# Factors Associated with Educational Completion for Students with Physical Disabilities in Doctor of Physical Therapy Programs

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## Abstract

Since the passing of the Americans with Disabilities Act (ADA) in 1990 many works related to the ADA and how higher education programs comply with the ADA have been published. However, few studies have investigated the factors associated with educational completion for students with physical disabilities (SWPD) in physical therapist programs. The purpose of this study was to explore the institutional context of where and how education for SWPD occurs and to learn more about factors associated with educational completion for SWPD in physical therapist programs. A conceptual framework was developed based on known educational scholars and on theories specific to the disability community. From the framework, a one-phase convergent approach consisting of a single data collection phase with both a quantitative and a qualitative component was conducted. Data were collected, analyzed separately, and then integrated to enhance the comprehensiveness of the findings. Results provide insight into the current demographics of SWPD in physical therapist education, including the relationship between technical standards, accommodations, disability resource offices, and institutional classification on SWPD with admission and completion. Supports and barriers related to SWPD were identified and can be applied across physical therapist programs. Implications for other health professional programs, ongoing research opportunities, and practice recommendations are detailed.


*Keywords*: Higher Education, Disability, Physical Therapy

Table of Contents

List of Tables

List of Figures

# Chapter 1

## Introduction and Overview

In 2020 the American Physical Therapy Association's (APTA) House of Delegates voted to amend the definition of underrepresented minority populations in physical therapy education to include individuals with disabilities (American Physical Therapy Association, 2020). While this addition is seemingly small, the work faced by the profession to meet the newly adopted definition is complex (Sharp & Herrman, 2021). A physical therapist is an individual who, by understanding movement, integrates prescribed exercise, patient education, and hands-on care to restore function, prevent disability, and to optimize the health and wellbeing of individuals across the lifespan (*American Physical Therapy Association*, 2019). Physical therapy is dynamic in skill requirement and offers broad practice opportunities for those licensed to deliver care. In many respects, physical therapists fill a stereotypical societal role, one often filled with images of fit, able-bodied individuals, natural athletes, and gifted academicians. When the APTA amended the minority definition to include those with disabilities, the profession was left without answers, guidance, or clarity on what can be done to shift the stereotypical image of a physical therapist into one that includes individuals with disabilities, particularly those with visible (physical) disabilities. Disability can be defined as visible (physical) or hidden (cognitive or psychological), and broad definitions of disability are reported in the literature. For the purposes of this paper, the focus is on individuals with visible or physical disabilities. Examples include amputation, upper or lower extremity weakness, or mobility limitation which requires the use of external support (i.e., wheelchair, cane, walker, or crutches), as well as vision or hearing loss.

Similar definitions of visible disability have been used in physical therapy literature (Hinman et al., 2012).

In considering a pathway into the profession for those with physical disabilities, one must first understand an important step, which occurs prior to professional licensure, that of training. The only degree available to those seeking to become physical therapists in the United States is the Doctor of Physical Therapy degree. Therefore, physical therapist education occurs exclusively in professional graduate programs. Within the United States, few individuals with disabilities are successfully accessing and completing graduate training to become physical therapists. While typical graduate programs report eleven percent of the student body is made up of students with physical disabilities, limited data on physical therapist programs indicate only five percent of enrolled students have physical disabilities (Hinman et al., 2012; Lehmann & Morgan, 2019). The number of individuals who successfully complete these programs is unknown. The Americans with Disabilities Act (ADA) was designed to ensure equal access for qualified individuals to institutions of higher education. In the 30 years since ADA implementation, however, representation of those with disabilities remains low as compared to the numbers of those with a disability in society (Okoro et al., 2018). This is particularly true for health professions like physical therapy.

Educational access and completion for students with a physical disability (SWPD) are multifaceted. A 2016 report published by World Physiotherapy, previously World Confederation for Physical Therapy (WCPT), provided summary recommendations on access to education and practice for those with disabilities based on survey results from international WCPT member organizations (World Physiotherapy, 2016). Barriers to

physical therapist education for those with disabilities identified by WCPT include: under-estimation of potential, negative attitudes in society, discriminatory practices, lack of urgency to change institutional policies, lack of knowledge and resources for reasonable accommodations, and the inability to identify specific professional practice requirements (World Physiotherapy, 2016). One common requirement specific to physical therapist programs relates to technical standards for matriculation. Technical standards are the non-cognitive skills and abilities determined to be fundamental for admission, promotion, and graduation from a given health professions program (Meeks & Jain, 2016). Accommodations refer to external supports used to facilitate academic success, often coordinated through campus-based disability service offices (Meeks & Jain, 2016). There is an interplay between technical standards and available accommodations for those with disabilities within a given institution. Technical standards are commonly misunderstood and have been cited as barriers to the admission and retention of students with disabilities in healthcare programs, including programs in physical therapy (Hinman et al., 2012; Marks & Ailey, 2014; Matt et al., 2012). While other professions have taken steps to standardize and update their technical standards (Marks & Ailey, 2014; Matt et al., 2012), physical therapy has yet to realize this as a relevant action item. Technical standards themselves are just one component of a complex issue. Profession-based awareness, implicit reactions or ideas related to the ability of a student with a physical disability (SWPD) to successfully participate in and complete educational training, can be better understood through assessment (Sharp & Herrman, 2021).

## Background and Contextual Significance

During the past decades, higher education institutions have expanded in size, in number, and have increased the types of campus-based services available to students. From technology to student support services, higher education has demonstrated an ability to enact change. While many changes in higher education apply to every student on every campus of every institution, few of these changes are directly related to sweeping national policies and legal regulations specific to a subset of the population, students with disabilities. The next section of this paper will review the initial development of the ADA and subsequent changes in higher education settings because of the enacted policy.

### History and Development of the Americans with Disabilities Act

The earliest policies related to individuals with disabilities date back to the middle of the 19th century and are said to be in response to the calls for increased education associated with the end of the industrial revolution (Pfeiffer, 1993). Early on, disabled individuals were referred to as "feebleminded" and restricted from marriage, procreation, and education (Pfeiffer, 1993). These stigmatizing limitations eventually led to the disability movement and the development of disability policies, which serve to protect the rights of disabled individuals. A variety of sources refer to the Rehabilitation Act of 1973, Section 504, when defining the term disabled and in identifying which individuals are protected under this Act given a qualifying disability (L. B. Kezar et al., 2019; Pfeiffer, 1993; Rhodes et al., 1999). The Rehabilitation Act protects disabled persons from discrimination in programs, which receive federal funding (Pfeiffer, 1993). In 1990, the ADA was passed. Broadly defined, the ADA is a civil rights law prohibiting

discrimination and ensuring equal rights for those with disabilities across a number of different areas, including public or private entities which receive federal funding (ADA National Network, 2020). With the passing of the ADA, and through the associated ADA Title sections, institutions are accountable to ensure discriminatory practices for admission and access do not impede individuals with disabilities from receiving an education (ADA Homepage, 2019). The ADA was based on previous civil rights work related to employment referred to as the Rehabilitation Act of 1973 (ADA National Network, 2020). Within the ADA, specific actions or accommodations educational institutions must take to enhance opportunities and decrease barriers to all individuals seeking educational advancement are included (Rhodes et al., 1999). Title II of the ADA covers public institutions of higher education given their connection to funding from states (Essex-Sorlie, 1994a). Although private institutions are not state funded, they too are impacted by the ADA. Under Title III, private institutions are considered places of public accommodation or commerce, whereby commerce includes educational settings (Essex-Sorlie, 1994a).

**ADA Policy Implications for Higher Education**

When the ADA was developed and passed, it was regarded as a significant policy, one on the heels of activism within the disability movement (Gostin, 2015; Pfeiffer, 1993). Such activism helped to facilitate not only the ADA, but also identified the importance of involving those with disabilities in planning, policy development, and highlighted the role of accommodations in providing equal access (Gostin, 2015). Soon after the ADA was enacted, there was a period of backlash related to the documentation of disability and how individuals were accommodated (Madaus, 2011). Part of the

backlash was related to fear over the cost of implementation of accommodations into educational settings and over how individuals were considered disabled under the law (Madaus, 2011). Eventually, these concerns impacted how the ADA was interpreted (Madaus, 2011). Resultant amendments to the ADA were passed in 2008 and enacted on January 1, 2009 (Public Law 110 – 233 110th Congress An Act, 2008). The 2008 amendments clarified who was considered disabled under the law. This was a direct response to a number of court cases in the previous years (L. B. Kezar et al., 2019).

Clarified definitions on who is or is not considered disabled, and greater awareness of available accommodations to increase educational access resulted in more students with disabilities on college campuses (Madaus, 2011). To meet the needs of these students, colleges and universities began to add services and professional staff (Rothstein, 2009). New offices for student services were created and experts in disability access became important contributors to academic settings. These disability professionals help to coordinate and facilitate documentation of disabilities, and to implement necessary student services (Rothstein, 2009). Sufficiently summarizing the breadth of student services managed by modern day disability professionals is difficult. Categories of support include: determining and providing accommodations, consulting and training faculty or staff on disability access for students, and identifying then eliminating access barriers (Thompson, 2018). By design, accommodations are intended to facilitate student success in the academic setting by neutralizing disability stigma (Horkey, 2019). There are numerous accommodations a disability professional might suggest for student support. Examples include extended testing time, interpreters, note-takers, voice

amplifiers, accessible furniture, Braille graphics, print to audio translation, or the use of emotional support animals, among others (Thompson, 2018).

**Higher Education Adaptations to the ADA**

Changes were necessary to facilitate ADA compliance across college campuses. The policy impacted the accessibility of spaces and specifically outlined the importance of colleges supporting students through classroom accommodations. The ADA increased the number of students with disabilities on college campuses and pushed colleges and universities to add services and professional staff (Rothstein, 2009). Initially, states of panic over how institutions would pay for the needed student accommodations and how faculty would learn to understand disability issues ensued (Madaus, 2011). Fortunately, campuses quickly adapted to support increasing numbers of disabled learners. In 1978, it was reported only three percent of college students were disabled, while eleven percent of undergraduates reported a disability in 2007-2008 (Madaus, 2011). Over time new offices for student services were created to ensure ADA compliance. Experts in disability access known as disability resource professionals were increasingly important contributors to academic settings. One example of the growing professionalization of disability-related student services area relates to the establishment of the Association on Higher Education and Disability (AHEAD). AHEAD held its first conference in 1977 with a total of 32 attendees. By 2010 more than 2,500 people attended (Madaus, 2011). AHEAD establishes professional guidelines, ethical standards, and moves the profession of disability support services forward (Madaus, 2011). In a historical summary on the impact of ADA legislation, Madaus (2011) makes the correlation between the field of universal design and higher education. While initially an architectural field, universal

design became relevant to disability services as colleges sought to comprehensively meet the needs of a broad base of disabled learners (Madaus, 2011).

Today, disability professionals and support offices are integral student support services on college campuses. If an institution employs fifteen employees or more they are required to have an identified ADA coordinator, someone who aids in the facilitation and implementation of accommodations in compliance with known disability law (Meeks & Jain, 2016). Disability professionals coordinate and facilitate documentation of disabilities and implementation of necessary services (Rothstein, 2009). Additional offices and officers who help with ADA compliance include: Equal Employment Opportunity (EEO) office, Title IX coordinator, Risk Management office, and the Office of General Counsel (Meeks & Jain, 2016). Beyond the classroom, disability professionals, particularly those who work with health professions programs, assist in the development of accommodations for clinical internships. Accommodations for internships improve access across a variety of internship settings including hospitals, outpatient clinics or long-term rehabilitation centers. Depending on the nature of the educational program, technical standards, and the context of the clinical internship, disability professionals will work to maximize access for learners using accommodations. Both technical standards and accommodations will be detailed later in this paper.

**Current Landscape of Professional Program Standards and the ADA**

Extending the application of the ADA to higher education settings, this section provides context specific to health professions programs which, given their technical standards, have unique performance expectations. This is due, in part, to the post-education transition to professional practice as a licensed provider. Therefore, some

clarification is worth providing. One such clarification is that ADA policy in educational settings applies *only* to academic programs. While the policy does extend to clinical internships associated with an educational program, it *does not extend* to future employment. This means that the ADA does not require programs to consider whether an individual can successfully work in the career for which they are trained. In the admission of a student with a disability, an educational program can only consider whether the student can meet school requirements, post-graduation employability is irrelevant (Meeks & Jain, 2016). Two terms are used to differentiate between these two areas (educational success and career success): *technical standards* and *essential functions*, respectively. Understandably, programs may struggle to mitigate unrest about providing an education to a student who may never be eligible for a career in their area of study. This is of particular concern given the current cost of education, however, beyond the intended goal of this line of inquiry. In the next sections of this paper technical standards related to professional training programs and the relationship between these standards and disability offices will be described in greater detail.

The expansion of disability offices on campuses has resulted in greater assistance to both students with disabilities and faculty or staff within professional programs to help plan for and accommodate efficiently and effectively. As such, in coordination with disability office professionals, professions are regularly adapting and implementing ADA policy into their educational programs. This has progressed over time in many ways. Medical training programs are often larger in number and resources than other programs. Often, trends in practice seem to begin in medical schools and then trickle down to other related fields. An important set of recommendations for ADA adaptations has been

described in medical-school specific literature. Table 1.1 identifies guidelines written for medical programs, yet are relevant to other programs in the health professions:

**Table 1.1** ADA Guidelines for Medical Programs (Essex-Sorlie, 1994b)

| |
|---|
| 1. develop policies and procedures related to applicants with disabilities needing accommodations or current students requesting accommodations |
| 2. identify a departmental point person who can coordinate and oversee ADA implementation within the training program |
| 3. ensure an appropriate assessment team can interpret accommodation requests |
| 4. collect resources on the most common disabilities to facilitate the decision-making process |
| 5. identify the skills and abilities necessary for admission and participation in the educational program (technical standards) |
| 6. identify the same functions established in recommendation five for every stage of medical training |
| 7. regularly review application, admission, and interview processes to ensure ADA compliance |
| 8. establish an appropriate chain of communication regarding accommodation needs within the training program |
| 9. ensure those who are giving applicant interviews for admission have been trained in ADA regulations |
| 10. establish a technical standards committee to collectively identify whether a given disability can be accommodated without risking safety or health risk for a client |
| 11. develop and implement a problem-solving approach for student accommodations |
| 12. ensure recordkeeping and sharing practices are in accordance with ADA requirements |
| 13. consider instituting dispute resolution processes and working with these professionals in the event agreement across parties cannot be achieved |
| 14. educate administrators, staff, and faculty on the ADA, noting the role of each |
| 15. involve legal counsel in the development of policies and standards |

Among the fifteen items are fundamental examples of ways health professions programs are not only required to engage with ADA policy, but also points to where these programs have the potential to regularly assess and modify program policies to maximize compliance. For example, number five relates to technical standards while numbers ten and eleven relate to accommodations. With advances in technology and increased availability of disability professionals, health professions programs, according to the

medical education recommendations, can maximally improve compliance with the ADA through regular review and changes in these areas, thereby positively impacting students with disabilities.

The field of nursing has made important contributions to our understanding of practices that support students with disabilities. For example, in a 2019 study assessing the implementation of accommodations into clinical nursing practice, the author highlighted the importance of faculty and staff understanding of accommodations (Horkey, 2019). The results of the study affirmed the need for clear policies, procedures, and emphasized the positive role disability officers have in supporting students and programs alike (Horkey, 2019). According to the authors, current practice, regardless of the educational program, should involve professional support offices, which can facilitate accommodations from development to implementation (Horkey, 2019). This is important due to the diverse settings where learning associated with professional programs must occur. Disability professionals are trained to accommodate learners in the didactic, lab, and clinical environments (Meeks & Jain, 2016). They are also trained to assess whether a requested accommodation is in fact reasonable or appropriate for a given profession and associated scenario or setting (Meeks & Jain, 2016).

A particularly challenging issue is the interpretation of what types of accommodations can be applied. Within the ADA language, accommodations are supposed to be used if they are considered reasonable, yet the word “reasonable” has been questioned as there is potential variability in the interpretation of what is or is not reasonable (Masinter, 2015). When a student requests an accommodation the educational program must determine whether the request is reasonable. Masinter (2015) contends that

accommodations should focus on the accommodation request, whether the request is necessary, and if it would fundamentally modify or alter the educational program, not on the way a task is performed. The central principle is that programs must carefully attend to the development of technical standards and work closely with disability professionals to design accommodations maximizing access while maintaining program requirements. With the inherent subjectivity in interpreting an accommodation request, some risk in limiting access may exist. This risk is primarily in cases where too much emphasis is placed on how a task is completed rather than whether the task was completed or not. With this in mind, programs can work to develop technical standards and accommodations that increase, not block those with disabilities from succeeding in a professional healthcare program (Blacklock & Montgomery, 2016; Meeks & Jain, 2016). Once developed, technical standards should be regularly reviewed and updated to maximize access (L. B. Kezar et al., 2019). The presence of and collaboration with disability professionals serves to enhance access and program compliance with ADA policy standards by providing an additional lens in the assessment of what is or is not reasonable.

A similar collaboration between educators and disability professionals can be utilized to develop accommodations for clinical internships. Within these clinical settings (i.e., hospitals, outpatient clinics, nursing homes, and others), additional factors related to off-campus facilities and staff external to the university setting must be considered. Among these factors, clinical staff who supervise and work with students were identified in one study as the most significant external factor in the accommodation process (Horkey, 2019). Clinical partners are those sites where off-campus training occurs, with

the term partner referring to sites and site staff that are regularly used for internships, those who are familiar with having University trainees on-site. Even though clinical partners are familiar with students, it is up to the educational programs to provide accommodation information. It is then up to the clinical site to determine what is reasonable for their setting. Universities must consider what is available in the clinical setting and whether or not appropriate supports exist when deciding how to best arrange an internship for a learner with a disability and an accommodation need (Rothstein, 2009). Likewise, clinical partners must weigh patient safety and resources on-site to aid in implementing student learner accommodations. Before sending students to a given clinical site programs must collaborate with the site to effectively communicate needed accommodations and identify who will pay for those accommodations, where applicable (Rothstein, 2009). Disability offices can provide language recommendations to aide in communication with clinical sites, as well as formal letters outlining the rationale and type of recommended accommodations for a given student (Meeks & Jain, 2016) while programs and clinical sites will need to coordinate for the application of the accommodations. Examples of clinical accommodations will vary depending on the training program and partner institution.

With regard to clinical settings, students have identified that collaboration between clinical sites and academic programs is an important component of the accommodation process (Horkey, 2019). Sharing technical standards of the program and proactively addressing any questions about accommodations will help to facilitate a successful transition from the classroom to the clinical environment. Collaboration and support from institutions for learners in the clinical setting is of particular importance. A

white paper on the inclusion of individuals with disabilities in nursing education programs identified clinical practitioners within healthcare fields as barriers for students to enter those fields (Marks & Ailey, 2014). Part of these identified barriers were related to misconceptions of ability of disabled nurses to safely practice, while others relate to negative attitudes of peers, and lack of support from employers in the development and implementation of accommodations (Marks & Ailey, 2014). Clinical practice is a requirement of professional training programs in healthcare; therefore these practitioners need education and an understanding of accommodations.

Beyond accommodations, practitioners must be attuned to the messages that they may be sending to students with disabilities. Individuals with disabilities have reported feeling stigmatized by reactions of others in relation to their disabilities, particularly those who work in healthcare, with some reporting that reactions of others about their disabilities are worse than the disabilities themselves (Marks & Ailey, 2014). If a profession is unable to embrace a diverse student body, they risk perpetuating stigma and negatively impacting healthcare outcomes. Part of this perpetuation may be tied to the presence of technical standards within these training programs.

## Gaps in the Literature

Many works related to the ADA and how professional programs comply with the ADA have been published in journals, white papers, and in the form of professional position papers. However, few studies have investigated the factors associated with educational completion for SWPD in physical therapist programs. In accessing literature from medicine, nursing, occupational therapy, physical therapy, in reviewing law cases, and literature from disability professionals, there are several gaps that merit further

investigation. These gaps can be organized within the context of social or academic factors that relate to SWPD. Social factors include attitudes specific to a certain program and attitudes within a community. Academic factors, specifically resources within an institution or a given clinical setting, include technical standards and available support for the development and implementation of accommodations. Without an understanding of the interplay of social and academic factors as related to SWPD, it is unlikely that the physical therapy profession will be able to effectively support SWPD as intended by law and per the newly adopted APTA House of Delegates definition of underrepresented minority.

## Study Purpose and Research Question

The purpose of this study is to explore the institutional context of where and how education for SWPD occurs and to learn more about factors associated with educational completion for SWPD in physical therapist programs. To best understand this issue within the target population, the following primary research question guides this study:

1. What factors contribute to success for students with physical disabilities who seek a Doctor of Physical Therapy degree?

## Significance of the Study

This study is significant as one of the current issues in the profession is improving diversity, equity, and inclusion (DEI) across all aspects of training and practice. The efforts targeting DEI within physical therapy, though frequently focused on racial and ethnic diversity, represent key pillars of the vision for excellence and relate not only to necessary calls to improve racial and ethnic diversity, but also to better align the profession with the diversity within society (American Council of Academic Physical

Therapy et al., 2021). The important DEI work being done to address racial and ethnic diversity is associated with disability diversity and inclusion, yet far less is known about disability diversity. Outside of position papers or editorials, fewer actionable steps have been taken which speak to DEI for SWPD (Jette, 2022; Sharp & Herrman, 2021). When the APTA amended the definition of underrepresented minority to include those with disabilities, the profession was left without answers, guidance, or clarity on what can be done to improve access to and inclusion in physical therapist education for individuals with disabilities, particularly those with visible (physical) disabilities. My study will ensure that educators and the broader professional community will have data to help inform decisions and improve practices designed to improve disability inclusion.

A more diverse student body serves to enhance the experiences of students in the classroom by improving the level of compassion, understanding, and comfort in working with those with disabilities. Ultimately, educational diversification will empower students as they transition to providers, thereby improving patient care. Increased representation across other areas of diversity in healthcare has been shown to improve the delivery of care and patient outcomes (Anuradha et al., 2021). In medicine, Iezzoni (2016) reported that physicians with disabilities demonstrated a greater understanding of patient needs in practice, including increased need for access to equipment and the clinic's legal obligations in serving a diverse population. Individuals with disabilities have also been reported to enhance the learning environment, benefitting all students in the teaching of compassion and identity formation (Stergiopoulos et al., 2018). These same tenets apply to physical therapy. If the profession is one committed to improving the lives of others,

representation across all areas of diversity will likely result in the same set of improved outcomes.

## Positionality of Researcher

I approach this work as a physical therapist and academician vested in the success of all my students. I identify as able-bodied. While I have worked with many individuals with physical disabilities in practice, I have had only one experience in supporting a student with a known physical disability. My experiences and positionality cannot be removed from my work and serve to bring a perspective of understanding and inquiry to my research process.

# Chapter 2

This study aims to identify factors related to success for students with physical disabilities who seek a Doctor of Physical Therapy degree. To best understand the topic, existing literature will be used to explain the general relationship between social and academic factors related to student success. Theories related to educational persistence, to disability, and unique to physical therapist education are integrated to create a conceptual framework for this study. The subsequent section describes the guiding framework and associated literature. First, literature on persistence for students with disabilities in higher education will be presented. Second, I will review social factors- community and program attitudes- associated with student barriers and success. Finally, academic factors- institution and clinic resources- technical standards and accommodations will be discussed. Together, these factors are important components in addressing the research question.

## Theoretical Framework

This study draws from foundational work by higher education scholar, Vincent Tinto, with additional context added to account for factors specific to SWPD seeking an education in physical therapy. Tinto, applied to my work, is the base, with layers added to ensure sufficient breadth is considered given the paucity of information on my population of interest. Tinto alone is insufficient to support my work. Additional theories and models include those related to how disability is positioned in society and supported with institutional resources, as well as how external factors impact SWPD in higher education. Specifically, the 1975 Model of Institutional Departure by Tinto, the revised 1993 Model, and his work linking classrooms, learning, and persistence ground this study. In his now

well-known Model (of Institutional Departure), Tinto (1975) postulates that student retention is directly associated with how well a student integrates socially and academically into an institution. Tinto (1975, 2016) describes Social Factors including peer interactions, social group participation, or involvement in student groups, and concludes that such social interactions contribute to the desire for a student to engage in their learning. He identifies academic integration as being associated with Academic Factors including overall performance, pedagogy, and intellectual ability (Tinto, 1975, 2016). Tinto (1975, 2016) later expands his initial model to reflect the longitudinal nature of the student experience and the factors thereby impacting them in persisting (Tinto, 2016). The Model of Institutional Departure, in the identification of Social and Academic Factors, as well as the later consideration of the longitudinal experiences of students, relates directly to the experiences of physical therapist students. In part, this is due to the cohort model design of these programs where students spend considerable time together in didactic and lab-based classes, engage regularly with faculty, and then transition to the clinical environment. These experiences, those impacted by social and academic factors, are integral to SWPD in physical therapy classrooms. Stated differently, we cannot view, according to Tinto and others, the student in isolation from their environment (Aljohani, 2016). We cannot either, ignore the role of culture, community, or motivation when considering student decisions to drop out (Guiffrida, 2006). This is one criticism of Tinto.

Although widely recognized, Tinto's work has been criticized, in part due to the lack of recognition of the unique familial and cultural factors which have also been shown to relate to persistence (Guiffrida, 2006). Guiffrida (2006), posited that Academic and Social Integration from Tinto should be called Academic and Social Connection to

emphasize the importance of connection over integration (Guiffrida, 2006). Integration, it has been argued, assumes a likeness and desire to assimilate to a cultural norm, therefore, limiting the applicability of Tinto's theory to more diverse individuals (Guiffrida, 2006). This is an important acknowledgment for SWPD who are diverse and often minoritized, and thus is germane to addressing the research question posed in this study. As such, this study pulls from the important work of Tinto while considering points by Guiffrida (2006).

Guiffrida further proposed changes to Tinto's theory associated with the student themselves and the intrinsic and extrinsic factors each individual brings with them as they prepare to enter the learning environment (Guiffrida, 2006). These are viewed as essential motivators and seen to be unique to each learner while noting that the learners may approach motivation from an individual or collectivist cultural perspective (Guiffrida, 2006). Tinto's model identified types of intrinsic and extrinsic factors but stopped short of formalizing these as pre-entry attributes (Tinto, 1975). Intrinsic to the individual are things like motivation toward goals, resilience, desire to achieve, past experiences, or fear of failure while extrinsic factors can be considered familial support, expectations, prior education, or commitments (Guiffrida, 2006; Tinto, 1975). Applied to this study, Intrinsic and Extrinsic Factors undoubtedly exist prior to physical therapist training and contribute to student experiences during their training. As an example, attitudes of self and attitudes toward those with disabilities experienced by SWPD are Intrinsic and Extrinsic Factors which can be considered pre-entry attributes of a student. They are also essential Social Factors reviewed later in this paper. Each of the factors identified by Tinto were important in the development of my conceptual framework. A visual representation of the

theoretical underpinnings summarized above and applied to this study is presented in the conceptual framework depicted in Figure 2.1.

## Persistence for Students with Disabilities in Higher Education

While literature specific to SWPD in physical therapy education does not currently exist, there are relevant factors identified for learners with disabilities (physical and non-physical) that are relevant to this population. Consistent with Tinto's Model of Institutional Departure, past literature supports that connection within academic and social communities positively contributes to student success for those with disabilities (Kutscher & Tuckwiller, 2019; Wessel et al., 2009). There is a common, unspoken familial bond among physical therapy learners given the cohort model of most programs, therefore, the importance of community cannot be understated. Disclosure of disability, request for and implementation of accommodations into the learning environment are also important considerations for SWPD who navigate institutional communities. Acknowledgment and support at the faculty level have been shown to contribute to persistence for those with disabilities in higher education (Newman et al., 2020; Yssel et al., 2016). Accessible campus supports, whether via disability professionals or advocates within a given program, have also been identified as positive for those with disabilities in higher education (Evans Getzel, 2008).

While the aforementioned factors are related to persistence among SWPD, less clear, is whether these same factors contribute to persistence for SWPD in physical therapist programs. The work by Tinto and additional research related to student departure is conducted with undergraduate students (Aljohani, 2016) Therefore, a gap in the literature specific to graduate and professional learners exists. Also relevant is that

only a fraction of those with disabilities persist to completion in higher education (Newman et al., 2020). Because demographic data on those with disabilities in physical therapist education is not collected at the accreditation or professional association level (APTA), graduation rates and baseline metrics on cohorts across physical therapists' programs are speculative at best.

## Social Factors

Understanding how broader educational and general community attitudes toward those with disabilities relate to the educational experience will be detailed in the next section. This is broadly categorized as "social factors" since it includes the dimensions of attitudes specific to communities and programs. These two contexts are explained below.

### Community Attitudes

Attitudes toward individuals with disabilities first develop within communities. These attitudes can carry weight in society. Therefore, the development of attitudes and the impact of attitudes on SWPD are important. Attitudes in the community related to this study refer to family, friends, clinical internship staff, and the broader society. One way to view the origin of attitudes toward those with disabilities is through the application of different theories which help to frame disability in relation to society. Four such examples are identified below.

#### *Functional Limitations Theory*

This theory emphasizes the limitations of a certain condition and focuses more on the degree of limitations of an individual rather than how the environment itself may be limiting access for someone with a disability (Jones, 1996). Emphasizing limitations inherently points to barriers, rather than facilitating success. With this theory in mind,

members of a society would view those with disabilities as less than capable, only focusing on what an individual cannot do, an attitude based on a negative lens. In the context of the present study, this means that the experience of a SWPD in a physical therapist program would be directly impacted by the held attitudes of those in the community who have learned over time to see them as inferior.

### *Minority Group Paradigm*

This theory contends that participation in one minority group results in a similar set of experiences as participation in another minority group (Jones, 1996). One benefit of this theory is that it suggests there are more considerations than simply the individual, and that the environment and privilege of others are factors to acknowledge. The identification of those with disabilities as a minority group has also been considered a positive consequence of the advocacy observed in the disability rights movement (Hahn, 1985). These social factors help to frame the importance of experiences outside of oneself. In applying minority group status to the disability community, Wertlieb (1985) stated, "The rejection of disabled persons and other minority group members is reflected in the negative attitudes directed toward them" (Wertlieb, 1985, p. 1049). Some, however, consider minority group theory a deficit model which builds on negative stereotypes rather than specifically acknowledging the complex factors impacting those with disabilities, as opposed to minority group barriers experienced by those with and without disabilities (Jones, 1996). In this way, the model perpetuates negative attitudes and "often serves as justification for setting those with disabilities apart from others" (Jones, 1996, p. 350). In the context of doctoral programs in physical therapy, this may

mean that if considered a part of a minority group within a community, negative attitudes may exist and impact the student experience.

### *Social Constructivist Theory*

This theory distinguishes between the biological components of a disability and the limits of the social environment (Asch, 1984). Within this theory larger societal connections begin to unfold, "it is the attitudes and institutions of the non-disabled, even more than the biological characteristics of the disabled, that turn characteristics into handicaps" (Jones, 1996, p. 7). A key to this theory is understanding that the social contract of disability is shaped by those without disabilities. Social constructivist theory helps to illuminate the intersection of society and the individual, rather than focus on the disability itself (Jones, 1996). In this theory rather than seeing the disability as a barrier, the barrier is said to be located in society and dependent upon social constructs (Goodley et al., 2012). This model shifts the deficit-base away from the individual, as is seen in the minority group model, toward society. Again, applied to physical therapist programs, this would suggest not only that community attitudes separate SWPD from able-bodied individuals, but also that community attitudes are a key reason those with disabilities are seen and treated differently, not due to the disability but due to community.

### *Medical Model*

Within the United States, the medical model is the most common model used to frame disability (Roush & Sharby, 2011). The medical model views disability as a defect or failure in the body or in a bodily system, which can be aided by medical intervention (Roush & Sharby, 2011). Although in some ways this theory may help limit stigma by encouraging medical advances, for those with disabilities, it can also be stereotypically

paternalistic and exclusionary (Roush & Sharby, 2011). “When people are portrayed stereotypically as helpless, dependent, and needing care, it can lead to exclusion from participation in many life experiences” (Roush & Sharby, 2011, p. 1717). The medical model is of considerable importance in relation to SWPD in a profession based on medicine such as physical therapy.

The development of attitudes starts long before one joins a profession. Focusing further on health professions, through the lens of the social constructivist and medial models, there is evidence not only of negative attitude development but also an affirmation of negativity within the professions. Professional standards and norms may only serve to reinforce certain stereotypical perspectives. Viewpoints toward those with disabilities in the medical and rehabilitation professions have been reported to contribute to negative stigma beyond their respective professions into society as a whole (Roush & Sharby, 2011). Because of the broad reach medical professions have in society, the negative frame from which medical professionals often approach those with disabilities has been highlighted as an important growth area needed for modern-day health professions training programs (Liasidou & Mavrou, 2017; Paris, 1993). The medical model helps inform the exploration of social factors related to the persistence for SWPD.

One key study in physical therapy illustrates the power of these negative frames in discouraging participation among professionals with disabilities. Specifically, a 2005 interpretive phenomenological study sought to learn about the impact of attitudes toward visually impaired physiotherapists[1] seeking employment in the United Kingdom. Six physiotherapists with visual impairments participated in the study whereby semi-

[1] Physiotherapist(s) is the term used to describe physical therapists outside of the United States.

structured interviews were employed. Attitudinal impact, including lack of profession-based peers with disabilities (limited ability to see themselves within the profession), negative societal attitudes about their potential as physiotherapists, and the presence of a lifelong stigma related to the presence of a disability were reported by participants (Atkinson & Hutchinson, 2012). One participant reported, specific to being able to access and succeed in higher education and eventual employment, "Even as a child I was told that I should not even try to go to a university that I would be better off being on benefits because I wouldn't be able to have a job" (Atkinson & Hutchinson, 2012, p. 39). The study participants cited generally negative societal viewpoints toward their disabilities, even if they did not themselves feel limited (Atkinson & Hutchinson, 2012), which is consistent with the social constructivist theory previously introduced. These study results identify many of the social factors already described in this paper. Those with disabilities have been reported to experience differing attitudes based on social context (Tsang et al., 2004). Recognition of social context, particularly within educational settings is clearly related to the experience and eventual persistence for students with disabilities.

Another impact is that of verbal communication via language used within societal contexts. Here, it is important to recognize that the medical model uses disability-based language rather than person-based language. This language negatively impacts health care and health outcomes (Crocker & Smith, 2019). An example of disability-based language is referring to someone as being *confined* to a wheelchair, as opposed to stating that someone is a wheelchair *user*. Referring to someone as an *amputee* or a *stroke victim* is negative. A more positive way to say this would be to say they are a person with an amputation or a stroke, separating the person from a condition they happen to have.

Language has also been identified as a relevant factor to attend to in order to increase acceptance and inclusion for those with disabilities (Crocker & Smith, 2019). If the medical model is the primary frame from which SWPD learn and come to understand the physical therapy profession, then the presence of negative language (or the absence of positive, ability-based language) in physical therapist education programs will be important to understand.

## Program Attitudes

Attitudes toward individuals with disabilities also exist at the level of the specific program. These attitudes, those of faculty and peers similarly carry weight as applied to students with disabilities. Further, attitudes held by those with disabilities cannot be overlooked. This section will describe how program-level attitudes relate to the student experience.

### *Faculty*

Faculty attitudes have been identified as access barriers for students with disabilities (Scott, 2019). Faculty set the tone for the classroom and the climate for learning (Huger, 2011). Negative faculty attitudes reported both inside and outside of the classroom can impact students prior to their participation in higher education, as SWPD inquire about necessary accommodations for classroom success (Scott, 2019). Further, faculty attitudes have been cited as a barrier for students to disclose their accommodation needs (Denhart, 2008; Hong, 2015). Students with disabilities (SWD) have reported that negative attitudes from faculty have impacted their self-outlook on success (Squires & Countermine, 2018). For example, in one study, SWD in higher education settings reported being misunderstood by faculty and being perceived as odd or less intelligent

than their non-disabled peers (Denhart, 2008). Others have reported similar findings from SWD, including faculty skepticism and judgment about their disability (Akin & Huang, 2019; Hong, 2015) as well as a lack of faculty training or awareness of their responsibility to support SWD in the classroom setting (Denhart, 2008; Snashall, 2009; Squires & Countermine, 2018). In a 2015 study, 16 SWD participated in reflective journaling on their college experiences (Hong, 2015). One student's quote sums up the impact of faculty attitudes, in this case, negative:

> Eventually, I weighed getting the accommodation versus the mortification of talking about my disability with a stranger. I ruled that it wasn't worth possibly making waves, so I just threw the paper away and studied twice as hard. I know it was my own fault, but the intimidation was too much for me. I'd had other courses that I've had to drop because of my disability (Hong, 2015, p. 215).

For those students who can overcome barriers and successfully complete undergraduate education, they are then faced with accessing and succeeding in health professions programs. Attitudes by faculty in health professions programs appear to be similarly negative. Lack of confidence in the abilities of SWD and negative attitudes toward SWD have been reported by faculty in nursing (Sowers & Smith, 2004). Negative faculty attitudes have been reported in medicine (Miller et al., 2009; Snashall, 2009) and in occupational therapy (Coffey, 2001). Faculty attitudes, negative, uninformed on the issues, or broadly stereotypical, are consistently cited as impactful for SWD (Da Silva et al., 2017; Hinman et al., 2012; Opie & Taylor, 2008). Within the field of physical therapy, the sentiment is the same. In a 2016 briefing published by the World Confederation for Physical Therapy, now World Physiotherapy, education for students

with disabilities was assessed via surveys of member organizations. Similar to other fields, persistently negative beliefs held by faculty were reported as an access barrier for SWD seeking physical therapy education (World Physiotherapy, 2016). Outside of this report, however, little literature specific to physical therapist faculty exists, particularly literature on physical therapist faculty who work in educational institutions within the United States. One study within the physical therapy profession assessing attitudes specific to the implementation of disability-related student accommodations was identified. In this study, despite initial faculty resistance, a physical therapist student with a physical disability was able to successfully complete the educational program (Francis et al., 2007). Another study determined that physical therapist faculty attitudes toward SWD were less positive than attitudes within practicing, licensed physical therapists (Satchidanand et al., 2012), affirming the role of negative attitudes as a barrier toward SWPD. With what little can be collected on faculty in physical therapy, physical therapy scholars must rely on data from related professional training programs and general faculty reports. Therefore, whether describing faculty attitudes within or external to health professions programs, attitudes in this vein can be together considered as contributing to the experience for SWPD and related to persistence (Squires & Countermine, 2018).

On the positive side, supportive faculty attitudes are associated with a sense of belonging by SWD (Vaccaro et al., 2015). One student with a disability reported when describing a positive faculty exchange, “For once, I felt like the disability was not my fault” (Hong, 2015). Faculty, as members of the educational community, have a responsibility to understand their roles in providing access to all learners. Attitudes of

faculty are essential for student success, yet faculty often remain unaware of their roles as related to supporting SWD (Huger, 2011; Kroeger & Schuck, 1993; Scott, 2019). Accommodations, a factor needed for access, particularly as related to students in health professions programs, are addressed later in this paper.

### *Peer Students*

Much like positive faculty attitudes, positive peer attitudes toward SWD help them integrate into campus and set the tone for inclusion. In a literature review specific to SWD accessing postsecondary education, the theme of belonging and relationships was highlighted (Vaccaro et al., 2015). Here researchers found that positive peer and faculty recognition of their academic success helped to minimize disability stigma, thereby positively impacting SWD (Vaccaro et al., 2015). Further, the feeling of belonging was shown to enhance the ability of SWD to advocate for their needs within educational settings (Vaccaro et al., 2015). As a part of the education community, peers clearly impact SWD through positive interactions. These interactions help further frame the social components of the student experience.

Unfortunately, not all peer exchanges are positive. Some studies have identified that SWD has been perceived to receive more attention and preferential treatment as compared to their non-disabled peers in physical therapist educational programs (Hinman et al., 2012). This type of negative peer-based attitude has been reported elsewhere, whether it be SWD feeling outcast (Denhart, 2008), being patronized by non-disabled peers (Akin & Huang, 2019), or feeling resented by peers for getting faculty attention (Hong, 2015). Peer attitudes are so impactful for SWD, that direction on disability-based inclusion and education was recommended for higher education new student orientation,

as well as in training for faculty, in a recent research report on Campus Climate and SWD (Harbour & Greenberg, 2017). Some have identified suggestions to improve the campus climate for SWD, including increased peer dialogue, increased participation in clubs by students of all abilities, and increased education on disability rights (Huger, 2011). A primary takeaway from those advocating for increased campus training is that although SWD are negatively impacted by peers, training can be considered one component to address campus climate and inclusivity for SWD.

Most often literature specific to SWD experiencing negative attitudes held by non-disabled peers are focused on undergraduate learners. As a result, even less is known about students in professional programs like physical therapy. For SWPD seeking access to physical therapist education at the graduate level, they must first successfully engage and complete undergraduate education. Recognition of and attention to these social factors is important but beyond the scope of this paper. Campus-based actions like these are specific to undergraduate education. Actions and dialogue related to SWPD may be similarly related to persistence for SWPD in physical therapist education, however, no literature exists specific to this area. Worth noting specifically to professional learners is that by the nature of their status as graduate students, they have already demonstrated some of the requisite skills associated with persistence. This makes my study all the more important.

### *Attitudes of Self*

As important as the multitude of external factors related to attitudes toward those with disabilities can be, perceptions of self may also limit opportunities (Asch, 1984). Evident as a physical therapist myself is the inherent ableism of the profession and the

potential internalization of negative attitudes in the society of disability as sad, bad, or less than. Disability, as a physical therapist, is something we train to 'fix' and a way that therapists can offer help; people with disabilities *need* therapy. If throughout their developmental years individuals with disabilities receive negative performance-based messages, lack of confidence would not necessarily be surprising. Self-believed attitudes, whether it be low levels of self-awareness or minimal determination can serve as a type of internal barrier to success for SWPD in higher education (Squires & Countermine, 2018). One study specific to college students with disabilities reported these students often balance judgment from peers and faculty with their own inner focus and desire to demonstrate their academic competence (Hong, 2015). Another study on college students with learning disabilities asked students about perceived success in higher education. Here, students reported feeling as though they think and experience the world differently, which could for some be a limiting factor (Denhart, 2008). Internal fears, insecurities, and the inability to self-advocate, are all reported barriers for those in education (Squires & Countermine, 2018) would be challenges necessary to overcome for any college student. For SWPD, experiencing these feelings while also having to identify necessary resources and accommodations, these internal, attitudinal-based social factors, are not particularly surprising.

Given the reported societal and educational barriers those with disabilities regularly encounter, one would expect that those students who are able to matriculate into physical therapist programs are likely to have a high degree of resilience or persistence. Accessing education, let alone graduate-level education, requires an inherent degree of dedication, drive, and persistence. Therefore, the absence of these qualities should be

recognized as internal educational access barriers. In fact, a study examining access barriers to physical therapist educational programs in the United Kingdom came to this same conclusion. Lack of persistence was an identified educational access barrier for SWD (Da Silva et al., 2017). Referencing back to social constructivist theory and medical models, the idea of persistence is perhaps more complex. Are these persistent students somehow missing or not internalizing negative messaging, or might the less persistent students be explicitly internalizing years of messages that they are not good enough? In referencing the physical therapy-specific perspective previously shared, the paradox between a profession for helping those with disabilities, physical therapy, and the negatively-framed view from which the medical model views those who are disabled as dependent provides additional insight (Roush & Sharby, 2011). Researchers in this field contend that disability is often context-based, making those with disabilities less likely to be seen as independent and as capable as those without disabilities (Roush & Sharby, 2011). Further, within the medical model, the theory is that when someone is disabled they are in need of rehabilitation (Roush & Sharby, 2011). Through this, we see a call to reconsider the lens and the negative basis from which those with disabilities are welcomed into the physical therapy profession. Such a path starts first with education, awareness, positive pathways, and then to support. Whether due to decreased sense of belonging, decreased confidence or ability to self-advocate, or uncertainty on what on-campus supports may be available, within higher education settings some degree of internally derived attitudinal-based access barriers exist for SWD. Without sufficient studies specific to graduate students, professional students, or those specific to physical

therapist education, the extent to which the individual internal factors impact persistence is unknown.

In reviewing the literature specific to attitudes as a potential contributing factor impeding success in physical therapist education programs, two key conclusions can be made. First, social factors include negative attitudes of faculty and peers. This was consistent both in general education literature and health professions literature. The internal self-imposed barrier of those who have disabilities is also an attitudinal-based factor identified in the literature. Most of the studies reviewed which included the voices of those with disabilities suggested self-limiting behaviors and perceptions as common for students with disabilities in higher education. Second, profession and society-based attitudes grounded in various theories also negatively impact students. Theories including the medical model and social constructivist model help to provide perspective on how negative attitudes both develop and relate to students with disabilities. Past literature has addressed deficit-based language in the medical model used in reference to those with disabilities. With the medical model as the inherent perspective from which the physical therapy profession practices, further studies on language within the physical therapy profession would enhance understanding of the direct impact of this as a factor related to success.

## Academic Factors

### Institution-Specific Resources

In continuing to describe the framework from which to consider persistence for SWPD, another area to explore is related to resources available to students at the level of the institution. These resources include disability offices and professionals who can assist

in the development of accommodations in-line with the ADA. The role of accommodations designed to minimize barriers and to enhance success ties back to the concept of professional technical standards, and both accommodations and technical standards relate to the disability access model for a given health sciences program. Each of these areas will be subsequently discussed.

### *Disability Access Models*

Several theories specific to disability access within institutions have been identified by Meeks & Neal-Boylan, 2020. These include Centralized, Liaison, Health Science Campus, and Program (Meeks & Neal-Boylan, 2020). Each of these unique access models describe ways that educational programs may operate and interact with disability professionals within a given institution and are described below.

**Centralized Model.** In this model, accommodations are directed centrally to a disability office, rather than to a single person or program coordinator. Centralized models use the accommodation development process as a guide for all health science programs, thereby utilizing the expertise of the office staff over those who work in the specific health science program (Meeks & Neal-Boylan, 2020).

**Liaison Model**. Considered the most common model, the liaison model builds on the centralized model by assigning a liaison who works with a specific health science program or programs. This allows greater depth of understanding of the liaison related to the program-level demands on their learners, and facilitates a relationship between a program and the disability experts in a given institution (Meeks & Neal-Boylan, 2020).

**Health Science Campus Model.** Certain health science programs exist in institutions that are not directly associated with a university and are considered free-

standing. As such, these free-standing institutions can directly hire a disability resource professional to oversee factors related to learners with disabilities including accommodations, access questions, or technical standards. This professional can be deeply engaged in the health science program(s) and may provide training for faculty or advocate on behalf of programs or program students, acting as an inside voice (Meeks & Neal-Boylan, 2020).

**Program Model.** The program model is the most comprehensive model whereby disability resource professionals are situated as faculty within the specific health sciences program. Efficient development and implementation of accommodations are common within the program model. In addition to the training and advocacy roles in the health sciences campus model, the professional in a program model may also engage in curriculum development, career planning, and be involved in research or policy development (Meeks & Neal-Boylan, 2020). These different models, as well as the staff-to-student ratios associated with a given model, are specific academic factors related to SWPD in higher education (Meeks & Sullivan, 2019).

### *Technical Standards*

Disability professionals work closely with professional programs in healthcare. Collaboration with these programs is necessary, particularly given the presence of technical standards. According to Blacklock and Montgomery (2016), technical standards are divided into the following areas: perception/observation, motor/tactile, cognition, communication, and professionalism (p.7). To be compliant with the ADA schools are required to define their technical standards, make them visible to all applicants (Shannon, 1998), and are required to provide reasonable accommodations to SWD who are admitted

into their programs (Reichgott, 1996). Technical standards cover both physical domains and non-physical domains, including functions of the sensory system (seeing or hearing, for example). Professional programs can work closely with disability professionals to design accommodations serving to increase, not block those with disabilities from applying to and succeeding in such programs (Blacklock & Montgomery, 2016; Meeks & Jain, 2016). The presence of and collaboration with disability professionals in professional programs should enhance learner access and ensure program compliance with ADA policy. Despite this, some have reported that the presence of technical standards may be a barrier for those who are disabled (L. B. Kezar et al., 2019).

Technical standards could exclude individuals from participation in a training program if the accommodations needed for participation are interpreted by the professional programs as unreasonable. One would assume then that a set of known standards exists, which could be thoroughly assessed for application to training programs across a given profession, but that simply is not the case. A lack of consistency in technical standards is common across and within a number of professions (Gallagher, 2010; VanMatre et al., 2004; Walsh, 1998), meaning that admissions criteria vary even in the same profession. This inconsistent nature of standards may be a factor in determining which accommodations are burdensome and which are not, relating to the ability of a SWPD to complete a program successfully. A recent call from medicine identified inconsistencies in technical standards and a need to reevaluate these standards altogether (L. B. Kezar et al., 2019). This is similar to others who have described the challenges with having variations in technical standards across institutions or within professions (Gallagher, 2010; Hendrickson et al., 1998; VanMatre et al., 2004). Blacklock and

Montgomery (2016) called for professional consensus in technical standards among a host of stakeholders from the disability access, professional, and academic communities. Others have pointed out that in order to justify decisions made regarding accommodations and technical standards, uniformity is required (Rothstein, 1997, 2015). Uniform standards would serve to minimize uncertainties and inconsistencies and increase the likelihood of completion for SWPD.

### *Accommodations*

Some studies have indicated the accommodations needed may be less about technical standards and more about a lack of understanding of how to best support a disabled student (Hargreaves et al., 2014; Shannon, 1998). By attending to the specific tasks which need to be completed, not how they are completed, accommodations are more readily incorporated into a variety of learning settings (L. B. Kezar et al., 2019). This would apply to physical assistance or the use of an intermediary to accommodate an individual with a physical disability, or the use of hearing amplifiers or sign language interpreters in cases of hearing loss. Accommodations provided are not supposed to put an undue burden on a training program, though one could argue that undue burden is a subjective determination and inherently difficult to prove. The subjective nature of undue burden has been reported in the literature where a number of students have taken cases for admission or accommodations related to professional programs to the courts in efforts to force compliance (Rothstein, 1997). Some have used these court cases as a basis for calling to develop and standardize technical standards (Shannon, 1998).

Courts have sided both with programs and with students related to technical standards and ADA policy. A summary of five cases was shared in a recent article on

technical standards (L. B. Kezar et al., 2019). In the 1979 *Southeastern Community College v. Davis* considered the first Supreme Court case specific to this topic, the court upheld a school's rejection of a deaf nursing student based on their technical standards stating students must be able to hear. In the 2014 *Palmer College of Chiropractic v. Davenport Civil Rights Commission* case, the Supreme Court of Iowa determined that the program violated ADA rights by not admitting a student with limited vision based on a related technical standard. Another 2014 case, *Featherstone v. Pacific Northwest University of Health Sciences*, did not support the school's claim that accommodating a deaf student would fundamentally modify their program. *Argenyi v. Creighton University* (2013) resulted in the school needing to provide real-time captioning devices for a deaf medical student. Finally, *McCulley v. University of Kansas School of Medicine* (2014) noted that the technical standards of the medical school related to lifting, pushing, and completing cardiopulmonary resuscitation were restrictive to the point where the student could not be admitted, however, the court also recognized that other schools with less rigorous standards would likely be able to support the student without substantial difficulty (L. B. Kezar et al., 2019). There is much to learn and consider within these cases as related to the ADA, in part, that courts have sided both with programs and students. Also important is to identify the complexity of how technical standards and accommodations are developed, interpreted, and how professional programs apply context to these areas. These are all relevant academic factors to consider for SWPD in physical therapist education.

Reichgott (1996) describes how a highly qualified individual from an academic performance lens was denied admission to a medical education program after an in-

person interview where it was noted the applicant mobilized using a wheelchair. That same applicant was ultimately accepted to a different medical school and successfully completed their medical education (Reichgott, 1996). To meet the technical standards for physical exam training, the student was supported by an aide. The experience is described below:

> The quadriplegic student, assisted by a nurse, participated in the regular course in physical diagnosis. By the end of the course, his integrated understanding of pathophysiology and, indeed, of the value and significance of the physical diagnosis maneuvers themselves, far surpasses that of his able-bodied partners, as did his scores on basic science exams and on the national boards. He has received honors evaluations in all the clinical clerkships completed to date (Reichgott, 1996, p. 728).

A similar case example is found in a professional training program for nurses. In reviewing the steps taken to facilitate learning for a profoundly deaf student, it was noted that at first, resistance existed among faculty because, "we have not admitted anyone who was profoundly deaf," and (in referring to the student with limited hearing) "how can she do assessments . . . answer patients' lights*"* (Rhodes et al., 1999, p. 3). Through education provided to faculty on what institution accommodations were available and in working with the student, this too became an example of success. The student's accommodations included support from an interpreter in the classroom for signing. In the clinical setting, the interpreter reported to the nursing student what they heard during auscultation with a stethoscope. The nursing student then identified what the noises meant (Rhodes et al., 1999). When this same student was working in the hospital setting

with patients who were unable to speak due to tracheostomies, she was able to read lips to facilitate communication, thus positively impacting patient care (Rhodes et al., 1999). As described by the author, the experience of educating this student was "probably one of the most rewarding accomplishments that faculty members have ever experienced" (Rhodes et al., 1999, p. 6). In a different case of a nursing student with hearing loss, the program denied admission, citing an inability of the student to be successful in clinical training (Walsh, 1998). In this case, the applicant had expressed a desire to waive part of the clinical training altogether, which would fundamentally alter the educational experience and cannot be accommodated. This case was eventually settled in the Supreme Court, whereby the school was not faulted for their decision, as under the ADA, the program was not required to lower performance standards to admit an individual with a disability (Walsh, 1998).

### *Technical Standards and Accommodations in Healthcare Education*

Despite the varied understanding of how to interpret the ADA with respect to technical standards, moving beyond misconceptions not only to develop appropriately cohesive standards but also to use accommodations to facilitate the success of disabled students is possible (Reichgott, 1996; Rhodes et al., 1999; Walsh, 1998). In traditional medical training, expectations are that a graduate would be undifferentiated, meaning upon graduation they would be prepared to practice any medical specialty (Reichgott, 1996). This now outdated approach led to concerns over limitations and has been adapted by the Association of American Medical Colleges (AAMC) to be less restrictive (L. B. Kezar et al., 2019). The amended AAMC guidelines focus more on how, through accommodations and in line with technical standards for the profession, medical

programs can support students for success in the classroom, on campus, and in clinical settings.

One point to clarify is that related to professional training programs and the idea of public safety. Accommodations do not mean lowering performance standards. In cases where a student asks for a lower standard, one that is integral to becoming a health professional, accommodation is not allowed. For example, in *Alexander v. Choate* the Supreme Court clarified that all professional programs must review technical standards and identify available accommodations for any applicant to determine if requests are reasonable (Walsh, 1998). Two cases related to vision loss, one in medicine and one in optometry, resulted in the courts siding with academic programs unable to support students, despite it seeming perhaps on paper that these are required accommodations under the ADA (Walsh, 1998). In the first case brought forward in the profession of physical therapy, a student with a knee replacement and limited mobility did not receive support from the program on their suggested accommodations. The court ultimately sided with the program, who had indicated they would be open to consideration of alternative accommodations, but that those initially brought forward by the student were not feasible for future practice or current education (Walsh, 1998).

As previously stated, there is potential for usefulness in developing a set of consensus or standard, profession-specific technical standards. While many professions do not have such consensus guidelines, programs do have accrediting bodies which serve to guide many educational processes (Evans, 1978; Shrewsbury, 2015). Physical therapist accreditation does not speak to technical standards, rather, accreditation guidelines identify a broad set of concepts and skills specific to physical therapist education

(*Commission on Accreditation in Physical Therapy Education*, 2021). In a 1997 study, physical therapist education program directors were surveyed on their opinions of essential performance functions for physical therapy (Ingram, 1997). This Delphi study identified agreement among program directors on the essential functions[2] required for student success (Ingram, 1997). Results indicated all participants came to a consensus on a few items, rating *practicing in a safe, legal, and ethical manner* and *communication skills with patients, families, and others* as "definitely essential" functions for students (Ingram, 1997). In the years since this study was conducted, no further studies on this topic related to physical therapy have been identified, meaning that technical standards remain inconsistent within the profession. In the legal profession, consensus technical standards have been proposed (Shannon, 1998). Davidson (1994) has suggested a similar approach among educational program directors in nursing. Further, authors have provided evidence that whether across the scope of all accrediting bodies of a profession or simply across the country for educational institutions, that consensus in technical standards would help clarify cases related to the application of ADA law into professional training programs (Albanese, 1999; Davidson, 1994).

Whether through identification in court cases or within a given profession, technical standards are commonly misunderstood and have been cited as barriers to the admission and retention of students in healthcare programs (L. B. Kezar et al., 2019; Marks & Ailey, 2014; Matt et al., 2012). Some of these misunderstandings are due to the end result of healthcare training programs where graduates acquire a license to practice

[2] In this 1997 study the term *essential functions* refers to what was described as technical standards. By definition, however, essential functions are specific to employment settings. Technical standards is the term applicable to standards for educational settings (Meeks & Jain, 2016).

(Marks & Ailey, 2014). Essential functions refer to employment requirements, not education-based requirements, though the concept of essential functions may be used to justify technical standards. As previously noted, this has been the case in physical therapy (Ingram, 1997; Rangel et al., 2001), however, the two areas should be viewed independently of one another to avoid confusing standards applicable to academic settings with employment-based requirements. Even so, technical standards have been cited as a major barrier to the education of students with disabilities who are seeking to enter professions with distinct essential functions (Marks & Ailey, 2014). Court cases specific to the ADA rely on technical standards of programs, weigh the safety of the public, and assess whether or not a suggested accommodation would or would not be burdensome to a program (Marks & Ailey, 2014). Essential, employment-based functions are not considered. Academic programs have a responsibility to provide education, not to guarantee employment. Within court cases, programs have been observed to receive deference related to their technical standards. As pointed out by Marks and Ailey (2014), interpretations of technical standards for education based on employment-based essential functions only serves to further limit the inclusion of those with disabilities in training programs.

**Clinical Resources**

Resources available to students at the clinical level relate to experiences of SWPD in physical therapist programs given the required nature of clinical training associated with all accredited programs. Like the institutional resources of disability offices and professionals who help with the development of accommodations, clinical site resources

available to help identify accommodations also impact students. This section describes clinical applications of program technical standards.

### *Clinical Practice and Technical Standards*

Interpretation of technical standards based solely on physical ability also causes a barrier for students seeking to enter healthcare professions. This is particularly relevant to a 2004 study that surveyed a small sample of medical students, residents, and faculty about technical standards related to disability issues in medicine. Specifically, the standards in question were relative to both motor-based and communication/observation-based standards. Participants were asked about the specific physical and non-physical skills and abilities needed to enter medicine. Of respondents, 69.8 percent disagreed or strongly disagreed that students should be undifferentiated at graduation, or able to enter any medical specialty regardless of physical or professional demands (VanMatre et al., 2004). The ability of a physician to have the technical skills associated with interpretation or observation was more important to residents than those related to physical tasks (VanMatre et al., 2004). These results suggest that perhaps the physical abilities of a physician are less relevant than technical standards lead us to believe. In this sense, technical standards specific to physical function are unnecessarily limiting.

A similar idea, that the physical nature of some technical standards can be prohibitive, was supported by a recent white paper produced by the Association of Academic Psychiatrists. Technical standards were cited as the reason for denial of admission to some with disabilities, despite evidence of medical graduates needing to have the cognitive skills to direct particular tasks, not necessarily to physically complete each of the tasks themselves independently (Ailey & Marks, 2017). Within physical

therapy, a recent study used a hypothetical scenario of a therapist with a new onset of a physical disability to identify perceptions of competence by physical therapy peers (Ficuello et al., 2019). Results indicated that employment-based accommodations, including the use of a physical aide for the therapist with a disability, were supported by peer therapists (Ficuello et al., 2019). Further, variability in determining the skills needed for successful practice and biases within the profession related to disabilities were identified (Ficuello et al., 2019). This study, although hypothetical and associated with post-educational employment, is consistent with the aforementioned studies, where understanding of disability, accommodations, and educational or clinical practice requisites remains variable. Part of the rationale for conducting my study is to increase the availability of information for educators and the broader community. Some have taken the perspective of advocacy, which could be associated with increased awareness. For example, the profession of nursing has advocated for the inclusion of individuals with disabilities in higher education in the publishing of a white paper on the topic, as well as in a review of technical standards (Ailey & Marks, 2017; Marks & Ailey, 2014). Assessment through data collection and analysis is one way to better understand the classroom landscape for SWPD. Data can both inform SWPD who desire to practice in a professional field and those associated with professional training programs on how to understand student needs, how to develop and implement accommodations, and that a physical disability does not always prohibit successful training (Snashall, 2009).

## Summary

As discussed in Chapter 1, the purpose of this study is to explore the institutional context of where and how education for SWPD occurs and to learn more about the

factors perceived to be associated with educational completion for SWPD in physical therapist programs. The Model of Institutional Departure by Tinto (1975, 1993) provides a broad framework for my study in that it connects classrooms, learning, and persistence to understand educational completion. As discussed in detail in Chapter 2, Tinto theorizes that experiences by students within *Academic* and *Social* systems relate to their integration within the educational community and eventual success or decision to drop out. Applied to this study, the terms *Academic Factors* and *Social Factors* are used as the containers to house the array of factors associated with SWPD success in physical therapist programs. Work by Guiffrida (2006) built on that of Tinto to account for pre-entry student attributes classified as Intrinsic and Extrinsic Factors. Figure 2.1, *Factors Associated with Success for Students with Physical Disabilities in Physical Therapist Education Programs*, illustrates the interaction of *Academic* and *Social Factors* and the learner throughout their educational progression.

As outlined in Figure 2.1, Pre-Entry Experiences (Intrinsic and Extrinsic Factors) feed into the overall student experience, represented longitudinally by the arrow directed from left to right. Across the top of the Figure, Campus and Clinical Experiences are represented, two areas directly associated with physical therapist training. The top half of the Figure represents Academic Factors while the bottom half of the Figure represents Social Factors. Within each of these halves are subsections specific to either the Academic Factors (Institution, Clinic) or Social Factors (Program, Community). Subsections are directly tied to previously presented literature in each of the areas as well as to the primary theory (Tinto), as well as the complementary theories which are all connected through the study methodology detailed in Chapter 3.

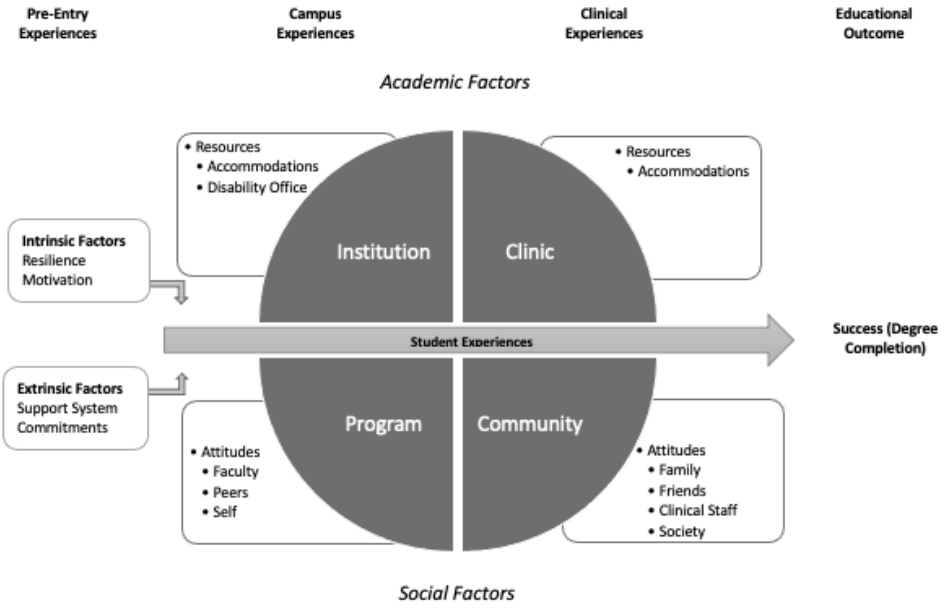



**Figure 2.1:** Factors Associated with Success for Students with Physical Disabilities in Physical Therapist Education Programs

# Chapter 3

## Overview of Methodology

As first identified in Chapter 1 the physical therapy profession is not representative of the diverse individuals whom the profession serves. The importance of DEI was identified by the American Physical Therapy Association (APTA) House of Delegates (HOD) when in June of 2020, the HOD voted to amend RC 13-20, the definition of underrepresented minority populations in physical therapist education to include individuals with disabilities (American Physical Therapy Association, 2020). While this action marked an important acknowledgement and step toward diversity, much work remains as few SWPD are accessing physical therapist education programs, graduating, and becoming physical therapists (Hinman et al., 2015). Entry into the profession is through application, acceptance, and ultimately through educational completion. However, little is known about the factors related to the completion for SWPD. In considering a pathway into the profession for those with physical disabilities, it is important to first understand how training is completed. Without successful educational training, there is no potential for professional licensure and subsequent practice.

This study is designed to explore the *Academic Factors* associated with educational completion for SWPD in Doctor of Physical Therapy Programs. In the first chapter, the historical context of disability within higher education and implications for health professions education associated with gaps in the literature were described. Chapter 2 provided theoretical framing for this study through a review of several *Social* and *Academic Factors* related to SWPD in higher education. A conceptual framework

was developed based on the interplay of theories and literature related to the topic at hand, first presented in Chapter 2.

Each of the items identified in this figure warrants independent exploration as the literature suggests that they are all relevant to understanding pathways to success or for students with disabilities in Physical Therapist educational programs. While this framework is comprehensive, examining the relationships across each dimension is beyond the scope of this study. Rather, this study is limited to an investigation of the upper left quadrant of the conceptual framework. An overview of this quadrant is depicted in Figure 3.1. The rationale for focusing on this aspect of the framework is two-fold. First, physical therapist education is delivered in a variety of higher education settings each with a variety of different resources available to learners. We can, by understanding how these factors are related, situate students and their likelihood for success within a given setting. This is an important first step. Second, the sheer scope of the topic far exceeds a single study. By focusing first on a subsection, which has been identified as relevant for students in higher education, forthcoming work can be better informed and then developed.

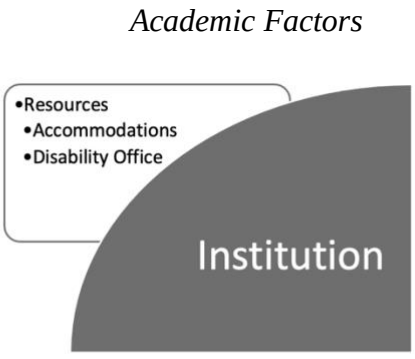



**Figure 3.1**: Academic Factors at the Level of the Institution

The above figure highlights *Academic Factors* at the level of the institution. This chapter describes the methodological framing for my study. Several aspects of this study are informed by the work of Tinto (1975) and his identification of academic factors external to the individual, those within the institution. Tinto's Model of Institutional Departure is the foundation of this study but cannot sufficiently represent all the aspects which inform my approach. Disability theories, both specific to the communities in which SWPD exist and ways that disability professionals engage with physical therapist programs are also considered. From my work, physical therapist educators will have an increased understanding of academic factors associated with success for SWPD. This may then enable the profession to increase disability diversity in the classroom by attending to the factors identified that have been associated with success for SWPD in the past. This is an important first step in aligning classroom diversity with diversity in the communities in which physical therapists serve. Subsequent investigations into each of the remaining three quadrants of my conceptual framework can be additional steps in a comprehensive understanding of a complex topic.

**Methodological Paradigm**

An overall pragmatic framework is the basis for my study. According to Patton (2015), pragmatic approaches are related to program evaluation and aim to assess consequences and applications associated with a given issue. The pragmatic approach relates to this study in that I aim to understand the attributes of those programs where SWPD have completed their degrees over the past 10 years. By using pragmatism, data can be obtained which may in turn help to better understand the problem (or question) and the related factors. Two complementary methods will be used to conduct this

research study within the pragmatic framework, quantitative and qualitative. These two methods will thus provide a deeper understanding of the relationship between each of the study questions.

According to Creswell (2018), a mixed methods design enables researchers to draw on both quantitative and qualitative data, providing a greater capability to capture broad perspectives. Integral to mixed methods is the understanding of which mixed-method approach best aligns with the primary research question or questions. I will be using a one-phase convergent design approach. This approach consists of a single data collection phase with a quantitative and a qualitative component (Creswell & Creswell, 2018). Data are then analyzed separately, merged, followed by a comparison of results where researchers assess for confirmation or disconfirmation of findings (Creswell & Creswell, 2018). Figure 3.2 below outlines the process of conducting a single-phase convergent design.

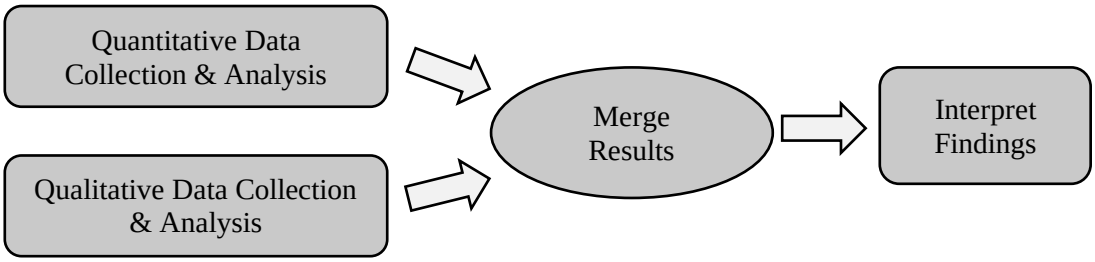



**Figure 3.2**: Convergent Mixed Methods Design, Adapted from Creswell (2018), p. 218

As depicted in Figure 3.2 the quantitative and qualitative stages of the study occur in parallel to one another. Rather than analyzing results from either quantitative or qualitative section, and then moving to the next section, as would be seen in a sequential design, a convergent process merges results after data collection is complete. Convergent designs are particularly applicable when clearly related variables are being studied

(Creswell & Creswell, 2018). I am seeking to understand institutional factors associated with program completion for SWPD in physical therapist education. To obtain information on the topic a survey can capture a substantive amount of data to address the research question. However, there may be additional contextual factors beyond what is currently known, therefore, a survey alone is not sufficient. A qualitative component provides a deeper understanding of the context of the institutions where SWPD are successfully engaging in physical therapist education. Part of qualitative inquiry is to unearth factors not previously identified or considered as related to the topic at hand (Creswell & Creswell, 2018). Therefore, the utilization of qualitative inquiry can serve to more comprehensively assess program completion in my population of interest (Boudah, 2020).

Applying the principle of convergent design to this study, the quantitative portion (survey) included a simultaneous call for interview participants (qualitative). Data collection occurred via the survey during the same time interviews were being conducted. A similar process was used for data analysis. Each of the steps in the study are described in detail later in this chapter.

### *Theoretical Frameworks*

Several theories drive my research and help to frame the development of the data collection and analysis methods used within this study. Given the nature of my research and the lack of comprehensive, similar existing theories on this work, several theories were used as methodological underpinnings. Each of the theoretical frameworks presented supports the current understanding of my research topic and has been

necessarily adapted to align with my study-specific questions and associated research design.

**Tinto's Model of Institutional Departure (1975, 1993).** As previously introduced, Tinto's Model provides a foundation from which to integrate several factors which relate to the student experience. A detailed analysis of Tinto was presented in Chapter 2. While Tinto focuses on the specific topic of student decisions to drop out, it is the identification of academic and social systems, both complex in nature, that are fundamental to consider. According to Tinto, colleges are divided into academic and social systems, with each of these systems encompassing a variety of factors which connect to the student (Aljohani, 2016; Tinto, 1975, 1993). This academic and social division is directly tied to the layout of my study. Tinto's model has also been studied extensively, thereby helping to justify the assessment of similar factors. Importantly, I do not seek to test this model, rather, I am using the components of the model to inform my data collection protocols and interpretation of results. Each of the secondary models I am using contributes by layering with Tinto's model to help support my research approach and related questions in a more comprehensive manner. We need to know more about how the factors described by Tinto are applied to my population of interest, SWPD. Currently little is known about SWPD, specifically, the external, academic factors related to SWPD in physical therapist educational programs. I made necessary adaptations to Tinto's model to account for variables specific to SWPD in physical therapist education, specifically the subset of variables in the category of *Academic Factors* based on the following additional concepts.

**Theories on Disability Access.** Several theories specific to disability access within institutions identified by Meeks and Neal-Boylan, 2020 were detailed in Chapter 2. These include Centralized, Liaison, Health Science Campus, and Program (Meeks & Neal-Boylan, 2020). Each of these unique access models describe ways that educational programs may operate and interact with disability professionals within a given institution. Building from Tinto, who recognized the role of academic system components, including institutional commitments, these disability access models layer with Tinto's framework. Models of disability access speak to the resources within an institution, those commitments to a given program, or those available to a given student based on where they are enrolled. Therefore, understanding how an institution commits to their students through disability resources is one way to connect SWPD in physical therapist programs to the grounding work by Tinto, a perspective absent from current literature. Programs can be classified in part based on the associated disability access model they have in place (Centralized, Liaison, Health Sciences Campus, or Program). With these models in mind, my study used qualitative inquiry in the form of semi-structured interviews to help classify specific educational program disability access models based on descriptions provided by those interviewed. Further, the interviews helped capture the detailed descriptions of the institutional resources available to learners, a subset of *Academic Factors.*

**Social Constructivist Theory.** Models of disability confirm that much of how disability is viewed and understood lies outside of the person. Tinto identified external community factors including formal and informal systems, which contribute to the overall student experience (Tinto, 1975, 1993). Applying the social constructivist theory

to Tinto helps us understand why we need to consider external factors and forces impacting SWPD. As detailed in Chapter 2, social constructivist theory is one theory that helps situate disability within society. Understanding disability through the social constructivist theory relates directly to my study as it helps to distinguish biological aspects of disability from social-environmental aspects (Asch, 1984). I am applying concepts from this theory and Tinto, that societally-derived factors, those external to the person, those which exist within institutions, relate to how accommodations are developed and whether or not faculty are prepared to work with SWPD (Goodley et al., 2012). Specifically, survey questions were developed which seek information associated with accommodations relate to this theory. By understanding accommodations, both in how they are developed within institutions and on faculty training related to accommodations, whether training is formal or informal, or exists at all, more about these external factors as related to SWPD can be understood.

*Academic Factors* based on the theories highlighted above were assessed in my study. According to the Carnegie Classification of Institutions of Higher Education, institutions can be classified based on research productivity and degree offerings (*The Carnegie Classification of Institutions of Higher Education*, 2021). Carnegie Classification was sought in the quantitative component of my study to allow for a comparison across institutions. Similarly, classification of physical therapist programs based on primary educational delivery model was sought based on Commission on Accreditation in Physical Therapy Education (CAPTE) definitions (*Commission on Accreditation in Physical Therapy Education*, 2021). Other *Academic Factors* of interest related to the relationship between Disability Services Offices and the educational

program. As detailed in Chapter 2 of this work, the presence and engagement of Disability Services Offices and staff serve to enhance access and the development of accommodations to minimize barriers for SWPD. Further, training programs specific to supporting inclusion for SWPD have been shown to enhance the quality and frequency of accommodations used and to decrease stigma among faculty and peers without disabilities toward SWPD (Harbour & Greenberg, 2017). Data on the presence of required faculty training programs related to students with disabilities were collected in the survey for this study. Attending to these *Academic Factors* will identify the relationship, if any, that the *Academic Factors* have on the success of SWPD in each program and ensure no potentially associated variable is neglected.

**Research Methodology**

As previously introduced, this was a one phase convergent mixed methods study designed to explore the *Academic Factors* associated with educational success for SWPD in physical therapist programs. *Academic Factors* specific to the institution, available and/or required training on accommodations, and the revision timeframe of most recent technical standards, were sought during the quantitative part of the study. These *Academic Factors* were first described in Chapter 2, revisited in Figure 3.1, and presented by Tinto in 1975 and in 1993. As applied to the questions and survey below, Tinto's identification of institutional goals, intentions, and commitments, within the academic setting were explored during this study. During qualitative inquiry, information on *Academic Factors* specific to models of disability access and descriptions of programs known to have worked with SWPD were gathered. Interviews were used to help explore disability models within institutions as well as how the concept of SWPD in physical

therapist education and practice is perceived by faculty. Tinto's work identified interactions within the academic system. Understanding such interactions between institution faculty and disability offices or professionals relates to the work by Tinto. In the next section of this Chapter, the specific details related to the study are described.

### *Quantitative Component*

**Research Question.** *What are the Academic Factors associated with program completion for students with physical disabilities in U.S.- based Doctor of Physical Therapy programs*?

Secondary research questions:

- What is the relationship between an institution's Carnegie classification and completion of SWPD in physical therapist programs?
- What is the relationship between CAPTE classification and completion of SWPD across physical therapist programs?
- What percentage of students in physical therapist educational programs in the U.S. are SWPD?
- What is the relationship between faculty training on accommodations and completion of SWPD in physical therapist programs?
- To what degree are revisions in technical standards correlated with completion of SWPD in physical therapist programs?

**Design**. A survey was used during the quantitative part of this study, specific to the research questions outlined above with a goal of connecting to both the Model of Institutional Departure by Tinto (1975) and to the focused quadrant of the conceptual framework depicted in Figure 2.1. Because there is no current model which

comprehensively accounts for SWPD in physical therapist education, questions specific to physical therapist education were needed. The survey for this study was based on a previous survey designed and used by Hinman (2012) with adaptations made to best align with the research questions. Permission to use and adapt the survey instrument was granted directly by Dr. Hinman via email in October 2021. The final survey for this study is available in Appendix A. The faculty survey used by Dr. Hinman is available in Appendix B. Table 3.1 lists survey questions and their ties to the conceptual framework, as well as the classification of questions as either demographic or modified from Dr. Hinman's work.

**Table 3.1:** Survey Questions with Theoretical Alignment

| Connecting Framework or Theory | Explanation | Question(s) |
|---|---|---|
| Tinto, Conceptual Framework Quadrant | Identification of specific factors at the level of the institution, related to the academic setting where the educational program takes place. | What is the Carnegie Classification for your institution? (*Doctoral, Master's, Baccalaureate, Baccalaureate/Associate's, Associate's, Special Focus Institution, Tribal Institution)* |
| Tinto, Conceptual Framework Quadrant | Relates to institutional commitments within the academic system. | What is your Institutional Classification? (*Public, Private, Private for Profit)* |
| Tinto | Relates to institutional commitments within the academic system, the intention of the program (level of possible engagement with learners) | According to CAPTE, what is the primary delivery method of your program? (*Traditional, Hybrid, primarily delivered online)* |
| Tinto, Conceptual Framework, Social Constructivist Theory | Resources at the level of the institution | Is training on accommodation implementation available for faculty at your institution? (*Yes/No)* |
| Tinto, Conceptual Framework, Social Constructivist Theory | Resources at the level of the institution and commitment of the institution | Is training on accommodation implementation required for faculty at your institution? (*Yes/No)* |

| | | |
|---|---|---|
| | | If yes, please identify the number of hours of training required *(5 or less; 6to 9; 10 or more)* |
| Tinto, Conceptual Framework | Associated with resources available within an institution, commitments | Have the technical standards associated with your program been updated in the past 5 years? *(Yes/No)* |
| **Demographic Questions** | | |
| In what region of the country is your program located? | | [*(New York/New Jersey (NY, NJ), West Mountain (MT, ID, WA, OR, WY, CO, UT, NV, AZ, NM, AK), Great Lakes (WI, MI, OH, KY, IN, IL), West South Central (TX, LA), West North Central (ND, SD, MN, NE, IA, MO, KS, AR, OK), Northeast Coast (ME, VT, NH, MA, RI, CT), Middle Atlantic (PA, MD, DE, WV, VA), South Atlantic (NC, SC, GA, FL, AL, MS, TN, Puerto Rico), Pacific (CA, HI)]* |
| Identify your academic role. | | *(Program Director/Associate Director, DCE, Other Faculty)* |
| How many students do you admit annually (cohort size)? | | *Enter number* |
| **Questions Specific to Physical Therapist Education, Modified from Hinman** | | |
| How long (approximate years) have you been associated with this educational program? | | *Enter number* |
| Has your program admitted one or more students with a physical disability within the past 10 years? | | *(Yes/No)* |
| State the number of students with physical disabilities who have been admitted to your program in the past 10 years. | | *Enter number* |
| Identify the number of students with a physical disability who successfully completed your educational program (i.e., graduated at some point) in the past 10 years. | | *Enter number* |
| Briefly describe the nature of the disability(ies) you've encountered. | | *(Provide dropdown menu: Hearing limitation, Vision limitation, TBI, General orthopedic, UE/LE Amputation, Decreased strength or mobility, Cerebral Palsy, Neurological* |

| | |
|---|---|
| | *disorder, Brain tumor, CVA, Cardiopulmonary, Bracing/orthotic use, Vocal limitation, Chronic pain, Other-open text)* |
| What accommodations, if any, were made to facilitate the student's ability to successfully complete your program? | *Enter number* |

**Participants**. All currently accredited physical therapist programs in the U.S. were invited to complete the survey in the quantitative part of the study. Only one survey per institution was sought to accurately represent the breadth and depth of current physical therapist education. Program leadership structure varies based on the institution, therefore any individual who met the following criteria was eligible to participate:

- A program chair, program director, associate director, or core faculty member in the PT program.
- Holds a physical therapist license in the U.S.

Those at newly accredited programs without a history of graduating students were not eligible to participate in the study. There were 271 accredited physical therapist programs in the U.S. at the time of the study.

**Recruitment**. Various approaches were used for study recruitment. Pre-study informational posts on public APTA listserv groups were placed in the 2-week period prior to the survey emails. The initial call for participants occurred via email. Access to the email list was available through the APTA, and initial inquiries were sent to program directors. Those individuals were prompted to complete the survey on behalf of their program or to forward the email to any other program representative who meets inclusion criteria. Initial emails were sent on 2/17/2022. Planned strategies were enacted in the weeks following survey distribution to maximize the response rate. These strategies

included the use of a paid advertisement on the American Council of Academic Physical Therapy (ACAPT) website, direct emails to faculty colleagues asking for assistance in reminding program directors to complete or pass on the survey and Twitter posts. A secondary email targeting Directors of Clinical Education from non-responding institutions was sent during week 3 of the open survey period.

**Data Collection.** Exempt status from the University of Minnesota IRB was obtained prior to recruitment or survey distribution. A copy of the IRB exemption letter is available in Appendix D. Data collection occurred over a 6-week timeframe. Reminder emails were sent to all non-responders during weeks 2, 4, and in the final week of the open survey period. Given the potential number of respondents, an ambitious target of 100 participating programs was desired. The survey was designed and administered in the Qualtrics platform. A copy of the survey from Qualtrics is available in Appendix E. Qualtrics was also used for the secure housing of the data and monitoring throughout the study. Within Qualtrics, an account is password protected. Data exported from Qualtrics was housed in the Box program as well as within a secure device on university servers. Within the University of Minnesota, Box is supported for research study data on and within secure servers.

**Data Analysis**. Quantitative data were organized in several ways so that descriptive statistics could be reported. Measures of central tendency can be used to present the data collected across institutions (Portney & Watkins, 2009). Specific demographic data collected in this part of the study included geographic region, the role of the respondent within their academic setting, cohort size, number of SWPD in the

program within the last 10 years, number of SWPD graduates in the last 10 years, types of physical disabilities of students, and types of accommodations implemented.

Relationships between the graduation of SWPD and survey predictor variables were assessed using both binomial and logistic regression. Regression can be applied in cases where a known dependent variable can be said to either occur or not occur (Portney & Watkins, 2009). In my study, there were two dependent variables analyzed with regression. One was programs that had admitted SWPD. The other was the percentage of SWPD who successfully the program over the past 10 years. Independent variables in this study are categorical, which is a requisite for using logistic regression during data analysis (Portney & Watkins, 2009). Specific independent variables include institution classification, CAPTE classification, Carnegie classification, available faculty training on accommodations, and a revision of technical standards within the past five years.
Key hypotheses are associated with this section of the study.

**Hypothesis**

- Ho= u- A relationship between *Academic Factors* and SWPD successfully completing the educational program exists.
- Ha≠ u- No relationship between institution classification, CAPTE classification, Carnegie classification, faculty training on accommodations (required or available), and a recent revision of technical standards exists.

**Power Analysis.** Determination of power associated with the study was completed. In this process, the binomial model was ungrouped to a logistic model, and power was calculated based on the Wald test and conducted in the R software program

(Demidenko, 2007; Zhang & Yuan, 2018). A significance level of 0.05 was set as was a medium desired effect size with a proportion of public to private institutions of 0.40.

### *Qualitative Component*

**Research Question.** *What are the perceptions of physical therapist program directors and/or faculty as it relates to academic factors that support or create barriers for students with a physical disability?*

Secondary research question:

- How does the Disability Access Model at a given institution relate to the success of SWPD among physical therapist programs?

**Design.** In this study, qualitative inquiry was used in an exploratory manner. Exploratory strategies helped to investigate what is occurring in certain programs, to identify related themes or factors associated with programs, and to make connections across programs (Boudah, 2020). Semi-structured interviews were used to gather information pertaining to the associated research questions within the pragmatic framework. The rationale for using a semi-structured approach was that at the least, all participants should be asked the same questions, while also allowing flexibility as the interview may uncover additional information outside of the set questions. A semi-structured approach allowed for some degree of flexibility. A full list of interview questions is available in Appendix C. Interview questions and their ties to the conceptual framework, as well as the classification of questions as are listed in Table 3.2 below.

**Table 3.2:** Interview Questions with Theoretical Alignment

| Connecting Framework or Theory | Explanation | Question(s) |
|---|---|---|
| | Relates to institutional commitments within the | Describe the ways your program interacts with the |

| | | |
|---|---|---|
| | academic system and engagement with resources for disability access | Disability Resource Office at your institution?<br><br>What do you believe to be the reasons why SWPD have been successful at your institution?<br><br>How do students at your institution obtain accommodations?<br><br>Tell me about faculty and their role in supporting SWPD. |
| Tinto, Conceptual Framework Quadrant, Disability Access Model, Social Constructivist Theory | Relates to institutional commitments within the academic system and engagement with resources for disability access | Can you describe some of your interactions and experiences with SWPD in your program?<br><br>How would you describe faculty perceptions of SWPD in your program?<br><br>Was there any pushback or concerns from the clinical learning environment or clinical instructors when these students were transitioning from classroom to clinic? |

**Participants.** Select individuals who met the inclusion criteria were invited to participate in the qualitative interviews as a part of this study. I hoped to obtain participants who had experience working with SWPD, ideally those who have worked with more than one student, as this would provide a richer set of experiences from which to draw. Given that the number of SWPD in physical therapist education is low, I anticipated a small number of individuals would be able to participate. Nonetheless, it was important to collect enough data through the interview process to hit a saturation point, therefore, ongoing assessment during the interview process was planned. The inclusion criteria used are listed below.

- Are a program chair, program director, associate director, or core faculty member who have had a SWPD graduate from their program. This did not have to be the same individual who completed the survey.
- Has had firsthand experiences working with a SWPD within their program.
- Self-select to participate in the interviews.

**Recruitment**. Survey respondents in the quantitative portion of the study were asked to complete a free-response box where the name and email of any individual who may be interested in being interviewed could be provided, including their own contact information if they were interested in participating. Alternatively, the interview information link was also set up so that it could be sent to a known individual who may be interested in participating in the interviews and who meets inclusion criteria. Inclusion criteria for the interviews were initially provided in the recruitment emails so survey respondents had awareness of criteria for both parts of the study. A purposeful sampling method was used for recruitment in this portion of the study whereby anyone meeting inclusion criteria who had a SWPD graduate from their program could volunteer for the interview section of the study, regardless of whether they were the individual who completed the program survey. Purposeful sampling is used when certain individuals have key information associated with the study questions (Quinn, 2015). Because this study relied on firsthand experiences of those who had worked with a SWPD within their programs, purposeful sampling helped to ensure that ideal individuals were participating.

**Data Collection.** Qualitative data was collected via 13 total interviews which occurred over Zoom during a 4-week period. Table 3.3 provides demographic information on the interview participants. Carnegie classification data was not requested

during the interviews; therefore I obtained post-interview data through an educational repository (*The Integrated Postsecondary Education Data System*, 2021). Of note Carnegie classification requested in the survey was limited to Masters, Doctoral, Baccalaureate, or Special Focus Institution, whereas the Carnegie classification I obtained provided a greater level of detail on each institution. Participant numbers were assigned to maximize anonymity in the process.

**Table 3.3:** Interview Participant Demographics

| Participant Number | Faculty Role in Program | Institution Type | Carnegie Classification |
|---|---|---|---|
| 1 | Program Director | Private | Masters Colleges |
| 2 | Program Director | Public | Doctoral: High Research Activity |
| 3 | Program Director | Private | Doctoral/Professional |
| 4 | Director of Clinical Education | Private | Doctoral/Professional |
| 5 | Director of Clinical Education | Public | Doctoral: Very High Research Activity |
| 6 | Director of Clinical Education | Private | Masters Colleges- Medium Programs |
| 7 | Program Director | Private | Doctoral/Professional |
| 8 | Student Affairs Director | Private | Doctoral: Very High Research Activity |
| 9 | Director of Clinical Education | Private | Doctoral/Professional |
| 10 | Director of Clinical Education | Public | Doctoral: High Research Activity |
| 11 | Educational Affairs Director | Public | Doctoral: Very High Research Activity |

| | | | |
|---|---|---|---|
| 12 | Director of Clinical Education | Public | Special Focus 4-year Research Institution |
| 13 | Director of Clinical Education | Private | Doctoral: Very High Research Activity |

Confirmation that all potential participants met inclusion criteria occurred at the onset of each interview. Individual consent was obtained verbally. Each interview was scheduled for up to 60 minutes. Recordings were used during the interviews to ensure accuracy in the post-interview review. Recording and initial transcription were completed using the Otter software program. During and immediately following each interview, notes capturing initial thoughts, questions, and ideas relating to the interview were recorded by hand in my research notebook. These were referenced and integrated during the data collection in a constant reflective and process, as well as during the analysis phase of the study. Constant reflection facilitated identification of data saturation during the study.

Establishment of credibility of the data and associated conclusions is an important component of the research process. Therefore I completed a post-interview reflection and review (Boudah, 2020; Quinn, 2015). I developed a chart to organize demographic data collected and to aid in the reflection process. To address credibility as a researcher, I was explicit in describing my role within the study as well as my professional role as a physical therapist, faculty member, and a person who identifies as non-disabled. While this would not have eliminated all subjectivity, establishing researcher positionality and background in this manner has been shown to help increase credibility (Boudah, 2020). Trustworthiness of data directly relates to credibility (Boudah, 2020). Several approaches

have been suggested to increase trustworthiness in qualitative studies which were implemented during the data analysis phase. Specifically, I used member checking and peer debriefing. As described by Boudah (2020), member checking is a process whereby study participants are asked to review interview transcripts or study conclusions. All interview respondents were provided a copy of the transcript in the 1-week period following the interview and were asked to review transcripts for errors and to confirm accuracy in the transcription process. Peer debriefing is the process of discussing research design and analysis with a peer researcher uninvolved with the study (Boudah, 2020). I engaged in peer debriefing prior to the initiation of interviews and data analysis with two colleagues familiar with physical therapist education and disability studies through email correspondence as well as during zoom calls. During these debriefings the study procedures were discussed, and clarification was added to planned analyses where suggested based on peer discussions.

**Data Analysis.** During the qualitative interviews and subsequent data analysis, I remained attuned to any information which could help contextualize the academic environment as related to SWPD. Existing research questions and the conceptual framework presented in Figure 2.1 were used later in the analysis process by comparing them to emerging themes. Data were regularly compared during the analysis, a process referred to as constant comparison (Bingham & Witkowsky, 2022; Quinn, 2015). Qualitative data transcriptions were transferred into the NVivo software program for analysis. Tools within NVivo including highlighting and memos were utilized during the initial review. Memos were used to document thoughts and considerations generated during data analysis. Memos have been reported to be an important part of qualitative

research and analysis (Quinn, 2015). The research questions were kept in mind throughout the process, however, in order to maximize the potential findings the coding was conducted with an inductive approach meaning that no pre-determined codes were used (Quinn, 2015). In addition to the transcribed data, memos written during the data collection were reviewed, and an open coding approach was employed. The process of initial data organization and open coding has been described as a way to allow for a broad identification of concepts from the data (Williams & Moser, 2019). Further, as the name suggests, inductive analysis enabled me to remain open to concepts and theories which could be induced from the data (Bingham & Witkowsky, 2022; Quinn, 2015) During open coding and line-by-line transcript review, the focus was first on identifying keywords or descriptors. Categorizing codes were identified and text was subsequently organized by the associated code or codes.

Axial coding was used in the next level of data analysis. Described as a process to identify relationships across the initial codes and begin to develop major codes, axial coding often follows an open process (Williams & Moser, 2019). In this level of analysis, categories or codes began to take shape as initial codes and associated content was paired down to yield a smaller number of codes. Regular review and analysis of identified codes, including consideration of the interplay of codes across one another, was completed during the subsequent phase of axial coding. In the next part of the analysis, codes were again analyzed and reduced, eventually yielding themes. The process of ongoing code reduction utilized during this period of data analysis is known as selective coding (Williams & Moser, 2019). Reduction into themes and associated sub-themes followed during the selective coding phase of data analysis. Review and reflection were

essential components to ensure a comprehensive understanding of the data throughout the entire process, therefore frequent re-visiting of the data was employed. Finally, after themes emerged, they were further tied to the data and research questions to assign meaning.

### *Data Integration*

A requisite component of any mixed method analysis is the integration of qualitative and quantitative data (Moseholm & Fetters, 2017). Within a convergent mixed method study, data can be integrated into a few different ways and at different times during a study. For this study, data were integrated during the analysis phase. This type of integration allowed both quantitative and qualitative findings to inform the results as the integration of data occurred after data were separately analyzed (Fetters et al., 2013). In this study, data collected provided information related to the *Academic Factors* associated with success for SWPD who have completed physical therapist programs as well as information on the institutions where SWPD have been successful. Integration through interpretation and reporting is a process whereby results are jointly displayed and then merged (Fetters et al., 2013). I used this process to help weave the results together based on the themes from which the questions were derived. From this intentional weaving, a comprehensive understanding of the primary research questions was accomplished. The integration itself, while serving to answer the research questions more comprehensively, does not minimize findings obtained in either of the initial analyses, quantitative or qualitative, therefore reporting of results includes a summary of each of the associated findings in addition to the integrated results.

### *Limitations*

Several limitations to this study exist. First, there is currently no data to indicate how many physical therapist programs have had SWPD matriculate and graduate. This may have impacted the response rate. Given the degree of uncertainty, there was some risk involved in the study itself. Having enough eligible and willing interview participants is another limitation to consider. Another potential limitation is related to the comparison of participant data based on the anticipated N in each study method (quantitative and qualitative). This inequality is common in mixed methods research whereby larger samples are often used for quantitative data and smaller samples for qualitative data (Creswell, 2018). Acknowledgment of this variability, and recognition that the depth and richness often obtained from qualitative inquiry lends itself to smaller sample sizes is my way of attending to this limitation. In addition, qualitative research is impacted by considerations of credibility and trustworthiness. While key steps were taken to minimize this limitation, pure objectivity was not possible. One consideration, which may warrant future exploration would be to take a deeper look at materials associated with the programs themselves. This triangulation process could include non-interview materials including a review of program handbooks, syllabi, meeting minutes, or student-facing documents as a means of deeper exploration. No triangulation was done during my study, which is a noted limitation. A final limitation to note is that a degree of interest in the topic and direct experiences may have influenced the likelihood of interviewees to be those individuals who had unique experiences, representing exemplary cases over normal

experiences. This limitation may limit the generalizability of the findings for the broader scope of physical therapist education.

# Chapter 4

## Results

This chapter provides a detailed overview of the results derived from the study. Findings will be presented in several sections, in line with the study methodology. Demographic data will be introduced first, followed by quantitative and qualitative results. Consistent with a convergent design, the last section of this chapter will describe findings associated with data merging.

### Survey Demographics

Of 271 potential programs, contact information was missing and unavailable for 21 programs, therefore 250 programs were invited to participate in the survey. Of those, 101 responded to the survey for an overall response rate of 40%. Public, private, and private not-for-profit institutions were represented in the responses. A summary of programs and their respective institutions is provided in Table 4.1. According to the most recent CAPTE information, 45% of institutions with physical therapist education programs are public and 55% are private (*Commission on Accreditation in Physical Therapy Education*, 2021). Based on CAPTE information survey participants in my study were representative of the broad distribution of programs in the U.S. as 47.6% of institutions responding were public and 52.4% were private (including for profit). My study had a higher number of Doctoral institutions at 77.7% and 12.6% Masters as compared to CAPTE, which reports a distribution of 35.2% and 41.5%, respectively (*Commission on Accreditation in Physical Therapy Education*, 2021).

**Table 4.1:** Institutional Information Collected

| | **Public (n=49)** | **Private (n=53)** | **Private-for-Profit (n=1)** |
|---|---|---|---|

| *Carnegie Classification* | # (%) | # (%) | # (%) |
|---|---|---|---|
| Doctoral | 42 (86) | 38 (72) | 0 |
| Masters | 4 (7.5) | 9 (17) | 0 |
| Baccalaureate | 0 | 1 (1.9) | 0 |
| Special Focus | 3 (6.1) | 5 (9.4) | 1 (100) |
| *CAPTE Classification* | # (%) | # (%) | # (%) |
| In-Person | 4 (96) | 51 (96) | 0 |
| Hybrid | 2 (4.1) | 2 (3.8) | 1 (100) |

Representation from all regions in the United States was obtained according to the survey results. A reporting of geographic location based on respondents is available in Figure 4.1.

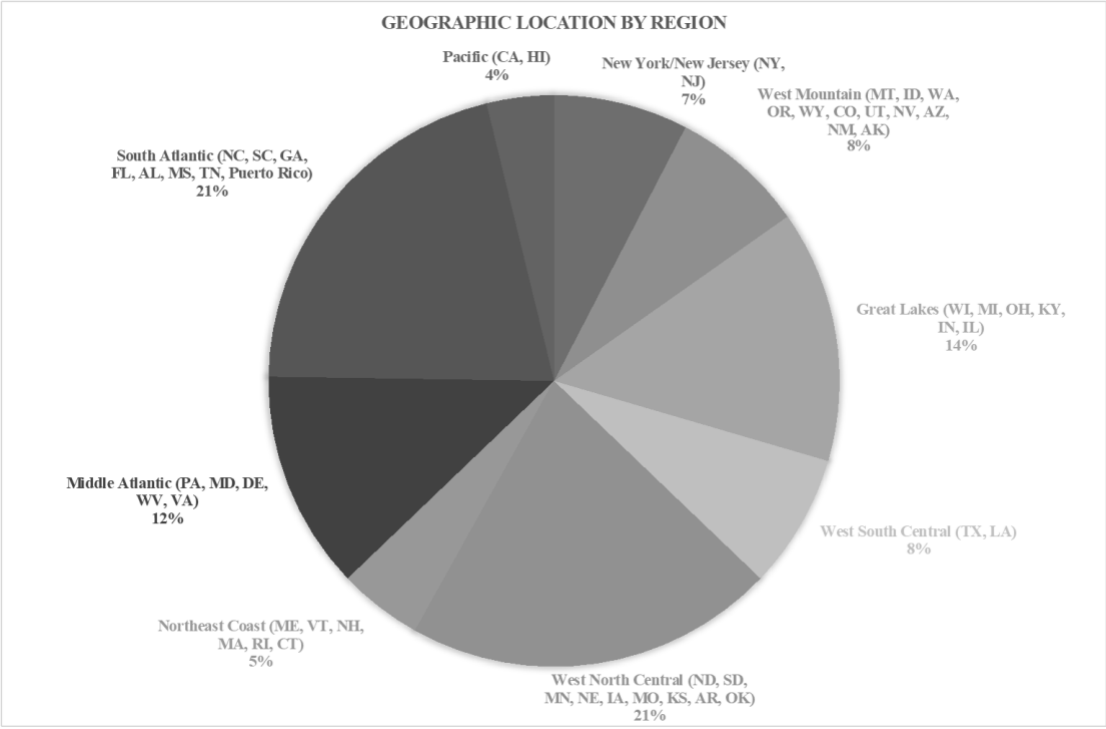



**Figure 4.1:** Location of Participating Programs by Region

Additional demographic information collected included information on which representative from the program completed the survey. Of the options, 49 identified as

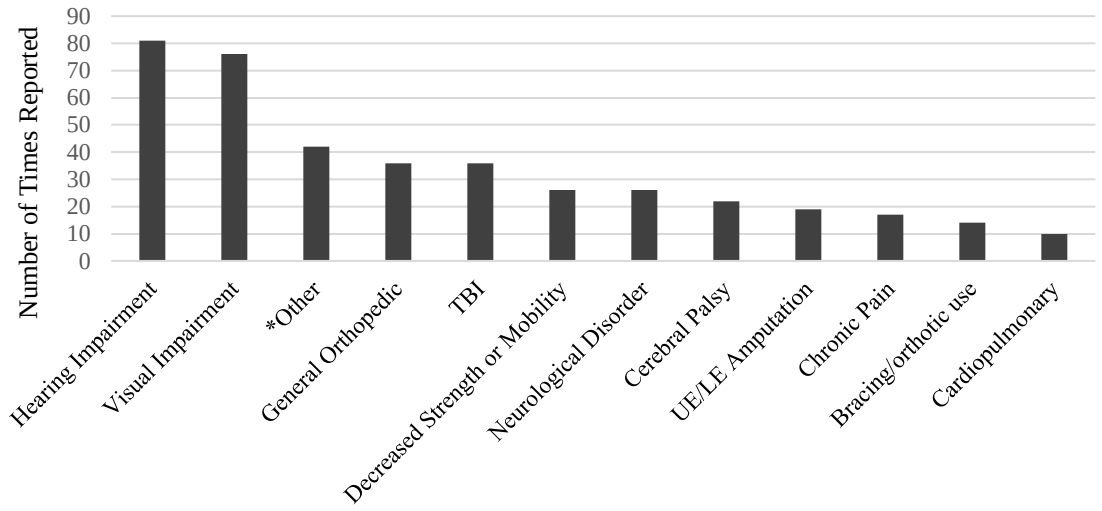
Directors of Clinical Education, 16 were core faculty (not in director-level roles), while 40 were either Program Directors or Associate Program Directors. The number of years of experience in their roles ranged from 2 to 37 years, with an average of 13.69 (+/- 8.87) years of experience. Regarding cohort size, several respondents did not report cohort size and are not included in demographic reporting. Descriptive statistics of cohort size for each program indicate the smallest cohort is 19 students with the largest cohort size being 110. The average cohort size was calculated to be 50.77 (+/- 20.32) with the average size of public program cohort being 52.26 (+/- 19.20) and private program 49.61 (+/- 21.27).

A total of 61 institutions reported admitting SWPD and the overall graduation rate was calculated to be 85.83%. Of respondents, 60.4% of institutions reported having admitted SWPD. Based on estimated cohort size over a 10 year period and the total number of SWPD admitted, <1% of students were SWPD, which is lower than previous reports of 5% (Hinman et al., 2012; Lehmann & Morgan, 2019).

**Quantitative Results**

***Exploratory Analysis*.** When provided a list, respondents indicated the most common physical disabilities encountered to be hearing and visual impairments. A category of other was provided and an opportunity to write in disabilities was offered, with 5 additional disability categories identified. A total of 410 entries were provided, which exceeds the number of SWPD reported in the study, indicating SWPD may have more than one disability. A summary of findings is available in Figure 4.2.

**Figure 4.2** Physical Disabilities Identified by Respondents




*Other- GI, hypermobility, chronic fatigue, arthritis, Chron's

When asked about past use of accommodations, both didactic and clinical questions were posed. Didactic accommodations are those accommodations, which are implemented to improve access in the classroom environment, including both lab and lecture sessions. Clinical accommodations are implemented in the clinical learning environment. Clinical environments include the hospital, outpatient, or nursing home settings, among others. Respondents provided numerous examples via open text. Data were organized and summarized by type of accommodation for both didactic and clinical settings. Results for didactic accommodations are shown in Table 4.2. Increased testing time was the most reported didactic accommodation. Accommodations associated with visual support, note supplements, and hearing support were also frequently reported. These findings are consistent with the results indicating visual and hearing loss as the most common physical disabilities.

**Table 4.2:** Didactic Accommodations Reported

| | | | |
|---|---|---|---|
| Increased Testing Time | 19 | Personal Devices (*prosthetics, hearing aids, service animals)* | 6 |

| | | | |
|---|---|---|---|
| Notes (*notetakers, recordings, copies of notes)* | 17 | Intermediary/Aide (*lab support, simulation, exams)* | 5 |
| Visual Support (*paper exams, large font, computer-enhanced text and images, colored paper use, Braille lettering)* | 14 | Modified Assessment | 5 |
| Hearing Support (*ASL interpreter, closed captioning, transcription services, clear masks)* | 12 | Sit or Stand Option (*during class, lab, and/or exams)* | 4 |
| Equipment (*magnifying device, electronic stethoscope, iPad, BP cuff, goniometer)* | 11 | Lighting (*filtered, adjusted down)* | 3 |
| Assigned/Preferential Seating | 10 | Available Breaks | 2 |
| Low Distraction Environment | 8 | Modified Exam Dates | 2 |
| Modified Manual Techniques (*lifting, handling, manipulating equipment, intervention delivery)* | 7 | Modified Curricular Plan | 1 |

Clinical accommodations were less frequently reported. Details on the types and number of times a clinical accommodation was reported are shown in Table 4.3. Hearing support, use of equipment, physical assistance, and visual support items were most reported as clinical accommodations. Differences in didactic and clinical application of visual and hearing supports include the use of electronic documentation and record systems. Access to an aide to either read charts or assist with a physically demanding task were among items reported which are unique to the clinical setting.

**Table 4.3:** Clinical Accommodations Reported

| | | | |
|---|---|---|---|
| Hearing Support (*ASL interpreter, recording of verbal feedback, transcription services, clear masks, dictation software, face-to-face communication)* | 11 | Extended Documentation Time | 4 |
| Equipment (*electronic stethoscope, BP cuff, goniometer, magnifying lens for wound care)* | 9 | Low Distraction Environment | 4 |

| | | | |
|---|---|---|---|
| Physical Assistance (*Aides, Techs)* | 9 | Increased Faculty Oversight | 2 |
| Visual Support (*EMR, magnified computer screen, colored paper use, Braille lettering, aide to read charts)* | 9 | Lighting (*filtered, adjusted down)* | 2 |
| Modified Manual Techniques (*lifting, handling, manipulating equipment, intervention delivery)* | 7 | Reduced Caseload | 2 |
| Available Breaks | 5 | Access to Public Transportation System for Placements | 1 |
| Personal Devices (*prosthetics, hearing aids, service animals)* | 5 | Pre-Placement Site Training (*seizure disorder support*) | 1 |
| Extended Length of Clinical | 4 | | |

***Data Analysis Overview*.** In examining the research questions associated with this study, data were analyzed based on question format and type of data reported. The primary research question is, "*What are the Academic Factors associated with program completion for students with physical disabilities in U.S.- based Doctor of Physical Therapy programs*? Additional research questions focused specifically on the relationship between successful program completion (graduation) by SWPD as related to six different predictor variables including Carnegie classification (four-level factor), CAPTE delivery method (in-person, hybrid, online), institution type (public, private, private-for-profit), availability (y/n) or requirement (y/n) of training on accommodations, and whether technical standards were updated in the past 5-year period (y/n). All except one of the responding private institutions identified as private for-profit, therefore, this program was included with the private institutions for the purposes of analysis.

The research questions required analysis of the subset of institutions who had reported SWPD being admitted in the past 10 years and the associated graduation rate in the context of six predictor variables. Answering the research question related to

admission of SWPD (a yes response) was completed with logistic regression. The percentage of SWPD was calculated based on reported cohort size, adjusted for a 10-year period. Binomial regression was used to study the effect of the six predictor variables of interest on graduation rate. A significance rate of 0.05 was set for the analysis process.

***Power Analysis.*** Power was determined for the binomial regression model, graduation rate. With a set significance of 0.05, a medium effect size, a total of 271 accredited programs, and a proportion of public to private institutions of 0.40, a 90% power would be achieved with a sample size of 31. Given there were 61 observations used for analysis it was determined that the study was fully powered.

***Data Cleaning.*** Prior to analysis, the full data set was processed to align with the research questions. Specifically, responses which were incomplete regarding SWPD were not included, and only those with SWPD were further analyzed, thereby consolidating the dataset. Some institutions reported SWPD still in progress, therefore those responses were not included in the graduation rate calculations. In two entries, the number of SWPD graduates was reported to be greater than the number of SWPD admitted, therefore the number of graduates was assumed as the number of SWPD admitted. Because only one of the responding institutions was classified as Baccalaureate, it was omitted from the analysis to improve the validity of the findings.

***Binomial Regression Results.*** Detailed results assessing how academic factors affect SWPD graduation rates are provided in Table 4.4. Among these results, there were no significant relationships between completion of SWPD and Carnegie classification ($p= 0.650$) or CAPTE classification ($p= 0.279$). In addition, the relationship between required faculty training on accommodations and completion of SWPD was not significant (p=

0.593). This finding indicates that requiring specific faculty training on accommodations does not significantly impact the rate of graduation for SWPD from physical therapist programs.

One variable was shown to have a significant relationship with program completion for SWPD, the relationship between available faculty training on accommodations and completion of SWPD was ($p= 7.89 \times 10^{-5}$). This means that where faculty training was available SWPD were more likely to graduate. A relationship was found between programs with recent revisions in technical standards and completion of SWPD (p= 0.058) and as well as when looking at SWPD graduation rate and institutional type (public or private) with a p-value of 0.147, however these findings were not statistically significant. Coding as either a public or private institution was completed during the survey by the survey respondents. For the statistical analysis, public and private institutions were assessed as a variable along with several others as identified in Table 4.4. There is a negative sign under the institution type as this was assessed as public as compared to private. The negative sign indicates less of a likelihood of graduation for SWPD at public institutions versus private. All variables are further detailed in Table 4.4 and described below.

**Table 4.4:** Binomial Regression (without modeling)

| ***Variable*** | **Intercept** | **Carnegie Classification** | | | **Training Available (Yes)** | **Training Required (Yes)** | **Institution Type (Public)** | **TS[c] Updated (Yes)** | **CAPTE (In-person)** |
|---|---|---|---|---|---|---|---|---|---|
| | | Doctoral | Masters | SFI[b] | | | | | |
| ***Effect Size (95% CI)*** | 1.523 (-1.373, 5.096) | -0.495 (-3.617, 1.744) | -1.210 (-4.501, 1.392) | -1.217 (-4.592, 1.609) | 2.001 (1.021, 3.010) | -0.350 (-1.592, 0.989) | -0.631 (-1.488, 0.225) | 0.839 (-0.029, 1.745) | -0.976 (-3.012, 0.722) |
| ***LRT[a] (P-value)*** | 0.335 | | 0.650 | | *$7.89 \times 10^{-5}$ | 0.593 | 0.147 | 0.058· | 0.279 |

**significant finding*
*a= likelihood ratio test, b= special focus institution, c= technical standards*

In recognition of the small sample of 61 programs with SWPD for binomial regression, additional modeling was done during this phase of data analysis. A stepwise model selection by AIC was performed to obtain a parsimonious model including the following variables: accommodation training available, recent technical standard revision, and institution type. AIC helps to determine the fit of a model and is an estimator of prediction error (Creal et al., 2013). After controlling for other variables, the modeling indicated that the log odds of SWPD graduating from an institution where training is available was 1.773 times higher than those institutions without such available training. Further, the log odds of SWPD graduating from a program where technical standards were updated is 0.929 times higher as compared to those programs that have not completed updates. The log odds of SWPD graduating from a public institution is 0.779 lower than from a private institution. Results are displayed in the Table 4.5: Binomial Regression (with modeling).

**Table 4.5:** Binomial Regression (with modeling)

| ***Variable*** | **Intercept** | **Training Available (Yes)** | **Institution Type (Public)** | **TS Updated (Yes)** |
|---|---|---|---|---|
| ***Effect Size (95% CI)*** | 0.205 (-0.689, 1.106) | 1.773 (0.914, 2.654) | -0.779 (-1.583, 0.007) | 0.929 (0.139, 1.741) |
| ***LRT (P-value)*** | 0.652 | *$6.68 \times 10^{-5}$ | 0.052· | *0.021 |

**significant finding*

These model results suggest that the availability of training is associated with increased chances of SWPD successfully completing a program, not the requirement of training. Moreover, private institutions have a higher graduation rate than do public institutions.

***Logistic Regression Results*.** All responses indicating a SWPD had been admitted were included in this portion of the analysis. After data cleaning, this totaled 100 institutions. Baseline predictor levels included a Carnegie classification of Doctoral,

private for institution type, hybrid for CAPTE classification, and "no" as a response for available training, required training, and updated technical standards. Results from the logistic model are provided in Table 4.6: Logistic Regression (without modeling). Among these, only having updated technical standards was significant at p= 0.027. This finding suggests that those institutions who have updated their technical standards in the past five years are more likely to admit SWPD. No other variables tested as significant.

**Table 4.6:** Logistic Regression (without modeling)

| ***Variable*** | **Intercept** | **Carnegie Classification** | | **Training Available (Yes)** | **Training Required (Yes)** | **Institution Type (Public)** | **TS[c] Updated (Yes)** | **CAPTE (In-person)** |
|---|---|---|---|---|---|---|---|---|
| | | Masters | SFI[b] | | | | | |
| ***Effect Size (95% CI)*** | 0.799 (-0.363, 0.822) | -0.923 (-2.245, 0.382) | -0.349 (-1.901, 1.353) | 0.275 (-0.969, 1.458) | -0.578 (-1.827, 0.694) | -0.344 (-1.246, 0.540) | 0.981 (0.113, 1.891) | -0.479 (-3.596, 1.751) |
| ***LRT[a] (P-value)*** | 0.552 | 0.365 | | 0.654 | 0.365 | 0.446 | *0.027 | 0.692 |

**significant finding*
*a= likelihood ratio test, b= special focus institution, c= technical standards*

Consistent with the binomial regression process, a model selection based on AIC was used to improve the trustworthiness of the results. Using the predictor of technical standards being updated, results indicate a significant finding (p= 0.046) related to admitting SWPD. Thus, when all confounding variables are held constant, the log odds of admitting a SWPD will increase to 0.851 when a program has updated technical standards as compared to those programs that have not. This means that the single action of updating technical standards is directly related to having more SWPD in a given physical therapist program. A depiction of the logistic regression with modeling is in the aptly named Table below.

**Table 4.7:** Logistic Regression (with modeling)

| ***Variable*** | **Intercept** | **TS[b] Updated (Yes)** |
|---|---|---|
| ***Effect Size*** | 0.223 | 0.851 |
| ***(95% CI)*** | (-0.363, 0.822) | (0.015, 1.713) |

| | | |
|---|---|---|
| ***LRT***[a] ***(P-value)*** | 0.457 | *0.046 |

**significant finding*
*a= likelihood ratio test, b= technical standards*

In summary, several descriptive findings were identified during quantitative analysis as related to the most reported physical disabilities, the most common accommodations in the classroom and clinical settings, and the percentage of SWPD admitted to and completing physical therapist education. Statistically significant *Academic Factors* associated with successful completion of SWPD in physical therapy programs include private institutions over public, having recently updated technical standards for matriculation, and having available training on accommodations. This finding confirms the hypothesis that a relationship between academic factors and SWPD completion exists.

**Qualitative Findings**

In this section, I present the findings from a series of interviews with participants who have had at least one experience in working with a SWPD in their physical therapist education program. Several themes and associated sub-themes were identified during the data analysis and will be described in detail below. For clarification, each theme is presented in text that is both bold and italicized. Each sub-theme is presented in italicized text within the overall theme section. The themes are grouped based on whether they are considered academic supports or academic barriers. An overview of the thematic results is presented in Table 4.11: Academic Supports and Barriers.

***Interview Demographics*.** A total of 13 interviews were completed during this study. Saturation, a goal of this part of the study, was identified at several points during the interviews and was confirmed with initial reviews of the data during the interview

process. Defined, saturation occurs when additional categories for data are not being found and when similarly described content is being reported and categorized without new categorization needs (Saunders et al., 2018). Study recruitment was subsequently ended at 13 interviewees. These participants represented six public and seven private institutions. Four held roles as Program Directors (PD), seven as Directors of Clinical Education (DCE), and two were faculty without director-level roles. Information on institution size was obtained by accessing an educational database after the completion of interviews. Average student enrollment numbers include both undergraduate and graduate learners (*The Integrated Postsecondary Education Data System*, 2021). As presented in Table 4.10: Participant Demographics, the number of SWPD each of those interviewed had worked with ranged from as few as one to as many as 15. Numbers were assigned to each participant during the data collection process to maintain institution and respondent anonymity during the reporting of results.

**Table 4.10:** Participant Demographics

| Participant Number | Role | Institution Type | Institution Size (average student enrollment) | Experiences with SWPD (# of students) |
|---|---|---|---|---|
| 1 | PD | Private | 2,625 | 2 |
| 2 | PD | Public | 13,992 | 6 |
| 3 | PD | Private | 1,937 | 12 |
| 4 | DCE | Private | 3,904 | 1 |
| 5 | DCE | Public | 24,267(medical campus) | 8 |
| 6 | DCE | Private | 4,024 | 2 |
| 7 | PD | Private | 2,266 | 6 |
| 8 | Student Affairs Faculty (former DCE) | Private | 23,409 | 15 |
| 9 | DCE | Private | 3,751 | 2 |
| 10 | DCE | Public | 15,424 | 3 |
| 11 | Educational Affairs Faculty | Public | 13,638 | 10 |
| 12 | DCE | Public | 3,750 | 1 |
| 13 | DCE | Public | 34,199 | 1 |

**Qualitative Results**

Each of the interviewees contributed to the data collected and subsequently analyzed. During qualitative analysis, the inductive process progressed from an open review of the data, including the review of memos and notes I took throughout the process, through axial and selective coding, finally resulting in themes and associated sub-themes. My conceptual framework and research questions driving this portion of my study served to guide the thematic analysis, including the primary question, "*What are the perceptions of physical therapist program directors and/or faculty as it relates to academic factors that support or create barriers for students with a physical disability?"* Secondarily, I aimed to understand the relationship between an intuition's Disability Access Model and SWPD success. Results from the qualitative analysis resulted in themes which related to the primary research question and are provided in Table 4.11: Academic Supports and Barriers.

**Table 4.11:** Academic Supports and Barriers

| **Theme (*supports)*** | **Theme (*barriers)*** |
|---|---|
| Adaptable Perspectives | Fixed Mindset (ableism) |
| *Sub-Themes* | *Sub-Themes* |
| Clear Philosophy | Defensive Questioning |
| Rolling with Things | Focusing on Limitations |
| Trusting the Process | Regulation Interpretations |
| Valuing New Approaches | Tendency to Default |
| Multi-Stakeholder Collaboration | Roadblocks |
| *Sub-Themes* | *Sub-Themes* |
| Frequent Communication | Ambiguity |
| Proactive Approach | Poor Communication |
| Shared Accountability | Time and Resources |
| | Unilateral Efforts |

Each of the above themes and sub-themes was derived from the collective set of interviews and subsequent analyses. Participants described their perceptions on SWPD at their institutions. An inductive analysis of their descriptions revealed several references to supports and barriers, in alignment with the primary research question. The inductive nature of the analysis provided ample opportunity for coding and a constant comparative approach ensured that findings were not limited. In the next section of this paper, the themes and sub-themes will be presented along with supporting quotes from participants.

***Adaptable Perspectives*.** Evident across the interviews was the idea that so much of what these programs are doing is adapting to the needs of their students. Although there was not consistency in the types of physical disabilities the programs were encountering, participants described a degree of openness and flexibility engendering student support. Program culture was frequently described as respondents discussed the role of faculty. Key cultural components included a collaborative and inclusive philosophy, a *clear philosophy* of supporting students. Several described having actual philosophical discussions about who "we" as a faculty were. For example, these discussions were described not as fleeting or hallway chats, but rather ones held at faculty meetings or annual faculty retreats. Often, these programs articulated the importance of putting student needs first and ensuring students feel heard. The concept of support and having a clear program philosophy of support was commonly observed in descriptions of faculty interactions and program goals. When asked why students were successful at their institution, Participant 5 stated, “I think our faculty has had open communication and lots of dialogue about our own philosophy on students.” They identified time used by faculty to collectively problem-solve, find resources for students, and a general approach to new

challenges or situations with optimism and creativity, as opposed to being burdened with varied student needs.

Participant 2 continued with the concept of a clear philosophy:

> I think students would, would perceive that we're very accommodating, we say bend over backwards. I think this is kind of a part of the culture. You can see that from our scheduling and other things that we that we do here. It's very student-focused, and students feel supported by faculty and the program as a whole.

Participant 3 further discussed the philosophy adopted by their collective faculty, "I think that you have some people that are just so passionate about helping students that they will do just about anything and make a lot of personal sacrifices to make those students successful."

There was honesty and transparency around making mistakes associated with the primary theme of adaptable perspectives. Programs were likely to embody the next sub-theme, *roll with things*, where they would openly share and then work to resolve challenges or new situations. Rather than limiting their thinking or approaches, programs that were able to *roll with things* were adaptable in their perspectives. Participant 11 described a time where their program had sent a SWPD to a clinical site where there had not been enough dialogue ahead of time about expectations, so the clinical instructor was questioning a technique in which the student was not successful. They owned the mistake, and used it as a learning opportunity for everyone:

> Ok, so it probably wasn't a good idea to send this student here and I'm worried for them and like what do we do? . . . So like, how can we make this work? You

> know, let's talk about [it] give me some for instances and let's work through it and see like, what could maybe be done?

The concept of adaptable perspectives is a bit like reframing, being able to encounter something new and adapt to (or roll with) what the situation calls for. This was a component of both classroom and clinical environments where students were successful. Participant 11 shared a conversation with a SWPD demonstrating the sub-theme of rolling with things, this time about classroom, clinic, and eventual employment choices:

> So how's this gonna work? Like, let's brainstorm together, how this is gonna work when you're actually out in the field and doing these things and like what kind of setting is maybe gonna make your situation more noticeable, more difficult to accommodate, and maybe not contribute to good quality of life for you and you know, kind of thinking about like, we will adapt and try to do whatever it is that you're passionate about in PT but let's think about what's going to be good holistically.

In reflections on student success, the sub-theme of *trusting the process* was important from several perspectives. Most simply, trusting the process is taking things as they come and for what they are. In one example, Participant 2 described working with the disability office on campus:

> We've always felt like had a good relationship with them and they understand our needs or if they don't we set out to talk about it and work through those things where we're able to kind of, you know, find something that's going to help the student be successful.

Participant 11 similarly talked about trusting in the process, extending that trust beyond just the program itself. Within the institution there was a similar amount of trust, as they described in this statement:

> And we just kind of like go yeah, send them to Deb [in the disability office]. She'll know what to do. One of those things that it just happens usually so seamlessly that we don't have to put a whole lot of thought into it, which is nice.

Participant 8 shared thoughts on SWPD in the classroom, "if it's something that the student has an accommodation for, we just move forward with it," as an additional example of trusting the process or processes established, each helping students be successful.

The final component of the adaptable perspectives theme is the sub-theme related to *valuing new approaches.* This sub-theme describes having the capacity to see things differently and to reframe thinking in an open, new way. Appreciation for learning new approaches often came into the descriptions provided by participants in their reflections on student success. For example, Participant 13 talked about varied approaches, "I think we are always strict, like constantly reminding ourselves that not everyone learns the same way and is going to be able to perform the same way in the same timeframe." They continued, "helping the students navigate the curriculum in a way that both honors the needs of successfully completing the program, that didactic coursework, but also make space for whatever this student might need that might be different from their peers." Participant 7 stated:

> I am one banana peel slip away from joining that group. And if I'm an able-bodied physical therapist, and I have an accident on the way home, I'm not going to

> probably go out and sell pencils on the street. I'm going to figure out a way to be a physical therapist, I can teach, I can do research.

Here, they were demonstrating an adaptable way, a new way, to think about practicing physical therapy, as a person with a disability. In many ways, they were describing the ability to demonstrate empathy and engage with students in the same way that training would dictate therapists approach patient care. Participant 11, continuing with the idea of valuing new approaches, shared:

> It's like, oh, okay, like, maybe they don't have to do the thing like so let's say that that therapist does locomotor training, right, which is very bodily intensive, and that's their image, their framework for what PT is right is like this heavy duty lifting every day. And that may not be at all what the student wants to go into. Like that student may be going into a very different facet of PT. And so just kind of explaining to that person who's confused about like, Well, yes. We want to graduate generalists. We want them to have this full generalist experience, but they're going to go pursue their specific passion, and what they're bringing into that as someone who's already lived with XYZ condition, whatever it is, is just going to bring something completely different. And if we don't have those people in our field, then you know, how are we going to be able to relate the best how are we going to be able to have the best truly physical therapy if we don't have those perspectives.

When Participant 5 described value for new approaches, the overarching adaptability came through:

> I think it takes openness on the faculty. I think it takes a huge contribution from the student themselves. [the student] Really knowing themselves knowing what their limitations are and having an understanding of what they might need in order to meet the qualifications because able-bodied people can't.

***Multi-Stakeholder Collaboration.*** One clear finding from this study was the importance that collaboration has on the ability to support a student. This finding included collaboration across faculty, staff, students, clinical sites, and at many levels of an institution. Within this theme, three sub-themes emerged. Having *frequent communication* with the collaborators can be best appreciated in the following example quotes. From Participant 1, "communication is just critical across the board," While Participant 5 stated, "there's a lot of communication between myself, the student, and the clinical site." They continued:

> So lots of communication, lots of communication with the student voicing what has worked as well as meetings even before a placement occurs. Meeting between myself SCCEs [site coordinator], students, and a potential CI [clinical instructor] and just open discussion about what this might look like, and how the program can also help support the site.

Participant 6 reflected on student collaboration, demonstrating the sub-theme of frequent communication as a component of multi-stakeholder collaboration, "I would say we have equal compassion and empathy. And concern about, again, long-term trajectory. So we have frank conversations, honest conversations. But compassionate conversations." Similarly, Participant 4 stated:

> So you know, as the academic program, we're the ones deciding this is the accommodation and we can we have some we have an obligation and there's communication, you know, within the institution, and then we're extending our institution to the clinical sites, and they if they agree to that accommodation, they're obligated to that. But they're not part of the institution.

Multi-stakeholder collaboration was also associated with the idea of taking a *proactive approach* to problem solving in relationship to student success. Participant 2 described how faculty set the stage for student support:

> I feel like our faculty do a good job that they're even proactive and reach out and encourage the students to seek out just so that we have a clear understanding and everyone's on the same page because I think that's the biggest thing you know, the faculty want to provide something students understand they need, let's just be you know, be clear about what that what that is.

Participant 6 talked about collaboration as a faculty advisor, “If I have a student with accommodations, that is one of my advisees, you know, I'm going to make sure that they are doing okay. Are the accommodations working? Do they need a revision?” Participant 10 recalled a time where the “student was extremely proactive,” as was the program, in collaborating with faculty and with clinical sites:

> So I helped initially set those rotations up and identify sites that we thought would be able to accommodate or would be willing to entertain the question of could they accommodate and then I went along with her and we met with the site, the CI, and did some education about things we found that worked here on campus in our labs, and with her documentation and things like that, and so kind of

> consulted with them about what we found works here and then tried to look at what does their space look like and without work while she was giving feedback, and we were getting feedback from some experts.

The sub-theme of *shared accountability* is exemplified in a quote from Participant 8:

> We just try and problem solve, and I take an approach of I'm collaborating with the student with the faculty and we're trying to figure this out together. No one has all the right answers, and every individual needs a bit of an individualized approach, which I think speaks to my background as a PT, right, like that's, you know, there's no one right exercise for everybody. And it needs to be determined collaboratively.

Participant 10, in describing collaboration with one SWPD stated, “it was like she also had to be part of the problem solving,” further supporting the idea of collaboration and shared accountability therein. Participant 9 stated, “It’s more than directing the student to get the written identifiers that yes, we do have an accommodation in place. And then once that is there, working directly with the student to figure out what's going to work best for them.”

Much like the supports identified, barriers also emerged during the study. This section presents such barriers, defined as those things found to limit the progression of SWPD or to be perceived to negatively impact SWPD. The two primary themes and their associated sub-themes are detailed below.

***Fixed Mindset.*** Despite the clear benefits of taking an adaptable, collaborative approach, this was not the only way SWPD were impacted by key academic factors. A fixed mindset is one of two primary themes that emerged in cases where participants

described deterrents to progression or success for SWPD. Fixed mindset is taking a rigid, familiar approach to novel situations whereby only known solutions or strategies for problem-solving are employed. Where those same strategies and solutions are viewed as the correct and superior approaches. This can also be considered a form of ableism, a limiting view toward disabled people whereby the absence of a disability is viewed as good or better than having a disability. One interesting finding was the idea of questioning. Within the fixed mindset theme, the specific sub-theme of *defensive questioning* arose. Defensive questioning is the use of questions to deflect an undesired response or to question intent. Using questions in this way further supports the theme of a *fixed mindset*. In *defensive questioning,* someone relies on their own (potentially limited) understanding of a situation to draw conclusions and questions anything that does not align with that framework. An example of this is determining that one approach to complete a clinical skill is the only way to accomplish the desired outcome. Anyone who selects a different approach, or perhaps a SWPD who might use accommodations to complete a task would be questioned. The underlying assumption is that the approach taken by a SWPD is not correct, not possible, or is invalid. Participant 8 shared, "I think that there are faculty who view students with this mindset for students with disabilities of any kind, like how will they function in the clinic?" Here, the underlying assumption is that the SWPD won't be able to function, as opposed to taking an open, inquisitive approach. Participant 3 referenced ways faculty have questioned the need for accommodations by assuming a negative intent, "And I think a lot of people just [asked] why is she getting special, you know, stuff?" Participant 10 shared, "Well, what are you going to do when you're in the clinical and forms are not on blue paper?" describing a

SWPD who needed visual support, using *defensive questioning* to justify a presumed frustration with an accommodation for blue paper handouts instead of offering an open and supportive approach to problem-solving.

Beyond the idea of questioning defensively, a fixed mindset was evident in the way that people may *focus on limitations* or take a rigid approach to *regulatory interpretations*, thereby *tending to default* to past (fixed) approaches. The following are examples, which help support these important sub-themes. Participant 9 shared a time when faculty struggled to initially understand an accommodation need as an example of a fixed mindset and focus on limitations:

> Initially, it did seem to be a lot of, 'well, we can't do that'. That gives an unfair advantage. Yeah, I guess that it was somewhat resistance, not wanting to provide a barrier but more of a this is a change and I think that it provides an unfair advantage.

Participant 3 described limiting thoughts toward SWPD:

> I mean, we say that we're advocates for people with disabilities, and yet, we don't want them to be part of our group. And to me, it's just it's such an ambiguous attitude. I don't get it. I think we're afraid that if they are unable to do something effectively because it is such a physical job, and there's a negative perception of PTs that results from that. I don't know if it's an image thing that they're concerned about or what but to me, having somebody with a disability treat you should actually boost the confidence of that patient.

Several participants spoke specifically about how rigid interpretations on regulations including technical standards was a limiting factor for SWPD. Participant 7

said, “I get a lot of pushback because we have technical standards- you’ve got to be able to jump over buildings,” in reference to how their colleagues have interpreted technical standards rigidly. Participant 8 talked about needing to update their technical standards, “I'll tell you our program has been meaning to look at our technical standards for a while.” They went on to provide this input on other program’s technical standards in reference to regulations, “I've looked at some technical standards that specifically say you must be able to lift 200 pounds or whatever, you know, manage a patient in a transfer who's 200 pounds or greater. We do not have that.” Participant 6 shared perspectives on the technical requirements for the job of physical therapy, which is external to academic requirements.

> Because of the psychomotor skills that and the variety of psychomotor skills that we have to demonstrate competency on, it does make it very challenging. For let's say, somebody who has amputation of a limb that, again, they could be successful in some aspects of PT, but they may not be able to be successful in all aspects.

The crossover described here, between academic and employment requirements is another example of rigid thinking and fixed interpretation of regulatory guidelines, further seen in this summary from Participant 3 who described an exchange among faculty regarding a question on disability office professionals:

> The biggest problem there was that we had a faculty member who was very into OSHA standards and all this kind of stuff. She worked in the clinic, and she said, ‘Well, this student will never, I mean, the clinics don't accommodate them the way we're supposed to accommodate them. So why are we doing this?’ and she

> was not a very strong advocate and she said, ‘I don't know how this student even got into a program.’

The idea of defaulting within the *tendency to default* sub-theme was clear in this statement, detailing faculty and their roles in working with SWPD: “And then there's others that just have the attitude why are we doing this when we have so many able-bodied people wanting to apply to school and why are we letting this person in?” Participant 3 continued:

> I think that's part of where that comes from, you know, with people who have degenerative types of disabilities or, you know, are they going to be able to give the best care and people in our profession. Some of them [faculty] just doubt that. And they're worried that it's going to hurt the image of everybody else, but you know, I don't know. Yeah, like I said, I think a lot of it is people's individual beliefs and personalities and values that get in the way.

When Participant 5 described challenges with SWPD entering PT they stated, “I think it's just hard for us to imagine being able to perform form our roles and responsibilities with a physical disability because we're coming from the lens of how we approach our roles and responsibilities,” a quote that is exemplary of a fixed mindset and defaulting to known ways of doing.

Participant 8 shared:

> I think as much as PT is trying to help people with disabilities there is such an ableist mindset. . . And it’s sort of frustrating to me that we're in a profession that is about trying to help people improve function, compensate for function that won't improve, and yet we can't do that for our learners. And I yeah, I just think

> there is an ableist attitude and if we really want to be an inclusive profession, if that is something that we hold to be valuable, then we need to think of inclusivity in its broadest terms.

Participant 11 expanded beyond the idea of just SWPD in this statement, demonstrating the overall theme of a fixed mindset. This was a post-interview statement sent to me via email.

> When people already in the field of PT give pushback or are confused about why someone with a physical disability wants to join the field of PT, maybe they don't realize that the world is generally, at baseline, not built for people with physical disabilities. Since people with physical disabilities have to adapt so much in life already, why wouldn't they be attracted to a field that is supposed to be about that? So when we [people without physical disabilities] question that, it's probably like we're questioning the whole way someone with a physical disability has gotten used to living—always trying to adapt to a world that wasn't built for them. If they're going to have to make adaptations anyway when they join the workforce, why not consider [SWPD] that they might be able to use their lived experience to help the next person with a physical disability?

***Roadblocks.*** This theme relates to the presence of barriers that were identified as associated with the progression of SWPD, things that seemingly get in the way or "block the road." Within the theme of roadblocks, the following sub-themes emerged: *Ambiguity, poor communication, time and resources,* and *unilateral efforts*. Considering the way that accommodations are developed and then implemented, the idea of *ambiguity* was evident as a deterrent or a frustration, something negatively impacting the student in

question. In describing working with disability office staff, Participant 2 said, “But sometimes, initially, some of the requests [from the office], it's like, they have no idea what they're, [what they're] asking.” Similarly, Participant 5 spoke to the role of faculty and how ambiguity comes into play with accommodations, “The clinical accommodations, as you probably are aware, Amanda, are different than the classroom accommodations and I find them hard to [to] determine what's reasonable.” Participant 4 described ambiguity and a lack of understanding of how to work with accommodations, “There was some hesitancy like, is this, how is this going to work? Is the student going to be successful?” Participant 5, in describing their role in supporting students continued:

> I am managing a situation right now. . . where their symptom or symptoms are still fluctuating. And so what does that look like day-to-day, and they not only have some physical symptoms like you know, dizziness, but they also have some cognitive symptoms where they aren't processing, they feel a sense of brain fog. And so it's managing both of those. . . it's definitely challenging.

The roadblock of *poor communication* was evident in several ways during the interviews and subsequent analyses. For example, Participant 5 described where communication was poor in describing a time when a student was not successful:

> We didn't know she had a disability until she came to the interviews. And it was an obvious physical disability and with significant challenges, and I think that, so I don't know if we were well prepared to accept her into our program, and really consider whether she would be able to meet the [the] technical standards even with reasonable accommodations.

Participant 10, in describing SWPD provided this example of poor communication, “everything that was recommended was not followed through. . . I [a student] simply have to bring the accommodation letter. She [SWPD who was not successful] didn't bring her accommodation letter. So we can't accommodate if we don't have an accommodation letter.” When talking about communication, Participant 13 had several examples to share, most clearly stating about accommodations, “you know it just doesn’t all happen on its’ own [communication on what is needed].” Participant 12 shared an experience that did not go well in terms of communication between faculty and disability office staff:

> Maybe we didn't feel as comfortable being as forthcoming about our recommendations, and we kind of just trusted that, you know, oh, they know what they're doing, which I'm not saying that they don't, that isn't my intent. It was just a new situation for both of us. And so navigating through it has been difficult for everyone involved.

*Time and resources* were additional roadblocks that arose. Participant 4 reflected on their institutional resources as a private program, “I don't think most programs would provide sign language interpreters 40 hours a week.” They continued, “I think the other another important thing is the [the] resources that it takes to support students with disabilities . . . I mean, imagine how much it costs the university to provide sign language interpreters for three years.” When Participant 2 spoke about time and resources, they did so in reference to faculty being willing to dedicate such time, recognizing it as a lot nonetheless:

> We're willing to make that extra time or time investment or shifting around things to [to] make those [those] accommodations. I think there's, [there's] been certainly

> like, whoa, boy, you know, [you know], here we go again, we got to [we got to] do this for one out of 60 [students]. It's a lot of effort going into that, to that one sometimes.

Participant 3 dedicated a lot of time to a case they described in detail, "I had the help of a retired PT assistant program director who came in and she and I went back through all the transfer techniques and guarding techniques and everything with this student individually." Considering the many pulls on faculty, this was an evident description of time and resources, one that may be a roadblock for others in different institutions or with less access to resources like time. Participant 9 shared the impact of accommodating SWPD in a clinical setting, specifically in the need to have certain software, "In doing that, it was a hefty financial investment. So her clinical experiences were limited to hospital organizations largely because our smaller private practice clinics didn't have that money that they can invest to then volunteer to host a student."

During the interviews, the sub-theme of *unilateral efforts* was implied most frequently when participants were asked about the role of faculty and faculty perceptions on SWPD in their programs. Unilateral efforts refer to situations where a faculty member may be working to support a student on their own either without collegial support or without active engagement from the SWPD. In several cases, the type of unilateral effort was one where faculty described actively reaching out and advocating for a student despite students denying or refusing these supports. Participant 10 stated, about hitting a roadblock related to unilateral efforts, "Like, I can't help you get a goniometer[3] that's

[3] A goniometer is a tool used in physical therapy practice to measure joint range of motion where the tool is placed near the joint axis and either arm of the goniometer is positioned along the adjacent limbs.

going to make that easier for you if you don't tell me." They continued to talk about modifications they had made for the student that was not followed through on:

> Recommendations for using risk splints for modifying position for doing stretching when people had tone and they [faculty] didn't see that the student took their suggestions and so they were kind of at a loss for well, now what because we've provided and we're not seeing it enacted so we don't know what else we can do to protect the student.

When Participant 12 shared an experience working with new disability office staff, they described frustrations associated with unilateral efforts:

> Because we really feel like it's been very much you do this, you do this, you do this, you do this. And like I said earlier, without a lot of collaboration, and then even a little bit of I don't want to place blame, but we had some kind of negative comments from the accommodations office and also from this student. And I think that took the wind out of our sails just a little bit because we were really trying very hard to [to] accommodate the student and do what we felt like was you know, in the best interest of the student.

Each of the participant interviews contributed to the identification of the academic supports and barriers as they detailed specific student experiences, faculty perspectives, and as they reflected on the broad spectrum of training, from the classroom to the clinic. The next section of results details information on disability models within each of the programs, in line with the secondary research question for this portion of the study.

***Disability Model Analysis*.** Among the ways disability offices and professionals interface with physical therapist programs for the development of accommodations, four

unique models were of interest in this study: Centralized, Liaison, Health Science Campus, and Program. Interview participants were asked to describe the way that their program interfaces with the disability office in the pursuit of accommodations for SWPD. Based on their descriptions, each institution was classified into one of the four models. Enrollment numbers were obtained from a public education database and the average enrollment was calculated based on the associated Disability Access Model. Table 4.12 summarizes the results.

**Table 4.12:** Disability Access Model by Institution Type

| **Disability Access Model** | **Institution Type** | **Average Student Enrollment** |
|---|---|---|
| Centralized | Private (n=6) | 3,084 |
| Liaison | Public (n=4) | 16,841 |
| Health Science Campus | Public (n=2), Private (n=1) | 20,438 |
| Program | none | n/a |

Except for one, all the private institutions were determined to be Centralized models. The average number of students across the six institutions with Centralized models was 3,084. Participant descriptions which helped in this classification included having a notification process whereby the office would notify the program of a student accommodation, or that the offices served the whole campus, rather than a smaller subset of program or programs. Participant 9 stated, “I just get a notification that a new accommodation has been uploaded,” regarding accommodations. The professionals in this model did not specialize in working with physical therapist programs, further identified by Participant 4, “I would say it's a little more general and we might work with different people depending on whom that student has connected with when this student was in our program.” Processes for accommodations in the Centralized model are not specific to one area of training. When a request comes into the office it is processed by

one of the disability professionals in the office. In some cases, the professional may have familiarity with a certain student or program, but that is not a requirement. In this model, there is a shared responsibility for student accommodations and notification, whereas other models are more specific.

The most common model for public institutions was the Liaison Model, where programs have a contact person, a liaison, who understands the demands of their programs. In the Liaison Model, the disability professional will work with specific graduate and health professions students while also servicing students in general education programs. This may include graduate students, undergraduate students, faculty, or staff. A distinguishing feature of this model is that there is someone dedicated to certain programs as a contact point. I will use my own institution as an example of the Liaison Model, the University of Minnesota. Our physical therapist program has a specific liaison who is the only person our students, faculty, and staff, interface with at the Disability Resource Center. Our liaison has spent time working with us, subsequently developing an understanding of the unique requirements our students face. This understanding helps our students obtain accommodations for improved access efficiently and effectively. Faculty have a relationship with our liaison and the liaison will regularly correspond with faculty to facilitate accommodations where needed. While we are not the only program that our assigned liaison works with, we have a clear, knowledgeable contact and a personal relationship with this disability professional. As is common in the Liaison Model, our contact learned about the special laboratory and clinical skills learners in the program will experience in their training. Knowing the details of a program helps in the development of accommodations.

Classification of a program into this model was assigned when participants discussed having a specific liaison or contact in the office. Participant 2 described their model, “They're [disability office] where they're located just serves the entire campus from undergraduate to graduate. We're primarily an undergraduate campus. But from my experience, it has been the same person that I've dealt with.” Participant 10 stated about their disability office professional, “And so that person would be bidirectional with our director and or with myself when we do clinical planning,” with regards to developing accommodations. Participant 13 identified two individuals whom their program works with, “Yeah, so there generally is, there's someone who's like the director of the office, she's actually an attorney. And then there's someone else who we also work with,” within their public institution. On average, the number of students at the institutions classified as having a Liaison model was 16,841. This figure is more than five times more than the number of students at the private institutions with Centralized models.

One of the private and two of the public institutions described having Health Science Campus Models. This model is like the Liaison model where programs have a specific person as their point of contact for the program. However, unique to this model is that the assigned liaison works only with learners in graduate or healthcare education and that the education takes place in a unique medical or graduate campus. Some of these programs are associated with large, multi-campus institutions where healthcare students train together in a smaller subset of the larger institution. These are often referred to as health science or professional centers or campuses. Knowledge of the campus setup as well as descriptors associated with a specific program liaison helped in this classification. For example, Participant 5 stated that they had a “person that was specifically our point

person for making accommodations." They continued to provide details around the expanding needs of their specific health science and professional graduate campus, that due to these expansions, the model of the disability office shifted to ensure SWPD had direct, knowledgeable disability office professionals to work with. Participant 8 said about their Health Science Campus Model, "our program helped in hiring the people to staff the office down here. They also service our medical school," as well as, "So we have just one person and recently got two so that's been good. And that person helps, those people help us implement accommodations." Participant 11 described, "I think having a centralized location that is accustomed to dealing with students that have various needs across a wide variety of health professions, I think just makes that office really strong." In these descriptions key aspects of the assigned model are evident. The average student numbers for the Health Science Campus model were the largest of the three models with 20,438 students. Table 4.13 provides an overview of the Centralized, Liaison, and Health Science Campus Models.

**Table 4.13**: Disability Model Overview

| | **Scope** | **Accommodations Process** | **Specialization** |
|---|---|---|---|
| **Centralized** | One unit serves all students on a given campus | Student or program works with anyone available in the centralized office. | General scope of knowledge to meet diverse needs across the entire institution. |
| **Liaison** | Staff from centralized unit serves specific programs; general campus where needed | Student or program works with an assigned liaison in the centralized unit. | Maintains unique knowledge base for assigned programs as well as general education |
| **Health Science Campus** | Independent unit specific to serving health and graduate programs | Student or program works with an assigned liaison in the health sciences unit. | Maintains unique knowledge base for assigned programs in the health sciences area. |

**Integrated Results**

In the final portion of analysis in this convergent mixed methods study and to most effectively understand the answers to the research questions posed, results must be integrated. From the survey information, I identified that programs that had updated technical standards in the past 5 years were significantly more likely to have SWPD admitted to their programs. After admission into the programs, however, my results indicate two factors to be statistically significant for a greater likelihood that SWPD would persist to graduation. The first factor is the availability of training on accommodations at the institution. Second, SWPD at private institutions as opposed to public ones are significantly more likely to graduate. In the qualitative portion of the study, results identified similarities between the types of disability model most seen in private or public institutions. Centralized models of disability offices were seen in smaller institutions, all private institutions. All the institutions with Liaison models were public and had many more students on average than the private institutions with Centralized models. Both public and private institutions were identified as having Health Science Campus models in this study.

Four primary themes emerged from the qualitative data. The first theme, adaptable perspectives, describes ways that programs support SWPD by having a clear philosophy of putting students first and engaging in views or actions that adapt to meet new situations with optimism and positivity. Multi-stakeholder collaboration was the second theme associated with supporting students. Evidence of multi-stakeholder collaboration was found in descriptions of using open dialogue as well as in the ways clear, frequent, and shared accountability was a part of practice within program faculty.

Two themes were identified which served as barriers to SWPD in programs: fixed mindset, where the emphasis may be more on the assumed limitations of a SWPD over recognizing their unique contributions, and roadblocks. Roadblocks show up as challenges related to communication, a lack of time, or unreciprocated, unrecognized efforts.

Integrating key findings from the quantitative and qualitative data provides a more comprehensive picture of the overall results from this study. All thirteen interview participants had described working with SWPD who had completed their programs and all participants were from institutions where training on accommodations is available. This is consistent with the quantitative analysis finding that SWPD are more likely to graduate from programs with available training on accommodations. Only two of the participants were from programs where similar training was required, though these were not the programs with the highest number of SWPD. The quantitative portion of my study found that requiring training on accommodations was not significantly associated with an increased graduation rate for SWPD. This will be discussed in Chapter 5. Technical standards were updated at four of the thirteen programs represented by the interview participants. According to the quantitative data, SWPD are more likely to be enrolled in programs where technical standards have been updated. Those interviewed reported a similar number of total SWPD at public and private institutions, however, overall student numbers were different between private and public institutions. More SWPD were reported at institutions where the disability office model was identified within a health science campus.

**Table 4.14:** Full Interview Participant Data

| Participant Number | Institution Type | Disability Model | SWPD Experiences | Training Available | Training Required | TS[a] Updated |
|---|---|---|---|---|---|---|
| 1 | Private | Centralized | 2 | Yes | No | No |
| 2 | Public | Liaison | 6 | Yes | No | No |
| 3 | Private | Centralized | 12 | Yes | Yes | No |
| 4 | Private | Centralized | 1 | Yes | No | No |
| 5 | Public | Health Science Campus | 8 | Yes | No | Yes |
| 6 | Private | Centralized | 2 | Yes | No | No |
| 7 | Private | Centralized | 6 | Yes | No | No |
| 8 | Private | Health Science Campus | 15 | Yes | No | No |
| 9 | Private | Centralized | 2 | Yes | No | Yes |
| 10 | Public | Liaison | 3 | Yes | Yes | Yes |
| 11 | Public | Health Science Campus | 10 | Yes | No | No |
| 12 | Public | Liaison | 1 | Yes | No | No |
| 13 | Public | Liaison | 1 | Yes | No | Yes |
| **Total Values** | | | Private (n=26) Public (n=29) | Yes (n=13) No (n=0) | Yes (n=2) No (n=11) | Yes (n=4) No (n=9) |

*a= technical standards*

## Summary

Sufficiently summarizing the collective information from this study helps to address the primary research questions while also giving an overview of institutions where SWPD are most likely to be admitted and be successful. Several important findings were detailed in this chapter. For example, according to my data, SWPD seeking an education in physical therapy are most likely to be found at institutions with recently updated technical standards. Those same students are more likely to successfully complete physical therapist programs in private institutions with fewer overall students and in those institutions where faculty training on accommodations is available. Despite

these institutions being smaller in overall student enrollment, the average cohort sizes were similar for physical therapist programs across public and private institutions. Within all of the institutions, greater numbers of students are seen in programs at specific health science campuses. Success therein appears related to several factors. These include having a collaborative relationship among stakeholders associated with education as well as an ability to adapt and reframe views when working through novel or difficult situations. The next and final chapter will explore the implication of these results while revisiting the overarching framework which served to guide the exploration.

# Chapter 5

## Discussion, Implications, and Conclusion

In this final chapter, I will discuss the findings associated with my study, provide connections to future practice, and outline additional research needs based on the study results. The chapter both begins and ends with the research questions in mind. Within, details relating to the underlying theories and the conceptual framework guiding the study will be discussed. The chapter concludes by calling attention to the broader implications of the findings as related to physical therapist education, as well as the implications for health professions programs and institutions of higher education overall.

### Approach to the Research Questions

At the root of this study is the fundamental desire to understand the reasons why so few SWPD are entering and subsequently completing education to become physical therapists. Given that physical therapist education occurs in higher education institutions, and in consideration of grounding theories including work by scholar Vincent Tinto, the primary research question I sought to answer was, *What are the academic factors associated with program completion for students with physical disabilities in U.S.- based Doctor of Physical Therapy programs?* Further, I sought to address the question, *What are the perceptions of physical therapist program directors and/or faculty as it relates to academic factors that support or create barriers for students with a physical disability?* Several associated, secondary research questions were included in the study. Those questions relate to SWPD and academic factors including CAPTE classification, Carnegie classification, faculty training on accommodations, revision of program technical standards within the past five years, and the Disability Office model within an

institution. Limited research is available to help address these questions within the body of work associated with physical therapist programs. Similarly, little is known about the current number of SWPD in these programs, their likelihood to graduate, and what factors may be associated with either having SWPD in the programs or the graduation rate of SWPD in physical therapist education. Given the natural interplay between these factors, a comprehensive and targeted approach was used in the application of a convergent mixed methods design. This mixed-methods design was specifically selected to ensure needed demographic information was collected on institutions, students, graduation rates, and accommodations, while also revealing the factors supporting or challenging SWPD in their educational journeys. Converging independently collected data after initial analysis allowed me to answer the primary research questions and to use the combined findings to make additional conclusions with broader implications.

**Demographic Discussion**

In the quantitative portion of the study, a survey was disseminated to physical therapist program contacts. Chapter 4 described several important details related to the survey which help to ground the results. Among these, the survey response rate was determined to be 40% and the study was sufficiently powered to address the primary research question. The specific distribution of responses was 46.7% public and 52.4% private institutions, consistent with CAPTE classification of institutions at 45% public and 55% private (*Commission on Accreditation in Physical Therapy Education*, 2021). Beyond institutional classification, Figure 4.1 provided evidence that the survey results included representation from all regions of the country. Also consistent with aggregate CAPTE data was the mean class size reported in my study of 50.77. The CAPTE reported

class size average is 46 (*Commission on Accreditation in Physical Therapy Education*, 2021). In attempting to apply findings from this study to the field of physical therapist education, these are important numbers to start with because the population represented in my results accurately represents the field. According to CAPTE, the average graduation rate across all accredited physical therapist programs is 96.5%. No studies exist to date, which report graduation rate specific to SWPD in physical therapist education, therefore my finding that the average graduation rate of SWPD is 85.83% can be considered a baseline from which to conduct further studies. Comparing the two graduation rates, SWPD and overall rate, there is an observed disparity between the two groups worth discussing. One of the first observations is that physical therapist programs have a much higher graduation rate, as compared to higher education in general, both for students with and without disabilities (Knight et al., 2018). Compared to general settings the SWPD graduation rate of 85.83% in my study could be considered to be excellent (Taylor & Cantwell, 2018). Therefore, the interpretation of my findings must be kept in the context of physical therapist education.

Within this context, the lower graduation rate connects directly to additional data derived from the study. For example, how can we account for the difference in graduation rate between students with a physical disability and the total of students (note that the total includes students with disabilities)? Factors specific to the institution, like available resources for accommodations, faculty training, and disability access models, were identified in a subset of my conceptual framework, Figure 3.1, and appear to be related to the graduation rate. These will be discussed later in this chapter. Beyond graduation rate is a compelling demographic finding from my study which situates the number of SWPD

in physical therapist programs to be <1%. Even in the limited data that does exist, numbers have been reported to be closer to 5% in physical therapist programs (Hinman et al., 2012; Lehmann & Morgan, 2019). In this vein, it is important to note that my study did not survey students themselves. I instead asked faculty to report known SWPD, therefore students who had a physical disability and did not disclose the disability to faculty would not have been included in the survey results. One of the theories that my study was based on is the Social Constructivist Theory. This theory positions disability in society, not in the person, meaning external factors could impact how disability is perceived or whether a disability is disclosed. External factors including formal academic systems are integral to social theories of disability and external factors relate to institutional departure (Asch, 1984; Tinto, 1975, 2016). As such, it is possible that students who did not have an overly visible disability or who did not seek an accommodation may not have disclosed a disability during training. While I cannot speculate how many individuals that could be, this is nonetheless worth noting.

Qualitative inquiry was an important component of my study and was used to uncover findings which are more detailed in nature, consistent with qualitative research (Boudah, 2020). Having deep descriptions of the complex settings where education of SWPD is occurring, while exploring the interactions across institution faculty, disability offices, and SWPD ensured that I was not overlooking the complexity of institutional departure described in the literature (Tinto, 1975, 1987, 2016). Thirteen faculty participated in my study, representing 7 private and 6 public institutions and 55 combined experiences with SWPD in their programs. Chapter 4 identified 4 primary themes and 15 sub-themes related to factors that are perceived as either supports or barriers to SWPD in

physical therapist education. The implications of these themes will also be discussed later in this chapter. From a demographic perspective, there was a notable degree of variation in the size of the institutions the faculty interview participants represented. The public institutions were much larger than the private institutions. Further, the type of disability access model described at the private institutions tended to be a Centralized model. Public institutions most often had Liaison models and three of the institutions (2 public, 1 private) were situated within health science campuses so had Health Science Campus disability office models. Grouping of the models along public or private institution lines in the results was not necessarily a surprise. I expected offices on larger, public campuses to have greater staff numbers therefore noting that public institutions had sufficient staffing to have an assigned liaison to work directly with the physical therapist program made sense. Similarly, the finding that private institutions would have more generalized offices where staff serve a more diverse but smaller number of students was not surprising. Those findings, however, once integrated with the survey data in the last portion of the study did provide an interesting result. The converged results will also be discussed later in this Chapter.

**Discussion of the Findings**

***Technical Standards and Accommodations.*** At the onset of this study and in justification of the methodology used to answer the research questions was a detailed overview of several theories. Chapter 1 provided necessary background on SWPD in higher education and introduced key campus-based factors which relate to SWPD including institutional resources and capacity to support a diverse student body. This Chapter also laid out the unique components related to learners specifically seeking a healthcare education.

Among those components, technical standards and accommodations in both clinical and classroom settings were covered. Chapter 2 expanded on the initial background from Chapter 1 by connecting what is known about SWPD in higher education with Tinto's Model of Institutional Departure (1975), with theories of disability access and understanding in society, along with the unique classroom and clinical environments where physical therapist education occurs to develop a conceptual framework grounding my study (Figure 2.1). Given the importance of each of the *Social* and *Academic Factors* identified in the framework, a subset of the framework was used for this study. The upper left quadrant of my conceptual framework was specific to *Academic Factors* at the level of the institution (Figure 3.1). These factors included both accommodations and disability offices as a subset of institutional resources. Results first provided in Chapter 4 directly relate to the conceptual framework quadrant in several ways. These connections allow for a rich discussion and lead to important conclusions.

In Tinto's Model of Institutional Departure (1975, 1993) multi-factorial contributors to student persistence include goals, commitments, and considerations of the internal and external factors which impact students either as supports or barriers to continued success. My study connects directly to Tinto's concepts while further applying the concepts to SWPD in physical therapist programs. One of the first connections is the finding that programs in institutions which have updated their technical standards in the past 5 years are significantly more likely to have admitted SWPD than those who have not updated technical standards in the past 5 years. Further, updated technical standards are also significantly associated with an increased likelihood that SWPD will graduate. Technical standards are unique to either a specific set of healthcare programs within an

institution or specific to an individual physical therapist program. Time and energy are needed from program faculty and from institutional legal counsel to update technical standards, therefore, simply having updated standards speaks to a degree of commitment on part of the institution itself. I consider this an example of an institutional commitment. Institutional commitments have been described in Tinto's model and related studies as being associated with student success specific to undergraduate learners (Aljohani, 2016; Tinto, 1975). While Tinto was primarily focused on undergraduates, it is important to recognize the relationship to Tinto's model found in my work. I have contributed evidence in support of the idea that commitment on part of the institution is relevant beyond the general undergraduate population. Further, that commitment can be observed at several academic levels. Technical standards span both the level of the program and the level of the institution. Commitment continues as SWPD progress and interface with academic factors like the availability of resources for accommodations both within the classroom and extending to the clinical setting. As evidenced in the support themes from my study, commitment at the level of the program relates to student success. Tinto's model may therefore be enhanced with research detailing more specifically the types of interactions at varying levels, which relate to commitments and ultimately impact the student experience.

In further considering technical standards, these are often classified as entry requirements. They are what students must attest to being able to achieve either with or without a reasonable accommodation. This means that information on accommodations also relates to the student experience for SWPD in physical therapist programs. As SWPD progress through their training, they may need accommodations to access the

classroom, lab, or clinic environments. My study examined accommodations in two ways. First, the study examined whether training on accommodations was available to faculty at a given institution. Second, it examined whether training on accommodations was required for faculty to complete at a given institution. My results were significant such that at institutions where training on accommodations was available SWPD were 1.773 times more likely to graduate from their physical therapist programs than those where training was not available. Requiring faculty to complete training on accommodations was not associated with an increased graduation rate and neither required nor available training on accommodations was found to be related to programs having admitted SWPD. Taken together, these results show that forcing training, in this case training on accommodations, may not achieve the intended or assumed result- that anyone who hears information will conform to the content therein. Rather, the availability of training may in and of itself be enough to allow those who are open to learning, open to change, and open to understanding ways that they can support learners to seek training on their own. This finding was initially surprising, given that more understanding and awareness will often lead to an improvement in attitudes as well as empathy for those with disabilities (Hong, 2015). Yet, it also reminded me of the proverb that goes, *you can lead a horse to water, but you can't make it drink*. Meaning we can make training required, but people won't engage in what they aren't ready for.

If we think of the available (not required) training as a part of a commitment necessary for student support and ultimately student success, several points are worth discussing. Again, commitment must be addressed. Commitment, as previously introduced, is one of the primary arguments made by Tinto (1975, 1993, 2016) as he

describes student retention. I believe that commitment by faculty can be seen in their willingness to seek the available training on accommodations to help support SWPD in their classrooms. In summarizing student retention, Tinto (1987) wrote, “It [retention] springs from the ongoing commitment of an institution, of its faculty and staff, to the education of its students,” (p. 187). Therefore the finding that requiring training by faculty was not significant while having training available for faculty to elect to take was significant is consistent with Tinto’s thinking of his model. Beyond this, Tinto has also described the importance of student integration into the educational setting, including classrooms as well as the broader campus. The process of integration is a complex, multidimensional experience and is directly related to classroom experiences where classrooms are “learning communities,” (Tinto, 2016, p. 616). Physical therapist classrooms are very much consistent with communities as the students spend a considerable amount of time together during their education. Therefore it is imperative that all students feel welcome, supported, and are equally able to engage in the classroom setting. The level of involvement will likely be enhanced for SWPD who have appropriately implemented accommodations. This will support involvement and persistence in-line with Tinto’s modeling (2016), detailed in the following quote, “Much depends on the degree to which student involvement is a meaningful and valued part of the classroom experience,” (p. 616). One of the areas associated with training on accommodations that was not assessed was how many faculty sought out training. Knowing this would help to strengthen the argument that faculty seek training to improve their knowledge base in an area associated with SWPD.

At an applied level, faculty must make sense of the accommodations process and assign it some value. On their own time and in their own way faculty then recognize available training and apply lessons learned to help them reframe and grow. Involvement in the process may help ensure sufficient change can be undertaken. Change processes have been the focus of higher education scholars, including Adrianna Kezar. In part because change is difficult and layered with complexity when bound in higher education spaces. Sensemaking is the term used to describe the ways that people develop new ways of making sense of things (A. Kezar, 2014). Applied beyond the focus of accommodations for SWPD, the concepts associated with sensemaking also arose in the qualitative data. The supporting theme *adaptable perspectives* and the theme associated with barriers, *fixed mindset* both relate to the idea of sensemaking. If a faculty member is one who is adaptable and open to new approaches, they are more likely to be able to support SWPD. This individual would be in a potential position to help a colleague with a *fixed mindset* begin to see things differently. Sensemaking as a change process can be facilitated by what Kezar (2014) describes as planting cues or "seeds" of the change needed (p. 71). To adopt new bases of understanding, faculty who are rooted in a *fixed mindset,* according to sensemaking theory, need to make their own sense of things (A. Kezar, 2014). My study did not specifically ask any questions which could connect individual perceptions or actions related to SWPD to the actual completion of training. Having that additional information could help connect to change theories and is one of many potential future research questions which arose because of my work.

***Accommodations in the Didactic and Clinical Setting*.** Survey responses indicated that the two primary categories of physical disability among their students over the past 10

years were hearing and visual impairments, with a variety of other types of disabilities being reported. Of interest, many more disabilities were reported than the actual number of students, indicating learners likely held more than one disability identity. This may mean that there is high variability in student presentation and in their unique needs throughout the program. Beyond this, that institutions must be able to adapt to meet the student needs as learners progress through the curriculum. Accommodations reported by survey respondents fell into several categories spanning didactic and clinical settings. Hearing and visual support were provided through a variety of accommodations including the use of interpreters, amplifiers, and magnification devices. Specialized equipment was utilized in both classroom and clinical settings. Access to equipment and American Sign Language (ASL) interpreters was also reported by interview participants when discussing accommodations. One of the unique components of working with ASL interpreters is related to clinical training where the student would be placed in a healthcare environment. In these placements, students are often required to complete detailed onboarding, which may include a background check, drug test, and providing documentation of immunization records. When an accommodation carries into a healthcare setting and involves another person like an ASL interpreter, complexity in supporting that student has additional layers as the interpreter would need to physically be in the healthcare setting. During study interviews, two participants referenced an accommodation of ASL interpreters. Participant 12 shared a story specific to the early days of the Covid Pandemic when access to healthcare settings was limited. In their experience, the addition of an ASL interpreter was more complicated in the Covid world:

> It was her accommodation that she will have a sign language [interpreter] in the entirety of these clinical rotations this semester. And I said, all right, well, you know I had concerns, especially with Covid about the [the] interpreter completing onboarding requirements for the site and just site concerns about having a whole other person coming to their site.

This summary aligns with two themes identified in my study, *multi-stakeholder collaboration,* a theme considered a support for SWPD, and *roadblocks*, a theme related to barriers for SWPD. In the case of having to utilize the accommodation of having an ASL interpreter in a clinical setting, collaboration in the management of healthcare onboarding regulations and documentation is essential for success. The absence of communication, a sub-theme under *roadblocks*, across those involved in student clinical assignments and implementation of accommodations would prohibit the ability of the ASL interpreter to be permitted to access the learning environment, in this case, the clinical setting. Time and resources is a sub-theme of the *roadblocks* theme from my study. Participant 4 reflected on the assumed cost and efforts undertaken to support a student with a hearing impairment, "Imagine how much it costs the university to provide sign language interpreters for three years." No additional information was collected related to the specific cost of providing an ASL interpreter was solicited from Participant 4 during this study, however, the description speaks directly to the costs, both financially and time-based, of accommodating SWPD.

Survey respondents also reported accommodations of modified techniques and modified schedules for students in both the clinical and classroom settings. Under the identified theme of *adaptable perspectives*, modifications in either techniques or

schedules would be considered supportive measures, those ways to value new approaches and to trust processes. Conceptually, the idea of a modification as an available accommodation could be met with questions of whether the accommodation is reasonable or whether it fundamentally alters the curriculum. Accommodations in physical therapist programs have previously appeared in the literature (Ward et al., 1998). In these cases modifications to testing administration and in the management of skill completion were considered reasonable. A similar approach in understanding, an *adaptable perspective*, helps to ground rationale associated with modifications reported in my study.

***Public and Private Institutions.*** According to my study, SWPD are significantly less likely to successfully graduate from physical therapist programs housed in public institutions as compared to private institutions. Despite this, my results found that there were no significant differences in likelihood of admission of SWPD to either a public or a private institution. Under the ADA both public and private institutions are required to meet standards related to people with disabilities and education (ADA Amendments Act of 2008, 2011; Pfeiffer, 1993; US Department of Justice, 2020), a point detailed in Chapter 1. My results point to something beyond just opening the point of access. They ask for a deeper consideration of what additional factors may be at play. The difference, in this case, is between just getting someone in the door as opposed to getting them to successfully graduate. In the latter, more resources and a greater level of commitment would potentially be needed to ensure success. One of the points made by Tinto (1987) in discussing his Model of Institutional Departure, is tied to my results whereby access will not lead to success for everyone. He wrote, “not every institution will be able to provide settings which will be conducive to all entering students,” (Tinto, 1987, p. 128). He

identified differences in the types of support that exist across public and private institutions, and that this directly relates to student success (Tinto, 1975). Specific to smaller, private institutions, “lower student-faculty ratio, may be able to enhance persistence through increased student-faculty interaction,” (Tinto, 1975, p. 116). This has been the case based on my findings.

Given their size, it may be assumed that most public institutions would have more offices, support staff, and resources available for students in general. Even so, this did not seem to translate to the individual student level, even though the size of cohorts was found to be similar for both public and private institutions in my study. Physical therapist programs function on a cohort model, with a high degree of interaction between students and faculty, and many hands-on lab classes with teaching or lab assistants on hand. Within these cohorts, students who need accommodations carried out in classrooms will need support and assurance that their access needs are met. It is possible therefore, that smaller programs can navigate their institutional spaces in a swifter, more comprehensive way to help SWPD if needed. Further, that these smaller institutions are more closely connected to their clinical partners and better positioned to ensure success in the transition from the classroom to the clinic. An additional factor may be related to faculty demands and stakeholders. For example, faculty at larger institutions with higher expectations for scholarship are more likely to be constrained by their research requirements. They may be overseeing funding from external sources and required to maintain external connections related to their research niches. Faculty at smaller, private institutions face more responsibility to meet student needs specific to education given the cost of attendance. They may have larger teaching loads and greater opportunity to

interface with their students. Carnegie classification beyond public or private was not a factor assessed in this study as survey respondents were not asked to report the specific to research activity level of their institution. I suspect that an additional study examining levels of research intensity would provide greater detail associated with the findings of my study and warrants future investigation.

***Discussion of Study Themes.*** In Chapter 4 of this work, results of qualitative inquiry and analysis were provided. The identification of four primary themes and their associated sub-themes was separated by whether the themes were supports for SWPD or barriers for SWPD. An abbreviated table shows the themes classified as either supports or barriers (Table 5.1).

**Table 5.1:** Study Themes as Either Supports or Barriers for SWPD

| **Supports** | **Barriers** |
|---|---|
| Adaptable Perspectives | Fixed Mindset |
| Multi-Stakeholder Collaboration | Roadblocks |

Tinto (1975, 1993) identified academic and social integration as student-specific components associated with persistence. Components of integration applied to SWPD and connected to my findings include both *adaptable perspectives* and *multi-stakeholder collaboration* however these findings do not appear to be specific to students alone. My study demonstrated that both students and programs, including program faculty, need to demonstrate adaptable perspectives as a component of success. Actions like maintaining an open mind in how a SWPD may progress through the program and assigning value to new ways of functioning are sub-themes which align with *adaptable perspectives*. In an analysis on student success in higher education, the importance of demonstrating flexibility, particularly during challenging times was described (Kuh et al., 2006). Applied to my results, this concept of flexibility directly aligns with the finding of

*adaptable perspectives.* When faculty are faced with new situations, new accommodations, and new student needs, a supportive stance is one consistent with adaptability. Considering the few SWPD currently in physical therapist education this is an understandable concept as most, if not all experiences, could be new for that program or faculty team.

Student success in higher education has been described through the lens of effective partnerships. These partnerships embody respectful collaboration while keeping the student in the forefront (Kuh et al., 2006). When using this foundational understanding of partnership, it is not surprising that my study identified *multi-stakeholder collaboration* as an essential factor associated with success for SWPD. My definition of *multi-stakeholder collaboration* is one the reflects a partnership, a way to collaborate. The variety of components associated with physical therapist training necessitates collaboration. For example, students who utilize accommodations to access the classroom will need to engage with Disability Resource Professionals to establish the components of those accommodations. Program administrators will likely work with the student and the disability office to review questions on implementation of accommodations prior to implementing the accommodations with the faculty. Collaboration with disability resource offices and having supportive, informed faculty have been identified as supports for students with disabilities in higher education (Scott, 2019). Participant 1 in my study described this collaborative process in the following example:

> That's the way it's structured here in terms of providing the accommodation form or the approval from [from] the center and once again, if they are comfortable,

including me in that CC so that the conversation can happen between myself, the faculty, and the person just to make sure that we are all on the same page. And if there any questions or any anything else that's necessary, that we can address it quickly.

After accommodations for the classroom environment are implemented, the transition to clinical learning could be considered a next step in *multi-stakeholder collaboration*. Even in cases where a student does not have a physical disability or an accommodation need, collaboration is essential. Clinical education comprises an average of 33% of the physical therapist curriculum according to CAPTE (*Commission on Accreditation in Physical Therapy Education*, 2021). This means that many months of training to become a physical therapist happen completely external to the physical location of the academic institution. To ensure a smooth classroom to clinic transition heightened attention to the students and their unique needs must be provided. In the clinical process, each of the learners in a physical therapist program receives a full-time clinical placement where they take on increasingly larger responsibility for patient care under the supervision of a licensed physical therapist. Collaboration between the academic program and the clinical site ensures clear performance expectations are identified and that objective assessment measures are in place. The clinical site coordinator often assigns a direct clinical instructor to supervise the student. It is the clinical instructor who is ultimately responsible for the day-to-day oversight, guidance, and assessment of the student. For SWPD, my study has indicated a variety of accommodations are used in the clinical setting. With all these factors in mind, collaboration components including specific sub-themes identified in my study are

understandably applicable. The sub-theme of *proactive approach* speaks to the importance of planning ahead and ensuring a smooth transition for the student into the clinical environment. Many study participants spoke about the ways that they collaborate proactively with clinical sites in the pursuit of student support. They also shared examples related to the sub-theme of frequent communication in planning collaboratively.

In a 2019 report specific to students with disabilities, barriers associated with access and participation in higher education were identified. These barriers were described from the lens of the disabled learner and were grouped into the following areas: work with the disability resource office, including being unaware of services, having difficulty navigating procedures, inadequate accommodations, and lacking support for self-advocacy or disclosure; classroom and instructional environment, including uniformed faculty, instructor pushback or non-responsiveness; campus access and support, with sub-areas of physical barriers and gaps in programs and services; and campus climate, which encompassed negative peer interaction, stigma, and added work of disability management (Scott, 2019). Sub-groupings of these areas reveal similar findings as my study. The 2 primary themes identified in my study which were classified as barriers for SWPD were *fixed mindset* and *roadblocks*. The *roadblocks* theme has several sub-themes which relate to the 2019 report including poor communication, time and resources, and unilateral efforts. My results found that poor communication was described in relationship to planning accommodations to be implemented at clinical sites, in ways that a lack of communication negatively impacted students in the classroom who needed accommodated access, including at times when accommodations were not fully

implemented, and as related to self-advocacy. Similarly, students with disabilities described the impact of poor communication as related to having to share more than they felt was necessary with faculty related to their disability and accommodation need (Scott, 2019). Further, they have reported faculty shying away from communication or not responding to emails related to accommodation needs (Scott, 2019).

Parallels between my study and the 2019 report help affirm the importance of awareness as a mechanism to prevent barriers for SWPD. Take my findings of time and resources and unilateral efforts under *roadblocks*. These barriers were described as having to go above and beyond for one student and as frustrations over acting or advocating without support or reciprocated efforts. Similarly, students in the 2019 report described "the added work of navigating college life as a student with a disability," (Scott, 2019, p. 13). The report went on to describe efforts undertaken by students and campus offices to advocate and noting that the efforts can be draining over time.

A *fixed mindset*, according to my results, is one that is set based on familiar means to complete a task or solve a problem. Using questions in a hostile, defensive way when interacting with SWPD demonstrated a fixed, lack of flexibility. This type of mindset and a lack of understanding of policy and accommodations has been reported in literature specific to students in medical training, both in classroom and clinical settings (Meeks et al., 2021; Nash et al., 2022). Given the similar types of training locations the medical literature is particularly applicable in affirming my findings. Awareness of when someone is fixed in their way of thinking about SWPD is a tangible action that can be used to help reframe thinking. The ability to reframe could help to minimize the impact of the *fixed mindset* barrier.

***Discussion of Integrated Results***. The integrated findings from the quantitative and qualitative components of this study help paint a picture toward understanding not only of what may enable SWPD access to a certain program, but what factors may help them sustain and succeed. Programs that had updated technical standards within the past 5 years were more likely to have admitted SWPD to their program, however this did not mean that this was the only factor of significance in having those same students graduate. Considering the additional factors from my work, this is not surprising. For example, the participant interviews revealed that there are both supports and barriers that exist and relate to SWPD. These supports and barriers are the key *Academic Factors* relevant for SWPD seeking a physical therapist education. Having *adaptable perspectives* and using *multi-stakeholder collaboration* were important for student success in my study. Students who enter a program may do so as related to the updated technical standards, however, if the program where they are training does not readily adapt to meet their unique needs, the student is less likely to succeed. In a scoping review on barriers in medical education for learners with disabilities, it was shown that multiple studies have emphasized the need for updating technical standards, but in not stopping there (Nash et al., 2022). Authors discussed the need to adopt inclusive practices, use creativity in approaches to education, and in advocating for broad inclusivity (Nash et al., 2022). These reviewed studies are consistent with my work in that I affirmed that technical standards alone are not enough. Updated standards open the door while the programs, institutions, and practices undertaken with an adaptable and collaborative lens help to ensure students succeed to graduation.

I found that the highest numbers of SWPD were reported by interview participants at those institutions where the disability models were Health Science Campus models. These models are important to note for two reasons. First, they are associated with focused campuses of learners with similar training programs. This may allow the disability professionals to become highly specialized in health sciences accommodations. Second, that there is a smaller campus in which to cover. Considering the importance of collaboration identified in this study, the smaller campus size is a likely factor contributing to success. The same collaborative factors can be said for the private institutions represented in the interviews. Total enrolled student numbers at these institutions were much smaller than at the public programs. Although not explicitly assessed, it is an important distinction to note when considering success for SWPD after program admission.

Across both quantitative and qualitative data, available training on accommodations was found to be related to successful program completion for SWPD. Interesting, however, is that a training requirement was not found to be associated with an increased likelihood of students to graduate. Given there were no additional follow-up questions specific to the training requirement, little can be taken from this finding aside from speculation. Among others, additional research in this area is warranted.

In picturing the path a student may take and the associated factors, a graphical representation can be used to summarize the study findings in an applicable way. The pathway and the associated potential impacts are identified in Figure 5.1. As shown the student is equally likely to enroll in a public or private institution, given the technical standards have been updated in the past 5 years. After admission, the student will

interface with disability resource offices, faculty, and engage in both classroom and clinical training. Supports and barriers for the student hold whether they are at a public or private institution. Available training on accommodations is associated with success overall. A distinction is made as related to institution type and disability access model. Success is likely with the set of factors shown in the top portion of the figure.

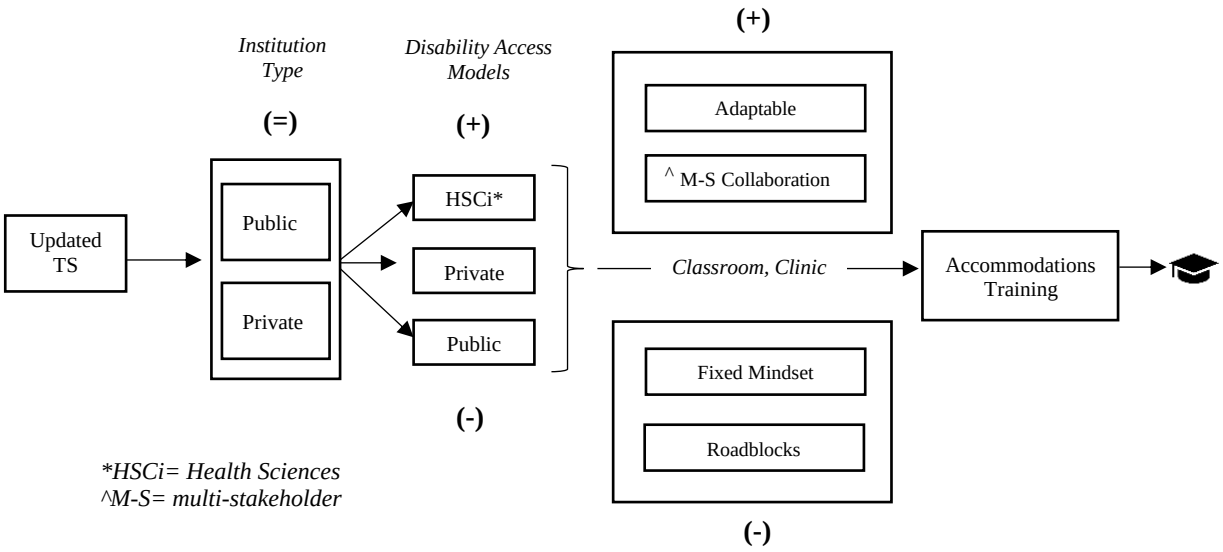



**Figure 5.1**: Pathway and Impacts, SWPD in Physical Therapist Programs

As the student progresses from left to right the successful completion of SWPD is shown where graduation is reflected by the image of a cap.

**Implications for Policy and Practice**

At the onset of my study, I sought to identify the *Academic Factors* associated with program completion for SWPD in physical therapist programs. Within the presented research findings there are several important practice implications. Evident, not only from available literature in nursing and medicine but also from my results, is the importance of addressing technical standards (Ailey & Marks, 2017; L. B. Kezar et al., 2019). Calls have been made to consider technical standards specifically in relation to the

ADA and to access, with some questioning whether technical standards are in compliance with the ADA (L. B. Kezar et al., 2019). I believe that all physical therapist programs must consider their own technical standards in a similar way. As has previously been presented, this small step is significant for improving access for SWPD and should be considered the first and most timely factor for programs desiring to improve disability diversity. Institutional policies as well as policies at the program level could be developed such that they assign a frequency under which technical standards are assessed for updates. For example, knowing that programs with updated technical standards are more likely to admit and have SWPD graduate, a policy may state that programs conduct a bi-annual or every five-year analysis of technical standards. Involvement of campus ADA officers and disability resource professionals would benefit the analysis process by being involved and providing their specific expertise.

Beyond program-level changes, the profession of physical therapy should also consider action. My results support the need for analysis and updated technical standards for the profession at the highest level, APTA. Examples from medicine indicate technical standards are outdated and directly impacting disability diversity (Stauffer et al., 2022). Given the APTA-level initiatives to diversify the profession, technical standards are implicated from the start (American Council of Academic Physical Therapy et al., 2021). The implication of technical standards is relevant within and external to physical therapist programs. While this work is selectively focused on SWPD in one profession, as was introduced early in this paper, the standards are found in many other health professions programs.

There are no current accreditation or APTA policies that speak to inclusion of students with disabilities. I believe that in order to address inclusion we need first to understand why that is the case and to consider a national reporting metric. Often, discussions I have related to disability diversity are met with feedback that we don't have ongoing or sufficient data to make any conclusions. My study certainly enhances the data; however, it does not include information on non-visible disabilities or psychological disabilities. More systematic and ongoing data collection is needed. Policies exist which require programs to report student body composition including age, race, ethnicity, and student debt. A parallel policy specific to data collection on learners with disabilities would enable the profession to better understand and therefore address this area of diversity, equity, and inclusion.

There is also an opportunity to explicitly address disability in the diversity work occurring at the professional level. Policies currently exist related to diversity in the profession. These could be expanded to intentionally include those with disabilities in the definitions and in the associated action items. Doing so could enhance the potential for funding to be directed to disability initiatives and would enable the establishment of workgroups or task forces to address new and ongoing diversity work in this area.

Institution-specific factors are implicated as important based on my study. Programs seeking to improve the likelihood for SWPD to graduate would benefit from assessing the status of their institution in different ways. Having an awareness of whether their program is public or private as explicitly related to SWPD is a first step. Reflecting on the culture, practices, and behaviors of the collective faculty, students, and interaction across clinical partners is also important. This process allows for identification of growth

areas. Programs could consider explicitly discussing philosophy related to student support as the ability to have open dialogue and clear philosophy were both components of *adaptable perspectives*, those which I found to be associated with success for SWPD. Relationships beyond clinical partners are also important to attend to and have awareness of. Disability resource professionals work across all types of campuses and with SWPD in physical therapist programs in the development of accommodations, however, accommodations alone do not ensure success. Barriers from my study, things like *fixed mindsets* and *roadblocks*, can only be attended to if active efforts are undertaken. Beyond the programs institutions themselves could consider the implications of their statuses and disability office structures in the context of supports and barriers for SWPD.

Building from the aforementioned content areas several implications from this work are more tangible in nature. These include potential for the development of resources such as a checklist for physical therapist programs to conduct an internal audit. Constructing a checklist would include things like asking when technical standards were last updated and analyzing their disability access model to consider opportunities to strengthen relationships for the sake of SWPD. Each of these items were identified from my study. In addition, the application of my identified study themes in a similar checklist could enhance dialogue and awareness needed to consider additional growth opportunities for programs.

No shortage of implications exists as a result of my study. I believe this work to be a fundamental starting point from which scholars and educators in physical therapy can engage in a largely overdue exploration of disability diversity. Often, conversations are limited by a lack of data to reference and from which to build upon. Starting with the

demographic finding, that <1% of those in physical therapist education are SWPD, progressing to known institutional factors, to consideration of accommodations training availability, to the currency of technical standards, and in taking time to recognize this timely opportunity, the data now exists. Additional research will be essential in the coming years. The subsequent section of this paper provides an overview of important research needs.

**Future Research Needs**

Tinto (1975) identified separation between academic and social domains, whereby integration could be different in either domain. This thought was in alignment with my focus on just the specific academic factors. In fact, several additional studies specific to SWPD are warranted given Tinto's established work. I can account for academic factors, but much like Tinto understood, the social factors are separate. Beyond Tinto, several other scholars have provided additional context for student persistence. Factors accounted for in these models are worth noting as related to the potential for future studies. Areas including stress, peer and faculty interactions, environment, familial culture, and intellectual or academic potential are all important in providing a rationale for ongoing scholarship (Aljohani, 2016).

Few research studies exist specific to SWPD in physical therapist education. At a minimum, this should be addressed. I believe there are key areas, which should be prioritized based on my research study. First, we need to hear from students on all sides of the aisle. Those who did not pursue physical therapy due to a disability, those who did yet were not successful, and those who completed education and are now practicing. My work detailed demographic data from programs and identified institutional factors related

to SWPD. I interviewed faculty who provided rich descriptions of perceived student factors and who described their faculty roles related to SWPD. Student voices were laterally represented in the work, but more should be done to enhance our understanding. If the profession intends to uphold the pillars of excellence, including diversity, equity, and inclusion, (American Council of Academic Physical Therapy et al., 2021), it is imperative that we have data to help drive decisions for maximal impact, data that includes all voices.

In Chapter 2 of this paper, I presented a conceptual framework depicting the integral and associated areas related to SWPD in physical therapist education. This framework was based on several scholars' work and is grounded in literature specific to health professional students with disabilities. My study focused on a single quadrant of the framework, that is specific to factors at the level of the institution including accommodations and disability offices. Given the overlapping nature of content in the framework quadrants, it was not surprising that during my study data emerged which related to the other quadrants. Areas of overlap included the identified study themes, those which applied to both the on-campus environment and to the clinical environment. My particular focus was not the clinical experiences of SWPD; however, this appears to be an important area for future research. Perspectives of those who serve as clinical instructors for SWPD and what factors they consider to be associated with success for SWPD in their settings was not assessed in this study. While I can identify specific supports and barriers from the faculty perspective, much like the perspectives of SWPD, those of clinical instructors would also be important to accurately represent.

Attitudes must also be examined as related to how SWPD are able to engage in the classroom or clinical setting, and how they are received as providers for those without disabilities in the community. As was detailed in Chapters 1 and 2 of this paper, attitudes toward people with disabilities, including students, are commonly negative, biased, and impact the student experience. My results identified factors associated with student success, however, I also identified that not all students were successful. This was particularly true in comparing graduation rates of SWPD to their non-disabled peers. Having awareness of implicit biases, and how our attitudes relate to the experiences and potential progression of SWPD is a necessary area of research.

Finally, my study focused on a specific subset of students, those with physical disabilities. Increasing numbers of health professions students are managing psychological and learning disabilities (Meeks et al., 2020). Accommodation needs and implementation factors may differ in this group of learners, and the supports or barriers for students may also be varied. To fully understand the scope of the topic will ensure the ability to effectively address areas to promote student success. There is a paucity of literature specific to students with disabilities in physical therapist education and no shortage of research to be conducted.

**Conclusion**

In closing this work I make a final connection to the questions posed and the theory most used in developing my study. Tinto (1975, 1987) identified that there are a variety of experiences which impact students during their paths to degree. He further established the role of academic factors and all that an institution encompasses as related to student experiences. My study looked at academic factors related to the student

experience to fill a gap in knowledge specific to SWPD in physical therapist programs. I believe my results demonstrate a clear connection to Tinto while advancing understanding of select academic factors related to SWPD. I was able to ground my work in what is known without compromising what was needed.

As an educator, one of the most important lessons I hope to impart to my students is importance of asking, "why"? That simple act, one of curiosity, one seeking a greater and deeper understanding is the driving force behind so much of what physical therapists do every day. The absence of the question, I believe, is the driving force behind upholding status quo in nearly everything one faces in life. In undertaking this study I sought to understand why, as a profession dedicated to improving the lives of people with disabilities, a profession who has the unique training to maximize access, and the expertise to advocate, that we see so few learners with disabilities in our classrooms who eventually graduate and join the profession. The literature available offered little insight specific to physical therapist education thereby affirming the need for answers to many questions. By engaging in a convergent mixed methods study, I found answers to help support the primary questions I developed. First, *What are the academic factors associated with program completion for students with disabilities in U.S.-based Doctor of Physical Therapy programs?* Second, *What are the perceptions of physical therapist program directors and/or faculty as it relates to academic factors that support or create barriers for students with a physical disability?* Addressing these questions resulted in a comprehensive view of the landscape of educational settings and experiences for SWPD. My work identified that there is no clear answer to either question, rather, there is a set of factors we can consider significant related to student access and ultimate success.

These factors include attention to technical standards and accommodations, two areas relevant in the literature within the health professions. Academic factors like institution type and disability access models were found to be applicable to SWPD according to my data. Beyond this, I established an overdue update to the basic demographic understanding of SWPD in the profession. From providing an updated number of SWPD in classrooms to calculating the associated graduation rate, it is this foundation from which we can proceed to more comprehensively develop supports, policies, and guidelines to improve access. Importantly, educators were able to effectively describe the contextual factors which relate to SWPD and their educational progression. From my work there is now established evidence that there are barriers for SWPD. *Fixed mindsets* where people default to familiar ways of task completion and *roadblocks* including poor communication were barriers for SWPD seeking to become physical therapists. We now also see that supports for SWPD exist in physical therapist spaces via *adaptable perspectives* and *multi-stakeholder collaboration* where dedicated educators learn to work alongside students and disability professionals to effectively meet student needs. In the introduction of his book Academic Ableism (2017), Jay Timothy Dolmage wrote, “We cannot recognize the foundations and futures of academia if we are constantly dodging the idea of disability,” (p. 11). I believe this quote is directly applicable to my work and to the ongoing work needed within the health sciences and physical therapist education. Should the pursuit of diversity be one undertaken by others as one that includes learners with disabilities, it will be the collective foundation and the collective asking, “why” which leads to new discoveries and improved access.

# Appendices

## Appendix A: Survey- Students with Physical Disabilities in PT Education

1. What is the name of your Institution?
2. What is the Carnegie Classification of your institution?
    a. Doctoral, Masters, Baccalaureate, Baccalaureate/Associate's, Associate's, Special Focus Institution, Tribal Institution
3. What is your Institutional Classification?
    a. Public, Private, Private for Profit
4. What is the primary delivery method of your program?
    a. Hybrid, Primarily online, Primarily in-person
5. Is training on accommodation implementation <u>available</u> for faculty at your institution?
    a. No, Yes
6. Is training on accommodation implementation <u>required</u> for faculty at your institution?
    a. No, Yes
7. Please identify the number of hours of training required for faculty.
    ** This can be either annually or total across the duration of the appointment*
    a. 0-5 hours, 6-9 hours, 10 hours or more
8. Have the technical standards for matriculation associated with your program been updated in the past 5 years? **Technical standards are the non-academic standards associated with admission to a healthcare program*
    a. Yes, No
9. In what region of the country is your program located?
    a. New York/New Jersey (NY, NJ)
    b. West Mountain (MT, ID, WA, OR, WY, CO, UT, NV, AZ, NM, AK)
    c. Great Lakes (WI, MI, OH, KY, IN, IL)
    d. West South Central (TX, LA)
    e. West North Central (ND, SD, MN, NE, IA, MO, KS, AR, OK)
    f. Northeast Coast (ME, VT, NH, MA, RI, CT)
    g. Middle Atlantic (PA, MD, DE, WV, VA
    h. South Atlantic (NC, SC, GA, FL, AL, MS, TN, Puerto Rico)
    i. Pacific (CA, HI)
10. Identify your academic role
    a. Program Director/Associate Director, Director of Clinical Education (DCE), Faculty (not a Program Director or DCE)
11. How many students do you admit annually (cohort size)?
    ** If your class size is changing, please use the number admitted in your last cohort*
12. How long (approximate years) have you been associated with this educational program?
13. Has your program admitted one or more students with a physical disability within the past 10 years?
    a. Yes, No

14. To the best of your knowledge, state the number of students with physical disabilities who have been admitted to your program in the past 10 years.
15. Briefly describe the nature of the disability(ies) you've encountered
    a. Hearing impairment, Visual impairment, TBI, General Orthopedic, UE/LE Amputation, Decreased strength or mobility, Cerebral Palsy, Neurological disorder, Brain Tumor, CVA, Cardiopulmonary, Bracing/orthotic use, Vocal limitation, Chronic pain, Other
16. To the best of your knowledge, identify the number of students with a physical disability who have successfully completed your educational program (i.e., graduated) in the past 10 years.
17. What <u>didactic</u> accommodations, if any, were made to facilitate the student or students' ability to successfully complete your program?
18. What <u>clinical</u> accommodations, if any, were made to facilitate the student or students' ability to successfully complete your program?

**Appendix B: Interview Guide- Students with Physical Disabilities in PT Education**

1. Please state your name and identify your current role.
2. How long have you been in this role?
3. How many students with physical disabilities have you worked with, and how would you describe your role?
4. During this time, have you worked with students with physical disabilities who have successfully completed the Doctor of Physical Therapy program?
5. Tell me about your perception of the experiences of SWPD in your program.
6. Describe the ways your program interacts with the Disability Resource Office at your institution.
7. How do students at your institution obtain accommodations?
8. Tell me about faculty and their role in supporting SWPD.
9. Can you describe some of your interactions and experiences with SWPD in your program?
10. What do you believe to be the reasons students have been successful at your institution?
11. How would you describe faculty perceptions of SWPD in your program?
12. Was there any pushback or concerns from the clinical learning environment or clinical instructors when these students were transitioning from classroom to clinic?
13. Why do you think we don't see more SWPD entering PT programs?
14. Is there anything else related to this topic you would like to share?

**Appendix C: Original Faculty Survey from Hinman, Peterson, & Gibbs (2015)**

1. In which type of educational program do you teach?
2. In what region of the country is your program located?
3. What is your gender?
4. What is your age?
5. Identify your academic role.
6. How long (approximate years) have you been associated with this educational program?
7. Does your program have an open (i.e., all who apply are accepted) or a competitive admissions process?
8. Is information on essential abilities/functions made available to program applicants? If YES, how is this information shared?
9. Which of the following statements BEST represents your opinion regarding the admission of students who have physical disabilities (as defined in the opening comments)?
10. Has your program admitted one or more students with a physical disability within the past 10 years?
    (Faculty who self-identified their program as having accepted students with physical disabilities)
11. State the number of students with physical disabilities who have been admitted to your program in the past 10 years.
12. Briefly describe the nature of the disability(ies) you've encountered.
13. Briefly describe the types of accommodations (if any) these students needed during the DIDACTIC phase of their educational program.
14. Briefly describe the types of accommodations (if any) these students needed during the CLINICAL phase of their educational program.
15. What was the average cost of these accommodations (per students), if known?
16. Who paid for these accommodations?
17. What impact, if any, did these accommodations have on your teaching?
18. If your program was unable to accommodate the needs of a student with a physical disability, what was/were the limiting factor(s)?
19. Identify the percentage of students with a physical disability who successfully completed your educational program (i.e., graduated at some point).
20. For students who did not graduate, what was their primary reason for leaving the program?
21. Has your educational program received a complaint, grievance, or lawsuit from an applicant or student claiming noncompliance with ADA regulations? If YES, what was the nature of the complaint/grievance/lawsuit?
22. Have you had any experience with students who acquired a long-term physical disability during their enrollment in your educational program? If YES, briefly describe the nature of this disability.
23. What accommodations, if any, were made to facilitate the student's ability to successfully complete your program?

24. Would you expect students who have a physical disability to have similar employment opportunities postgraduation as students who have no physical disability?
25. In your opinion, should PT/PTA licenses either: (1) restrict practice areas or skills based on physical functioning, OR (2) stipulate when accommodations are required for safe practice?

Please provide any additional comments that you feel would help us better understand the issues related to accommodating students with physical disabilities in physical therapy educational programs. We appreciate your input.

## Appendix D: IRB Exemption Letter

UNIVERSITY OF MINNESOTA

*Twin Cities Campus*

***Human Research Protection Program***
*Office of the Vice President for Research*

*Room 350-2*
*McNamara Alumni Center*
*200 Oak Street S.E.*
*Minneapolis, MN 55455*

*612-626-5654*
*irb@umn.edu*
*https://research.umn.edu/units/irb*

EXEMPTION DETERMINATION

February 15, 2022
David Weerts
612-625-2289
dweerts@umn.edu

Dear David Weerts:

On 2/15/2022, the IRB reviewed the following submission:

| | |
|---|---|
| Type of Review: | Initial Study |
| Title of Study: | Academic Factors Associated with Educational Completion for Students with Disabilities in Doctor of Physical Therapy Programs |
| Investigator: | David Weerts |
| IRB ID: | STUDY00015274 |
| Sponsored Funding: | None |
| Grant ID/Con Number: | None |
| Internal UMN Funding: | None |
| Fund Management Outside University: | None |
| IND, IDE, or HDE: | None |
| Documents Reviewed with this Submission: | Twitter, Category: Recruitment Materials;<br>AS hip-587, Category: Consent Form;<br>Interview Guide, Category: Other;<br>AS.V2.hrp-580, Category: IRB Protocol;<br>Survey, Category: Other;<br>Interview Interest Survey, Category: Other;<br>Recruitment Email, Category: Recruitment Materials; |

The IRB determined that this study meets the criteria for exemption from IRB review. To arrive at this determination, the IRB used "WORKSHEET: Exemption (HRP-312)." If you have any questions about this determination, please review that Worksheet in the HRPP Toolkit Library and contact the IRB office if needed.

This study met the following category for exemption:

(2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (ii) Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation

Ongoing IRB review and approval for this study is not required; however, this determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities impact the exempt determination, please submit a Modification to the IRB for a determination.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the HRPP Toolkit Library on the IRB website.

For grant certification purposes, you will need these dates and the Assurance of Compliance number which is FWA00000312 (Fairview Health Systems Research FWA00000325, Gillette Children's Specialty Healthcare FWA00004003).

**We strive to provide clear, consistent, and timely service to maintain a culture of respect, beneficence, and justice in research. Complete a brief survey about your experience.**

Sincerely,

Bri Warner IRB Analyst

## Appendix E: Qualtrics Survey

**Students with Physical Disabilities in DPT Education**

**Start of Block: Default Question Block**
Q21 Have you reviewed the information sheet associated with this study?

- No (1)
- Yes (2)

*Display This Question:*
*Have you reviewed the information sheet associated with this study? = No*
Q24 Please review the information sheet prior to accessing the survey.

Q22 The following criteria are required for participation: A program chair, program director, associate director, or core faculty member in the PT program, Hold a physical therapist license in the U.S.

Based on these criteria, are you eligible and do you agree to participate?

- Yes (1)
- No (2)

*Skip To: QID19 If The following criteria are required for participation: A program chair, program director, associate director = No*
Q1 What is the name of your Institution?

** This is required in order to confirm that only 1 survey per institution is completed* _____
_

Q2 What is the Carnegie Classification of your institution?
*Lookup information:* https://carnegieclassifications.iu.edu/lookup/lookup.php

- Doctoral (1)
- Masters (2)
- Baccalaureate (3)
- Baccalaureate/Associate's (4)
- Associate's (5)
- Special Focus Institution (6)
- Tribal Institution (7)

Q3 What is your Institutional Classification?

- Public (1)
- Private (2)
- Private for Profit (3)

Q4 What is the primary delivery method of your program?

- Hybrid (1)
- Primarily online (2)
- Primarily in-person (3)

Q5 Is training on accommodation implementation <u>available</u> for faculty at your institution?

- No (1)
- Yes (2)

Q6 Is training on accommodation implementation <u>required</u> for faculty at your institution?

- No (1)
- Yes (2)

*Skip To: Q8 If Is training on accommodation implementation required for faculty at your institution? = No*

*Display This Question:*
*If Is training on accommodation implementation required for faculty at your institution? = Yes*
Q7 Please identify the number of hours of training required for faculty.

** Total across the duration of the appointment*

- 0-5 hours (1)
- 6-9 hours (2)
- 10 hours or more (3)

Q8 Have the technical standards for matriculation associated with your program been updated in the past 5 years?
**Technical standards are the non-academic standards associated with admission to a healthcare program*

- Yes (1)
- No (2)

Q9 In what region of the country is your program located?

- ○ New York/New Jersey (NY, NJ) (1)
- ○ West Mountain (MT, ID, WA, OR, WY, CO, UT, NV, AZ, NM, AK) (2)
- ○ Great Lakes (WI, MI, OH, KY, IN, IL) (3)
- ○ West South Central (TX, LA) (4)
- ○ West North Central (ND, SD, MN, NE, IA, MO, KS, AR, OK) (5)
- ○ Northeast Coast (ME, VT, NH, MA, RI, CT) (6)
- ○ Middle Atlantic (PA, MD, DE, WV, VA) (7)
- ○ South Atlantic (NC, SC, GA, FL, AL, MS, TN, Puerto Rico) (8)
- ○ Pacific (CA, HI) (9)

Q10 Identify your academic role

- ○ Program Director/Associate Director (1)
- ○ Director of Clinical Education (DCE) (2)
- ○ Faculty (not a Program Director or DCE) (3)

Q11 How many students do you admit annually (cohort size)?
** If your class size is changing, please use the number admitted in your last cohort*
_____

Q12 How long (approximate years) have you been associated with this educational program?
Q13 Has your program admitted one or more students with a physical disability within the past 10 years?

*For the purposes of this study, a physical disability is defined as a condition resulting in sensory or motor limitation (including vision or hearing limitation).*

- ○ Yes (1)
- ○ No (2)

*Display This Question:*
*If Has your program admitted one or more students with a physical disability within the past 10 year... = Yes*
Q14 To the best of your knowledge, state the number of students with physical disabilities who have been admitted to your program in the past 10 years.
_____

*Display This Question:*

*If Has your program admitted one or more students with a physical disability within the past 10 year... = Yes*
Q15 Identify the nature of the disability(ies) you've encountered

- ☐ Hearing impairment (1)
- ☐ Visual impairment (2)
- ☐ TBI (3)
- ☐ General Orthopedic (4)
- ☐ UE/LE Amputation (5)
- ☐ Decreased strength or mobility (6)
- ☐ Cerebral Palsy (7)
- ☐ Neurological disorder (8)
- ☐ Brain Tumor (9)
- ☐ CVA (10)
- ☐ Cardiopulmonary (11)
- ☐ Bracing/orthotic use (12)
- ☐ Vocal limitation (13)
- ☐ Chronic pain (14)
- ☐ Other (15) _____

*Display This Question:*
*If Has your program admitted one or more students with a physical disability within the past 10 year... = Yes*
Q16 To the best of your knowledge, identify the number of students with a physical disability who have successfully completed your educational program (i.e., graduated) in the past 10 years.
_____

*Display This Question:*
*If Has your program admitted one or more students with a physical disability within the past 10 year... = Yes*
Q17 What <u>didactic</u> accommodations, if any, were made to facilitate the student or students' ability to successfully complete your program?
_____
_____

*Display This Question:*
*If Has your program admitted one or more students with a physical disability within the past 10 year... = Yes*

Q18 What clinical accommodations, if any, were made to facilitate the student or students' ability to successfully complete your program?

_____

_____

Q25 You have reached the end of the survey. Thank you for your time and participation!
**End of Block: Default Question Block**

## References

ADA Amendments Act of 2008, Pub. L. No. 3406, 357 (2011). https://www.eeoc.gov/statutes/ada-amendments-act-2008

ADA National Network. (2020). *What is the Americans with Disabilities Act (ADA)?* https://adata.org/learn-about-ada

Ailey, S. H., & Marks, B. (2017). Technical standards for nursing education programs in the 21st century. *Rehabilitation Nursing*, *42*(5), 245–253. https://doi.org/10.1002/rnj.278

Akin, D., & Huang, L. M. (2019). Perceptions of College Students with Disabilities. *Journal of Postsecondary Education and Disability*, *32*(1), 21–33.

Albanese, M. (1999). Rating educationl quality: Factors in the erosion of professional standards. *Academic Medicine*, *74*(6), 652–658.

Aljohani, O. (2016). A Comprehensive Review of the Major Studies and Theoretical Models of Student Retention in Higher Education. *Higher Education Studies*, *6*(2), 1–18. https://doi.org/10.5539/hes.v6n2p1

American Council of Academic Physical Therapy, American Physical Therapy Association, & APTA Academy of Education. (2021). A Vision for Excellence in Physical Therapy Education. *Journal of Physical Therapy Education*, *35*(Supplement 1), 1–35. https://doi.org/10.1097/JTE.0000000000000216

*American Physical Therapy Association*. (2019). http://www.apta.org/ScopeOfPractice/

American Physical Therapy Association. (2020). *House of Delegates Post-House Packet HOD P06-14-13-08*. https://www.apta.org/apta-and-you/leadership-and-governance/house-of-delegates

Anuradha, J., Jabbarpour, Y., Pollack, J., Huerto, W. S., & Petterson, S. (2021). Patient-

Physician Racial Concordance Associated with Improved Healthcare Use and Lower Healthcare Expenditures in Minority Populations. *Journal of Racial Ethnic Healthcare Disparities*. https://doi.org/10.1007/s40615-020-00930-4

Asch, A. (1984). The experience of disability: A challenge for psychology. *American Psychologist*, *39*(5), 529–536. https://psycnet-apa-org.ezp3.lib.umn.edu/fulltext/1984-28751-001.pdf

Atkinson, K., & Hutchinson, J. O. (2012). Transition from higher education to National Health Service for visually impaired physiotherapists: An interpretative phenomenological exploration. *The British Journal of Visual Impairment*, *31*(1), 32–46. https://doi.org/10.1177/0264619612466101

Bingham, A. J., & Witkowsky, P. (2022). Deductive and inductive approaches to qualitative data analysis. In C. Vanover, P. Mihas, & J. Saldaña (Eds.), *Analyzing and interpreting qualitative data: After the interview* (pp. 133–146). Sage Publications. https://www.andreajbingham.com/resources-tips-and-tricks/deductive-and-inductive-approaches-to-qualitative-analysis

Blacklock, B., & Montgomery, T. (2016). *Understand technical standards in health science and medical education*. *21*(11), 7. https://doi.org/10.1002/dhe

Boudah, D. J. (2020). *Conducting Educational Research* (2nd ed.). SAGE PublicationsSage UK: London, England.

Coffey, D. M. (2001). "The Experience of Being an Occupational Therapist With a Disability": What About Being a Student? *American Journal of Occupational Therapy*, *55*(3), 352–352. https://doi.org/10.5014/ajot.55.3.352a

*Commission on Accreditation in Physical Therapy Education*. (2021).

http://www.capteonline.org/home.aspx

Creal, D., Koopman, S. J., & Lucas, A. (2013). Generalized Autoregressive Score Models with Applications. *Journal of Applied Econometrics*, *28*(5), 777–795. https://doi.org/10.1002/JAE.1279

Creswell, J. W., & Creswell, J. D. (2018). *Research Design: Qualitative, Quantitative, and Mised Methods Approaches* (5th ed.). SAGE PublicationsSage UK: London, England.

Crocker, A. F., & Smith, S. N. (2019). Person-first language: are we practicing what we preach? *Journal of Multidisciplinary Healthcare*, *12*, 125–129.

Da Silva, C. P., Bhatt, A., Avant, E. B., Morar, R. T., Ebrahim, S., & Patel, R. (2017). Experiences of students, teachers, and physical therapists from blind people's association in Ahmedabad, India: A qualitative study. *Journal of Physical Therapy Education*, *31*(3), 45–53. https://journals.lww.com/jopte/Fulltext/2017/31030/Experiences_of_Students,_Teachers,_and_Physical.11.aspx

Davidson, S. (1994). The Americans with Disabilities Act and essential functions in nursing programs. *Nurse Educator*, *19*(2), 31–34.

Demidenko, E. (2007). Sample size determination for logistic regression revisited. *Statistics in Medicine*, *26*(18), 3385–3397. https://doi.org/10.1002/SIM.2771

Denhart, H. (2008). Deconstructing barriers: Perceptions of students labeled with learning disabilities in higher education. *Journal of Learning Disabilities*, *41*(6), 483–497. https://doi.org/10.1177/0022219408321151

Essex-Sorlie, D. (1994a). The Americans with Disabilities Act: I. History, summary, and

key components. *Academic Medicine*, *69*(7), 519–524.

Essex-Sorlie, D. (1994b). The Americans with Disabilities Act: II. Implications and suggestions for compliance for medical schools. *Academic Medicine*, *69*(7), 525–534.

Evans Getzel, E. (2008). *Addressing the Persistence and Retention of Students with Disabilities in Higher Education: Incorporating Key Strategies and Supports on Campus*. *16*(4), 207–219. https://doi.org/10.1080/09362830802412216

Evans, P. R. (1978). Accreditation, vehicle for change. Part I. *Physical Therapy*, *58*(2), 151–155. https://doi.org/10.1093/ptj/58.2.151

Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs-principles and practices. *Health Services Research*, *48*(6pt2), 2134–2156. https://doi.org/10.1111/1475-6773.12117

Ficuello, J., Lichtman, S. W., Whalen, J., & Campo, M. (2019). Evaluating the perceived competency of a physical therapist with a new disability. *Physical Therapy Journal of Policy, Administration and Leadership*, *19*(4), 17–25.

Francis, N. J., Salzman, A., Polomsky, D., & Huffman, E. (2007). Accommodations for a student with a physical disability in a professional physical therapist education program. *Journal of Physical Therapy Education*, *21*(2). https://journals.lww.com/jopte/Fulltext/2007/07000/Accommodations_for_a_Student_With_a_Physical.10.aspx

Gallagher, H. C. (2010). New fitness-to-practice requirements for pharmacists in Ireland: Implications for undergraduate pharmacy education. *Medical Teacher*, *32*(2), 71–78. https://doi.org/10.3109/01421590903199635

Goodley, D., Hughes, B., & Davis, L. (2012). Introducing Disability and Social Theory. In D. Goodley, B. Hughes, & L. Davis (Eds.), *Disability and social theory: New developments and directions* (pp. 1–14). Palgrave Macmillan UK.

Gostin, L. O. (2015). The Americans with disabilities act at 25 the highest expression of American values. *JAMA*, *313*(22), 2231–2235. https://doi.org/10.1001/jama.2015.6405

Guiffrida, D. A. (2006). Toward a cultural advancement of Tinto's theory. *Review of Higher Education*, *29*(4), 451–472. https://doi.org/10.1353/rhe.2006.0031

Hahn, H. (1985). Disability Policy and the Problem of Discrimination. *American Behavioral Scientist*, *28*(3), 293–318. https://doi.org/10.1177/000276485028003002

Harbour, W. S., & Greenberg, D. (2017). *NCCSD Research Brief Campus Climate and Students with Disabilities*. www.NCCSDonline.org

Hargreaves, J., Dearnley, C., Walker, S., & Walker, L. (2014). The preparation and practice of disabled health care practitioners: exploring the issues. *Innovations in Education and Teaching International*, *51*(3), 303–314. https://doi.org/10.1080/14703297.2013.778048

Hendrickson, S., Lyden, S., Tarter, C., Banaitis, D., & Cicirello, N. (1998). Implementation of the Americans with Disabilities Act into physical therapy programs. *Journal of Physical Therapy Education*, *12*(2), 9–15.

Hinman, M. R., Peterson, C. A., & Gibbs, K. A. (2012). Prevalence of physical disability and accommodation needs among students in physical therapy education programs. *Journal of Postsecondary Education and Disability*, *28*(3), 309–328. https://www.ahead.org/publications/jped%0Ahttps://eric.ed.gov/?id=EJ1083842

Hinman, M. R., Peterson, C. A., & Gibbs, K. A. (2015). Educating students with disabilities: Are we doing enough? *Journal of Physical Therapy Education, 29*(4), 37–41. https://doi.org/10.1097/00001416-201529040-00006

Hong, B. S. S. (2015). Qualitative Analysis of the Barriers College Students With Disabilities Experience in Higher Education. *Journal of College Student Development*, *56*(3), 209–226. https://doi.org/10.1353/csd.2015.0032

Horkey, E. (2019). An Exploration of the Clinical Accommodation Process for Nursing Students with Physical Disabilities Using Grounded Theory. *International Journal of Nursing Education Scholarship*. https://doi.org/10.1515/ijnes-2018-0010

Huger, M. S. (2011). Fostering a disability-friendly institutional climate. *New Directions for Student Services*, *2011*(134), 3–11. https://doi.org/10.1002/ss.390

Ingram, D. (1997). Opinions of physical therapy education program directors on essential functions. *Physical Therapy*, *77*(1), 37–45. https://doi.org/10.1093/ptj/77.1.37

Jette, A. (2022). "The Paradox of Physical Therapy." *Physical Therapy and Rehabilitation Journal*, *102*, 1–2. https://doi.org/10.1093/ptj/pzac013

Jones, S. R. (1996). Toward Inclusive Theory. *NASPA Journal*, *33*(4), 347–354. https://doi.org/10.1080/00220973.1996.11072421

Kezar, A. (2014). *How Colleges Change: Understanding, Leading, and Enacting Change* (1st ed.). Routledge.

Kezar, L. B., Kirschner, K. L., Clinchot, D. M., Laird-Metke, E., Zazove, P., & Curry, R. H. (2019). Leading Practices and Future Directions for Technical Standards in Medical Education. *Academic Medicine*, *94*(4), 520–527. https://doi.org/10.1097/ACM.0000000000002517

Knight, W., Wessel, R. D., & Markle, L. (2018). Persistence to Graduation for Students With Disabilities: Implications for Performance-Based Outcomes. *Journal of College Student Retention: Research, Theory & Practice*, *19*(4), 362–380. https://doi.org/10.1177/1521025116632534

Kroeger, S., & Schuck, J. (1993). Moving Ahead: Issues, Recommendations, and Conclusions. *New Directions for Student Services*, *64*, 103–110.

Kuh, G. D., Kinzie, J., Buckley, J. A., Bridges, B. K., & Hayek, J. C. (2006). *What Matters to Student Success: A Review of the Literature Commissioned Report for the National Symposium on Postsecondary Student Success: Spearheading a Dialog on Student Success*.

Kutscher, E. L., & Tuckwiller, E. D. (2019). Persistence in higher education for students with disabilities: A mixed systematic review. *Journal of Diversity in Higher Education*, *12*(2), 136–155. https://doi.org/10.1037/dhe0000088

Lehmann, B. C., & Morgan, A. (2019). *The Journey of PTs With Disabilities : Challenges and Contribution*. *March*, 1–9.

Liasidou, A., & Mavrou, K. (2017). Disability rights in higher education programs: The case of medical schools and other health-related disciplines. *Social Science & Medicine*, *191*, 143–150. https://doi.org/10.1016/j.socscimed.2017.09.009

Madaus, J. W. (2011). The History of Disability Services in higher education. *New Directions for Higher Education*, *2011*(154), 5–15. https://doi.org/10.1002/he.429

Marks, B., & Ailey, S. (2014). *White paper on inclusion of students with disabilities in nursing educational programs.*

Masinter, M. R. (2015). Avoid the word “reasonable” in accommodations policy.

*Disability Compliance for Higher Education*, *21*(3), 3. https://doi.org/10.1002/dhe

Matt, S. B., Maheady, D., & Fleming, S. E. (2012). Educating nursing students with disabilities: replacing essential functions with technical standards for program entry criteria. *Journal of Postsecondary Education and Disability*, *28*(4), 461–468.

Meeks, L. M., Case, B., Plegue, M. A., Moreland, C., Jain, S., & Taylor, N. (2020). National prevalence of disability and clinical accommodations in medical education. *Journal of Medical Education and Curricular Development*, *7*, 1–4.

Meeks, L. M., Case, B., Stergiopoulos, E., Evans, B. K., & Petersen, K. H. (2021). Structural Barriers to Student Disability Disclosure in US-Allopathic Medical Schools. *Journal of Medical Education and Curricular Development*, *8*, 238212052110186. https://doi.org/10.1177/23821205211018696

Meeks, L. M., & Jain, N. R. (2016). *The guide to assisting students with disabilities: Equal access in health science and professional education* (L. M. Meeks & N. R. Jain (Eds.); 1st ed.). Springer US.

Meeks, L. M., & Neal-Boylan, L. (Eds.). (2020). *Disability as Diversity* (1st ed.). Springer US.

Meeks, L. M., & Sullivan, L. (2019). Appropriately staffing DS offices in health science education. *Disability Compliance for Higher Education*, *24*(6), 1–5. https://doi.org/10.1002/DHE.30564

Miller, S., Ross, S., & Cleland, J. (2009). Medical students' attitudes towards disability and support for disability in medicine. *Medical Teacher*, *31*(6), e272–e277. https://doi.org/10.1080/01421590802516814

Moseholm, E., & Fetters, M. D. (2017). Conceptual models to guide integration during

analysis in convergent mixed methods studies: *Methodological Innovations*, *10*(2), 1–11. https://doi.org/10.1177/2059799117703118

Nash, R., Conner, B., Fellows, K., Clemmensen, B., Gullickson, R., & Goldrup, S. (2022). Barriers in medical education: a scoping review of common themes for medical students with disabilities. *Discover Education*, *1*(1). https://doi.org/10.1007/S44217-022-00003-0

Newman, L. A., Madaus, J. W., Lalor, A. R., & Javitz, H. S. (2020). Effect of Accessing Supports on Higher Education Persistence of Students With Disabilities. *Journal of Diversity in Higher Education*, *14*(3), 353–363. https://doi.org/10.1037/dhe0000170

Okoro, C. A., Hollis, N. D., Cyrus, A. C., & Griffin-Blake, S. (2018). Prevalence of Disabilities and Health Care Access by Disability Status and Type Among Adults — United States, 2016. *MMWR. Morbidity and Mortality Weekly Report*, *67*(32), 882–887. https://doi.org/10.15585/mmwr.mm6732a3

Opie, J., & Taylor, M. C. (2008). An exploratory Delphi study on the integration of disabled students into physiotherapy education. *Physiotherapy*, *94*(4), 292–299. https://doi.org/10.1016/j.physio.2008.05.008

Paris, M. J. (1993). Attitudes of Medical Students and Health-Care Professionals Toward People With Disabilities. *Archives of Physical Medicine and Rehabilitation*, *74*, 818–825.

Pfeiffer, D. (1993). Overview of the disability movement: History, legislative record, and political implications. *Policy Studies Journal*, *21*(4), 724–734.

Portney, L. G., & Watkins, M. P. (2009). *Foundations of Clinical Research Applications to Practice* (3rd ed.). Prentice Hall.

Public Law 110 – 233 110th Congress An Act, Pub. L. No. 3553, US Government 7 (2008).

Quinn, M. P. (2015). *Qualitative Research and Evaluation Methods* (4th ed.). SAGE Publications Sage UK: London, England.

Rangel, A., Wittry, A., Boucher, B., & Sanders, B. (2001). A Survey of Essential Functions and Reasonable Accommodations in Physical Therapist Education Programs. *Journal of Physical Therapy Education*, *15*(1), 11–19.

Reichgott, M. J. (1996). Without handicap: Issues of medical schools and physically disabled students. *Academic Medicine*, *71*, 724–729.

Rhodes, R. S., Davis, D. C., & Odom, B. C. (1999). Challenges and rewards of educating a profoundly deaf student. *Nurse Educator*, *24*(3), 48–51.

Rothstein, L. F. (1997). Health care professionals with mental and physical impairments: Developments in disability discrinimation law. *Saint Louis University Law Journal*, *41*, 973–1004.

Rothstein, L. F. (2009). Higher Education and Disability Discrimination: A Fifty Year Retrospective. *Journal of College and University Law*, *36*(3), 843–874. https://heinonline.org/HOL/Page?handle=hein.journals/jcolunly36&id=893&div=29&collection=journals

Rothstein, L. F. (2015). Impaired physicians and the ADA. *JAMA - Journal of the American Medical Association*, *313*(22), 2219–2220. https://doi.org/10.1001/jama.2015.4602

Roush, S. E., & Sharby, N. (2011). Disability reconsidered: The paradox of physical therapy. *Physical Therapy*, *91*(12), 1715–1727.

Satchidanand, N., Gunukula, S. K., Lam, W. Y., McGuigan, D., New, I., Symons, A. B., Withiam-Leitch, M., & Akl, E. A. (2012). Attitudes of healthcare students and professionals toward patients with physical disability: A systematic review. In *American Journal of Physical Medicine and Rehabilitation* (Vol. 91, Issue 6, pp. 533–545). https://doi.org/10.1097/PHM.0b013e3182555ea4

Saunders, B., Sim, J., Kingstone, T., Shula Baker, •, Waterfield, J., Bartlam, • Bernadette, Burroughs, • Heather, & Jinks, C. (2018). Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant, 52*, 1893–1907. https://doi.org/10.1007/s11135-017-0574-8

Scott, S. (2019). *NCCSD Research Brief Access and Participation in Higher Education: Perspectives of College Students with Disabilities Access and Participation in Higher Education: Perspectives of College Students with Disabilities*. www.NCCSDonline.org

Shannon, J. P. (1998). Who is an otherwise qualified law student? A need for law schools to develop technical standards. *University of Florida Journal of Law and Public Policy*, *10*, 57–84.

Sharp, A., & Herrman, D. (2021). Disability and Physical Therapy: A Complicated Relationship, an Uncertain Path Forward. *Physical Therapy*, *101*(7). https://doi.org/10.1093/PTJ/PZAB085

Shrewsbury, D. (2015). Disability and participation in the professions: examples from higher and medical education. *Disability and Society*, *30*(1), 87–100. https://doi.org/10.1080/09687599.2014.982785

Snashall, D. (2009). Doctors with disabilities: licensed to practise? *Clinical Medicine,*

*9*(4), 315–319. https://doi.org/10.7861/clinmedicine.9-4-315

Sowers, J. A., & Smith, M. R. (2004). Nursing faculty members' perceptions, knowledge, and concerns about students with disabilities. *Journal of Nursing Education, 43*(5), 213–218. https://doi.org/10.3928/01484834-20040501-03

Squires, M. E., & Countermine, B. (2018). College Students with Disabilities Explain Challenges Encountered in Professional Preparation Programs. *Exceptionality Education International, 28*(1), 22–44.

Stauffer, C., Case, B., Moreland, C. J., & Meeks, L. M. (2022). Technical Standards from Newly Established Medical Schools: A Review of Disability Inclusive Practices. *Journal of Medical Education and Curricular Development, 9*, 238212052110727. https://doi.org/10.1177/23821205211072763

Stergiopoulos, E., Fernando, O., & Martimianakis, M. A. (2018). "Being on Both Sides." *Academic Medicine, 93*(10), 1550–1559. https://doi.org/10.1097/ACM.0000000000002300

Taylor, B. J., & Cantwell, B. (2018). Unequal higher education in the United States: Growing participation and shrinking opportunities. *Social Sciences, 7*(9), 167. https://doi.org/10.3390/SOCSCI7090167

*The Carnegie Classification of Institutions of Higher Education*. (2021). https://carnegieclassifications.iu.edu/

*The Integrated Postsecondary Education Data System*. (2021). U.S. Department of Education, National Center for Education Statistics. https://nces.ed.gov/ipeds/

Thompson, T. L. (2018). Disability resources in higher education, part 2: Mission and role of disability resources and services. *Dean and Provost, 19*(7), 7–7.

https://doi.org/10.1002/dap.30431

Tinto, V. (1975). Dropout from Higher Education: A Theoretical Synthesis of Recent Research. *Review of Educational Research*, *45*(1), 89–125.

Tinto, V. (1987). *Leaving College: Rethinking the Causes and Cures of Student Attrition*. The University of Chicago Press.

Tinto, V. (1993). *Leaving College: Rethinking the Causes and Cures of Student Attrition. Second Edition.* (2nd ed.). University of Chicago Press, 5801 South Ellis Avenue, Chicago, IL 60637 ($24.95).

Tinto, V. (2016). Classrooms as Communities. *The Journal of Higher Education*, *68*(6), 599–623. https://doi.org/10.1080/00221546.1997.11779003

Tsang, H. W., Chan, F., & Chan, C. C. (2004). Factors Influencing Occupational Therapy Students' Attitudes Toward Persons With Disabilities: A Conjoint Analysis. *American Journal of Occupational Therapy*, *58*(4), 426–434.

US Department of Justice. (2020). *ADA Homepage*. https://www.ada.gov/index.html

Vaccaro, A., Daly-Cano, M., & Newman, B. M. (2015). A sense of belonging among college students with disabilities: An emergent theoretical model. *Journal of College Student Development*, *56*(7), 670–686. https://doi.org/10.1353/csd.2015.0072

VanMatre, R. M., Nampiaparampil, D. E., Curry, R. H., & Kirschner, K. L. (2004). Technical Standards for the Education of Physicians with Physical Disabilities: Perspectives of Medical Students, Residents, and Attending Physicians. *American Journal of Physical Medicine and Rehabilitation*, *83*(1), 54–60. https://doi.org/10.1097/01.PHM.0000104670.37735.80

Walsh, L. A. (1998). Technical standards in education programs. *PT: Magazine of*

*Physical Therapy*, *6*(2), 28–29.

Ward, R. S., Ingram, D. A., & Mirone, J. A. (1998). Accommodations for students with disabilities in physical therapist and physical therapist assistant education programs: A pilot study. *Journal of Physical Therapy Education*, *12*(2), 16–21.

Wertlieb, E. C. (1985). Minority Group Status of the Disabled. *Human Relations*, *38*(11), 1047–1063. https://doi.org/10.1177/001872678503801104

Wessel, R. D., Jones, J. A., Markle, L., & Westfall, C. (2009). Retention and Graduation of Students with Disabilities: Facilitating Student Success. *Journal of Postsecondary Education and Disability*, *21*(3), 116–125.

Williams, M., & Moser, T. (2019). The Art of Coding and Thematic Exploration in Qualitative Research. *International Management Review*, *15*(1), 45–55.

World Physiotherapy. (2016). *WCPT Briefing Paper: Access to physical therapist education and practice for people with disabilities* (Issue February). https://world.physio/resources/publications

Yssel, N., Pak, N., & Beilke, J. (2016). A Door Must Be Opened: Perceptions of Students with Disabilities in Higher Education. *International Journal of Disability, Development and Education*, *63*(3), 384–394. https://doi.org/10.1080/1034912X.2015.1123232

Zhang, Z., & Yuan, K.-H. (2018). *Practical Statistical Power Analysis Using Webpower and R*. ISDSA Press. https://www.researchgate.net/publication/328388862_Practical_Statistical_Power_Analysis_Using_Webpower_and_R