignments to give students practice at using these resources critically and analytically.

Cons include the fairly “heavy” technological requirements of this kind of classroom endeavor. The technology used in our classes required every student to have a laptop, as well as a classroom projection system and a stable, high-speed Internet connection. Technical support during the sessions is also crucial: There are numerous system breakdowns, which would be difficult for a faculty member to manage while also managing the students and the classroom session. However, certain collaborative technologies, such as Google Documents, are becoming increasingly familiar to students so less technology support may be needed in the future.

Implications for Further Research

Future research would benefit from collecting video data on these types of activities. What we could not analyze during these sessions was the extent and quality of students’ oral/manual talk during the lab assignments. We assume that those who chatted less in the online format probably had higher levels of oral/manual communication that enabled them to prepare for their group’s presentation at the end of the lab session, but we do not know if that is true. Additionally,

looking at their interactions across both oral/manual and text-based chat modalities would be of great value to the field of classroom collaboration research.

For this study, students were identified as DHH or hearing in a class registration list, and the students in groups knew whether a member was DHH or hearing. It seems that this approach may also be useful with other students who have difficulty communicating in groups, such as those with a learning disability or English language learners. It would be desirable to conduct future research with groups whose members have diverse communication characteristics other than being DHH or hearing. As mentioned above, this approach to collaborative group work increased students' communication options. While we have not evaluated whether the approach "works" for students with different temperaments (e.g., introverted versus extroverted), we suspect that such efforts level the communication playing field in a classroom of diverse learners. The tools certainly encourage complex thinking: The authors, who design and require these activities in the courses they teach, judged the "products" as being generally thorough, complete, and nicely done². And, finally, this type of assignment represented and encouraged active rather than passive learning.

In sum, this approach proved to be an effective way of encouraging online and in-person synchronous collaboration with a diverse group of postgraduate learners. While further research is necessary, it was a promising classroom exercise and we will continue to include such methods in our future teaching.

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Authors' Note

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Footnotes

¹ Face-time video chat functions can be incorporated into Google's Chat function, but we did not use this feature during these lab sessions.

² While not analyzed or summarized in this paper, grades for these collaborative assignments were consistently high across both years of the course. At the time, grades at this college consisted of letter grades only, without +/- gradations. There was not enough variation in grades to include it in the analyses.

Table 1

Descriptive Statistics: Google Chat Summary Data

Measure	Year 1 (n=17)				Year 2 (n=10)			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Time	42.6	26.6	6	84	54.7	19.6	34	94
Lines	67.3	46.7	3	169	43.3	41.9	4	144
Density	1.72	0.9	0.3	3.18	0.80	0.70	0.11	2.08

Table 2

Descriptive Statistics for Google Chat Data by Lab Groups: Density of Chat Sessions (# lines/# minutes), N=27

Lab	Year 1		Year 2		Overall	
	Mean	SD	Mean	SD	Mean	SD
Lab 1	2.03	1.55	.73	.37	1.29	1.16
Lab 2	1.53	.61	1.09	1.03	1.33	.79
Lab 3	1.59	.73	.37	.36	1.36	.83
Overall	1.65	.83	.80	.70	1.34	.88

Table 3

Google Chat Analysis Examples

Type	Example
Assignment Mechanics	<p>student1: do we pick one website and indepth analze it or do we all pick different ones? analyze* it'd be nice if i could spell</p> <p>student2: i think we choose one in the end spelling blah</p>
Assignment Process	<p>student3: I say we each pick one and explore that way we can get more information that way the last page says combine information into a page with a list of topics two suggestions and one exaple of a website</p> <p>student2: right so lets look s and pick oe one</p> <p>student4: I can do Familieswith Deaf Children Resources</p> <p>student3: sounds good</p>
“Meaty” Conversation	<p>student1: i like mine it has a bunch of handouts for parents and a lot of them are translated into spanish or other possible home languages it seems like something realistic that i'd actually use</p> <p>student2: OOOOH how about technology for the home</p> <p>student3: my is mostly legal information so that kids the support needed in school. there is stuff about IDEA it has different organizations that they can join and schools that are affiliated with the website</p> <p>student3: here is a great thing if we can do younger. it is a program of how to read to deaf children</p> <p>student4: im gonna check out te hands and voices site</p>
Sharing Links/Videos	<p>student4: i found a site about deaf role models http://handsandvoices.org/articles/perfect/V12-1relevant.htm</p> <p>student3 http://www.ncbegin.org/index.php?option=com_content&view=article&id=100&Itemid=55</p> <p>that link is to ASL but you can search around the home page has a lot of other topics</p>

Note. All text is presented as it occurred during the Chat sessions (spelling errors were not corrected).

Figure 1. Screenshot of Google Chat Sessions in Progress.

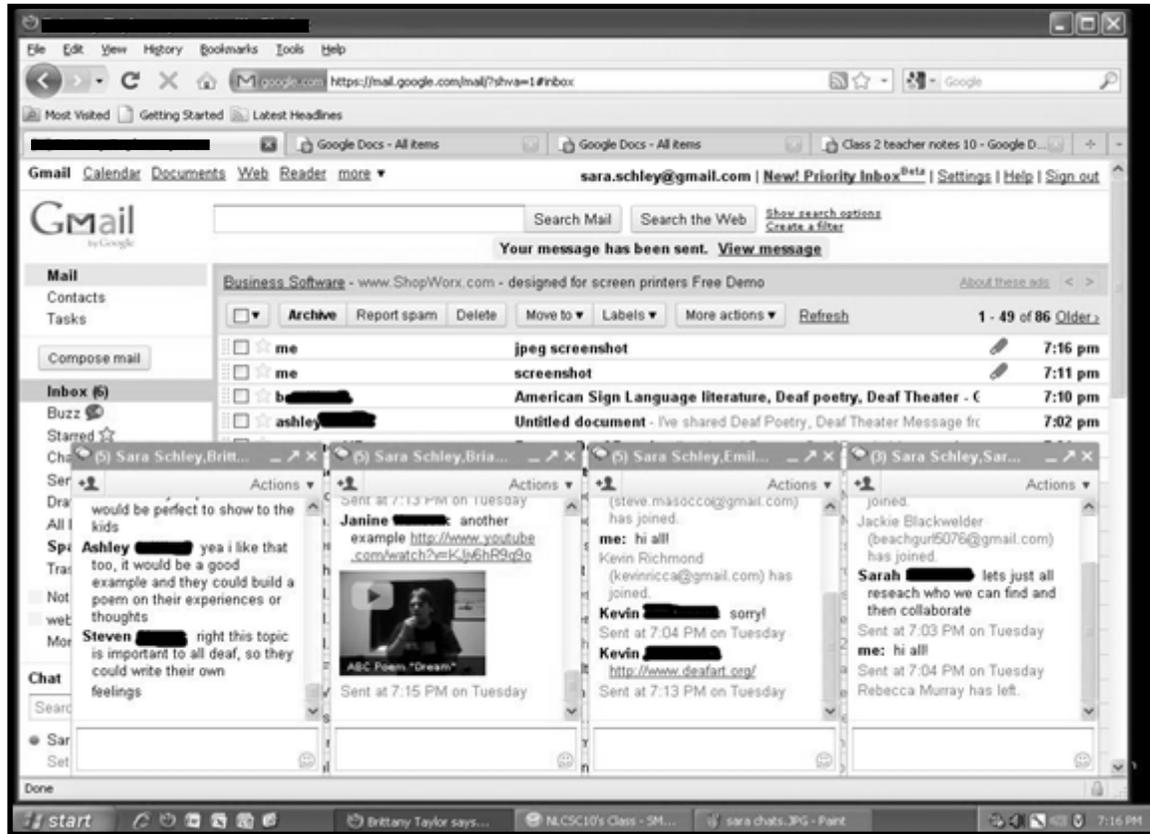


Figure 1. The figure displays a Gmail account window, with four chat windows next to each other along the bottom half of the screen. Each chat window has individual chat lines from 2-3 students, including text chat, web links, and a screen shot of a small embedded You Tube video.

Figure 2. Screenshot of Google Chat Sessions in Progress

Deaf Artists
(Names redacted)
References:
<http://www.rit.edu/ntid/dccs/dada/dada.htm>
<http://www.chuckbaird.com/bio.html>
<http://www.arthistory.sbc.edu/artartists/artartists.html>

Suggestions: Using Deaf Artists on Everyday Curriculum
When using an image or picture in the classroom, ask the students to have an open description/open discussion on what they look at. Discussion on paintings, sculptures, digital art, etc.

(name redacted)

What Is Art?
- Art is "the use of skill and imagination in the creation of aesthetic objects, environments, or experiences that can be shared with others" (Britannica Online)
-Deaf Artists use hands, ears and mouth in their art.
- "I am no longer interested in whether I am a Deaf artist or an artist who happens to be deaf. I have accepted being either cultured Deaf or hard of hearing; that's fine with me. But what makes me an artist, that really matters. The process is the power of creativity and all the gifts inside and from the surrounding environment. It is so much more fun that way. The brush becomes so free, and speaks or moves for itself."

Chuck Baird Biography
- Born in 1947 with moderate hearing loss but grew up culturally Deaf.
- Attended residential school in Kansas.
- Studied at both Gallaudet University and Rochester Institute of Technology.
- Through many artistic organizations he set up his own studio
- Traveled to many different workshops, schools, clubs and festivals to paint or teach painting.
- Involved in numerous murals and art exhibits.


Assignment
Use your creative writing skills to create a paragraph explaining what you see in the picture.
Explain how the picture makes you feel. What things are you most attracted to in the picture? What do you think the artist is trying to say?

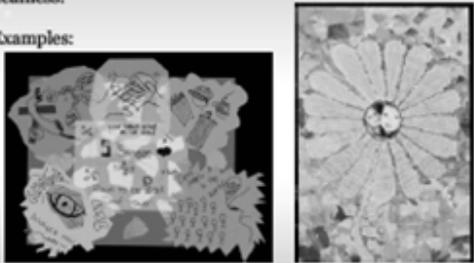
Assignment
Create your own self-portrait that shows who you are and your deafness.
Examples:


Figure 2. The first slide is a title slide, “Deaf Artists,” with three references to web pages of deaf artists. Slide 2 briefly summarizes “Suggestions for Artists in Everyday Curriculum” (for K-12 classroom teachers). Slide 3 summarizes what art is for Deaf artists: “The use and skill and imagination in the creation of aesthetic objects, environments, or experiences that can be shared with others.” Slide 4 gives biographical information of Chuck Baird, a prominent deaf artist. Slide 5 summarizes a classroom assignment (“Use creative writing skills to describe what you see in a Chuck Baird picture”). Slide 6 summarizes another possible assignment (“Create your own self-portrait that shows who you are and your deafness”).

Classroom Audio Distribution in the Postsecondary Setting: A Story of Universal Design for Learning

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Wendy D. Bokhorst-Heng²

Abstract

Classroom Audio Distribution Systems (CADS) consist of amplification technology that enhances the teacher's, or sometimes the student's, vocal signal above the background noise in a classroom. Much research has supported the benefits of CADS for student learning, but most of it has focused on elementary school classrooms. This study investigated the effects of CADS in the postsecondary setting. Surveys and focus groups were used to elicit the perspectives of both students and professors toward CADS in university classrooms, revealing many themes and multidimensional attitudes. Teachers' and students' perspectives are considered within the principles of Universal Design for Learning (UDL), which encourages a flexible approach toward teaching in order to include as many different types of students as possible in the learning process. CADS is seen as one way to support UDL in higher education settings.

Keywords: *Classroom audio distribution systems, Universal Design, higher education, voice amplification, student support*

Classroom audio distribution systems (CADS), also known as classroom sound field amplification, is a method for enhancing the teacher's, or sometimes the student's, vocal signal above the background noise in a room (Smaldino & Flexer, 2012). CADS consists of a transmitter, a receiver, and an amplifier, using infrared or FM radio technology. Ideally, the speaker's voice is spread uniformly to each listener in the room through one or more loudspeakers at a comfortable and consistent listening level (Whyte, 2010). Research confirms the positive effects on students' learning when the classroom listening environment is enhanced through teachers' amplification (Flagg-Williams, Rubin, & Aquino-Russell, 2009; Flexer, 2005; Massie & Dillon, 2006; Millett, 2008).

Flexer (2005) notes the following student populations that especially benefit from CADS: those with hearing impairments, auditory processing problems, cognitive disorders, learning disabilities, attention and behaviour problems, and articulation disorders. Those learning in a language that is not their primary language

also benefit, allowing them to hear every word clearly (Nelson, Kohnert, Sabur, & Shaw, 2005). In fact, all young children benefit since the ability to distinguish targeted speech sounds, especially within conditions of noise, does not fully develop until puberty (Flexer, 2005; Nelson & Soli, 2000). Bennett (1994) estimates "as many as one-third of the students in a typical classroom run the risk of academic difficulties because of the acoustical conditions present" (p. 45). Thus, there are myriad reasons why enhancing the acoustical quality of the classroom listening environment is critical. Improving the acoustics in the room is one part of the solution; enhancing voice volume and distribution, the focus of this study, is another.

Most of the research on CADS and its implications for learning has been with children in K-12 schools. In their reviews of the literature, Rosenberg (2005) identified only four studies specific to higher education and Millett (2008) identified only four additional ones. Our own search within the EBSCO database revealed few others. Yet, learning in postsecondary

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classrooms is similarly largely dependent on verbal communication and merits greater analysis of the listening environment.

The few studies that have examined higher education learning environments tend to focus on the inadequate acoustical quality of university classrooms with respect to background noise, reverberation, and distance between the speaker and the listener (Hodgson, 2002, 2004; Kennedy, Hodgson, Edgett, Lents, & Rempel, 2006; Larsen, Vega, & Ribera, 2008; Woodford, Prichard, & Jones, 1999). For example, Larsen et al. (2008) compared the speech recognition performance of students with normal hearing in two college classrooms, one of which met the American National Standards Institute ([ANSI]; 2002) acoustical standards required for elementary school classrooms. In both classrooms, they compared speech recognition with and without the use of CADS. Not only did they find that following the acoustical standards benefited learners in postsecondary classrooms, but also CADS improved speech recognition in all classroom environments. Woodford et al. (1999) examined the acoustics in seven different classrooms at a large university and found that noise levels exceeded the recommended maximum (as determined by Clabaugh, 1993). Seventy-five percent of students indicated they had experienced difficulty understanding the instructor, but with CADS, the students and instructors noted improved listening conditions.

Two studies looked at the benefits of CADS beyond general improvement of the listening environment. Smaldino, Green, and Nelson (1997) considered the effects on college students in a phonetics course, specifically chosen because the course content required fine auditory discrimination. The results indicated a positive benefit for using CADS in that course, but the implications focussed mainly on applying the information to K-12 classrooms. Valente (1998, as cited in Rosenberg, 2005) demonstrated improvement in the academic achievement of college students with the use of CADS, based on improved exam scores.

Our study thus fills a significant gap in the literature. Specifically, we examine the role of CADS for university students within the context of Universal Design (UD), a concept that is being increasingly applied to educational contexts across North America (Burgstahler & Cory, 2008; Higbee & Goff, 2008). UD began as an architectural and environmental concept, focusing on not just accommodating persons with disabilities but, rather, at the start designing products and environments that are more functional for everyone. Welch (1995) put it this way:

[Universal Design] emphasizes a creative approach that is more inclusive, one that asks at the outset of the design process how a product, graphic communication, building, or public space can be made both aesthetically pleasing and functional for the greatest number of users. (p. iii)

He refers to UD as a “value system” that embraces human diversity as the norm, suggesting a radical paradigmatic shift.

Within education, the principles of UD have been most commonly expressed in the terms of Universal Design for Learning (UDL) and Universal Design for Instruction (UDI) (see McGuire, Scott, & Shaw, 2006 for a full discussion of the distinction between these and other terms). The Center for Applied Special Technology (CAST) has led the development of principles and applications of UDL, particularly at the K-12 level. On their website (2015), CAST describes UDL as “a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn.” As a result of brain-based research, there is greater awareness in K-12 education about the variability in the way students learn. To that end, UDL promotes the development of best practices in all aspects of the learning environment and pedagogy in order to reach the widest possible range of learners (Rose, Harbour, Johnston, Daley, & Abarbanell, 2006; UDL, n.d.). The definition of UDL adopted by CAST (2011) is as follows:

The term UDL means a scientifically valid framework for guiding educational practice that:

- a. Provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged; and
- b. Reduces barriers in instruction, provides appropriate accommodations, supports, and challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient. (p. 6)

These objectives are met through flexible curricular designs, providing multiple means of representation (presenting information and content in different ways), multiple forms of action and expression (differentiating the ways that students can express what they know), and multiple means of engagement (stimulating interest and motivation in learning). At the postsecondary level, UD initiatives have been most typically expressed

through UDI. Similar to UDL, “UDI is an approach to teaching that consists of the proactive design and use of inclusive instructional strategies that benefit a broad range of learners, including students with disabilities” (McGuire et al., 2006, p. 169), without compromising academic standards. While UDL is largely a response to brain-based research, the impetus for UDI has come from the increasing diversity found in the postsecondary student body, particularly with respect to the increasing number of students with cognitive disabilities. According to Burgstahler (2008), “diversity has become a fact of life in higher education” (p. 4). A study in 2003 found that the average percentage of postsecondary students with disabilities (those registered to receive disability related services) varies from ½% to 6% and noted that these figures are dramatically increasing (Fichten et al., 2003). Furthermore, of the students who report having disabilities, the majority and fastest growing group are those who have “invisible disabilities” that affect learning (Burgstahler, 2008), including hearing, learning, attention, and communication differences, all of which relate to CADS. UDI is considered a tool for faculty to reflect on their practice and develop more inclusive instruction. Closely paralleling the seven well-established principles in UD (Connell et al., 1997), UDI contains nine principles (adapted from Scott, McGuire, & Shaw, 2001; Roberts, Park, Brown, & Cook, 2011):

1. Equitable use – accessing course information in a variety of formats;
2. Flexibility in use – varying instructional methods;
3. Simple and intuitive – clearly describing course expectations for grading, in different formats;
4. Perceptible information – necessary information is communicated effectively, regardless of ambient conditions, or the students’ sensory abilities, or language competency;
5. Tolerance for error – anticipating variation in the pace of learning, and providing ongoing feedback on coursework (rather than just final exams);
6. Low physical effort – instruction is designed to minimize nonessential physical effort;
7. Size and space for approach and use – allowing for use regardless of a student’s body size, posture, mobility, and communication needs;
8. A community of learners – the instructional environment promotes interaction and communication among students and between students and faculty; and

9. Instructional climate – instruction is designed to be welcoming and inclusive, while maintaining high expectations.

The fundamental premise of UDL and UDI is thus inclusive education, shifting our attention from a deficit model that accommodates individual students to one that seeks to reach the widest possible range of students. It is a proactive process rather than a reactive one (Burgstahler, 2008). UD, UDL, and UDI represent a value that assumes diversity to be the norm, and anticipates diversity in all aspects of educational planning and instruction. In this context, CADS needs to be given serious consideration as a support for learning by all students.

In our discussion, while UDI is the more common term used in higher education, we prefer to follow the practice of the recent symposium on Universal Design at the University of New Brunswick (Bokhorst-Heng & Flagg-Williams, 2014) by using the term UDL in our work. In using UDL, we place the emphasis on student learning, while at the same time acknowledging that it is the responsibility of the institution and the instructors to design their instructional and classroom practices with diversity in mind.

Context

The context of this study is a small private liberal arts university in Canada. At the time of the study, there were approximately 825 students and 50 faculty members at the university. In addition to a general liberal arts curriculum, the university also has a Bachelor of Education (B.Ed.) program and an Advanced Education Certificate program for in-service teachers. With the completion of new construction in October 2010, CADS was installed in all of the new classrooms (RedCat NXT integrated flat-panel speakers with Redmike VC infrared pendant-style microphones, by Lightspeed Technologies). Two classrooms in an older building also used the systems before the equipment was moved to the new facility. In addition, the lecture hall in an older building is equipped with a wireless beltpack transmitter and Peavey mixer and speaker system. The types of amplified classrooms throughout the university include small and medium-sized rooms, large lecture halls, and classes of both large and small numbers of students. When the new system was installed, a university technology specialist provided a brief orientation to all faculty members.

Methodology

Purpose

Our study examined the perspectives of both students and professors regarding their experiences and attitudes. We wanted to know:

1. What are the attitudes that this university's professors and students hold toward the use of CADS in their classrooms?
2. How are these attitudes and experiences interpreted with respect to higher education teaching and learning?
3. What are the implications of these attitudes and experiences for the effective implementation of CADS in higher education?

To answer these questions, we administered a university-wide survey for students and faculty, and conducted four focus group discussions: undergraduate students, B.Ed. students, Advanced Education Certificate students, and faculty.

Participants

All students and faculty members at the university were invited to participate in the study by completing a survey. Students were invited through the professors of core courses, thus ensuring access to the entire student body; faculty members were invited through email. A total of 324 students (39% of total sample size) completed the survey and, of these, 307 indicated they had experienced the use of CADS at some point in their education either as user or listener. Identifying information on the student surveys included only their year or program in the university. The 307 participants included in our analysis identified themselves as follows: 52 first year; 26 second year; 30 third year; 45 fourth year; 111 B.Ed; 38 Advanced Education Certificate (Graduate); and 5 'Other' (such as Part Time) students. Given the small size of the student population, our analysis grouped students according to undergraduate, B.Ed and Advanced Certificate (the latter being the only two postgraduate programs at the university). Undergraduate classes tend to be larger, and hence provided a distinct perspective; classes in the B.Ed program tend to be smaller, but also this group had a unique perspective as future educators who were already familiar with the broader ideas of inclusion and UDL; and the graduate students are professionals in the field of education and hence have K-12 experience in addition to experience as students in the university. Seventeen (34%) faculty members completed the survey. Sixteen indicated they had more than five years of teaching experience at the time of the survey.

There were four focus groups, each formed through a convenience sample (those who responded to an email invitation to participate, controlling only for gender – although in forming the undergraduate group, only male students were available at the times scheduled) and each comprised of four participants: Undergraduate students (four males), B.Ed. students (two male, two female), Graduate students (two male, two female), and Faculty (two male, two female; two were Education Faculty). All of the student group members had experience with CADS in at least one of the university's postsecondary classrooms and all of the faculty members had used the technology at some point in their teaching. All of the Advanced Education students and some of the B.Ed. students had additional experience using it when teaching in K-12 classrooms.

Instrumentation and Procedures

The study involved two survey questionnaires: one for the students and one for faculty. The student questionnaire was adapted from Cornwell and Evans (2001), changing the wording to suit the university context (for example, instead of school work, learning) and to reflect the system used at the university (instead of FM system, amplification system). It included the following questions:

1. Do you think amplification of the teacher's voice helped you in your learning? Please tell us how you think it has or has not helped your learning.
2. Would you like to see voice amplification used in more classrooms?
3. If you could change the amplification system in some way, what would you do?

To ensure anonymity, student surveys were distributed, administered, and collected during class by the instructor who then submitted the materials to an office administrator. Students were told participation was voluntary and would not influence their grades.

Faculty surveys were adapted from Cornwell and Evans similar to the student surveys, and we added an additional open-ended question to give faculty an opportunity to expand their ideas. Questions included:

1. Do you think that having the voice amplification system in your classroom benefits your students? Please tell us how you think it does or does not benefit your students.
2. Do you think using the voice amplification system is beneficial to you as a teacher?
3. If you could change the voice amplification system in some way, what would you do?

4. Is there any further information about voice amplification that would be beneficial to you in your use of this technology?

Surveys were completed voluntarily, in respondents' own time and anonymously submitted to an office administrator. Data collection through surveys was completed within a one-week time period in a winter semester.

Subsequent to the surveys, we conducted one faculty and three student focus groups. The discussions were semi-structured, and each ran for about 30-45 minutes. The questions were designed to elicit a more nuanced understanding of the issues raised in the survey responses. Prompts included questions such as:

1. Some respondents indicated that the use of voice amplification had a positive effect on student learning. Let's discuss this in greater depth: What might be the positive benefits you have experienced with respect to your learning? Perhaps you feel that the use of voice amplification has not had a positive effect on your learning – can you expand on this?
2. Have you used voice amplification in your role as a student? If so, did using it have any effect on you as a speaker?
3. Most research concerning voice amplification has been done in the context of elementary education. Do you think there is anything unique about its use with adults that might indicate different benefits or challenges?

Focus group discussions were recorded and transcribed for analysis.

Procedures of Analysis

The surveys elicited both quantitative and qualitative data. The quantitative data was related to respondent characteristics and used to determine respondent validity (e.g., if the respondent had no experience with CADS, their survey was not included). In analyzing the survey's qualitative data, we took each question separately and, following an inductive process outlined by Cresswell (2013), developed codes and themes as they emerged. To ensure inter-coder reliability (Cresswell, 2013), we first each took the same five surveys and independently coded them; we then met to discuss the codes we had developed and came to agreement on the definitions and applications of the codes. We each coded different sets of surveys and combined our findings. Responses to the survey questions were mostly one-sentence answers or short

phrases, which were tabulated to get a sense of the priority of the coded themes. The same process of determining inter-coder reliability was used in analyzing the focus group data. We also tabulated the number of speaker turns during focus group discussions that related to the different codes.

Results

While our survey questions were fairly broad, some very consistent themes emerged (see Table 1). Our first question was whether, and how, CADS improved student learning. Answers to this question in the student surveys mostly related to improved attention (15.6%), although often with the caveat that it depended on the classroom size and number of students in the class (14.2%). When students were asked what they would like to change about CADS, concerns about the quality of the technology (14.1%) and the need to provide better training and support for the users of the technology (4.3%) dominated their responses. Faculty also indicated the need for improved technology to enhance the effectiveness of amplification (17.2%); however, only 1.6% felt they needed any training in using the technology. Their bigger concern (26.6%) had to do with the voice factor: Technology was mostly seen as necessary to compensate for one's soft voice, or conversely not needed "because I have a loud voice."

We took the information generated by the survey responses to our focus groups to probe these issues more deeply. Subsequent analysis of our focus group conversations revealed seven main themes regarding their experiences with CADS: *impact on learning; classroom management; conditions of learning; usage; health and wellness; identity; and inclusion.*

Impact on Learning

Impact on learning was most commonly expressed in terms of how amplification enhances student attention, and its importance to students' own learning management. In the B.Ed., graduate, and faculty focus groups, respondents noted the importance of overcoming various sources of background noise: from building construction, road works, and traffic heard through open windows; noise polluting sounds coming from other classrooms such as moving furniture; and sounds within the classroom, such as typing. In the words of one participant, "You got 20 people on their laptops. They're taking notes... when you go home you can still hear the clicking sound! That's something you really hear." The effect of background noise was described by participants as "distracting," and most felt that amplifying the teacher's voice helped to mitigate that

distraction. A graduate student expressed this idea by saying, “I like to use my computer to take notes, but [CADS] would take away that sound.” Some faculty members found their students to be “more alert” and to “drift” less often when amplification was used. One gave the example, “If there are students talking in the last row... that’s a big distraction to the students in the last row who want to listen to the lecture and take down all the notes;” CADS would help.

In the faculty focus group a great deal of the conversation about students paying attention converged on the cognitive connections between learning and attending. They discussed the amount of information students naturally miss due to inattention as well as the limits of the human attention span. Some wondered if amplification could really help when these limitations on learning are always present, but the consensus was that it could. For example, one faculty respondent noted that “the amplification system clearly hits the auditory side,” referencing multiple pathways for learning. Another noted, regarding attention span limitations, “If we’re losing them through them not being able to hear, it’s going to be even shorter” without amplification.

The faculty, graduate, and B.Ed. focus groups all maintained that student attention has a major impact on learning even in the postsecondary classroom, and that CADS was a major player in enhancing that attention. One graduate student’s opinion was that, “We’re here paying for our courses, so most of us want to do well so we want to hear as much as possible.” This was true when students used CADS in their presentations as well, resulting in other students paying better attention. And, as one faculty member noted, “A lot of learning occurs as a result of what students [say] and if students can’t hear other students, you’re losing.”

The undergraduate students, however, had a different perspective about the impact of CADS on their learning. They acknowledged that when professors used CADS, it kept them “awake” and focused, but, unlike the other groups, they did not think this was a significant issue in higher education contexts. “We’re not from high school or anything like this, so, where, we can focus better...[the] lower level schools [are] not as attentive as we are,” they pointed out. “When it comes to middle school, you have kids who talk, you know, they pass notes and there’s a lot of noise going around. We’re more matured and so there’s not that roughhousing going on.” However, their perspective changed when they discussed the impact of CADS on the attention of the audience when they were the presenter:

For presentation as a student, you’re always worried about, ‘am I going to lose your attention’ or ‘am I going to gain their attention’ or ‘are they going to talk if I don’t’, or ‘are they going to drown me out’ [with distracting noises]. For me, I found that if you have the mic, they are going to hear no matter what they do.

This distinction between attitudes as learners and as presenters was not seen in the other focus groups.

Finally, a thought-provoking nuance of the *impact on learning* theme came from the B.Ed. focus group. They discussed how attention might vary from situation to situation. One respondent observed that it wasn’t necessarily just noise that was distracting, but also “where I’m at in my head space on a given day.” When students feel focused, the noise may have less effect than when they are feeling on the fringes. Also, some noise is expected and thus may not be as distracting: “Like the construction noise doesn’t bother me [because I’m used to it].” However, “when something is out of the ordinary, it’s harder to tune that out” – like the clicking of a pen, “and all I could do is not turn around [and say] ‘stop doing that!’” One student called it the “participation factor” and noted how “there’s times when you may be zoned out, but if you do have the amplification, you can still catch a part of it.”

Classroom Management

A second theme that emerged from our data was the role of amplification in classroom management. As with impact on learning, this theme was sometimes discussed in terms of the postsecondary setting and sometimes in reference to K-12 schools. All of the focus groups, except undergraduates, felt amplification enhanced teacher ‘presence’ throughout the classroom. For example, a B.Ed. student said:

[In university] we do a lot of group work. So, when it comes time to call us back together, there are times, especially at this time of the year when we all know each other, things are starting to go off the rails [and CADS helps to get the class back on track].

A faculty member who wished amplification was in the science labs said:

When they’re moving around [the lab], and you have to be different places... I would want to see [CADS installed]...you can see somebody doing something wrong three benches over and you’re over here, you can’t get to them because you’ve got rows and benches [in your way].

Some graduate students with experience using CADS in elementary school settings described teacher “presence” as the ability to maintain student attention all over the room, particularly when speakers are mounted in more than one location on the ceiling. Even in university classrooms with only one wall-mounted speaker, respondents felt amplification broadened the teacher’s presence in the room, a feeling referred to succinctly by one faculty member as “omnipresence,” or, as put by a B.Ed. student, “artificial proximity... because you feel that voice is behind you.”

Furthermore, all of the focus groups (again, except undergraduates) noted that students were less likely to miss important points and instructions did not have to be repeated as often by teachers when CADS was used. This was seen to be important because, as one B.Ed student described it, the issue even “compounds itself...you’re trying to think, what did I miss? And then you’re actually missing what she, what the person is saying right now.”

Enhanced voice clarity was mentioned in our survey responses, so we wanted to seek a deeper understanding of its meaning through the focus group responses. It seemed to be related to the previous idea about not missing important information. With the B.Ed participants, it meant “more projection from the microphone,” which meant “you are actually getting it quicker, clearer.” Another B. Ed. student described clarity as “audible,” and being able to “make out the voice,” while another thought of clarity as being “sharper sound;” that is, “I don’t have to stop and think and question, ‘what did he or she say.’” And within the faculty group there was agreement that a speaker with an accent could be heard and understood more clearly by using the microphone.

Faculty members also talked about how CADS had a role in “conditioning” the class to begin: “When you started adjusting [the microphone] around your neck, then they know the lecture is going to begin and, you know, they have to pay attention.” Faculty members also used descriptive terms such as a “sense of importance” or “a stronger measure of presence.” In the graduate student group, however, there was a debate about whether this same idea conveyed a negative message because it was too formal: “There is a level of separation... it doesn’t really radiate a conversational atmosphere; it is more of a listen-to-this type of thing.” In this regard, the group generally agreed that teachers need to be more “interactive to engage the students; step [engagement strategies] up.”

Conditions of Learning

By *conditions of learning*, we mean the learning environment: how amplification contributes to the classroom setting, such as helping to reduce anxiety or to create a calm atmosphere. One of the B.Ed. students who had a background in substitute teaching made the observation:

For some students, I think it’s a matter of even tone of voice. When you are in front of a class or in a class, you have to raise your voice in order to be heard. Some students don’t necessarily take that as just an increase in volume. They take, they feel an increased anxiety, and they react to that.

CADS allows the teacher to speak in a “normal voice” and hence does not “get that raised voice issue.” While most of this discussion was related to K-12 teaching, a faculty member spoke of this notion in the postsecondary classroom: “If students can hear you, that is going to speak well to the way they view you... like, I can hear them, they are caring about making sure that I’m listening.”

Classroom size emerged as another relevant aspect of the *conditions of learning* theme at the postsecondary level. All of the groups recognized that CADS is essential in large lecture halls. For example, an undergraduate noted, “If you have a class of two hundred, I think it will be worth it.” But some participants pointed out that amplification was not really needed in small rooms and/or classes with just a few students. Some also felt that professors with naturally loud voices became too loud when amplification was used in small settings. One B.Ed. student offered, “If it’s too loud, then that’s just as much a distraction.” A faculty member mentioned this, too: “I am used to projecting... I have a ‘stand in front of people’ voice...it was too hard on me mentally to dial that back [when using a microphone].”

Overall, though, there was more discussion about the advantages of CADS in the learning environment. A common thread was how it helped those with soft voices. Examples were: “I remember when one of my professors lost her voice and the mic did help with that;” and “even the small classrooms [without amplification], there were times, if you’re sitting on the outside, it is difficult to hear the prof because they are focused on the back of the room;” and [some professors] “stick to their notes; they are looking at their notes when they are talking to you and they really do need a little extra amplification.”

Usage (The Human Factor and the Technological Factor)

When our participants discussed issues related to using the equipment, two often-conflating aspects emerged: technical difficulties and operational difficulties. This topic especially pre-occupied the undergraduates, comprising almost half of their discussion. All groups recognized the importance of training on proper usage of the equipment.

One problem involving both usage and technology was static coming from the loudspeakers. The undergraduate participants described it as “constant humming” and distracting. One respondent said, “It’s just something that you have to get through to focus... As a college student, I have no problem focusing on the prof. It is just when you are in the classroom for three hours, it bothers you.” And a B.Ed. student described the static as being “nasty sometimes.” The problem had to do with setting the correct volume level on the microphone as well as on the display control module on the wall. One student noted some professors did not know how to use these controls, resulting in interference or inconsistent volume control. Another highlighted the disruption in the flow of the class when the professor had to adjust the volume control on the wall module. In contrast to the view presented (mostly) by the undergraduate participants, most faculty members felt they were competent in using the equipment, and only one felt the need for improved understanding of the equipment’s volume control. They did note other challenges related to the technology, but tended to minimize them by posing constructive solutions.

A second problem related to usage, or the “human factor” as one student put it, concerned issues specific to wearing the pendant microphone. For example, “It rubs against...button or chains or anything, it keeps making that [unwanted sound].” “[It would] pick up everything that’s close...like...ruffling every time it rubs against the shirt.” In all focus groups, respondents recognized that, as with any new technology, such issues could be avoided through practice and training. One graduate student put it like this: “You have to get used to it...it’s not natural, it’s not part of your body.” Another said, “It’s not just a matter of practice; it’s a matter of taking the time and explicitly telling someone, ‘you want to make sure to avoid doing this while the mic is on.’”

A third usage issue, raised by the undergraduate students, had to do with different input sources feeding into a single speaker system. They talked about the anxiety they felt when watching videos in class: “Everybody cringes and plugs their ears because...the volume just isn’t consistent with the prof speaking and

then the level of volume coming through the computer.” They also described how some professors would increase the volume on the display control module to adequately amplify their voices. But, if the volume on the computer was already on a high setting, the sound would, of course, be very loud, and as such, “there’s always that moment of dread” when the sound source switches from voice to audio-visual media. Given these experiences, some undergraduate students made it clear they preferred a professor’s natural voice to an amplified one, even though they recognised that informed users could manage the effect of the discrepant input sources. On the other hand, some undergraduates valued the improved sound quality of audio-visual media using the integrated system.

From the students’ perspectives, learning to use amplification competently was something they wanted for themselves as well as for their professors. As one undergraduate put it:

I think it will be beneficial for the student body to have microphones to use. Because there’s a nerve factor that comes behind using the microphone... At some point down the road [in life]...there is [likely to be] an expectation that you’ll stand behind the podium, and use the mic.

The B.Ed. students similarly felt the need for repeated practice with the microphone, indicating that, in the words of one, “The anxiety comes from just not being exposed to the technology.” Another student commented: “It is nerve-wracking at first [because] you hear yourself. You’re not used to hearing yourself and you are hearing yourself coming from the speaker at the other side of the room.” But, with repeated practice, one student found her anxiety lessened: “I know the last couple times I used it, I forgot I’ve got it on... I find I’m more relaxed now using it, and I can talk normal and everyone seems to hear me just fine.”

One more way the human factor plays a role is when users forget they are wearing a live microphone at times when it should be turned off. One B.Ed respondent observed that, “Working in the [K-12] school system, I think one of the biggest negative effects of these microphones is that teachers sometimes forget that they have them on,” especially when having a private conversation with someone or even talking to oneself. A faculty member recalled a similar situation: “I was playing a game with the class and I brought [one group] into a huddle [to whisper something to them] and [the rest of the class] all just started laughing because I still had it on.”

Health and Wellness

The importance of using CADS with respect to health and wellness featured prominently in the faculty discussions, together with the need to enhance the voices of soft-spoken people, taking up about half of their conversation. Their comments included ones like, “You don’t feel you need to force your voice. You talk in a more conversational manner;” and “For me, using it in a classroom, it’s an energy-saver,” and “I did have laryngitis once, and then that really helped.” But the primary focus of health and wellness for the graduate and B.Ed. participants (the undergraduate members were silent on this issue), and even some of the faculty, centred on the K-12 context, rather than higher education. A graduate student mentioned, “I know teachers that had to take time off because... the doctor told them that you have to rest [your voice] and they have to go to therapy or learn another way to talk.” Another recalled that, without amplification, “In September, when I finished the first days, I always had a sore throat because I’m always straining my voice.” Thinking about his future teaching context, a B.Ed. student felt amplification would be particularly helpful in a gym setting: “[Physical education teachers’] voices are raspy because they have to make it at such a high level for everybody to hear because it is such a big space.”

Identity

An interesting theme that emerged was the impact of CADS on the user’s identity, usually expressed as an increased sense of importance or confidence, although for some, a negative impact as well. This theme did not feature prominently, but it was an intriguing insight. Some of the undergraduate students talked about how access to microphones would be in keeping with the general ethos of the Business degree program. They observed that there is a sense of authority that comes with using the microphone:

When you have the mic, you are the one that is on the floor. So you feel like you are a star...the person with the mic will obviously be the one that everyone’s going to be directing their attention to; it highlights the person who’s talking.

Thus, attention is given to that person not just because their voice can be heard, but also “because they have a mic.” Another undergraduate said, “When you have the mic, you have the power. You have the authority in that classroom. That is your class. So it boosts confidence in the person speaking... [the microphone] changes the dynamic of the class.”

Interestingly, the opposite of this view appeared in some of the other discussions, ranging from discomfort to anxiety. One faculty member recalled, “I didn’t like it around my neck so I kept taking it off.” Shyness or anxiety was also discussed, as in a graduate student’s comment: “At first you’re shy because you’re not very used to it; being a shy person, maybe it would affect you a little bit.” Another said, about getting used to the microphone, “When I was [accidentally] hitting it, I was noticing that it was making a noise and I was afraid to make the people jump out of their seats, I guess.” Also, a faculty member gave an example of an undergraduate student who was uneasy giving presentations in class and was too nervous to use the microphone.

Both the faculty and the B.Ed. groups discussed the stigma that some people associate with using amplification. One B.Ed. participant put it like this: “People look at it too as, oh, my voice isn’t strong enough... it’s almost like an insult... as if it’s a reflection on the person themselves.” The faculty group also recalled instances of people who would not use it: “You go to conferences and the keynote speaker refuses the microphone...in a lecture hall with 300 people” and “I think there is a measure of embarrassment on the part of the adult” and “It is suggesting that you can’t do it by yourself; you require an aid.” In each of these conversations, participants agreed it is incumbent upon speakers to overcome their reluctance, and that increased access and training would not only diminish the anxiety but also the perceived stigma associated with using CADS.

Inclusion

One theme that emerged from the graduate student and faculty groups (but not the B.Ed. or undergraduate groups) was that CADS could make the higher education classroom more inclusive for students with hearing impairments. Respondents recalled university students they had known who benefitted greatly from the technology: “I’m just thinking of [a peer]; you can tell that it bothers her when she’s not able to hear because she wants to learn.” One faculty member observed that, while in K-12 classes a student’s hearing impairment is likely to be identified, an adult student might not share this type of personal information with a professor. As such, it was important to be proactive in the use of CADS, especially since, as both faculty and graduate students noted, all students in any classroom would benefit from this technology. For one student, it was a matter of respect: “In the classroom where, if somebody has some sort of hearing impairment...it is important to respect [that person].”

Discussion

While the postsecondary classroom becomes increasingly diverse, current thinking among those providing student support is grounded in UD. As its underpinning, UD has long embraced the view that diversity is the norm within the human population (Welch, 1995). The construct of UDL applies this thinking to the classroom through flexible teaching approaches and reduction of barriers to learning (CAST, 2011).

The results of this study indicate that the role of CADS within the UDL framework can be complex and multidimensional, permeating all aspects of learning. To sum up our results, its role may be seen as (1) providing flexibility in presenting and accessing information or providing appropriate accommodations and (2) a method for managing the learning environment in terms of acoustics and universal access to verbal communication.

In terms of providing flexibility and accommodations, disability service providers may find in CADS one more technological tool for helping make the higher education classroom environment more inclusive. From our data, it is apparent that CADS provides specific instructional flexibility. CADS can help faculty be more flexible in presenting information that is clearly understood within many types of learning activities. Students can demonstrate their knowledge and skills by making their own presentations with verbal clarity. Students' confidence can be built by frequent exposure to using a microphone themselves. While the present study did not identify any student disabilities, research from K-12 schools and extension of the comments from our participants indicate that CADS may be able to serve as an accommodation to reduce barriers to learning for those with disabilities related to hearing, auditory processing, and attention deficits (Flexer, 2005). Our study did not result in themes specifically related to English language learners, but according to research with younger students, the improved learning environment provided by CADS may also assist this student population (Nelson et al., 2005).

Our results highlighted other benefits of CADS in regard to voice enhancement for those instructors with naturally soft voices or temporarily strained voices from fatigue or from illness. It was also noted that CADS can provide universal support for learning by amplifying voices or media above temporary background noise or to manage the verbal lectures in large classrooms or with large groups of students. Our participants also noted that CADS affects both instructors and students who use it with respect to a feeling of confidence and identity in the classroom. The improved attention from the listeners not only

helps them individually, but also improves overall classroom engagement.

If disability service personnel are considering CADS as a pedagogical tool to enhance the learning environment of all students, there are a number of technical and educational factors that must be considered. To fully maximize the potential of CADS, faculty members must be educated on its use. Training should include the technical procedures, but also take into account the impact that CADS has on both the learner (such as focus as a listener and public speaking skills) and the educator (such as classroom presence and voice wellness). Users need to be involved in conversations about how CADS can enhance classroom management and engage all students in the learning experience.

Further, those planning to implement CADS need to recognize that the type and quality of technology selected, its installation, and its availability to instructors and students are all essential parts of providing an optimal listening environment. Whyte (2010), an educational audiologist, states: "It is important that soundfield systems are installed correctly, in appropriate places in the classroom and with consultation of the teachers who will be using them; training in the use of soundfield systems is essential" (p. 1). Jónsdóttir (2002) similarly points to the technical problems and teachers' lack of skill as being the main negative features of the use of CADS. Along these lines, our participants provided a great deal of input on the positives and negatives of the technical aspects of CADS as well as the need for and benefits of training its users. Our conclusion is that training should involve how the technology can be effectively fused with pedagogy leading to one more way to put UDL into practice in higher education.

Limitations and Further Research

The main limitation of this study is its focus on students' and faculty's perceptions, rather than on measurable factors such as grades, speech perception, or attention levels. Along the same lines, the study did not measure the hearing abilities of our students or the acoustical quality of the classrooms. Our participant groups were somewhat limited in that the sample size was small and some of the participants had prior knowledge about the use of CADS in K-12 schools. Nevertheless, the results of this investigation contribute to a deeper understanding of CADS in the postsecondary setting, a part of UDL.

In our study, awareness of the pedagogical significance of CADS was heightened and a number of significant issues were identified, but it is clear that research with CADS in higher education needs

a great deal more attention. Those working in post-secondary disability services may be well situated to focus attention on this topic. Those who assist with the professional development of faculty in UDL may investigate the feasibility of incorporating CADS technology into that training. The degree of benefit CADS could provide for specific student populations, such as those with hearing disabilities or attention deficits or those whose first language is not English, would be an important aspect to study at the postsecondary level as well. Future researchers may want to consider how learning is enhanced with CADS in classrooms where microphones and speaker systems already exist or where they may be retrofitted. Of course, the ideal setting for future research is one where a newly built facility includes CADS in its classrooms. In any future research with CADS, the goal is to obtain a deeper understanding of how universal design in architecture and technology can partner with universal design for learning in an effort to enhance the learning experiences of *all* students in broader inclusionary practices.

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Table 1

Survey Responses (% of total statements)

Code	Description	% of Total Statements (Students)	% of Total Statements (Faculty)
Access	Increased access to the technology	4.3%	9.4%
Attention	Use of technology improve attention, concentration, focus and enhances hearing	15.6%	7.8%
Calmer	Use of technology contributes to a more calm, positive classroom environment	0.4%	0%
Clarity	Improvement in specific aspects of verbal communication, such as clarity of the instructor's voice	8.1%	1.6%
ENG	Increased student engagement	0.4%	0%
ENV	Specific environments where the technology is the most or least effective (such as large classrooms)	14.2%	15.6%
INC	Improved inclusion of all participants in class	3.0%	1.6%
LRN	Positive hearing-learning connection explicitly stated	2.5%	9.4%
NEG-G	General negative comment, such as not worth the expense	6.4%	0%
NEG-S	Specific negative comments such as 'it gives me headaches'	2.1%	0%
NOD	The technology makes no difference	6.7%	0%
POS	General positive comments such as 'I like it' or 'don't change it'	6.6%	0%
SLF	A sense of self; more confidence	0%	6.3%
TEA	Teaching is enhanced, allows for mobility, improved teacher presence in the classroom	1.5%	1.6%
TEC	Specific technical difficulties related to the equipment such as static, feedback, speaker placement	14.1%	17.2%
USG	Users are unfamiliar with proper usage of the technology; more training/support is needed	4.3%	1.6%
VOI	Technology improves voice volume/ projection; reduces strain on the voice	8.8%	26.6%
		*99.00%	*100.2%

Note. * totals do not add up to 100 due to rounding

The Impact of High School Extracurricular Involvement on the Postsecondary Outcomes of Deaf and Hard-of-Hearing Youth

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Abstract

Involvement in extracurricular activities provides youth with opportunities to develop important personal skills, abilities, and preferences, and to build meaningful social support networks. Historically, students who are deaf or hard of hearing (SDHH) have had limited access to opportunities for both academic and occupational development, including extracurricular participation, although legal changes such as the Americans with Disabilities Act (1990) and the Individuals with Disabilities Education Improvement Act (2004) have shifted this landscape. Drawing from data available in the National Longitudinal Transition Survey 2 (NLTS2) and controlling for demographic covariates, we examine the predictive role overall extracurricular involvement and the breadth of that involvement play in postsecondary outcomes, including education, employment, independent living, and self-beliefs, for approximately 1,000 SDHH ages 14 to 18. We also describe the extracurricular activities in which SDHH are most often involved. Our findings suggest that overall involvement in extracurricular activities significantly predicted independent living, and that involvement in more than one activity significantly predicted postsecondary enrollment. We also discuss the limitations of the study design and implications for future research. It is clear that participation in extracurricular activities in high school benefits SDHH later in life.

Keywords: *Adolescent development, extracurricular involvement, deaf and hard of hearing, postsecondary outcomes*

There is growing recognition in educational research and practice of the important role extracurricular involvement plays in young people's positive development (Eccles, Barber, Stone, & Hunt, 2003; Fredricks & Eccles, 2006; Feldman-Farb & Matjasko, 2012; Feldman & Matjasko, 2005; Mahoney, Larson, & Eccles, 2005; Troutman & Dufur, 2007). Traditional definitions of *extracurricular activity* include a highly structured school- or community-sponsored collaborative activity that is guided by one or more adult supervisors. Examples of extracurricular activities within this definition include school and community athletics, performing arts, academic clubs, leadership clubs, and

Boy Scouts (Gilman, Meyers, & Perez, 2004; Mahoney & Stattin, 2000). Many U.S. high school students participate in extracurricular activities. In *Trends in the Well-Being of American Youth, the National Center for Education Statistics* Fox, Connolly, and Snyder, (2005) reported that, in 2001, 15.3% of high school seniors participated in an academic club, 38.6% in a sport, 25.3% in music or a performing art, 15.3% in an academic club, 10.8% in student council/government, and 10% in the newspaper or yearbook.

The purpose of this article is to explore the extracurricular involvement of students who are deaf or hard of hearing (SDHH), a low-incidence population with

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unique educational backgrounds, language modalities, and identification with cultural communities (Batten, Oakes, & Alexander, 2013; Luckner & Muir, 2001; Marschark & Spencer, 2010; Moeller, 2007). Historically, SDHH have had limited access to opportunities for academic and occupational development, including extracurricular activities. Recent legal changes, including the Americans with Disabilities Act (1990) and the Individuals with Disabilities Education Act (2004), have begun to open doors for SDHH both within and outside the classroom. For example, when the 1975 Education for All Handicapped Children Act was amended and signed into law in 1990 as the Individuals with Disabilities Education Act (IDEA), the term *handicap* was replaced by *disability* (Jacob & Hartshorne, 2003). Furthermore, according to Section 504 of the Rehabilitation Act of 1973 and Title II of the Americans with Disabilities Act (ADA) of 1990, any programs or services that receive federal money, including educational settings, are required to be accessible to individuals who are deaf and hard of hearing (DHH; DuBow & National Association of the Deaf, 2000). Thus, under ADA, institutions are required to provide accommodations for individuals with disabilities to ensure their equal access to educational opportunities, including extracurricular activities (Cawthon, Nichols, & Collier, 2009).

Previous research on extracurricular activities has explored the important role athletic participation plays in school, community, and cultural life for SDHH (Stewart, 1991; Stewart & Ellis, 1999). However, the impact of involvement in athletics and other extracurricular activities on postsecondary outcomes for DHH youth has yet to be fully examined. Only one study, by Antia, Jones, Luckner, Kreimeyer, and Reed (2011), has found that SDHH participation in school-sponsored extracurricular activities is significantly and positively correlated to both teachers' ratings of students' social skills and students' ratings of their own social skills. Participation in extracurricular activities was significantly and negatively correlated to teachers' problem behavior ratings.

In this article, we first define and discuss the salience of extracurricular involvement as an important context for the adolescent development of all youth. We then review and discuss outcomes specific to DHH youths' participation in extracurricular activities. In our analysis, we use data from the National Longitudinal Transition Study 2 (NLTS2) to investigate the relationship between SDHH extracurricular involvement in high school and their postacademic outcomes. We conclude this article with a discussion of the results and implications for individuals, practitioners, and researchers who work with DHH youth.

Extracurricular Involvement as a Context for Adolescent Development

The ecological systems theory of development provides the theoretical framework for much of the research on extracurricular involvement. It emphasizes a person-environment fit approach to understanding important factors of adolescent development (Bronfenbrenner, 1992; Gilman et al., 2004). This theory accounts for the integration of the individual, the family, and the school and community context, as well as the broader economic and sociological influences on extracurricular participation. This framework has inspired researchers to consider the direct and indirect effects participation in extracurricular activities has on positive youth development and adolescent well-being (Feldman & Matjasko, 2005; Mahoney, Larson, & Eccles, 2005).

Extracurricular activities put adolescents in important leisure environments that create opportunities for them to carry out developmental tasks (Darling, Caldwell, & Smith, 2005), such as exploring and expressing identity, discovering preferences, engaging in challenges outside of academics, building life skills and developing soft skills, social negotiation, and generating academic and social capital. Participating in extracurricular activities gives adolescents the opportunity to develop an extended support network of peers and of adults who serve as mentors (Darling et al., 2005; Eccles & Barber, 1999; Feldman & Matjasko, 2005). For students at risk for academic delay or who struggle with the academic demands of the classroom, extracurricular involvement may offer a place where they can develop important skills and be recognized for successes other than traditional academic achievement (Feldman & Matjasko, 2005).

The Impact of Extracurricular Involvement on Youth Development

Feldman and Matjasko (2005) and Feldman-Farb and Matjasko (2012) systematically examined 88 studies on extracurricular involvement, all published by 2012. Findings from these preeminent literature reviews suggest that extracurricular involvement during secondary school is indeed associated with enhanced academic and social functioning, which in some cases continues into the postsecondary setting. The studies primarily indicate that extracurricular involvement has a positive impact on educational attainment and academic success (Broh, 2002; Camp, 1990; Crosnoe, 2001; Eccles & Barber, 1999). Cooper, Valentine, Nye, and Lindsay (1999) found that extracurricular involvement accounted for 11% of the variance in high school students' GPA above and beyond what was predicted by demographic

information, such as age, race, and socioeconomic status (SES). Marsh (1992) used a large sample (N = 4,422) of nationally representative students and found a curvilinear relationship between extracurricular engagement and GPA. This indicated that stronger extracurricular engagement was associated with a higher GPA, but that the relationship may not be a simple “more is better” result at the upper end of the scale.

The literature also reveals that participation in extracurricular activities has a positive impact on psychological factors related to academic attitude and behavioral outcomes, such as academic persistence (Hanson & Kraus, 1998; Marsh & Kleitman, 2002). Several studies found that students who participated in athletics were almost twice as likely to remain in school as those who did not participate (Davalos, Chavez, & Guardiola, 1999; McNeal, 1995). Darling et al. (2005) reexamined data collected in 1995 from nine high schools in California and Wisconsin and found that extracurricular involvement positively predicted attitudes toward school, as well as the students’ academic aspirations. Eccles and Templeton (2002) proposed that participation in structured extracurricular activities fosters school engagement, interpersonal competence, educational aspirations, and college enrollment, which is similar to Tinto’s (1975) model of academic persistence. Tinto maintained that student persistence as opposed to withdrawal in postsecondary settings is a function of two major factors: a student’s interactions with (a) social systems and (b) academic systems operating within a given institution. Together these findings suggest that extracurricular activities are fundamental to a student’s development of academic motivation and achievement, and to their sense of engagement in school (Feldman-Farb & Matjasko, 2012). Participation in extracurricular activities may foster a sense of belonging and can strengthen social relationships, particularly among students from different ethnic groups or SES classes (Brown & Evans, 2002; Eccles & Barber, 1999; Feldman & Matjasko, 2005). It can also give academically challenged students a way to achieve a sense of community at school, thus reducing dropout rates and the negative impact of student attrition on community cohesiveness (Darling et al., 2005; Khmelkov & Hallinan, 1999; Reis & Díaz, 1999).

Researchers also have examined the impact of the breadth of involvement in extracurricular activities. This is an important concept because it distinguishes between an individual who spends all of their time and energy on one extracurricular activity, such as playing the piano, and one who is involved in multiple activities, such as music, student council, and a sport. Students with a broader range of activities theoretically

are exposed to a greater variety of peer groups, mentorship models, and social networks than those who participate in fewer activities. In the early research, it seemed that participating in more activities resulted in enhanced developmental outcomes. However, Feldman and Matjasko’s (2005) review suggested a curvilinear relationship that includes a point at which participation in too many extracurricular activities is detrimental to an individual’s well-being. This finding was corroborated by the Marsh (1992) analysis, which showed a similar curvilinear relationship between extracurricular engagement and GPA.

There is significant covariation in the literature that relates to various student characteristics and participation in extracurricular activities. In studies of the prevalence of extracurricular involvement and its impact on youth development, these factors often result in interaction effects. For example, early studies measuring participation trends found that adolescents engaged in extracurricular activities were more likely to be from higher SES backgrounds and of European American descent (Marsh, 1992; McNeal, 1998). More recently, Darling et al. (2005) found differences in the rates of youth participation: high school boys were more likely to participate in extracurricular activities than girls, and youth whose parents had less formal education were less likely to participate in extracurricular activities. These researchers also found that students of Hispanic descent were less likely to participate in extracurricular activities than students from any other ethnic demographic. Given the covariation in the literature related to various student characteristics, the analyses in the current study also include interactions for gender, SES, and academic achievement.

Extracurricular Involvement in the Lives of DHH Youth

Sports have been a strong influence in Deaf culture and DHH communities for decades, and they continue to play a role in the lives of DHH youth today (Arsic, Svetlana, & Jasmina, 2012; Stewart, 1991; Stewart & Ellis, 2005). In Deaf communities, athletics provide an important social context for meaningful interaction and facilitates opportunities for young people to strengthen their self-esteem and self-identity, and to contribute as a member of the community (Stewart, 1991; Stewart & Ellis, 2005). Schools for the Deaf also tend to emphasize the athletic tradition by holding competitions between state schools, which are widely supported by parents, alumni, and students. For DHH youth attending school in mainstream educational settings, involvement in extracurricular activities may be a major factor in their success (Luckner & Muir, 2002).

Participation in extracurricular activities also may facilitate the unique transition of DHH individuals who may not have full access to the linguistic modality of the postsecondary setting (Stewart, 1991). Recent research in Deaf education raises significant concerns about the adequacy of the preparation SDHH are given for life after high school (Luft, 2012). Using the Transition Competence Battery to measure the transition strengths and needs of 53 SDHH in middle and high school, Luft and Huff (2011) found that the majority of them were lacking the skills needed to be employed and to live independently. The authors suggested that school-based transition programming for deaf students in public schools should focus on their long-term needs and skill-building, rather than on the kinds of skills needed immediately after high school. Extracurricular sporting events, for example, provide both a buffer and the shared experiences inherent to group sports, which enables DHH athletes to build intimacy and social bonds with their peers (Stewart, 1991).

Outcomes Related to Participation in Extracurricular Involvement for DHH Youth

SDHH enroll in a variety of postsecondary educational institutions (Pepnet2, 2013). Some choose schools such as Gallaudet University or the National Technical Institute for the Deaf in the United States, which have programs specifically for SDHH. Some mainstream postsecondary institutions have a large DHH student population, but most serve fewer than 10 SDHH (Hochgesang, Dunning, Benaissa, De-Caro, & Karchmer, 2007). The most recent estimates, from the National Longitudinal Transition Study (NLTS2), are that only 53% of students identified as having a hearing impairment (including SDHH) completed their postsecondary degree, including diplomas, certificates, or licenses (Newman et al., 2011). Only 34% of students with disabilities completed a four-year college program, compared to 51% of nondisabled students (Newman et al., 2011).

Although some mainstreamed DHH college students who persist through their first year may be particularly resilient, not all choose to complete their degree. Stinson and Walter (1992) found that many SDHH who withdraw from mainstream colleges reported being dissatisfied with their social lives, having difficulty making friends with hearing peers, and lacking DHH peers to interact with. Stinson, Scherer, and Walter (1987) tested a path-analytic model of several factors on outcomes for 233 first-year SDHH at the National Technical Institute of the Deaf, which specifically serves SDHH, to determine whether such social interactions could be facilitated by involvement

in extracurricular activities. Their results suggested that increased college-sponsored extracurricular participation was negatively correlated with college retention after freshman year; in other words, students who participated in college-sponsored extracurricular activities were more likely to withdraw than those who did not. Stinson, Scherer, and Walter (1987) interpreted this finding to mean that students who over-emphasized social involvement in their first year of college may have not mastered self-management skills or developed deeply satisfying relationships. Their findings suggest that it is essential for first-year students to balance the time they devote to extracurricular and social activities with the time they give to their personal care-taking and academics.

Because SDHH are a low-incidence population, quantitative longitudinal studies on the impact community factors have on their higher education outcomes are few and far between. As part of a large five-year study of DHH youth in mainstream educational settings, Antia et al. (2011) examined the correlation between students' participation in school and community extracurricular activities and their social skills and problem behaviors. The study included 191 SDHH in grades two through eight from 125 elementary and middle schools in Arizona and Colorado. Participation in school and community activities were both significantly correlated with high social skills ratings and low problem behavior ratings. Antia et al. (2011) also conducted a principal factor analysis to account for possible collinearity among predictor variables and to obtain the best set of predictors for the social skills and problem behavior ratings. Participation in school and community activities was a consistent predictor under a broad family factor, which included families on the assumption that student participation in an activity is often influenced by their parents' willingness and ability to finance it and provide transportation. This study is the first to provide empirical evidence that extracurricular involvement has a direct effect on the social well-being of DHH students.

The Current Study

The purpose of this study was to investigate a predictive relationship between extracurricular involvement and postschool outcomes for DHH individuals, controlling for the following individual student characteristics: gender, socioeconomic status, Woodcock-Johnson III tests, grades, additional disability, and age. The NLTS2 database contains large samples that have the potential to capture variability within the DHH population, in terms of both individual characteristics

and the family and school contexts of extracurricular involvement. This study occurred in two phases. The first was a descriptive analysis of the number of DHH youth involved in six superordinate categories the researchers created to capture 17 extracurricular activities that NLTS2 reported during the first wave of data collection in the 10-year longitudinal study. The purpose of this first phase was to examine which extracurricular activities DHH youth were involved in. The second phase examined the predictive relationship between extracurricular involvement and the postschool outcomes of education, employment, and life satisfaction. The research questions for this second phase were as follows.

- Research Question 1a: What is the prevalence rate of high school participation in categories of extracurricular activities (athletics, religious, leadership/community, performing arts, knowledge-based, and disability support) for SDHH?
- Research Question 1b: Are there differences in the prevalence rates of participation in extracurricular activity (versus nonparticipation) by socioeconomic status (as measured by household income), gender, and achievement (as measured by scores on the Woodcock-Johnson subtests of achievement)?
- Research Question 2a: Does participation in any extracurricular activity (versus nonparticipation) predict postsecondary outcomes (education, employment, and life satisfaction), after controlling for other student characteristics (gender, family socioeconomic status, Woodcock-Johnson III, grades, additional disability, and age)?
- Research Question 2b: Does breadth of participation in extracurricular activities (as measured by the summed participation in any one of six researcher-categorized groups of activities: athletics, religious, leadership/community, performing arts, knowledge-based, and disability support) predict postsecondary outcomes (education, employment, and life satisfaction), after controlling for other student characteristics (gender, family socioeconomic status, Woodcock-Johnson III, grades, additional disability, and age)?
- Research Question 3a: If an interaction is found between socioeconomic status (as measured by household income) and extracurricular involvement (as a binary variable), does that interaction predict postsecondary outcomes?

- Research Question 3b: If there is an interaction between gender (male or female) and extracurricular involvement (as a binary variable), does that interaction predict postsecondary outcomes?
- Research Question 3c: If there is an interaction between academic achievement (as measured by scores on the Woodcock-Johnson subtests of achievement) and extracurricular involvement (as a binary variable), does that interaction predict postsecondary outcomes?

Methods

Dataset

The U.S. Department of Education funded the second National Longitudinal Transition Study to help scientists understand the achievements of disabled youth who are entering adult life (see <http://www.nlts2.org>). To be included in the study, students had to be between 13 and 16 years of age on December 1, 2000. Many different stakeholders participated, including the students themselves, their parents, teachers, and school staff. The surveyors contacted youth biannually from 2001 to 2009, and collected data via mail surveys, computer-assisted telephone interviews, and direct psychological assessments. This current analysis utilizes data from the first, second, and final waves that were collected in 2001, 2003, and 2009, respectively.

The NLTS2 was intended to be nationally representative for a wide variety of students with a wide variety of disabilities. A simple random sample would do a poor job of achieving this goal, therefore the NLTS2 surveyors used a stratified weighted sampling scheme, which improved the generalizability and precision of estimation. In the rest of this section, we discuss the sampling scheme in more detail.

Stratification occurred at both the local education agency (LEA) level and the disability level. The surveyors first stratified the LEAs by enrollment size, district wealth, and region. The enrollment size stratification was based on the number of students in grades seven through twelve, inclusive. LEAs with fewer than 1,600 students had a “small” enrollment; between 1,600 and 4,700 students had “medium” enrollment; between 4,700 and 15,000 students had “large” enrollment; and more than 15,000 students had a “very large” enrollment. Surveyors based the “district wealth” stratification on the Orshanky index, or the percentage of students living below the poverty line (Fisher, 1992). LEAs where 25% to 43% of its enrollment lived below the poverty line were coded as having “low” district wealth, whereas those where 14%

to 24% were below the poverty line had “medium” district wealth. Outside of this range, LEAs were coded as having either “very low” or “high” district wealth. The NLTS2 surveyors based the final stratification, region, on a grouping scheme that other federal organizations (the U.S. Department of Commerce, U.S. Bureau of Economic Analysis, and National Assessment of Educational Progress) used: Northeast, Southeast, Midwest, and West. This made NLTS2 consistent with other large-scale datasets related to American education and employment. After identifying these stratifications, the surveyors randomly sampled the LEAs and stratified students in the selected schools by disability category. The latter stratification helped ensure that NLTS2 had a nationally representative sample for every disability category sampled.

This study included roughly 950 students who are DHH. To be included, participants had to satisfy two criteria. First, the student’s parents had to verify that their child was deaf or hard of hearing (D/HH). Due to sparsity in the dataset, the surveyors collapsed the participants into the category DHH, despite the diversity of these two groups. Very little audiological information is available in this dataset, so we simply consider them as a whole. The second criterion was that the participant could have no missing data on the dependent variable for any particular analysis. Of the 950 students included in this study, 290 attended schools that specialize in serving students with disabilities. It is unclear what proportion of those students attended a residential school for the d/Deaf, as no variable in the dataset provided this information available. Only 10 of the 950 students participated in a 504 plan.

Variables

The independent variables in the current study included information about the youth’s extracurricular involvement and various interaction terms. Covariates and auxiliary variables for the missing data model involved both demographic and ability-related data. We took almost all of the independent variables, covariates, and auxiliary variables from the first wave of NLTS2. The only exception was the Woodcock-Johnson measure, which psychologists administered as part of the direct assessment across waves one and two. Sample size depended on the exact variable we looked at, not just the wave. For example, wave 1 of the dataset included data on 950 DHH students; Woodcock-Johnson assessment data from waves 1 and 2 were available for 680 DHH students; data on grades were available for 760 DHH students; and data from wave 5 were available for 540 students. More information on the study variables follows.

Independent variables. Independent variables may be grouped into three categories: participation, breadth of involvement, and interaction terms. The simplest variable, participation, recorded whether students participated in any organized extracurricular activities. We set this binary variable at one if parents reported that the youth participated in school activities outside of class, or if parents reported that the youth participated in out-of-school activities (variable names: np1F3 and np1F4). Otherwise the variable was set to zero.

The second variable, breadth of involvement, captured the wide variety of extracurricular activities the NLTS2 participants reported being involved in. They originally reported participating in at least 17 different extracurricular activities. We grouped these activities into six larger categories, each of which was binary. For instance, the athletic variable was set to one if parents reported that the youth belonged to a sports team or were in the Special Olympics. Variables were categorized by shared common qualitative features, such as the subject matter or nature of the activity. Otherwise it was set to zero. These larger categories consisted of religious youth groups, leadership and community-related groups, knowledge-based activities, disability support groups, athletic groups, and groups related to the performing arts. For more information on the coding of these six groups, see Appendix A.

The breadth of involvement variable was the sum of these six smaller binary variables. For instance, if students participated in both a sports team and a religious group, their score for this variable would be a two. Students who did not participate in any extracurricular activities would have a zero for this variable, and so on. Finally, a number of interaction terms were used in this analysis. SES status (measured by household income), gender, and academic achievement (measured by the Woodcock-Johnson tests) were hypothesized to interact with the participation variable.

Dependent variables. Our research lab has employed these seven dependent variables many times, from a variety of theoretical perspectives (e.g., removed for blind review) We group them into three larger categories: academic outcomes, employment-related outcomes, and general life outcomes. These variables were all collected from the fifth and final wave of NLTS2. The two academic outcomes were binary, one describing enrollment in a postsecondary institution and the other describing graduation from a postsecondary institution.

One employment outcome was binary, while two others were continuous. The binary variable described whether the youth had ever worked for pay outside the home. One continuous variable was the youth’s

hourly wage, the other described the youth's job satisfaction. The job satisfaction score was the sum of seven questions asked about the youth's satisfaction with the social aspects of the job, their compensation, and their career advancement potential. Four of the seven questions were binary, which we coded as zeros and ones. Three of the questions were on a continuous scale, which we rescaled so they varied between one-fourth and one. The individual questions can be found in Appendix B. Finally, we used one binary general life outcome and one continuous general life outcome. We added up five scaled questions to obtain the continuous outcome, which assessed aspects of the student's self-beliefs, in particular their self-esteem and self-efficacy. These questions can be found in Appendix C. The binary outcome described whether the student lived independently, with a spouse or roommate, or in any dormitory, including college housing.

Covariates and auxiliary variables. The covariates and auxiliary variables included demographic information and data related to achievement and aptitude. We took these data primarily from the first wave of NLTS2, which had the highest response rate. We used auxiliary variables only in the missing data model, not the research model. The demographic covariates included household income, gender, age, additional disabilities, and parental education level. NLTS2 surveyors created the cross-instrument dataset, which provided the gender and age variables. Parents reported the other variables in the first wave. We had two continuous variables to covary for achievement and ability level. The first covariate was the average of the six selected subtests of the Woodcock-Johnson III that psychologists administered in the first and second wave of NLTS2. The selected subtests included passage comprehension, the synonym-antonym subtest, calculation, applied problems, social studies, and science. The other covariate estimated the students' average grades, which NLTS2 surveyors reported in the cross-instrument dataset. Auxiliary variables helped correct for missingness but were not used in the primary analysis. The binary variables described whether a student's parent or guardian lived with a partner, and whether a student was ever expelled, suspended, or subject to other serious disciplinary action.

Missing Data Procedure

To make this study as representative as possible, we used multiple imputation to deal with missing data. This is consistent with our prior work (authors names removed for blind review). In multiple imputation, the software predicts missing values of the covariates and independent variables, using every other

variable in the dataset. This is done multiple times, which introduces some amount of randomness to the predicted values; the randomness helps to properly estimate standard errors.

This procedure is only appropriate if the data are missing at random. This assumption states that there is no response bias, conditioning on the other variables in the model. In most practical situations, it's not possible to directly evaluate the validity of this assumption. However, we may add variables to the missing data model to make the assumption more credible (Allison, 2001; Collins, Shafer, & Kam, 2001), which is why we added a few auxiliary variables to the missing data model. Table 1 displays the amount of missing data for independent variables, covariates, and auxiliary variables.

Overall, there was a tolerable amount of missing data for most of the independent variables and covariates, in particular the "participation" and "breadth of involvement" variables, which had 0% and 10% missing data, respectively. The one exception was the Woodcock-Johnson III measure and its interaction with the participation variable, which had 40% missing data. This was partly due to simple attrition; some percentage of students took the test in the second wave of NLTS2. However, part of the attrition was intentional. Trained psychologists had the option of deciding whether to administer the Woodcock-Johnson or an alternative assessment. Unfortunately, this decision-making process does not seem to be transparent to researchers. The NLTS2 documentation states that there was a routing questionnaire, but to our knowledge the routing test wasn't provided in the datasets. This uncertainty is one of the biggest reasons why we employed multiple imputation. Students could be included in this research whether or not they took the Woodcock-Johnson subtests. All the basic demographic covariates, like age, gender, additional disabilities, and parental education level, had no missing data. NLTS2 surveyors were not able to ascertain typical grades or household income for 20% of the sample. Finally, we had complete data on student disciplinary action for the auxiliary variables but lacked data on parent spousal status for 20% of the sample.

Data Analysis Strategy

To correct for the high degree of missingness in the Woodcock-Johnson III subtests, we created 20 imputations in R using the "mice" package (Buuren & Groothuis-Oudshoorn, 2011). Predictive mean matching imputed missing values for most of the dataset, while logistic regression imputed missing values for binary data. After R created the imputations, we used

the “survey” package (Lumley, 2004), which created a survey-corrected imputation list. The *glm* function fit the linear models and, finally, the “mitools” package combined the 20 models to give these statistics. Three sets of linear models were fit, each with four binary and three continuous dependent variables. Taylor linearization corrected for the stratified sampling design. The first set of linear models only included the participation IV. The second set included only the breadth of involvement IV. Finally, the last set of models included the participation IV and its associated interaction terms. Test-wise type I error rates are set at 0.01, and we report only statistically significant results.

Results

Descriptive Statistics

This section provides descriptive statistics for the independent variables, covariates, and auxiliary variables. We first discuss demographics and ability measurements. There seems to be a fair amount of demographic diversity in the sample. About half of the sample was female and about half of the sample had additional disabilities. Household income varied widely: 20% of households had an income greater than \$70,000 annually, and 20% had incomes less than \$20,000 annually. Other demographic data may be found in Table 2.

Descriptive statistics for ability and achievement covariates are also provided. About 40% of the students made mostly A’s and B’s or higher. On average, students scored 77.34 points on the Woodcock-Johnson subtests, with a standard deviation of 19.35 points. More information may be found in Table 3.

About 70% of students participated in some sort of extracurricular activity. Out of all those who did so, 30% participated in only one kind of activity, 20% participated in two different kinds of activities, and about 10% participated in three or more activities. Again, these numbers are rounded to the nearest ten in accordance with IES policy. Finally, we provide some descriptive information about which specific extracurricular activities the students participated in. Recall that we broadly categorized extracurricular activities into six groups; see appendix A for details. Of the roughly 950 students who participated in some type of extracurricular activity, 450 participated in athletics, 330 in a religious youth group, and 180 in a leadership or community group. About 110 students participated in the performing arts, 90 in a knowledge-based group, and 40 were in a disability support group.

Primary Analysis

Overall, none of the interaction terms was significant. We found no evidence to suggest that participating in extracurricular activities interacted with household income, gender, or achievement, as measured by the Woodcock-Johnson III subtests. As such, we discuss the other two sets of linear models. Participating in extracurricular activities significantly predicted independent living ($t[14270] = 3.02, p < 0.01$). Specifically, the odds of living independently were 9.50 times greater for students who participated in extracurricular activities, which is considered a strong effect (Ferguson, 2009; see Table 4 for more details). Table 5 is a contingency table for descriptive purposes. It uses independent living status as an outcome, which was drawn from wave 5 of the dataset, thus around 540 students are accounted for.

Finally, the breadth of involvement variable had a statistically significant impact on postsecondary education enrollment ($t[793] = 2.61, p < 0.01$). Being involved in more than one kind of activity improved the odds of attending postsecondary school by 2.41 times, a mild-to-moderate effect (Ferguson, 2009). More details may be found in Table 6.

Discussion

Predicting the outcomes (including academic success) of DHH students is challenging for several reasons, primarily because the low incidence of the population makes it difficult to locate participants for such studies (Convertino et al., 2009). Moreover, the linguistic, cultural, and educational heterogeneity within the population contribute to statistical variability, making it a challenge to generalize findings across the entire population. Given this, the use of a large-scale longitudinal database like the NLTS2 was promising because it contained representative sample sizes that had the potential to capture variability within the DHH population.

The purpose of this study was to identify which extracurricular activities DHH youth are involved in and further explore the potential predictive relationship between extracurricular involvement in high school and postsecondary outcomes for these youth. Our findings suggest that overall involvement in extracurricular activities significantly predicted only one of our postsecondary outcomes (independent living), but that involvement in more than one activity significantly predicted postsecondary enrollment. Limitations to the study design and implications for future research are discussed below.

Range of Activities in Which DHH Youth Are Involved

Roughly 950 students who are DHH were included in this study. Our descriptive analysis revealed that approximately 450 participated in athletics, 330 participated in a religious youth group, and 180 participated in a leadership or community group. About 110 students participated in the performing arts, 90 were in a knowledge-based group, and 40 were in a disability support group. As discussed earlier, it is not surprising that the largest percentage (slightly less than half) of students who are DHH participated in some form of athletic activity. The percentage of DHH students involved in athletic activities is fairly consistent with findings from Fox, Connolly, and Snyder (2005), who reported that 38.6% of high school seniors were involved in some form of interscholastic or intramural athletic activity. These descriptive findings highlight which activities DHH youth are most involved in and shed light on the activities of most interest to these youth.

Participation in Extracurricular Activities

Of all the outcomes measured in this study, only one was significantly predicted by DHH youth's involvement (participation versus nonparticipation) in any extracurricular activity. Our findings revealed that participation in any extracurricular activity significantly predicted independent living and was considered a strong effect. The value of this analysis is in understanding where extracurricular involvement contributes to the postschool experience of DHH individuals. Our findings may suggest that engaging in extracurricular activities gives DHH youth the opportunity to develop or strengthen important life skills that are transferable to living independently in postsecondary settings. Important life skills such as time management, decision-making, self-advocacy, self-determination, soft social skills, and social navigation are all examples of the transferable life skills DHH youth may develop through their participation in extracurricular activities (National Secondary Transition Technical Assistance Center, 2010). The lack of a significant relationship between overall involvement in extracurricular activities and postsecondary enrollment was a surprise, given the findings of previous studies indicating a significant and positive relationship between extracurricular involvement and academic aspiration and performance (Eccles & Barber, 1999; Eccles et al., 2003; Eccles & Templeton, 2002; Fredricks & Eccles, 2006; Mahoney, Cairns, & Farmer, 2003). Only a few studies found little or no correlation between general extracurricular involvement and any academically oriented outcome (Antshel & Anderman, 2000; Lisella & Serwatka,

1996). This particular finding from our study seems to add to this small collection.

The lack of significance in our findings is influenced to some degree by our choice of methodological designs. As Marsh (1992) comments, the use of regression analyses implicitly assumes that extracurricular involvement is linearly related to postsecondary outcomes. Although we found a lack of significance between overall extracurricular involvement and postsecondary education enrollment, it may be that extracurricular involvement has an indirect effect on these outcomes. In our study, a potential mediator may exist between extracurricular involvement and our outcomes of interest, such as student motivation. Fredericks and Eccles (2006) highlight an important concern in the field that was raised by researchers employing nonexperimental methods; there is likely some motivational construct underlying both involvement in extracurricular activities and outcomes related to academic achievement. It may be that we have failed to capture the true nature of the relationship between our variables of interest. Stinson and Walter (1997) insightfully argue that DHH students' motivation is a particularly important noncognitive predictor of college achievement. Future studies on the predictive ability of extracurricular involvement that account for the impact of student motivation on the postsecondary outcomes of DHH youth are recommended. Future studies would also do well to incorporate a path analytic approach to examine any indirect effects of extracurricular involvement on the postsecondary outcomes of DHH youth.

Breadth of Participation in Extracurricular Activities

In terms of the role breadth of involvement plays in postsecondary outcomes for DHH youth, our findings reveal that participation in more than one extracurricular activity significantly predicted postsecondary enrollment. While this effect was only mild to moderate, it validates the body of research that asserts that involvement in diverse activities is associated with better academic outcomes and enhanced psychosocial functioning (Bartko & Eccles, 2003; Fredericks & Eccles, 2006; Mahoney, Lord, & Carryl, 2005). As Fredericks and Eccles (2006) suggest, participating in a wide range of extracurricular activities gives youth additional opportunities to develop important competencies and exposes them to new experiences and peers. Our findings may also contribute to the body of research that suggests a curvilinear relationship between activity participation and student well-being (Feldman & Matjasko, 2005; Feldman-Farb & Matjasko, 2012; Marsh, 1992). Our findings primarily suggest that

increasing extracurricular participation benefits DHH youth and significantly predicts postsecondary enrollment. However, future studies would do well to include an interaction term to test for the curvilinearity in the relationship between extracurricular involvement and postsecondary outcomes for DHH youth, which would validate those findings more explicitly and extend them to DHH populations.

Limitations

There are several limitations to this study. The NLTS2 is primarily a research tool that provides data across a nationally representative sample of students, including those from low-incidence populations, such as DHH youth. This study is longitudinal, following individuals as they transition from high school to postsecondary opportunities and contexts. As such, this dataset, and this study in particular, is not experimental and is not designed to draw inferences between the experiences of individuals who are DHH and those who are hearing. It was not possible to distinguish which of the students in our sample attended a mainstream setting and which attended a d/Deaf school. This is a major limitation of the study, since no investigation of how this difference impacts extracurricular involvement or our selected outcomes was possible. There is also no appropriate control group within the NLTS2 dataset for DHH individuals that does not assume a disability as a function of their inclusion in the study. While this may be seen as a limitation of the analysis, it does provide discussion that moves away from a deficit perspective or expectation of a normative experience. Most of the current research on this topic is either cross-sectional or correlational and has been based on small-scale samples of convenience with very limited generalizability (Marsh, 1992). Future research is needed to directly address causal connections between extracurricular involvement and various outcome variables, using experimental designs to the greatest extent possible (Gilman et al., 2004). Experimental designs certainly would need to account for other methodological issues that are inherent to the topic of extracurricular involvement. However, the issue of student “self-selection” into extracurricular activities is the biggest methodological challenge all researchers face because of the difficulty in separating any real causal effects from preexisting differences among the study subjects (Marsh, 1992).

Implications for Individuals, Practitioners, and Researchers in the Field

Our study supports the current efforts of educational scholars and youth policy advocates who argue for the provision of extracurricular opportunities in schools and communities that will enable youth to engage in important developmental tasks. Participation in structured, organized, extracurricular activities such as athletics and academic and community clubs supports positive youth development and is a productive use of adolescents’ leisure time (Fredericks & Eccles, 2006). These findings can now be extended to DHH youth because, as our study shows, overall participation in extracurricular activities significantly predicts ability to live independently, while increased participation in extracurricular activities significantly predicts postsecondary enrollment. Policy-makers and educators, particularly those who work directly with DHH youth, should provide ample opportunities for their students to become involved in a variety of extracurricular activities and encourage them to do so.

Specific legal or policy implications of these findings may be found within strategies for improving transition planning for students who are DHH. IDEA requires that youth with individualized education programs begin planning for the transition to college by age 16, and in some cases the process starts as early as age 14. These findings thus encourage transition planners, parents, and teachers to consider the benefits of extracurricular activities for students who need to develop skills that lead to independent living outcomes. The transition planning could address these skills specifically and recommend both academic and extracurricular opportunities. These skills may be related to those used in academic settings, but they can also include those that add to an individual’s employability and to their agency in making decisions for themselves. For SDHH in both mainstream and self-contained settings, extracurricular activities may provide the social interaction and mentorship they can use to develop skills for successful life outcomes.

Conclusion

Our study found that participation in structured school or community extracurricular activities fosters one positive postsecondary outcome: independent living. Our study also found that breadth of participation increases the likelihood of enrollment in postsecondary education. Our study appears to validate other researchers’ findings that participation in extracurricular activities is beneficial to youth, especially DHH youth,

for the opportunities it affords (Eccles & Templeton, 2002). Youth who participate in extracurricular activities are given the chance to solve problems and overcome challenges; to develop skills in the social, academic, and physical domains; to belong to peer groups and establish positive and supportive mentoring networks; and to transfer the skills they acquire to a postsecondary setting. From a developmental perspective, all youth, DHH included, should be given the opportunity to engage in school and community activities, as they promote and foster important and positive adolescent growth.

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Footnote

¹ This was measured with a set of 17 Likert-scale items assessing frequency of participation in activities such as sports, fraternities/sororities, etc. Total scores were obtained by summing individual scores across the 17 items.

Table 1

Missing Data Percentages

Variable	Percentage Missing
Independent Variables	
Participation	0
Breadth of involvement	10
Interaction: Participation*Gender	10
Interaction: Participation*SES	20
Interaction: Participation*WJ	40
Covariates	
Age	0
Gender	0
Presence of additional disabilities	0
Household income	20
Woodcock-Johnson III measure	40
Typical grades	20
Parents highest education level	0
Auxiliary Variables	
Whether child was suspended	0
Whether parent lives with a partner	30

Note. Since these data are individually identifiable, these numbers are rounded to the nearest ten, in accordance with IES policy.

Table 2

Participant Demographics

Variable	Percentage
Covariates	
Youth is female	50
Age (as of 2002)	
14	20
15	20
16	20
17	30
18	10
Has additional disability	50
Yearly household income	
\$20,000 or less	20
\$20,001-\$30,000	20
\$30,001-\$40,000	10
\$40,001-\$50,000	10
\$50,001-\$60,000	10
\$60,000-\$70,000	10
\$70,001 or more	20
Parents highest education level	
No GED/High school diploma	20
GED/High school diploma only	30
Some postsecondary education	10
Vocational degree	<10
Associate's degree	10
Bachelor's degree	10
Some graduate work	<10
Graduate degree	10
Auxiliary variables	
Parent has a partner living in the home	90
Student subject to disciplinary action	30

Note. These numbers are rounded to the nearest ten, in accordance with IES policy.

Table 3

Ability Covariates

Students' Grades Are...	Percentage	
Mostly D's or below	<10	
Mostly C's and D's	10	
Mostly C's	10	
Mostly B's and C's	30	
Mostly B's	10	
Mostly A's and B's	30	
Mostly A's	10	
Woodcock-Johnson III subtests: Standard-score*	Average score	Std dev
Grand mean	77.34	19.35

Note. Because NLTS2 provides individually identifiable data, the percentages reported here are rounded to the nearest ten, in accordance with IES policy.

Table 4

Logistic Regression Results for Independent Living

Variable	Odds Ratio Estimate	<i>t</i> -statistic	<i>p</i> -value	Odds Ratio 95% Confidence Interval	
Extracurricular Participation	9.50	3.03	0.0025*	2.21	40.92
Parent education	1.01	0.04	0.9681	0.75	1.35
Household income	0.95	-0.63	0.5312	0.82	1.11
Presence of additional disabilities	0.46	-1.47	0.1400	0.16	1.29
Woodcock-Johnson III score (standardized)	1.05	1.75	0.0824	0.99	1.10
Typical grades	0.86	-0.76	0.4460	0.58	1.27
Youth is female	0.89	0.66	0.8297	0.30	2.63
Youth's age	0.90	0.42	0.7356	0.49	1.65

Note. * $p < .01$

Table 5

Contingency Table: Student Extracurricular Participation and Independent Living Status

Independent Living	Extracurricular Participation	
	Did not participate	Participated
No	110	30
Yes	240	200

Table 6

Logistic Regression Results for Postsecondary Enrollment

Variable	Odds Ratio Estimate	<i>t</i> -statistic	<i>p</i> -value	Odds Ratio 95% Confidence interval	
Breadth of involvement	2.41	2.61	0.0094*	1.24	4.69
Parent education	1.40	1.74	0.0818	0.96	2.05
Household income	1.01	0.11	0.9117	0.85	1.20
Presence of additional disabilities	0.22	1.97	0.0500	0.05	1.00
Woodcock-Johnson III score (standardized)	1.10	3.23	0.0016*	1.04	1.17
Typical grades	1.41	2.03	0.0426	1.01	1.98
Youth is female	2.04	1.09	0.2755	0.57	7.33
Youth's age		1.42	0.1574	0.84	

Note. * $p < .01$

Appendix A

Categorizing Extracurricular Activities

Category	Category includes...	Variable names
Leadership & community groups	Scouting groups YMCA/YWCA/JCC/Boys-Girls club 4-H club Student Government Volunteer service Group Cultural Affinity Group Leadership/Group Development club	np1F5_01 np1F5_03 np1F5_06 np1F5_09 np1F5_11 np1F5_13 np1F5_15
Knowledge-based groups	Special interest clubs School subject matter club Homework club Vocational club	np1F5_07 np1F5_10 np1F5_14 np1F5_16
Religious youth groups	Religious youth groups	np1F5_02
Disability-related groups	Disability-oriented support group	np1F5_12
Athletics	Sports team Special Olympics	np1F5_04 np1F5_05
Performing arts	Performing group	np1F5_08

Appendix B

The Job Satisfaction Score

Prompt	Scale
Youth thinks he/she has opportunities to work his/or her way up	Binary
Youth thinks he/she is paid pretty well for his or her work	Binary
Youth thinks he/she is treated pretty well by others at work	Binary
Youth thinks his or her education is being put to good use	Binary
How well youth gets/got along with co-workers at current or most recent job	Likert 1-4
How well youth gets/got along with boss at current or most recent job	Likert 1-4
How well youth usually likes/liked his/her current or most recent job	Likert 1-4

Appendix C

The Self-Beliefs Score

Prompt	Scale
Youth identification with statement: you know how to get the information you need	Likert 1-3
Youth identification with: you can handle most things that come your way	Likert 1-3
Youth identification with statement: you are proud of who you are	Likert 1-3
Youth identification with statement: you feel useful and important	Likert 1-3
Youth identification with: You feel your life is full of interesting things to do	Likert 1-3

From Assessment to Action: Identifying Progress Toward Enhanced Accessibility and Campus Climate (Practice Brief)

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Abstract

In 2013, a focus group of administrators, faculty, staff, and students at Skidmore College was held to discuss cross-campus changes implemented following the Assessment of Campus Climate to Enhance Student Success survey and an external disability services audit, which were conducted during the 2008-2009 academic year. The focus group gave these campus constituents an opportunity to both gauge progress and identify areas of continuing need in serving the college's students with disabilities. The participants identified changes in policies, procedures, and services, and in the level of awareness and attention given to the needs of students with disabilities at the departmental and institutional levels. This practice brief describes the implementation of this focus group and reviews cross-campus initiatives implemented between 2009 and 2013, as identified by the respondents. Three themes emerged from the focus group responses: enhanced communication and coordination, increased awareness and receptivity, and areas needing further development.

Keywords: *Campus climate, disability services, focus group, college students with disabilities*

Literature Review

As of 2009, approximately 11% of all students enrolled at U.S. postsecondary education institutions reported having a disability (Korbel, Lucia, Wenzel, & Anderson, 2011; Snyder & Dillow, 2013). While legal mandates such as Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act have increased access to postsecondary education for individuals with disabilities, access alone cannot guarantee that these students will be afforded full participation or inclusion in the campus environment (Belch, 2011; Meade, 2006). As the need for individualized support continues to increase beyond accommodations in the classroom, providing support for students with disabilities has become an imperative responsibility for departments other than college disability services offices (Huger, 2011). Thus it is essential to coordinate institutional efforts to establish

effective support services. This requires faculty, administrators, and staff to go beyond mere compliance with legal mandates to foster a welcoming campus climate (Korbel et al., 2011; Simon, 2011). Campus climate refers to individuals with disabilities' attitudes toward and perceptions of the campus environment, including their evaluation of the institution's support systems and resources, educational and social practices, and the physical environment (Cress, 2008; Huger, 2011).

To establish a welcoming campus climate for students with both documented and undocumented disabilities, university leaders must evaluate the accessibility of their institution's physical, social, organizational, and technological systems and structures (Strange, 2000). Campus climate assessments are one way to evaluate an institution's current effectiveness in meeting the needs of the entire campus population, and the results may provide a catalyst for developing more informed practices and new student support ini-

¹ Albany College of Pharmacy and Health Sciences; ² Skidmore College

tiatives (Stodden, Brown, & Roberts, 2011). However, while it is common practice among higher education institutions to conduct campus climate assessments, there is limited evidence on how the data from these assessments have been used to implement changes in services, policies, and procedures for students with disabilities. This practice brief provides an overview of the progress Skidmore College has made in implementing the recommendations that emerged from disability services and campus climate assessments, specifically those identified and discussed by campus constituencies in a focus group.

Background of Campus Climate and Disability Services Assessment Implementation

With the support of senior administrative leadership, Skidmore College, a small, highly selective liberal arts college in Upstate New York, contracted with the Association on Higher Education and Disability in fall 2008 to conduct the Assessment of Campus Climate to Enhance Student Success (ACCESS) in order to gain a better understanding of the campus climate (see Eilola et al., 2011, for a complete discussion of this process). Recommendations resulting from the ACCESS survey included a need for greater awareness across the campus about the needs of students with disabilities and the accommodations process, stronger relationships between faculty and the school's Office of Disability Services, and the establishment of an Americans with Disabilities Act (ADA) advisory board to implement accessibility initiatives (Eilola et al., 2011). Skidmore College concurrently contracted with an external consultant to audit its disability services program, which was done from October 2008 to March 2009. The audit recommendations included creating an ADA advisory group to implement accessibility and educational initiatives, adopting a formal disability services model, and identifying methods to increase the accessibility of programs and services by making information about the accommodations process more available to the public. These concurrent initiatives prompted conversations across campus departments and facilitated plans to create an enhanced campus experience for students with disabilities.

Discussion of the Problem

In spring 2013, members of the ADA advisory group decided to assess progress made toward satisfying the recommendations from the 2008-2009 audit and survey in terms of policies, procedures, services, and overall awareness within individual departments

and across the campus. The purpose in gathering data more than four years after implementing the two initial initiatives was to formally recognize progress made in implementing the recommendations, promote conversation across constituencies about disability and accessibility, and detect areas of continued need in serving the college's students with disabilities. If the school failed to assess progress and plan future initiatives, the needs of its students with disabilities could go unmet, an issue the ADA advisory group continually works to eradicate.

Strategy for Enrolling Students with Disabilities

Since 2008, the number of students with disabilities enrolled at Skidmore College who registered to receive academic accommodations has steadily increased (Table 1). For example, the number of students who took exams with extended time allowed or in the college's testing room with reduced distractions more than tripled from fall 2009 to fall 2012 (Table 2). The majority of students who registered as having documented disabilities identified themselves as having a learning disability, ADD, or ADHD.

In 2013, members of the college's ADA advisory group decided to conduct a focus group to elicit feedback from school administrators, faculty, staff, and students on progress made toward creating a more inclusive environment for students with disabilities since the 2008-2009 assessments. The administrators selected this over alternative data-collection methods as it enabled campus constituencies to have thoughtful conversations around disability and accessibility issues on campus, in accordance with the ADA advisory group's mission. Administrators from academic advising, academic affairs, residential life, special programs, campus life, the counseling center, student academic services, institutional technology, and library services were invited via e-mail to participate. Those invited to participate were selected based on their involvement in campus services related to ADA concerns. Current students with and without disabilities who had been attending Skidmore College since 2009 were also contacted via e-mail and invited to participate in individual interviews, which asked the same focus group questions but within a confidential environment.

Before starting, participants were given a verbal and written overview of the background, procedures, risks and benefits, confidentiality, and voluntary nature of the focus group. All participants signed an informed consent form to acknowledge their understanding and agreement with the procedures. Each question was then posed (see Appendix), and participants were given time

for open discussion on each topic. The focus group process was documented using an audio-recording device. When the focus group ended, the recording was reviewed and analyzed to identify unique areas of progress and overarching themes in the participants' responses. This involved examining the data in each domain of inquiry (i.e., each interview question) to identify emergent themes across the individual responses. These themes were then reviewed to ensure that they appropriately represented what the interviewees expressed in each domain of inquiry.

Observed Outcomes

Ten individuals representing the areas of academic advising, academic affairs, residential life, special programs, campus life, the counseling center, student academic services, institutional technology, and library services, and one student, participated in the focus group. Three students (two with disabilities and one without) and two administrators (one from academic affairs and one from human resources) who were unable to attend the focus group participated in individual interviews, which were conducted using the focus group questions, as explained above. Three themes emerged from the focus groups and interviews (see Table 3 for quotes corresponding with each theme). These themes included enhanced communication and coordination between and within campus constituencies; increased awareness and receptivity to inclusion and the accommodations process; and the need for more development to create a fully inclusive, accessible campus environment.

Enhanced Communication and Coordination

The ADA advisory group established in 2011 was comprised of administrators, faculty, staff, and students, upon the recommendation of both the ACCESS survey implementation team and the external auditor. The committee's aim was to improve cross-campus communication, address issues of access and ADA compliance, and plan and execute initiatives to improve inclusion and access across the campus. The group chose a shared model of disability services provision, in which responsibility for providing services is distributed among faculty, administrators, and staff. Communication between the Coordinator of Student Access Services (formerly titled coordinator for students with disabilities), the offices of admissions, special programs, and residential life, and the counseling center became more intentional, which resulted in seamless student referrals to the appropriate departments. Anna,* an administrator participant,

noted that the student housing accommodations process had been streamlined when this task was reassigned to the Coordinator of Student Access Services.

The curriculum committee instituted a requirement for faculty to include an academic accommodations statement on all course syllabi. When they registered with the Coordinator of Student Access Services, these statements informed students what course-related accommodations were available. The Office of Academic Advising and the Coordinator of Student Access Services jointly implemented faculty training on how student academic services operated, with an emphasis on serving students with disabilities. They also implemented a training session for new faculty hires on coordinating the delivery of accommodations. New student employees also received training through the Office of Residential Life about the inclusive programming offered in the residence halls. This training was given by administrator respondent Anna and included an explanation of the accommodations statements provided on program flyers. Application materials for special programs and study abroad opportunities were also updated to include information about what accommodation supports were available and the process for requesting them. Student respondent Jane* stated that adding accommodation information to the study abroad application had made coordinating and receiving academic accommodations at an institution abroad a straightforward process.

Physical enhancements to the campus had also been undertaken following the assessments conducted in 2009. A testing room was established by student academic services in 2009, which improved the college's ability to provide appropriate testing accommodations. Faculty respondent Mark* noted that the Office of Student Academic Services saw a steady increase in the number of students who took exams with extended time and/or reduced distractions after the testing room was established, although a relationship between the testing room and the increase in test accommodations used cannot be confirmed without further evaluation (Table 1). Walkways, doorways, and bathroom facilities across the campus were also renovated to improve physical accessibility.

Increased Awareness and Receptivity to Inclusion and the Accommodations Process

The focus group participants noted that an increase in deliberate coordination and communication among the college departments generated greater awareness and receptivity to the need for inclusive practices across the campus. They also said they sensed that the administration had more fully embraced an ethos of

ADA compliance. While additional evaluation would have to be conducted to confirm their responses, the respondents all said they felt a shift on campus toward increased awareness and receptivity relative to the increased coordination of services since the college had started to implement the various initiatives in 2009.

The respondents perceived that employees and students had become better self-advocates and were able to articulate their needs early in the employment process or when registering with the Coordinator of Student Access Services, respectively. According to administrator respondents Mark* and Alyssa,* external factors contributing to the positive changes may have included the evolution of the ADA, high schools' preparation of students with disabilities for the college experience, and more students coming from regions where protection under ADA standards is strictly enforced. Administrators also mentioned recognizing changes in their own attitudes when making accommodation requests on behalf of students, in particular a shift away from an apologetic tone to one of ease.

Need for Future Development for an Inclusive, Accessible Campus Environment

The respondents recognized that all campus constituencies needed additional training. Increased staff training and continued faculty development were considered crucial, as administrator respondent Alyssa noted, especially in methods for effectively meeting the needs of students with particular disabilities. Alyssa also suggested that faculty, administration, staff, and students could benefit from knowing which disabilities were represented on campus in order to provide support for those individuals' unique needs. The Office of Residential Life is currently contemplating offering student leader trainings on using inclusive and "person-first" language. Student respondent Mary* recommended offering more opportunities for all campus community members to participate in dialogues on disability. The student respondents also felt that creating a group specifically for students with disabilities and their allies to discuss needs, challenges, and avenues for social change could be a powerful and supportive resource.

Plans to continue plant renovations are in progress, such as hiring a consultant to evaluate the campus and recommend improvements. The Institutional Technology Office discussed plans to provide a campus accessibility map on the college website, which would enable individuals to identify accessible pathways before visiting the campus, and Academic Affairs expressed interest in providing a resource guide of best practices on the website to support students with disabilities.

Increased coordination and visibility have created workload issues for the Office of Student Access Services located within Student Academic Services. The responsibilities of the Office of Student Access Services have grown considerably in recent years, and additional growth is expected as the needs and number of students with disabilities continue to increase. Additional staffing may be needed to support the Office of Student Access Services. The work of the ADA advisory group will continue to be crucial for planning and effecting change, and the respondents agreed that making the committee better known across campus would benefit its mission and vision.

Implications

The focus group and individual interview participants identified campuswide changes that not only were concrete (e.g., physical and procedural changes) but also could be sensed in the institution's climate. The ACCESS survey and external audit were productive steps that helped campus constituents solidify plans to create greater awareness and enhance accessibility. Ultimately, efforts to change the campus climate since conducting the ACCESS survey and audit were made possible by the attention and efforts of the institution's dedicated faculty, administrators, and staff. Employees of Skidmore College collectively implemented several of the recommendations identified by the assessment and audit, such as establishing an ADA advisory group, holding faculty and student trainings to increase awareness of the needs of students with disabilities and the accommodations process, including an accommodations statement on course syllabi and application documents, adopting a formal disability services model in the selection of a shared model, and increasing cooperation between the Coordinator of Student Access Services and various other departments.

The limitations of this brief include potential personal bias in the participants' responses and possible inhibition about disclosing their observations in a public forum. Participants' responses can only be considered representative of a subset of individuals, not of the entire campus community. The focus group process could be improved by holding multiple sessions to increase the number of respondents and concurrently implementing a quantitative assessment to offer campus constituents multiple ways to report their observations. Moreover, inviting all individuals on campus to participate, rather than targeting select departments, would allow for a wider range of perspectives and greater representation of the entire campus. Despite their limitations, focus groups are a valuable

way of allowing campus constituents who have an interest and stake in meeting the needs of students with disabilities to collectively recognize progress and identify areas where future development is needed. Focus groups can also be reproduced at other institutions, given adequate backing from campus leaders.

Looking ahead, it will be important to provide more training for faculty, staff, and administrators on the principles and implementation of universal design. As “flipped” classrooms (i.e., those where faculty give students class time to apply active learning techniques rather than relying completely on lecturing) become more common, helping faculty adapt their materials to meet universal design standards will become even more necessary. Having a better understanding of faculty needs in this area will inform this work. Finally, assessment of the campus climate using both qualitative and quantitative measures should continue, and those outcomes should be used to improve services and enhance inclusion as part of the ADA advisory group’s charge.

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Authors' Note

The authors would like to thank Sue Layden and Pat Oles from Skidmore College for their comments on previous drafts of this manuscript. Please note that pseudonyms have been used to protect the respondents' identities (indicated by * on first appearance).

Table 1

Number of Students Registered with Student Access Services

Year	Number of Students
2005-2006	126
2006-2007	131
2007-2008	145
2008-2009	173
2009-2010	197
2010-2011	210
2011-2012	231
2012-2013	234

Table 2

Testing Room Use Since Established

Academic Term	Number of Exams Given
2009-2010	124
2010-2011	208
2011-2012	317
2012-2013	350
2013-2014	590

Table 3

Themes and Illustrative Quotes

Theme	Response	Respondent
1. Enhanced Communication and Coordination	<p>“This past June, we shifted the chair of the [housing accommodations] process to the [Coordinator of Student Access Services position]... Streamlining that process has made it easier for students to engage with the person who is the expert in that area. I think for family, many students who are seeking housing accommodations are also seeking classroom accommodations, so having that in one place has really helped.”</p>	Administrator, Anna*
	<p>“Overall I feel the shift from 2008 or prior...We really feel like we have an advocate and someone we could go to with questions that we previously didn’t have.”</p>	Administrator, Rita*
	<p>“Ever since I was a freshman, they had the [testing] room in Student Academic Services...I like the fact that there is a physical location for support.”</p>	Student, Jane*
	<p>“At the beginning of class, professors will bring up if you have any disability needs or concerns, please come talk to me, and they put it on the syllabus.”</p>	Student, Mary*
	<p>“Students used to come up to faculty the day of the exam... but because of the work you are doing with students early on, that is being reduced. With the statement in the syllabi and students being aware and understanding their responsibilities, that has changed a lot.”</p>	Faculty, Leslie*
2. Increased Awareness and Receptivity to Inclusion and the Accommodations Process	<p>“The other [change] in the area of Academic Affairs along with faculty has been the increase in the ADA statement on syllabi, and the work that has been done by the Curriculum Committee to encourage all faculty to include that on all of their syllabi.”</p>	Faculty, Mark*
	<p>“I’m not apologizing when I come with requests... We have a lot of students in the summer with diet restrictions. If we do need an accommodation, it’s not a problem...Everybody’s attitude really seems more supportive.”</p>	Administrator, Anna*
	<p>“I definitely think there is a change from freshman year...Going to professors, I didn’t feel really stigmatized at all for it...it’s something I need and I felt like they understood.”</p>	Student, Jane*
	<p>“Once the testing room was established, we saw slow but steady increase in the use of that testing room from students and faculty.”</p>	Administrator, Mark*

(Table 3, continued)

3. Needs for Future Development for an Inclusive, Accessible Campus Environment	“If there was some outlet...for people who would like to talk about their experiences...if they want to share. I feel like that would have been helpful for me early on.”	Student, Mary*
	“I still think there is some confusion around how to work with students with particular disabilities...Some targeted work with faculty and staff around those issues would be really important.”	Administrator, Alyssa*
	“One concern that I have...there is only one person in this position [of Coordinator for Student Access Services]...and we need to continue to look at staffing and support in this area.”	Faculty, Marla*
	“I don’t think that the campus community is fully aware the ADA committee exists and what it’s working on...As a part of the awareness effort, it could include the committee itself.”	Administrator, Mark*

Appendix

Focus Group and Interview Discussion Questions

1. In what ways have policy, procedures, and/or services in your department/area changed relative to the inclusion of students with disabilities or sensitivity to ADA compliance standards since the Assessment of Campus Climate to Enhance Student Success (ACCESS) survey that was conducted in fall 2008?
2. If applicable, in what ways have you recognized an increase in overall awareness of students with disabilities and access issues among administration, staff, faculty, and students since ACCESS was conducted?
3. In what way(s) do you feel your area and the overall campus need to further progress in regard to inclusiveness and accessibility?

The Guide to Assisting Students with Disabilities: Equal Access in Health Science and Professional Education (Book Review)

Lisa M. Meeks & Neera R. Jain
New York: Springer, 2015
240 pages, \$65 (Paperback).

Reviewed by Kate Link ¹

As a disability services educator, I can say with some certainty that many in my field have felt stressed when addressing a situation that a student with a disability felt was an emergency. Disability services educators must consider numerous layers before suggesting a reasonable accommodation—patient safety, technical standards, confidentiality, and assistive technology available—which makes it highly challenging to accommodate students with disabilities who are studying the health sciences. Emergencies can take on a new meaning for these students, since they may occur inside or outside the classroom setting. This also can make accommodating their needs more complex. *The Guide to Assisting Students with Disabilities: Equal Access in Health Science and Professional Education*, edited by Lisa Meeks and Neera Jain, offers a lifeline to disability services educators who are navigating the health sciences. This well-written and thorough approach to determining reasonable accommodations for students with disabilities who are studying in this field offers ideas on what accommodations are appropriate and how to implement them in the classroom and in clinical settings.

Because college campuses differ, Meeks and Jain begin the book with an in-depth analysis of what resources are available on which college campuses to help guide students with disabilities and the professionals who work with them. It helps readers learn, for example, that Title IX complaints go to one campus office and disability discrimination cases to another. By providing such an overview, the editors help fill gaps in the reader's professional knowledge, rather than overwhelming them with unnecessary information. The editors then discuss disability law, a disability services

provider's bread and butter, and how those laws are applied in determining which academic and clinical accommodations are reasonable and appropriate.

As a person with an adverse reaction to all things science and math, I avoided taking chemistry, biology, and any other laboratory courses while in college. Because of my lack of knowledge and experience in these areas, I am sometimes at a loss when interacting with students with disabilities who are studying the health sciences. Reading chapter 4 of *The Guide* gave me a better understanding of how accommodations operate in these classrooms and clinical settings, and also helped me realize that each student needs to be assessed individually.

All health sciences students have some required clinical rotations and therefore may need additional accommodations to progress through their degree program. While most disability services providers have a firm grasp on the classroom portion of a program or course, they often have no clinical experience because many academic programs do not require it. Therefore, the real-life cases presented throughout chapter 4 were of particular interest to this reader. These tidbits address "what ifs" and special considerations a disability services provider is likely to encounter in the field.

A topic of conversation with many advancing students, regardless of degree program, is certification or licensure exams. Another topic may be how to critically and effectively serve students in need of assistive technology within the health care arena. In an age where technology reigns supreme, there is always something to learn and explore. This book provides an intelligent analysis of both of these topics, which will enable disability services educators to serve health sciences students more efficiently and personally.

Another interesting chapter addresses professionalism in the health fields and how to communicate about one's disability. When, how, or whether to disclose a disability is an important consideration for many students with disabilities: Do I discuss my disability before a flare-up affects my ability to go to work or wait until it is necessary? What language do I use when disclosing my disability? Should I disclose my disability at all? These real-life questions require serious, individualized discussion. Chapter 7 provides individual cases and tips to finding solutions, as well as a highly informative appendix, all of which will help disability services educators support their students' self-advocacy skills development.

¹ University of Wisconsin-Madison

There are not many disability services providers working on college campuses, and many of us are “one-person shops.” Sometimes we need a little extra advice. *The Guide* provides this by addressing some less obvious subjects related to providing disability services in the health sciences. The last few chapters offer help in troubleshooting accommodation concerns, developing critical thinking skills, and debunking myths, and also provide general tips for best practices.

A major strength of this book is the transferability of its ideas across fields of study. While its central focus is to support professionals who are working with students with disabilities who are studying the health sciences, the critical thinking skills this book helps one develop can easily be applied to other college programs and majors. Most disability services providers will tell you that providing accommodations is not a one-person job and that teamwork with campus colleagues is of the utmost importance. After all, every student needs to discuss professionalism in communications to prepare for the workforce or further education, not to mention developing strong self-advocacy skills. Moreover, every faculty member working for an institution of higher learning needs to know the laws applying to reasonable academic accommodations and how those laws maintain the essential nature of a particular program or course.

As a relatively new disability services educator, I found this book reassuring. Most of the best practices suggested throughout the work confirm what I have learned at various conferences, from webinars, and through other professional development opportunities, as well as in conversations with my coworkers, while also providing me with new and helpful information. One of the best things about working in disability services is the wealth of knowledge and expertise shared among colleagues. When we can celebrate that knowledge while using it to improve our work and the lives of our students, we have done our jobs well. By creating *The Guide to Assisting Students with Disabilities: Equal Access in Health Science and Professional Education*, Lisa Meeks and Neera Jain are helping disability service educators do just that. I suggest that all disability services educators read it, not just because it is a good read but because you never know when a student emergency may arise, and it is always best to be prepared when one does.

About the Reviewer

Kate Link received her B.S. from the University of Wisconsin-Madison and M.A. from Ball State University. Her experience includes working as a student affairs professional at Ball State University and a disability service provider at the University of Wisconsin-Platteville. She is currently an Accommodation Specialist with the McBurney Disability Resource Center at the University of Wisconsin-Madison. She can be reached by email at: kate.link@wisc.edu.

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- **Implications and Portability:** Discuss what you have learned thus far and how you could further develop this practice/program in the future. Be honest about any challenges you may have encountered. This transparency enhances the rigor of your reporting. What would you do differently next time to achieve stronger outcomes? Provide a clear description of how and why disability service providers on other campuses should consider adapting your practice/program. Finally, how could your practice be studied by researchers? Identify possible research questions, hypotheses, or potential outcomes that could be studied if you and/or colleagues could expand the practice/program into a research investigation.
- **References:** Use the current APA guidelines to format and proofread your paper prior to submitting it. This includes the proper use of spelling, punctuation and grammar, appropriate use of headers, correct formatting in listing references, and formatting any tables or figures appropriately.

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